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# Responding to the opioid and overdose crisis with innovative services: The recovery community center office-based opioid treatment (RCC-OBOT) model

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## HIGHLIGHTS

- RCC-OBOT model developed in partnership with medical, clinical, & community-based partners.
- The model combines novel innovations that show efficacy in responding to the opioid crisis.
- Engaging higher-risk individuals in the community may improve retention and outcomes.

## ARTICLE INFO

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## ABSTRACT

Opioid use disorder (OUD) and opioid-related overdose mortality are major public health concerns in the United States. Recently, several community-based and professional innovations - including hybrid recovery community organizations, peer-based emergency department warm handoff programs, emergency department buprenorphine induction, and low-threshold OUD treatment programs - have emerged or expanded in an effort to address significant obstacles to providing patients the care needed for OUD and to reduce the risk of overdose. Additional innovations are needed to address the crisis. Building upon the foundational frameworks of each of these recent innovations, a new model of OUD pharmacotherapy is proposed and discussed: the Recovery Community Center Office-Based Opioid Treatment model. Additionally, two potential implementation scenarios, the overdose and non-overdose event protocols, are detailed for communities, peers, and practitioners interested in implementing the model. Potential barriers to implementation of the model include service reimbursement, licensing regulations, and organizational concerns. Future research should seek to validate the model and to identify actual implementation and sustainability barriers and best practices.

## 1. Introduction

Overdose mortality continues to rise in the United States, with over 72,000 overdose deaths provisionally reported in 2017 (Ahmad, Rossen, Spencer, Warner, & Sutton, 2018). This trend has steadily increased for the last 17 years - at a rate of 10% per year from 1999 to 2006, 3% per year from 2006 to 2014, and a rate of 18% per year from 2014 to 2016 (Hedegaard, Warner, & Miniño, 2017). Opioid-related overdose mortality has also increased dramatically in the time period with 42,249 overdose deaths in 2016 involving opioids of any type (Hedegaard et al., 2017).

Prevalence of past-year individual opioid use also points to the severity of the public health crisis with 11.4 million Americans aged-12 or older reporting past-year use (Substance Abuse and Mental Health

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Services Administration [SAMHSA], 2018a, 2018b, 2018c). Additional indicators of the scope of the problem include new initiates of opioid use, 2.08 million Americans aged-12 or older in 2017, and the estimates of past-year opioid use disorder (OUD), 2.1 million Americans aged-12 or older in 2017 (SAMHSA, 2018a, 2018b, 2018c). Taken together, the continued rise in overdose mortality, heavily impacted by opioid-related overdose deaths, and the prevalence of use, misuse, and OUD, are perhaps the largest modern-day public health concerns that the United States has ever experienced. Several recent innovations and advancements in the field have sought to stem the crisis yet it persists.

Common strategies to address OUD and opioid-related overdose events include OUD pharmacotherapy (i.e., medication-assisted treatment; SAMHSA, 2018a, 2018b, 2018c) and harm reduction strategies such as naloxone distribution (Wheeler, Davidson, Jones, & Irwin, 2012). However, barriers to OUD treatment initiation and engagement exist with less than 20% of individuals who need OUD treatment receiving it (Wu, Zhu, & Swartz, 2016). In addition, restrictive regulations for the provision of OUD pharmacotherapy, such as who can prescribe medications and in what settings, limit the impact such strategies can have (Fiscella, Wakeman, & Beletsky, 2018). Broadly, barriers to SUD treatment including OUD treatment, engagement and initiation, include treatment capacity, funding, regulations, staffing development, and patient access (Ashford, Brown, & Curtis, 2018; Knudsen, Abraham, & Oser, 2011; Lundgren, Chassler, Amodeo, D'Ippolito, & Sullivan, 2012; McLellan & Meyers, 2004; Roman, Abraham, & Knudsen, 2011).

With more recent attention and assistance from the United States government, addressing these barriers has become a priority, resulting in several new programs, policies, and funding streams. For example, the state-targeted response to the opioid crisis, state opioid response, and medication-assisted treatment:prescription drug and opioid addiction grants have appropriated billions into states, tribal nations, and US territories over the last 5 years. These programs endeavor to fund system expansion and innovation, with a strong focus on OUD pharmacotherapy services (Johnson et al., 2018; McCance-Katz, 2018). On the policy front the US Congress has passed several opioid-related bills including the Comprehensive Addiction and Recovery Act of 2016 (S.524, 2016), the 21st Century Cures Act (H.R.34, 2016), and most recently, the Substance Use Disorder Prevention that Promotes Opioid Recovery and Treatment for Patients and Communities Act (H.R.6, 2018). However, perhaps the two most pivotal barriers to OUD treatment – patient access and program capacity – have remained largely unaddressed (Andrilla, Moore, Patterson, & Larson, 2019; Fiscella et al., 2018; Mojtabai, Mauro, Wall, Barry, & Olfson, 2019).

Practitioners, community members, and researchers have developed several programmatic innovations seeking to address patient access to OUD treatment though many are still being piloted across the country. These include peer-based solutions, such as emergency department (ED) warm handoff programs (i.e., the referral of a patient presenting to the ED immediately to a treatment or other social service program in the community by ED staff or peer specialists (Ashford, Meeks, Curtis, & Brown, 2018; Duber et al., 2018), hybrid recovery community organizations (RCO) (i.e., community-based recovery organizations providing both recovery support services and harm reduction services) (Ashford, Curtis, & Brown, 2018), and treatment model innovations, such as low-threshold programs (i.e., treatment programs designed to reduce barriers to entry or engagement such as engaging in counseling, frequent urinalysis testing, etc.) (Bhatraju et al., 2017; Kourounis et al., 2016) and ED buprenorphine induction programs (i.e., the induction of ED patients on buprenorphine immediately, often as a bridge dose for the period before a patient can engage with a community-based pharmacotherapy provider) (D'Onofrio et al., 2017).

Researchers recently found ED warm handoff programs increase initial patient engagement rates (Ashford, Meeks, et al., 2018), and increase the likelihood of a patient engaging in OUD treatment when coupled with ED buprenorphine induction (D'Onofrio et al., 2015). Similarly, hybrid RCO programs were found to successfully engage high-risk populations, such as those experiencing homelessness, justice-involved, intravenous drug use, or HIV/HCV positive (Ashford, Curtis, & Brown, 2018), though no evidence for the impact on future clinical treatment engagement and outcomes is available as of yet. Examination of low-threshold OUD pharmacotherapy programs in two recent studies revealed compelling outcomes, including post-induction one-week dropout rates of less than 20% (which have ranged from 6 to 28% in previous studies (Fiellin et al., 2006; Stein, Cioe, & Friedmann, 2005), median treatment engagement lengths of 57 weeks (Bhatraju et al., 2017), high retention of patients who have historically been characterized as resistant to treatment (Bhatraju et al., 2017; Cunningham et al., 2011), and comparable overall patient retention (e.g., 40–60%) to higher threshold programs (Bhatraju et al., 2017; Cunningham et al., 2011).

Researchers examining ED buprenorphine induction programs found patient engagement improvements in outpatient OUD treatment programs following induction and referral (Cushman, Liebschutz, Anderson, Moreau, & Stein, 2016), as well as decreases in future opioid use but only at a 2-month follow-up post ED induction (D'Onofrio et al., 2017). Though preliminary evidence from these initiatives suggests that each is making a positive impact in the lives of those with OUD, those at risk for experiencing a fatal overdose event, and those unlikely to access more traditional OUD treatment offerings. However, further responsive action is called for given the severity and scope of the problem.

In an effort to expand upon the recent innovations in the OUD pharmacotherapy treatment field, especially the success of peer-based programs such as hybrid RCOs, the current paper outlines a potential new model for low-threshold OUD treatment engagement – the Recovery Community Center Office-Based Opioid Treatment (RCC-OBOT) model. This theoretical model draws upon the foundations of the hybrid RCO, ED buprenorphine induction, low-threshold treatment programs, and office-based opioid treatment (OBOT) programs, and puts forth a model of care and practice for use in communities impacted by the opioid crisis.

The model was developed in partnership with a diverse research team including university and federal agency researchers and peer-based community partners. Importantly, the team included several authors from peer-led hybrid RCOs in the United States, which were included in all model development and manuscript writing activities. Including the perspective of peers in the model formation was a critical element that cannot be understated given the necessity of peer run organizations (i.e., hybrid RCOs) to implement the RCC-OBOT model successfully. The proceeding sections outline the RCC-OBOT model foundations, provide an overview of two different scenario implementations of the model (e.g., overdose event and non-overdose event), and concludes with a discussion on potential obstacles to implementation, necessary next steps, and future research endeavors.

## 2. Model foundations

### 2.1. Hybrid recovery community organizations (Hybrid RCO)

Community-based and grassroots responses to SUD have been common in American society (White & Evans, 2013; White, Kelly, & Roth, 2012). RCOs are one such popular community-based response that have emerged as a promising new innovation driven by social need, created by the recovery community, and grown by and for the populations they serve (White et al., 2012). In 2016, a hybrid model of RCO was created, combining the delivery of recovery support services and harm reduction services, such as syringe exchange (Ashford, Curtis, & Brown, 2018). Preliminary research on hybrid RCOs demonstrates that such organizations are capable of delivering a multitude of services, and that such services can be tailored to respond to the specific community in which they are situated (Ashford, Curtis, & Brown, 2018). Though only documented in one study to date and additional research is needed, hybrid RCOs have demonstrated the ability to serve

a multitude of clients across various recovery ideologies and pathways, while meeting the needs and challenges of their communities, such as homelessness, peer training, and community outreach. As such, these organizations are intended to serve some of the most at-risk populations for both OUD and opioid-involved overdose events, including a subset (e.g., experiencing homelessness, intravenous users, etc.) not often engaged in other levels or settings of care. Having already adopted an expanded array of services, hybrid RCOs are well positioned to adopt further OUD recovery services and may provide a platform for expanded OUD pharmacotherapy and more evidence-based practices as they emerge.

### 2.2. Office-based opioid treatment programs (OBOT)

The treatment of OUD in the United States has historically been limited to specialty settings, such as opioid treatment programs or residential SUD treatment centers, due to the regulation of prescribing OUD medications (Walley et al., 2008). OBOT, or the treatment of opioid use disorder in primary practice settings, became possible in the United States in 2004 when the US Food and Drug Administration approved two formulations of buprenorphine (the monoformulation of buprenorphine and buprenorphine/naloxone) and placed both in Schedule III (McNicholas, 2004). OBOT models of care typically include induction, stabilization, and on-going pharmacotherapeutic maintenance treatment, with some, but not all, OBOTs offering concurrent psychosocial supports (Fiellin et al., 2006). Other models of care providing expansion of OUD pharmacotherapy options similar to OBOT, include buprenorphine HIV evaluation and support model, the one-stop shop model, the integrated prenatal care model, the Medicaid home health model, the hub-and-spoke model, the collaborative opioid prescribing model, and the nurse care manager model (Korthuis et al., 2017).

With the release of the 2015 American Society of Addiction Medicine (ASAM) consensus guidelines (Kampman & Jarvis, 2015), clinical and practice guidelines concerning OBOT provision were liberalized from the more conservative SAMHSA Treatment Improvement Protocol (TIP) 40 (SAMHSA, 2004), especially as it relates to observed versus unobserved induction, timing of post-induction observation, and concurrent psychosocial supports. More recently, SAMHSA TIP 63 updated recommended the clinical protocols in TIP 40 via consensus, closely aligning recommendations with the 2015 ASAM consensus guidelines (SAMHSA, 2018a, 2018b, 2018c).

### 2.3. Emergency department buprenorphine induction programs

Individuals with OUD often use EDs to receive OUD treatment and care (Weiss, Barrett, Heslin, & Stocks, 2016). Recent studies of ED initiated buprenorphine (i.e., a 3-day prescription of buprenorphine provided in the hospital with accompanying linkage to community-based OUD pharmacotherapy providers) found patients were more likely to be continuously engaged at 30-day follow-up, compared to linkage or brief intervention grouped patients (D'Onofrio et al., 2015). These findings on ED initiated buprenorphine induction, as an acute care intervention, suggests that providing individuals with OUD immediate access to OUD pharmacotherapy, promotes engagement. In the case of populations with OUD, immediate care coupled with linkage to ongoing care may mean the difference between life and death.

### 2.4. Low-threshold treatment programs

Low-threshold OUD treatment programs aim to minimize barriers to treatment engagement and retention, through the removal or reduction of barriers often found in traditional OUD treatment programs, such as long-waiting lists, costs, limited medication choice, frequent urinalysis testing, etc. (Deering et al., 2011; Stöver, 2011). These programs utilize many of the clinical guidelines recommended by ASAM and SAMHSA (Kampman & Jarvis, 2015; SAMHSA, 2018a, 2018b, 2018c), though place less importance on observed in-office induction, focus on concurrent psychosocial supports, and urinalysis testing (Bhatraju et al., 2017; Kourounis et al., 2016). As previously described, low-threshold OUD pharmacotherapy program outcomes include low post-induction one-week dropout rates, 57 week treatment engagement lengths, increased retention of patients historically characterized as resistant to treatment, and comparable retention rates of patients to high threshold programs (Bhatraju et al., 2017; Cunningham et al., 2011).

As low-threshold OUD programs have deviated from more restrictive consensus guidelines from ASAM and SAMHSA (e.g., observed in-office induction), it is important to note that Bhatraju et al. (2017) found no evidence of serious adverse events among patients at one-week follow up after unobserved induction, and only minor incidence of precipitated withdrawal (5–10%), which is similar to rates in observed inductions. This adds to mounting evidence that unobserved induction is feasible and relatively safe (Lee, Vocci, & Fiellin, 2014), and that such inductions may be an important factor in improved retention and engagement at low-threshold OUD programs. Overall, ideal low-threshold programs deploy clinical frameworks that focus on patient autonomy and individualization while not requiring abstinence (Gjersing & Bretteville-Jensen, 2013; Kourounis et al., 2016). Evidence suggests these program features increase the likelihood of an individual with OUD engaging initially and staying engaged for longer periods of time in the program (Kourounis et al., 2016).

### 2.5. Recovery community center office-based opioid treatment model (RCC-OBOT)

Incorporating elements from hybrid RCOs, ED buprenorphine induction programs, low-threshold treatment programs, and OBOT programs, we propose the RCC-OBOT model as a potential solution to expanding the availability, accessibility, and engagement of individuals with OUD. We crafted two implementation scenarios, overdose event and non-overdose event, to demonstrate both a comprehensive response and practical flexibility in potential real-world applications. Each implementation scenario begins with different referral pathways, either an overdose event and emergency room linkage, or linkage from a range of community partners without a preceding overdose event. Once linked to the hybrid RCO, individual experiences and treatment design remains the same in both scenarios.

### 2.6. Overdose event scenario

Following an overdose event and transport to an ED, the overdose event scenario begins with a peer recovery support specialist engagement in the ED, similar to current ED warm handoff programs (Ashford, Meeks, et al., 2018). For patients that elect to engage with OUD pharmacotherapy treatment following the peer engagement, ED buprenorphine induction would take place, providing a 72-h bridge prescription and linkage to the hybrid RCO using the RCC-OBOT model of care. In instances where ED buprenorphine induction is not available, assertive linkage (i.e., medical stabilization in emergency department, followed by transport to the hybrid RCO at any time) to the hybrid RCO would take place, where immediate buprenorphine induction would take place via on-call medical staff (e.g., medical practitioners authorized to prescribe with a DEA X-waiver - nurse practitioners, physicians' assistants, or medical doctors). Following either pathway, the hybrid RCO would engage the individual in the RCC-OBOT model of care from that point forward (Figs. 1 and 2).

### 2.7. Non-overdose event scenario

For individuals referred to the hybrid RCO in instances not involving an overdose event, of which referrals may take the form of relationships with the justice system or other community providers of

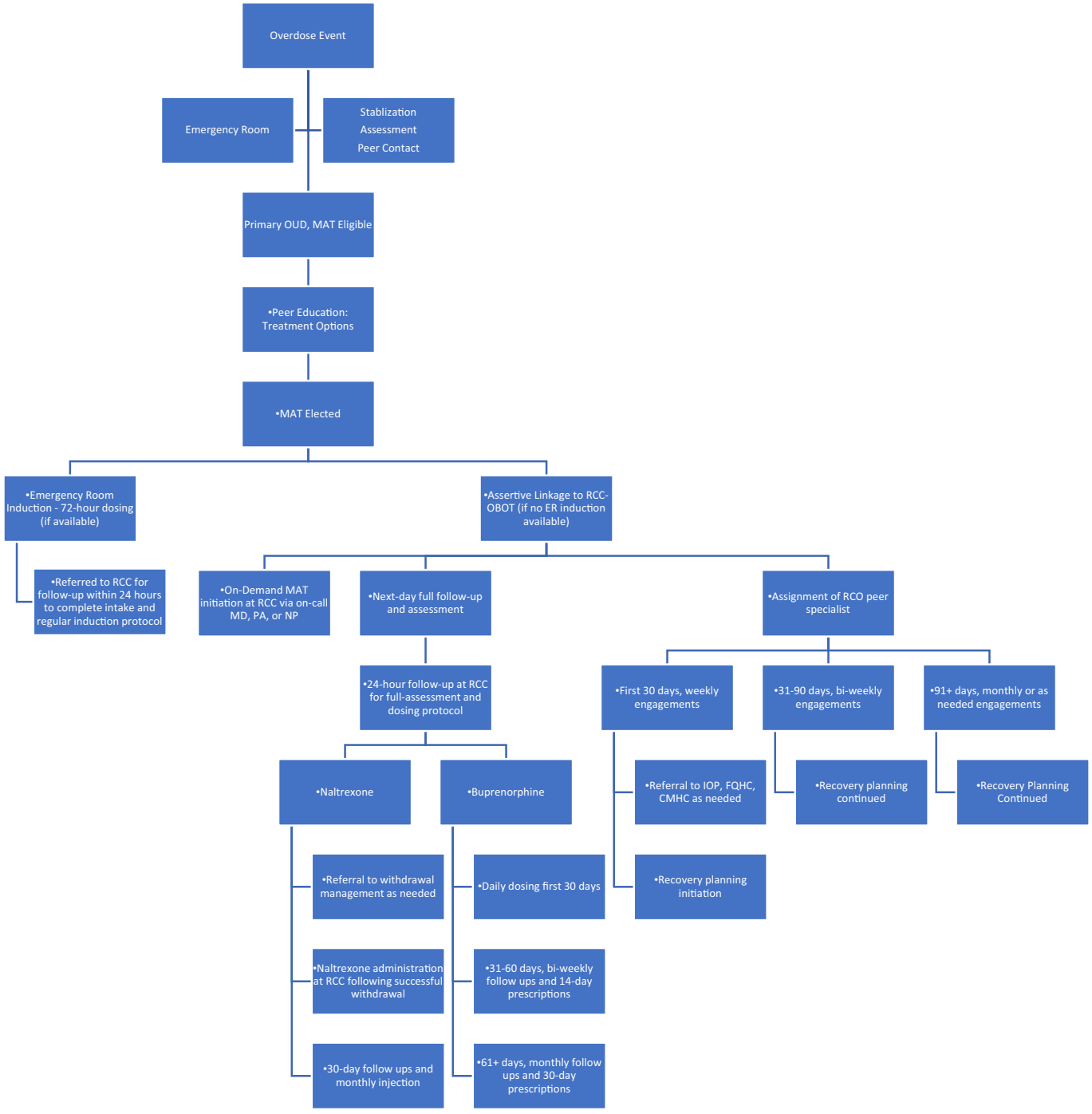


**Fig. 1.** Overdose event scenario.
MAT = medication-assisted treatment; OUD = opioid use disorder; RCC = recovery community center; OBOT = office based opioid treatment; MD = medical doctor, PA = physician's assistant; NP = nurse practitioner; RCO = recovery community organization; IOP = intensive outpatient; FQHC = federally qualified health center; CMHC = community mental health clinic.

social and health services, through RCO peer outreach, or from walk-ins, the individual would initially be screened and assessed for OUD and OUD pharmacotherapy appropriateness. For individuals positively screened eligible, a peer specialist would provide an initial engagement to discuss treatment options (e.g., referral to a treatment provider external to the hybrid RCO, residential programs, pharmacotherapy options, etc.), similar to the initial engagement in ED warm handoff programs. Individuals electing to engage in OUD pharmacotherapy through the RCC-OBOT model of care using buprenorphine would be inducted immediately via the on-call medical staff, and participate in the RCC-OBOT model of care from that point forward. Alternatively, individuals electing to use naltrexone would be referred to a medical withdrawal management program, with a bridge dose of buprenorphine as deemed medically necessary. Following successful withdrawal, individuals would return for initial naltrexone administration and engagement in ongoing RCC-OBOT. For individuals deemed eligible in the initial assessment, an immediate naltrexone administration would be provided, proceeded by ongoing engagement in RCC-OBOT.

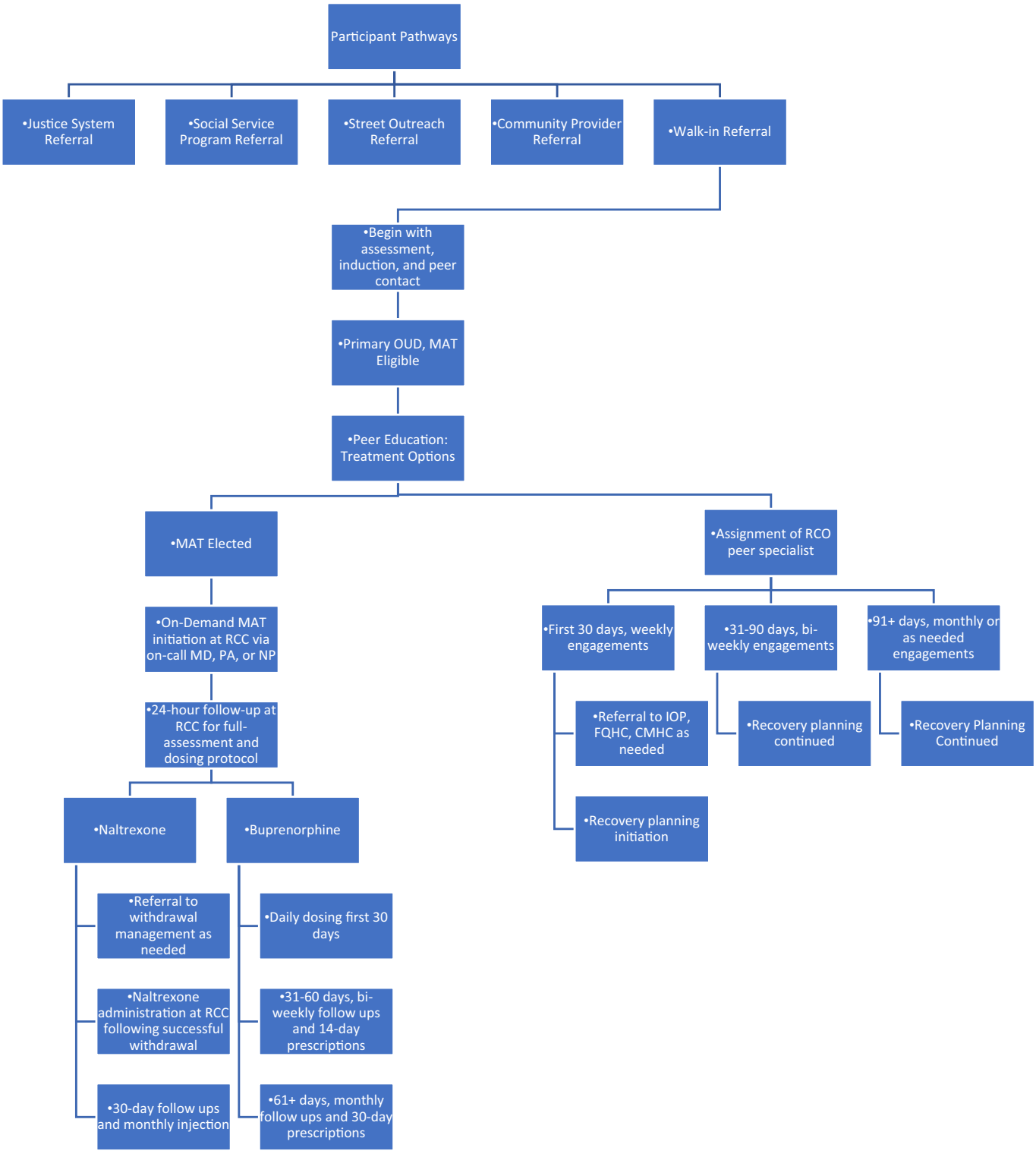


**Fig. 2.** Non-overdose event scenario.
MAT = medication-assisted treatment; OUD = opioid use disorder; RCC = recovery community center; MD = medical doctor, PA = physician's assistant; NP = nurse practitioner; RCO = recovery community organization; IOP = intensive outpatient; FQHC = federally qualified health center; CMHC = community mental health clinic.

### *2.8. Ongoing care following referral and induction*

For individuals engaged in the RCC-OBOT model of care through either the overdose event or non-overdose event scenario, service delivery is identical following initial induction. Medically, this protocol includes a 24-h follow-up post initial induction, with on-call medical staff conducting a full-assessment and dosing verification, followed by daily buprenorphine dosing for the first 30 days; bi-weekly follow-ups and 14-day prescription dosing for the next 30 days; and monthly follow-ups and 30-day prescription dosing ongoing at 61 + days. For

individuals engaged through the overdose event scenario electing to use naltrexone, rather than buprenorphine, referral to withdrawal management as appropriate would be completed, followed by an administration of injectable naltrexone via on-call medical staff. For all patients using naltrexone, on-going monthly injections with in-person follow-ups with on-call medical staff would take place.

All individuals engaged in RCC-OBOT would concurrently be assigned a peer recovery support specialist while proceeding through medical services. For the first 30-days beginning at initial engagement, individuals would engage with their assigned peer specialist on a weekly basis, followed by bi-weekly engagements for the next 30 days, and either monthly or as-needed engagements at 61+ days. Peer engagements are focused on recovery management and the delivery of peer-based recovery support services, which include forming an action and goal-oriented recovery plan within the domains of housing, education, employment, and health (Jacobson, Trojanowski, & Dewa, 2012; White, 2009). Some individuals may require additional support, especially earlier in the engagement period, and increasing the frequency of engagements with a peer may be warranted on an as needed basis.

Cessation of service delivery in the RCC-OBOT model is not prescribed and should be individually directed, in consultation with hybrid RCO medical and peer support staff. For some individuals this may mean 90-days of engagement, for others it may mean engagement in perpetuity. For individuals with either a medical need or desire for a higher level of care, the peer specialist will provide direct linkages to external mental health, SUD, or physical health treatment services, which is a common function of peer specialists in RCOs already (Haberle et al., 2014; Jacobson et al., 2012). All individuals engaged in RCC-OBOT should also be provided naloxone and harm reduction education (i.e., safer use and overdose prevention training) within the first two weeks of engagement.

## 3. Discussion

The use of hybrid RCOs, which have a variety of service capacities ranging from harm reduction to recovery supports, may provide a localized and systemic means of deploying OUD pharmacotherapy. This is especially true in expanding treatment options to populations that are more likely to be engaged at a hybrid RCO (e.g., experiencing homelessness, intravenous users, etc.; Ashford, Curtis, & Brown, 2018) as opposed to more traditional OBOT programs. Following from this, expansion in this novel setting may also help to increase individual demand for OUD pharmacotherapy. A lack of individual demand for OUD pharmacotherapy, which has been cited as the most common barrier for medical practitioners to prescribe buprenorphine (Jones & McCance-Katz, 2018), is one of many critical barriers to overcome, including reimbursement, infrastructure, and referral continuity. The RCC-OBOT model can specifically address several barriers simultaneously, while remaining client-centered and recovery-oriented.

Successful implementation of an RCC-OBOT model into a hybrid RCO will require several steps that include engaging with key stakeholders (e.g., staff, consumers, community members, etc.), identifying regulatory barriers such as licensing and registration, creating policies and procedures that mirror current OUD pharmacotherapy programs and RCOs, exploring funding options, and hiring appropriate staff. The first step we recommend is for organizations to intentionally engage their current consumer base to identify potential tension arising from expanding the RCO's scope of services, perhaps due to stigma of medication-assisted recovery or a desire not to offer medical services at all. While multiple pathways to recovery ideology is common at RCOs and among the “new recovery movement” - a community of advocacy and recovering individuals that has manifested in the last two decades who are more supportive of several distinct pathways and programs of recovery as compared to previous decades; White & Kurtz, 2005; Ashford et al., 2019) - stigma and misinformation about OUD pharmacotherapy is still prevalent (Andraka-Christou, 2016; White, 2011). Engaging in a community-based participatory process with stakeholders may reduce future tensions as well as create more community buy-in; a practice that has worked in drug user and recovery research in the past.

Engagement in the RCC-OBOT is intended to be low-threshold. While this is achieved in part through on-demand induction with on-call medical staff, it is also critical that hybrid RCOs employing this model of care do not place requirements of abstinence, employment, or frequent urinalysis testing on engaged individuals. As RCOs do not typically operate with these principles in the other programs and services they offer (Armitage, Lyons, & Moore, 2010; Bitting, Nash, & Ochoa, 2016; Davidson et al., 2010; Haberle et al., 2014; White, 2010), it is unlikely that this would occur. However, the inclusion of medical staff in the model of care will introduce a new staff that may not operate within the same framework. It will be important that all staff, including newly onboarded medical staff, agrees to the RCC-OBOT standards and procedures so as not to introduce biases or barriers unnecessarily. Many of the recommendations of RCC-OBOT are congruent with many of the ASAM consensus guidelines (Kampman & Jarvis, 2015) and SAMHSA TIP 63 (SAMHSA, 2018a, 2018b, 2018c), with significant differences including the frequency of follow-up visits after initial induction, the frequency and utilization of urinalysis testing, and the recommendations of concurrent psychosocial supports; and as such, creating buy in among new medical staff may be streamlined with only minor points of potential contention.

Regulatory burden is likely to be minimal on those hybrid RCOs wishing to implement the RCC-OBOT model of care, as medical practitioners are eligible to prescribe in office-based settings under an existing DEA X-waiver. However, whether or not the RCO will be required to register and be licensed by their state authority as a treatment provider is unknown. While policy may be a minimal burden, we suggest that RCO's consider national guidelines on OUD pharmacotherapy programs when adopting standard policies for RCC-OBOT implementation and operation (Kampman & Jarvis, 2015). Additionally, insurance coverage (liability, medical malpractice, etc.) will likely be a new domain for many RCOs, but a critical one to explore prior to full implementation.

RCOs implementing the RCC-OBOT model will require several new staff in order to successfully implement the model. Given the novelty of the model, we would recommend that medical doctors with an expanded DEA X-waiver are hired or contracted first, with two supporting nurse practitioners (NP) or physician's assistants (PA) following, if possible. This will depend on the RCO's state regulations and if NPs or PAs are authorized to prescribe OUD medications under the expanded X-waiver regulations (Haffajee, Bohnert, & Lagisetty, 2018). The additional support staff will be needed to maintain on-demand induction coverage, and the utilization of NPs and PAs, where possible, can help reduce expanded staffing costs. It is also feasible that organizations implementing RCC-OBOT choose to use an unobserved induction protocol in light of emerging safety and efficacy evidence (Bhatraju et al., 2017; Lee et al., 2014). However, in light of the recommendations from ASAM and SAMHSA TIP 63, this decision should be made in consultation with newly hired staff, and if implemented, as an option along with on-site observed induction, for individuals choosing to engage in services.

The RCC-OBOT does not directly take into account the on-site provision of concurrent psychosocial supports, such as behavioral therapy, apart from peer-based recovery support services. However, RCOs currently provide linkage services to these types of supports for consumers on a regular basis (Bassuk, Hanson, Greene, Richard, & Laudet, 2016; Jacobson et al., 2012), and should continue to do so under the RCC-OBOT model. Doing so would align with ASAM and SAMHSA TIP 63 guidelines and would not require changes in current operations of most RCOs.

Finally, with any increase in services, comes an increase in operational costs. While recovery support services are now reimbursable in

some states under Medicaid (Myrick & del Vecchio, 2016), and OUD pharmacotherapy is reimbursable via the private insurance market as well, payment models and mechanisms for the RCC-OBOT model present unique opportunities and challenges. Reimbursement for medical services may be provided direct to the medical practitioner, while the RCO maintains invoicing for the recovery support services only, reducing the need for enhanced administrative infrastructure at the RCO. However, the increased indirect costs of adding medical staff (e.g., space, utilities, etc.) will likely need to be offset. This may be possible through local, state, or federal grants, however, this funding type may not be sustainable long term. Another potential solution is for the RCO to invoice for all services provided at the RCO, at least through Medicaid to begin, and work towards becoming covered entities in the private insurance market for future billing.

## 4. Future directions

The RCC-OBOT model is comprised of components that have been validated in practice (e.g., ED induction, ED warm handoff programs, hybrid RCOs, low-threshold OUD treatment programs), however, as a comprehensive model, the efficacy of the RCC-OBOT is unknown and should be a primary focus of future research. In order to engage in such study, research should first engage current RCO staff and consumers about the acceptability of offering pharmacotherapy services on sites at drop-in recovery centers. Following this, an examination of the implementation barriers of the model, such as regulation, funding/payment, and staffing, should be completed. Following implementation of an RCC-OBOT model, ongoing quality assurance and improvement protocols should be put into place, combined with experimental trials examining individual outcomes of individuals engaging with opioid treatment programs, OBOTs, and RCC-OBOTs.

Broadly, future research should also continue to examine low-barrier OUD pharmacotherapy. The first area of research should entail the rigorous study of barriers, systemic response capacity, needs assessments within communities, and the overall reach of such programming including in the RCC-OBOT context. The second area should examine efficacy of such programs in improving public health outcomes. A tertiary examination of long-term outcomes for those who engage in low barrier programming should also be considered, above and beyond traditional public health outcomes. Functional outcomes, quality of life, and other related measures may be helpful in establishing best practices for true patient-centered approaches in low-barrier systems.

## 5. Conclusion

As OUD and overdoses continue to escalate in the United States, the need for innovative models of care is pressing. Recent research has found that community-based organizations, such as hybrid RCOs, are well-placed to provide both harm reduction and recovery support services, and this may extend into providing low-barrier OUD pharmacotherapy as well. The RCC-OBOT model combines elements from ED warm handoff programs, OBOT programs, ED buprenorphine induction programs, and hybrid RCOs, in an effort to increase the availability and accessibility of life-saving treatment and services – especially for those at high risk of mortality. While a theoretical model at this time, the two potential implementation scenarios for RCC-OBOT, following an overdose event or a community referral, may help bolster comprehensive linkages and support, and address current infrastructure gaps in OUD treatment access, while also increasing the utility of recovery support institutions.

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