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Research Paper

Barriers and facilitators to implementing CareConnect: A telehealth, low-barrier buprenorphine bridge clinic in Philadelphia

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ABSTRACT

Introduction: Rates of fatal overdose continue to rise in the United States, and most people with opioid use disorder (OUD) are not engaged in evidence-based treatment with medications. In Philadelphia, a city with one of the highest fatal overdose rates in the country, many residents face significant care access barriers. The COVID-19 pandemic – which destabilized the street drug supply and forced many clinics to limit services – worsened this crisis, but also led to regulatory changes that allowed for buprenorphine induction and maintenance visits via telehealth in the U.S. To increase access to buprenorphine across the Philadelphia area and reach individuals who struggle to access care, Penn Medicine developed the CareConnect Warmline in October 2021. CareConnect is embedded in an existing virtual urgent care practice. Staffed by advanced practice providers and substance use navigators (SUNs), CareConnect provides same-day buprenorphine bridge (i.e., short-term) prescriptions and linkage to longitudinal OUD care.

Objective: To examine barriers and facilitators to implementing CareConnect from the perspective of key stakeholders, including CareConnect leadership, clinicians, and staff, and attitudes and beliefs about providing care for patients with OUD via this model.

Methods: In this qualitative descriptive study, we interviewed 14 participants and used thematic analysis to analyze the data. The sample included CareConnect prescribing clinicians, SUNs, and administrative staff.

Results: Our analysis yielded four themes: 1/ CareConnect is a unique program that fills an important care gap; 2/ Benefits of leveraging existing infrastructure; 3/ Importance of an interdisciplinary team; and 4/ Necessity of relationships with outside stakeholders. Prescribing clinicians and administrative staff – most of whom had little experience with OUD care before CareConnect – stressed how embedding the model within an existing virtual clinic and involving experienced SUNs increased their comfort prescribing buprenorphine. However, all participants highlighted how the program's effectiveness is contingent upon buy-in from outside stakeholders, including pharmacists who fill the prescriptions and longitudinal care providers in the community.

Conclusions: Innovative delivery models can help expand OUD care access to individuals who are poorly served by traditional treatment infrastructure. Our findings provide valuable insight to improve and sustain CareConnect and can guide the development and implementation of future programs nationally.

Introduction

The United States remains engulfed in an ongoing overdose crisis, with over 900,000 people dying from drug overdose between 2000 and 2021 (Powell, 2023). Philadelphia has been particularly impacted by high rates of overdose deaths, with an average of over 3 Philadelphians dying from an overdose daily since 2017 (Philadelphia Department of Public Health, 2021). The onset of the COVID-19 pandemic overlaid onto this decades long overdose crisis further intensified the number of individuals experiencing overdose and related complications, exposed systemic gaps in access to treatment, increased social isolation, and resulted in changes to an already volatile street drug supply (Aronowitz et al., 2023; Friedman & Akre, 2021; Jeffers et al., 2022). In 2022, Philadelphia experienced over 1400 fatal overdoses, an 11 % increase

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from 2021 (Philadelphia Department of Public Health, 2023). Disparities in overdose rates and access to treatment exist across racial, ethnic, and socioeconomic divides and while the recent overdose crisis has been associated with white suburban and rural communities, opioid deaths have increasingly risen among people of color. During the COVID-19 pandemic, rates of fatal overdose among Black individuals was higher than white individuals in Philadelphia for the first time in recent history (Khatri et al., 2021).

Medications for opioid use disorder (MOUD), such as methadone and buprenorphine, are effective treatments for opioid use disorder (OUD) that reduce mortality by more than 50 % and lead to improved outcomes in social functioning, reduced risk of HIV transmission risk behaviors, reduced risk of hepatitis C virus (HCV), and improved quality of life compared to individuals without access to MOUD (Leshner & Mancher, 2019). Despite their effectiveness, MOUDs are inaccessible to most individuals with OUD, 80 % of whom receive no treatment at all (Mojtabai et al., 2019; Wu et al., 2016). Numerous barriers to accessing treatment contribute to this gap, including stigma towards individuals with OUD and the use of MOUD as a treatment, a lack of prescribers and inadequate professional training and education around MOUD, and systemic failures within medical care and health insurance structures (Andraka-Christou & Capone, 2018; Jakubowski & Fox, 2020; Mackey et al., 2020). Recent research about the state of OUD treatment access in Philadelphia highlighted numerous treatment gaps and barriers, including long wait times to access care due to bureaucratic delays, onerous program requirements, co-occurring medical issues like wounds that disqualified patients from inpatient substance use disorder treatment, and lack of stable housing, food, and transportation access (Kelly et al., 2023).

Before the COVID-19 pandemic, the Ryan Haight Online Pharmacy Consumer Protection Act required that initial prescriptions for controlled substances, including buprenorphine, be prescribed after an in-person evaluation (Davis & Samuels, 2021). The COVID-19 pandemic prompted changes in federal regulations that led to flexible innovations – most notably allowances for telehealth buprenorphine initiation, expanded telehealth visits for buprenorphine, and increased take home medication allowances for both methadone and buprenorphine – creating opportunities to expand virtual models for buprenorphine initiation and continuation (Samuels et al., 2022). Penn Medicine – a large academic health system affiliated with the University of Pennsylvania located in the greater Philadelphia area – took advantage of these regulatory changes during the COVID-19 pandemic to begin a virtual buprenorphine bridge program. Bridge clinics are an emerging model for OUD treatment to create rapid MOUD access and transitional care support (Taylor et al., 2023). Although models vary, bridge clinics typically provide low-barrier treatment with an emphasis on harm reduction, and the philosophy of medication-first, which emphasizes access to medications without requiring additional psychosocial services (Buchheit et al., 2021; Jakubowski & Fox, 2020; Substance Abuse & Mental Health Services Administration, 2023). Early assessments of these clinics have found that they engage a diverse group of individuals, including those who have recently been discharged from hospital or carceral settings (Tofighi et al., 2022); are successful at connecting patients to longitudinal care (Taylor et al., 2023; Tofighi et al., 2022); can fill a treatment gap caused by long wait times at longitudinal clinics (Taylor et al., 2023); and that the use of telehealth at bridge clinics can improve appointment no-show rates (Clark et al., 2021). Penn Medicine's program, called CareConnect, operates as a virtual bridge clinic and provides same-day, short-term buprenorphine bridge prescriptions and linkages to longitudinal care through a model embedded within the existing, broader telehealth urgent care program of Penn Medicine OnDemand (PMOD) (Lowenstein et al., 2022). PMOD visits are open to both patients new to the health system and those with previous Penn Medicine encounters, and the program is staffed by family and internal medicine physicians and nurse practitioners who focus on urgent care issues.

CareConnect utilizes trained generalist clinicians already established within PMOD who provide buprenorphine prescriptions with the support of a substance use navigator (SUN) team that assesses patients, and supports patients and clinicians throughout a patient's initial visit through connection to longitudinal care (Lowenstein et al., 2022). A critical component of the CareConnect model, SUNs are individuals with lived and/or professional experience with substance use care with additional training in care navigation, case management, recovery support, and harm reduction. When patients call in to CareConnect (open from 9am to 9pm, 7 days a week), their first interaction is with a SUN who completes an initial assessment to understand the patient's needs, collects a basic history of current substance use and buprenorphine use for those who are seeking a buprenorphine prescription, coordinates preferred pharmacy and referral needs, and integrates them into PMOD's urgent care workflow. CareConnect's goal is to see patients on the same day, and often appointments within one or two hours are possible depending on PMOD availability. The SUN's initial assessment also supports PMOD clinicians by providing an understanding of the patient's dosing requirements, duration of prescription, and their preferred pharmacy. After the telehealth visit, SUNs help patients get their prescriptions by coordinating transportation and payment if needed and assisting with follow-up care if a longitudinal care plan is not already in place. When this study was conducted, CareConnect employed 12 prescribing clinicians (2 physicians and 10 nurse practitioners) and 5 SUNs.

The purpose of this study was to examine barriers and facilitators to implementing CareConnect from the perspective of key stakeholders, including CareConnect leadership, clinicians, and staff, and attitudes and beliefs about providing care for patients with OUD via this model. We envisioned that our findings could be used to strengthen the CareConnect program and inform the development of similar programs at other institutions.

Methods

Participants & recruitment

In this qualitative descriptive study, we interviewed 14 CareConnect stakeholders. Individuals were eligible if they worked at or were involved with the design and/or implementation of CareConnect in any capacity. After receiving approval from the University of Pennsylvania Institutional Review Board, we purposively recruited study participants from CareConnect. We first notified staff about the project at a CareConnect meeting, explained the study objectives, and asked any interested individuals to contact the study team. We also communicated directly with CareConnect leadership via email, who agreed to discuss the study with CareConnect clinicians and staff. The study team had an existing relationship with CareConnect as two members were co-medical directors and one was the program manager.

Data collection

Study team member MHD conducted all interviews via Zoom teleconferencing software. This team member has a bachelor's degree and extensive experience working in OUD treatment programs and as a substance use disorder research coordinator, where they were trained in qualitative interviewing techniques. They were not formally affiliated with the CareConnect program. Interviews were semi-structured, one-on-one, and lasted approximately 30–45 min; each participant was interviewed one time. All interviews were audio-recoded and transcribed. The design of the interview guide was based on the Consolidated Framework for Implementation Research (CFIR) (Keith et al., 2017). The interview guide included questions about participants' roles with CareConnect and the Penn Medicine health system; their involvement in the original design and implementation of CareConnect; difficulties they've encountered in relation to their work with CareConnect;

how they would improve CareConnect if given the opportunity; the 'next steps' for CareConnect, as they envision them; and advice they would give to other health systems looking to implement a similar program. In addition, prescribing clinicians and SUNs were asked questions about previous experience working with people who use drugs; barriers to providing care; and training they received prior to working with patients with OUD. They were also asked to describe CareConnect patient encounters that went well and encounters that did not go well, and to reflect on the factors that contributed to the encounters' outcomes.

Data analysis

After transcription and cross-checking, three research team members (SA, RF, MHD) used Dedoose software to analyze interview transcripts inductively using reflexive thematic analysis methodology (Braun & Clarke, 2019). They first read through interviews to become familiar with the content, and then created a preliminary codebook by coding the first three interviews. They used this codebook to code the remaining interviews. They met weekly throughout this process to discuss the analysis and refine the codebook. With input from other research team members, the coders then created and named themes based on the codebook. We engaged in member-checking with three of the study participants once we developed themes to assess if they mirrored participants' experiences of barriers and facilitators to implementing CareConnect. These study participants endorsed the themes as barriers and facilitators they had either personally experienced or knew that other CareConnect team members experienced. We consulted and followed the COREQ checklist (see online supplement) throughout the study period and while writing this manuscript to ensure that our methods were rigorous and that we reported our process and findings comprehensively (Tong et al., 2007).

Findings

Participant characteristics

We interviewed 14 participants, including seven prescribing clinicians (physicians and nurse practitioners), two telehealth coordinators, two SUNs, one practice manager, one lead SUN who also served as a CareConnect project manager, and one CareConnect affiliated clinician-researcher who helped with implementation of the model. Twelve participants were women, one was a man and one was non-binary. Three participants were Black and the remainder were white. The average age of participants was 38.

Results

Our analysis yielded four themes related to barriers and facilitators to implementing a virtual buprenorphine bridge clinic: 1/ CareConnect is a unique program that fills an important care gap; 2/ Leveraging existing infrastructure; 3/ Importance of an interdisciplinary team; and 4/ Necessity of relationships with outside stakeholders. We outline these themes and their associated subthemes below. See Table 1 for a succinct overview of barriers and facilitators.

CareConnect is a unique program that fills an important care gap

All study participants emphasized the importance of CareConnect's services and the treatment gaps that the program addresses. Many participants acknowledged the lack of programs in Philadelphia offering same day treatment with buprenorphine and emphasized that timely care is vital for this population – this understanding motivated CareConnect stakeholders to implement, sustain, and strengthen the program. Participants who had previous experience working with people with OUD expressed previous awareness of this need, and participants who were new to OUD care stated that they quickly learned about the unique nature of the program via their interactions with patients, who expressed that they struggled to find the care they needed elsewhere.

Table 1
Barriers and facilitators to implementing CareConnect.

Barrier	Example
Lack of access to buprenorphine at pharmacies	*"a lot of pharmacies don't carry [buprenorphine] in the city, or they only take patients they already have in their systems…patients that are uninsured, we have a —we have funds, right? Like…we want to pay your pharmacy for the medication. And some of the chain pharmacies, a lot of the chain pharmacies, CVS, Rite Aid won't take payment over the phone."*
Difficulty securing longitudinal care for patients	*"it's very frustrating, but those like system barriers that we all know that exist… patients falling out of care, patients not getting enough medication to like leave inpatient treatment with. Even though there's an appointment made, right? Like an appointment's in three weeks because that's when you can get the appointment. You know, the after-care specialist makes the appointment, but then the doctor only prescribes seven days of medication."*
Funding challenges, especially for substance use navigator (SUN) roles	*"But the challenge is these support roles are variably or poorly reimbursed, which is a shame, because it's again I think the most important role in many ways. So there needs to be some seed money to do that."*
Facilitator	**Example**
Clear need for the program with expanded hours facilitating timely care	*"The ease of appointments and the fact that patients can be seen the same day, and sometimes within the same hour or two."*
Audio-only appointments	*"…these are also people who shy away from medical care, and in telemedicine in general…and for this population in general, just to be able to maintain some confidentiality by not having to have your face on a screen, not having to sit in the office and feel like you're being judged, it's just an audio interaction. I think that's huge here and it just makes the appointment so much more comfortable for them."*
Embedding program within existing urgent care clinic with existing electronic medical record	*"I think it works really well. And I think even if free-standing urgent cares could offer this to people, they should be able to as well…I think we are totally the appropriate service for this."*
Training generalist clinicians rather than hiring addiction specialists	*"I think one of the things that's both kind of unique but also much more scalable about our program is we train non-specialty clinicians to do this work, because I think many bridge clinics…are all staffed by specialty clinicians… if you have an existing staff that does virtual care, you don't need to develop a whole new infrastructure…having some basic training on prescribing for the clinicians."*
Interdisciplinary team including substance use navigators (SUNs) who are knowledgeable about opioid use disorder	*"Working with a substance use navigator is something we weren't used to [before CareConnect], but it's all gone very seamlessly. And the substance use navigators are so helpful, and so useful, and so resourceful."*
Administrative support and leadership buy-in	*"Engaged leaders. I can't stress that enough. An engaged set of clinicians… engaged leaders on both sides [clinical and administrative]."*

Timely care for a patient population who needs it. Participants described the need for patients with OUD – many of whom face significant barriers to quality healthcare access and who are at high risk of overdose – to have access to flexible, virtual appointment scheduling. All participants

identified same-day appointments as an important benefit of the program: "*Definitely the ease of appointments and the fact that patients can be seen the same day, and sometimes within the same hour or two.*" One clinician who didn't have previous experience working with patients with OUD learned about the importance of timely access to OUD care via an interaction with a patient who called during the hours that CareConnect was closed: *"…by the time I got on in the morning, I added the patient right away but that's when I couldn't get ahold of him. So then I called his emergency contact, which just was his mom, and he was pretty much had overdosed overnight at his house and had went to work the next day. And I was so fearful that this would happen again. I was like, time is of essence."*

Embedded in an existing 24/7 virtual urgent care model, CareConnect is accessible to patients from 9:00am to 9:00pm, enabling the program to serve a patient population that *"does not fit into an 8:00 to 4:00 model."* However, one clinician believed the program should be expanded even further, stating: *"I do think it should be a 24/7 service because I think a lot of the need for help might arise overnight…I do think if [other programs] are gonna start the service, it needs to be 24/7 because it is a 24/7 issue."*

Audio-only telehealth. Rather than requiring patients use video applications to complete their visits – like most longitudinal telehealth programs – CareConnect conducts patient visits via traditional audio-only phone calls. The use of audio-only telehealth services is critical to improving access to short-term buprenorphine treatment for marginalized populations who may not have access to the Internet or smartphones equipped with video calling applications, or who may be intimidated by or inexperienced in using these video platforms. Using traditional audio-only telephone calls also increases access to treatment and reduces stigma by maintaining patient confidentiality. One clinician said: *"…we are so easily able to help somebody. And we can keep it confidential. We don't even need to see their face. We make it comfortable for them…There's no difference whether I see what they look like or not. I get all the information I need over the phone with them."* Remarking on how the use of video calls in traditional telemedicine can act as a barrier for vulnerable OUD patient populations, a clinician with previous OUD treatment experience said: *"…these are also people who shy away from medical care, and in telemedicine in general…and for this population in general, just to be able to maintain some confidentiality by not having to have your face on a screen, not having to sit in the office and feel like you're being judged, it's just an audio interaction. I think that's huge here and it just makes the appointment so much more comfortable for them."* By using traditional phone calls for patient visits, CareConnect prioritizes low-barrier, fast access to medication over visual assessments of patients. While this type of visit might not be ideal for many longitudinal care programs, it likely makes initial engagement easier for patients and has the added benefit of allowing CareConnect staff and clinicians to focus on patient care rather than assisting patients in using video call technology, which is a documented barrier in other telehealth programs (Aronowitz, Engel-Rebitzer, & Dolan, 2021).

Leveraging existing infrastructure

Study participants stressed that a major facilitator of CareConnect implementation was the leveraging of existing infrastructure rather than building from scratch. CareConnect embeds its service within an existing telehealth urgent care platform (Penn Medicine OnDemand, PMOD). This allowed for rapid implementation and scaling and did not require the program to hire new prescribing clinicians. Instead, CareConnect clinical leadership trained all PMOD clinicians to provide OUD care with buprenorphine. Relatedly, rather than hiring addiction specialists, CareConnect relies on generalist clinicians who, according to what they shared in their interviews, feel comfortable and competent providing this care despite not having extensive addiction training or prior experience. CareConnect also uses an existing electronic medical record (EHR) that has been customized to include CareConnect specific documentation.

Embedding within penn medicine on demand (PMOD). The CareConnect program is integrated into Penn Medicine's existing 24/7 virtual urgent care model, PMOD, where clinicians provide care for conditions that do not require an ED or in-person assessment. Importantly, PMOD had an existing infrastructure for scheduling, completing, and billing for virtual patient appointments that the CareConnect program was able to tap into, making the virtual urgent care model *"a good access point"* for OUD patients in need of bridge prescriptions. The practice manager discussed the move to use existing virtual urgent care centers for short term buprenorphine treatment, saying: *"So I think it works really well. And I think even if free-standing urgent cares could offer this to people, they should be able to as well…I think we are totally the appropriate service for this."* A nurse practitioner who worked at PMOD before CareConnect was added to PMOD services described why the urgent care was well suited to adopt CareConnect into its model: *"So I think maybe – and we [PMOD] had the capability to do it because we were a 24/7 service. So we understand the urgency in these visits. So it just, I think naturally made sense."* Although the CareConnect Warmline was not, at the time of these interviews, a 24/7 service, PMOD's orientation towards providing rapid care for urgent health needs ensured that clinicians were already accustomed to providing same-day care. A clinician participant who had been involved in designing CareConnect before it embedded into PMOD reflected on the decision to partner with the virtual urgent care, stating: "*I actually don't remember who introduced this to the concept of Penn Medicine OnDemand, as someone who could support this platform that would've seemed impossible to build on our own…but from our very first meeting with them, they were a really excited partner. It was like, yeah, I think we can do this. Yeah, we can train the NPs. We could figure out how to make appointments quickly. So as soon as we tracked down who they were, they were eager to partner*." Although OUD treatment was a new service for PMOD, the program administrators saw how timely, low-barrier buprenorphine access was relevant to their program and goals as an urgent care provider and were willing to expand their services to include CareConnect.

Utilizing generalist clinicians rather than addiction specialists. Despite most PMOD clinicians and nurse practitioners having no specific experience with buprenorphine prescribing or addiction treatment prior to the CareConnect Warmline, all clinician team members applied for their X-waiver (the need for which has since been eliminated federally) to prescribe buprenorphine. CareConnect leadership developed two additional training sessions specifically for PMOD clinicians on short-term buprenorphine prescribing with linkage to longitudinal care, delivered by addiction medicine specialists affiliated with Penn Medicine. Although addiction medicine physician backup was available, clinician participants reported feeling comfortable and competent providing this care despite not having extensive addiction training or prior experience. On starting buprenorphine prescribing through CareConnect, one clinician stated: *"[It was] the education that came from the opioid task force and the substance use navigators. Then coming on and actually doing a bupe 101…there [were] a couple of lectures they did… they provided slides and kind of a blueprint of how to manage patients. A lot of good detail around medications for opioid use disorder, but also the background of the condition and the treatment, and the literature that supports it, so it's evidence based."* Another clinician stated: *"…at first it was a little daunting. I'd never treated anybody with any kind of addiction disease before, but I love it."*

On comparing CareConnect's unique approach to training generalist clinicians to standard telehealth OUD models, one clinician in a leadership role with previous OUD treatment experience said: *"I think one of the things that's both kind of unique but also much more scalable about our program is we train non-specialty clinicians to do this work, because I think many bridge clinics, many telehealth OUD treatment places are all staffed by specialty clinicians…And I think what's nice and scalable about our model is that you actually can kind of plug and play with an existing – if you have an*

existing staff that does virtual care, you don't need to develop a whole new infrastructure…having some basic training on prescribing for the clinicians. But I don't think it has to be overly complicated and I think what we did well was just really messaging about keep it simple." Training generalist clinicians who have prior experience with telehealth delivery models to provide this type of addiction care was likely less resource intensive for the program than hiring a team of addiction specialists and allowed the program to scale up relatively quickly. A leadership team that includes an experienced SUD treatment clinician can provide training and support as needed. This approach also implicitly asserts that low-complexity SUD care is a health issue that can be competently managed by generalist clinicians – an attitude that, if broadly adopted, could likely improve SUD treatment shortages on a larger scale (Buresh et al., 2021).

Customization of existing electronic health record (EHR). At the outset, one of the barriers to providing on-demand buprenorphine care is the need for a mechanism for documentation, billing, and registering patients to engage patients not already established with Penn Medicine clinics. Because PMOD had infrastructure for billing for virtual visits for new patients and systems for uninsured patients, integrating into PMOD's existing scheduling, documentation, and billing frameworks made it possible to scale CareConnect's program. Discussing the importance of tapping into existing, robust systems, one participant said: *"So I think any system – and that probably limits us to larger health systems or larger organizations that have this, but I think any system that has the key components are really having an infrastructure to schedule, do the visits and bill for them to make it sustainable."* On specifically integrating SUN intakes into the existing PMOD EHR system, a clinician stated: *"And [he] had helped us to design a template that actually takes the data from the substance use navigator note and just pulls it into the clinician notes, so that all the documentation is sort of appropriate to guidance, that clinical guidance that we would use as clinicians."* Participants emphasized the importance of including instructional templates for buprenorphine treatment for generalist clinicians. One clinician explained: *"So, we have a physician that works on our team that helped us build a template. It's a very straightforward template. All the diagnosis is there for us. The different doses of medications are there for us. The education piece for patient instructions is there for us. So, a lot of that has been very straightforward. And the template in Epic [electronic medical record system] is seamless. So, there's really no hiccups."*

Importance of an interdisciplinary team

CareConnect's interdisciplinary team model uses substance use navigators (SUNs) as the first point of contact for patients. These staff members have previous experience in the OUD treatment world, and some have lived experience of substance use disorder as well. In addition to supporting patients and helping them feel at ease, SUNs helped support clinicians as well, most of whom had very little previous OUD treatment experience. In addition, participants stressed the importance of supportive administrative team and leadership.

Important role of SUNs. In addition to leading training programs for generalist clinicians, SUNs and their services were a key component of CareConnect's day-to-day success. SUNs supported patients and clinicians by working with patients to design an ongoing treatment plan (including helping patients find longitudinal care), following up with them to ensure prescriptions were picked up from pharmacies, providing harm reduction education to patients and clinicians, and reducing stigma associated with accessing buprenorphine treatment. Discussing the critical role that SUNs play in CareConnect, one clinician participant said: *"They [SUNs] do all the hard work in this. They are the ones who talk to the patient, who pin them down, who get them on the phone. I think just upfront patients are often stressed and panicked and maybe a little chaotic, because of what's going on and whatever reason maybe they're lost or are now seeking care. So I think just that initial contact is really important and I think…we really prioritize hiring people that we felt like could be a calm, compassionate, open, non-judgmental presence, because that's so important… the substance use navigators actually are the ones who often take most of the history. They help with triage."* Another clinician stated: *"Working with a substance use navigator is something we weren't used to [before CareConnect], but it's all gone very seamlessly. And the substance use navigators are so helpful, and so useful, and so resourceful." "Having the SUN do the pre-work"*, through initial history taking, answering patient questions, and providing a compassionate first contact in treatment helped to make later visits with PMOD prescribers shorter and more efficient. Initial visits with SUNs set a precedent for reducing systemic stigma within the health system, and the practice manager said: *"I would very much advocate that the patient should be screened by someone who's very knowledgeable about opioid use disorder, who has experience with this type of therapy."*

Clinicians reported that their visits with patients were often short and efficient due to the substance use history-taking and education provided by SUNs. As expressed by a clinician: *"I thought these visits were going to be long. I thought they were going to ask us a ton of questions and need a lot of reassurance. But really by the time they get to us, their decision has been made that they're ready to make this move."* Discussing their role in the CareConnect program, one SUN participant stated: *"Anything that they [providers] don't have to do, I try to do on our end…And that's kind of like I – one of the reasons, I think, that it worked. Because we're asking these really busy clinicians to do things. And so to them it feels like more work, right? And they already have a lot going on…So I try to do all the things aside from prescribing for PMOD so it makes their job easier."* These quotes highlight how SUNs provide integral support to both clinicians and patients in multiple ways – by reducing the time burden on busy clinicians who were less experienced in SUD treatment and may have felt overwhelmed by SUD specific history taking and education, and by helping patients feel at ease accessing healthcare for a condition that is often highly stigmatized (Parish et al., 2023).

Administrative support and leadership buy in. PMOD clinicians and staff bought into the CareConnect program because of their willingness to meet patient and community needs and the support received from health system leadership. In discussing the workflow that was set up to accommodate OUD patients through the CareConnect program, one telehealth coordinator said: *"We [schedulers] put the patient on the schedule, the nurse practitioner sees the patients, order the buprenorphine and then communicate back that the buprenorphine has been ordered. If there's any issues getting the patient or anything – the patients have the lifeline to the substance use navigator and then so do we. And so it's a multi prong approach to the whole thing."* PMOD clinical leaders helped spearhead the CareConnect program through their *"willing[ness] to make it work and start, even though it wasn't perfect in the beginning."* Commenting on why PMOD was well-suited to adopt the CareConnect program, the practice manager said: *"Engaged leaders. I can't stress that enough. An engaged set of clinicians, and to be motivated by those engaged leaders on both sides."* Participants described these leaders and administrators as "*"champions"* who are "*a key component of every successful program."*

Necessity of relationships with outside stakeholders

Participants shared that a major barrier to the success of CareConnect was lack of buy-in and cooperation from outside stakeholders. For example, all participants acknowledged that patients faced challenges receiving their prescribed buprenorphine from pharmacies. In addition, although many patients served by CareConnect have a regular buprenorphine prescriber (and need a bridge prescription because they are out of medication and unable to get in touch with their clinic), some patients are calling CareConnect to start buprenorphine for the first time. In these cases, SUNs also help patients connect with longitudinal care, but the success of these linkages depends on the availability of treatment slots in programs that are accessible and appropriate for the

patients. Finally, while SUN involvement is vital for the success of the program, study participants reported difficulty obtaining funding for these non-billable services.

Pharmacy barriers. Prescribers and SUNs who followed up with patients regarding prescription pick-ups expressed frustration about buprenorphine access at the pharmacy-level in Philadelphia. Discussions around pharmacy barriers included issues such as certain pharmacies refusing to stock buprenorphine due to the stigma around the OUD patient population and incompatible pharmacy opening hours with prescription pick up – particularly for same day visits. In addition, CareConnect has funding to help cover the cost of prescriptions for uninsured patients, however, some pharmacies would not accept payment over the phone from CareConnect staff. Trouble shooting efforts in the face of pharmacy barriers included logistical preplanning, calling pharmacies in advance, and identifying pharmacies willing to dispense buprenorphine, but finding cooperative and compatible pharmacies resulted in time burdens for administrators and SUNs. The lead SUN said: *"Like the patient says, I want it sent to this such-and-such pharmacy. We have to call the pharmacy just to make sure they have it, because you know how it is, right? Like you have to like re-prescribe. You can't just like move a prescription at a pharmacy, it sucks. So calling a lot of – pharmacies don't carry it in the city, or they only take patients they already have in their systems. For us, patients that are uninsured, we have a —we have funds, right? Like we want to pay you, we want to pay your pharmacy for the medication. And some of the chain pharmacies, a lot of the chain pharmacies, CVS, Rite Aid won't take payment over the phone."* Discussing the logistical barrier of pharmacy opening hours, another SUN stated: *"A lot of pharmacies, chain pharmacies are maybe only open until five or seven. So, if you're always expecting a four-hour wait, if someone calls between one and three, then they might not be able to get their medication from an accessible pharmacy."* While increasing the number of programs and prescribers who provide prescriptions for buprenorphine is an important part of expanding access to treatment, the success of initiatives like CareConnect ultimately depends on pharmacy access to buprenorphine, which is limited in many parts of the U.S. (Cooper et al., 2020).

Barriers to longitudinal care. SUNs reported some difficulty securing longitudinal care placements for CareConnect patients and said that some patients needed to receive multiple bridge prescriptions from CareConnect because of delays in finding and securing an appointment with a long-term provider. In some cases, strict rules and rigid scheduling at OUD treatment programs meant that patients who missed their appointment needed to wait days or weeks for another appointment – and needed an additional CareConnect bridge prescription in the meantime. One SUN reflected on an experience she had while assisting a patient connect back with a treatment provider they had seen in the past: *"I had a patient that used to pay cash, see a doctor, everything was fine for seven years. And he lost his job because of COVID and then couldn't afford it anymore, right? And was gonna fall out of care, couldn't get follow-up because he only had a photocopy of his ID as opposed to his card ID…like I was on a three-way call with the provider, which was [local clinic name], and him trying to make the appointment, do the things. And they're like, no, it's a copy of your ID. And you need like your real ID to hold up on the camera. Shit like that."* In this case, rather than assist a new patient access care, CareConnect staff spent time providing case management services to a patient who had wanted to remain in treatment but was denied access due to bureaucratic barriers at a different clinic. While CareConnect staff expressed willingness to assist patients in these scenarios, these types of tasks can take time that might otherwise be spent engaging treatment naïve patients. Ideally, the CareConnect team would have a referral network of low-barrier longitudinal care providers to send patients to that were similarly motivated to easily enroll patients in treatment.

In some cases, patients already have an appointment scheduled with a longitudinal provider but need CareConnect support because of preventable gaps in medication access: "*it's very frustrating, but those like system barriers that we all know that exist, things like that – patients falling out of care, patients not getting enough medication to like leave inpatient treatment with. Even though there's an appointment made, right? Like an appointment's in three weeks because that's when you can get the appointment. You know, the after-care specialist makes the appointment, but then the doctor only prescribes seven days of medication."* Although these types of situations can be addressed with the CareConnect model, participants reflected on the various shortcomings of the OUD treatment landscape that create frustrations and barriers for patients and extra work for SUN staff. The effectiveness of the short-term bridge clinic model in rapidly engaging patients in treatment and promoting retention in care is limited without timely referrals to longitudinal care providers.

Funding for sustainability and scalability. CareConnect's use of SUNs provided an innovative solution to improving triage systems for OUD patients within a virtual urgent care model. Unfortunately, funding for SUNs is a challenge because their services are not currently reimbursable under most traditional insurance fee-for-service models. Currently, SUNs are grant funded at CareConnect; however, a more sustainable funding structure is required to hire more SUNs, scale up the program, and replicate it within other major health systems. Discussing funding barriers, the CareConnect affiliated researcher said: *"But the challenge is these support roles are variably or poorly reimbursed, which is a shame, because it's again I think the most important role in many ways. So there needs to be some seed money to do that."* Highlighting the cost saving nature of employing SUNs and the unique role of this peer navigator role, a clinician in a leadership role stated: *"I think it's a relatively less resource-intensive model than a lot of substance use treatment models, because it goes into this existing infrastructure and it trains general clinicians and staff, but I think that, yeah, a couple of the key lessons for me would be really around finding not only the clinician champions but also getting the right sort of person in that navigator role and investing in some of the getting people charged up about doing this work, because that's the tricky part."* While a grant from the City of Philadelphia filled funding gaps in the short term, one participant commented on finding longer financial stability, saying: "*And so having this grant from the city is great. We don't have to really care about insurance or all that. And so, I imagine that finding financial solutions to make this sustainable is probably a big piece of this. Yeah. And so I think that's important both for this [CareConnect]. When this funding from the city dries up, it would be a nightmare if all of this went away."*

Discussion

In this study we assessed the barriers and facilitators to the development and implementation of the CareConnect Warmline from the perspectives of a diverse group of stakeholders. Our findings emphasize the importance of flexible OUD treatment delivery models that prioritize timely access to life-saving medication. The need for low-barrier programs that provide same-day medication access, deliver care where patients are (in this case, via audio-only telehealth), and follow a harm reduction model (e.g. not requiring drug testing prior to medication initiation) is increasingly apparent and our findings echo a growing body of literature calling for the adoption of this approach by OUD treatment programs. (Baslock et al., 2021; Corace et al., 2023; Jakubowski & Fox, 2020) CareConnect and other bridge clinics can help engage patients not currently receiving any treatment and also fill an important gap in medication access caused by OUD treatment programs that can't offer same-day scheduling or do not offer bridge prescriptions when patients miss appointments (Taylor et al., 2023).

Although the existing literature points to generally favorable views about telehealth among OUD treatment clinicians, there is some debate about the appropriateness of audio-only models (Riedel et al., 2021).

While audio-only visits may not be preferable for long-term treatment, clinicians in our study believed that this approach helped engage patients new to care who may have been resistant to being seen in person or via video, or patients who lack access to phones with video-conferencing capabilities. It is possible that these patients – once inducted on buprenorphine and after having had a positive OUD treatment experience – might be amenable to longitudinal care via video-conferencing or in-person (Wunsch et al., 2023). Given the severity of the overdose crisis and the vulnerability of patients at the beginning of treatment, allowing for audio-only induction visits may help address one of the hurdles patients face to engaging in care. At the time this study was completed, the U.S. Drug Enforcement Agency (DEA) had not yet announced a final rule regulating the use of telehealth for controlled substance prescribing (U.S. Department of Justice Drug Enforcement Administration, 2023). Given our findings and those of other researchers highlighting the benefits of audio-only visits (Taylor et al., 2023), especially for bridge clinics, it is vital that the DEA's final rule allow for these types of visits. We urge the DEA and state lawmakers to consider the positive impact of virtual bridge clinics when formulating policy regulating the use of telehealth for buprenorphine prescribing.

Lack of trained treatment providers is one of many oft-cited barriers to OUD treatment expansion. Our study suggests that generalist clinicians, supported by Substance Use Navigators, can successfully deliver low-barrier OUD care after a limited number of training sessions. These findings echo previous literature highlighting the growing number of generalist clinicians – including MDs, NPs, and PAs – providing OUD treatment with buprenorphine outside of substance use disorder specific settings (Olfson et al., 2020). In fact, Gertner and colleagues (2020) found that generalist clinicians provided OUD care that was similar in quality – and sometimes better – than addiction specialists (Gertner et al., 2020). Our findings also highlight the special role that urgent care clinicians can play in expanding access to buprenorphine. Unlike many OUD treatment providers who may be accustomed to a system where patients often do not receive treatment induction at their first visit (or who are not able to make an appointment in a timely manner), urgent care clinicians are already operating in a system that delivers on-demand care. It is possible that embedding this program into an existing urgent-care system helped address some of the resistance to change in the existing OUD treatment system among clinicians who may have previously been trained in a model where requiring patients to wait to initiate care is the norm (Beetham et al., 2019; Peles et al., 2013).

All participants in our study highlighted the centrality of SUNs in the success of CareConnect. This reflects a growing body of literature affirming the potential value of both an interdisciplinary team-based approach to OUD care and the involvement of peer recovery specialists or other team members with lived experience of substance use (Stack et al., 2022). However, despite the growing body of literature about the strengths of these models (Wartko et al., 2023) – especially research about improved patient experience with nurse care managers (Beharie et al., 2022) and other non-prescribing team members with OUD expertise – funding these models can be a challenge because the roles are often not reimburseable (Blankson, 2023; Wallis et al., 2023). The literature increasingly suggests that team-based OUD care is the model that quality OUD treatment programs should be using; however, implementation continues to be limited by inadequate reimbursement. To be sustainable in the U.S., these models would benefit from policy that allows for reimbursement for nurse care management and SUN services (Pappas et al., 2024).

Pharmacy-level barriers to buprenorphine are well-described in the OUD treatment literature (Cooper et al., 2020; Kazerouni et al., 2021; Yeung et al., 2022). Despite the ballooning of telehealth treatment models since the COVID-19 pandemic began, current evidence suggests that pharmacists might be especially wary of telehealth prescriptions (Textor et al., 2022). In response to the barriers faced by the CareConnect team, we developed a web-based application that maps buprenorphine availability at pharmacies across Philadelphia. This application, used by the CareConnect SUN team to find pharmacies in the city that are convenient for patient, stock the medication, and dispense to new patients, is publicly available here (Aronowitz & Seeburger, 2023). To more comprehensively address this issue, U.S. policy-makers should address factors that contribute to pharmacies being hesitant to stock and dispense buprenorphine, including fear of DEA liability, and consider legislation that requires pharmacies to stock the medication and allows for home delivery (Qato et al., 2022).

Finally, our study and the experiences of the CareConnect team more generally point to the dire need to strengthen existing OUD treatment programs and to scale up longitudinal care capacity. As expressed by participants in our study and previously collected CareConnect data, most calls to CareConnect are from patients requiring a bridge, rather than initial, buprenorphine prescription, meaning that they had recently been engaged with OUD care (Lowenstein et al., 2022). Many referrals to CareConnect come from substance use disorder treatment programs themselves – who are unable to meet these patients' needs for a buprenorphine prescription for a variety of reasons – in some cases because they don't have a clinician on duty or because a patient missed an appointment and the program does not offer bridge prescriptions. While CareConnect is offering a vital service by providing care continuity for patients who are unable to receive medication from their usual prescriber, ideally, OUD treatment programs would be able to ensure that their patients do not go without medication – which would allow programs like CareConnect to engage as many *treatment-naïve* patients as possible. In addition, participants in our study discussed some of the difficulties connecting patients to longitudinal care. The sustainability and impact of bridge clinics rely on the availability of quality longitudinal OUD treatment programs where bridge clinic staff can refer patients (Calcaterra et al., 2023).

This study has a few important limitations. We did not assess patient experiences with CareConnect, so we cannot make inferences about the quality of care from a patient perspective. We are also unable to assess how effective this program is at ensuring patients receive medication and follow up treatment. Although findings from this study highlight some important facilitators to implementation of this type of program, other environments may present different barriers and clinicians hoping to start a similar program may find that factors specific to their institutions make implementation difficult.

Conclusion

Rates of fatal overdose continue to rise in the U.S, and most people with opioid use disorder (OUD) are not engaged in evidence-based treatment with medications. In Philadelphia, a city with one of the highest fatal overdose rates in the country, many residents face significant care access barriers. Virtual buprenorphine bridge clinics can help address some care barriers by providing same-day buprenorphine prescriptions via audio-only telehealth. Our study of barriers and facilitators to implementing Penn Medicine OnDemand CareConnect from the perspective of key stakeholders provides valuable insights to improve and sustain CareConnect and can guide the development and implementation of future programs nationally.

Ethics approval and consent to participate

We received University of Pennsylvania IRB approval prior to any study activities. All participants provided verbal informed consent, as specified by the IRB, before interviews took place.

Consent for publication

Consent for publication was included in the informed consent completed prior to each interview.

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CRediT authorship contribution statement

Shoshana V. Aronowitz: Writing – original draft, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **M Holliday-Davis:** Writing – review & editing, Formal analysis, Data curation. **Rachel French:** Writing – review & editing, Formal analysis, Conceptualization. **Selena Suhail-Sindhu:** Writing – original draft. **Nicole O'Donnell:** Writing – review & editing, Conceptualization. **Jeanmarie Perrone:** Writing – review & editing, Conceptualization. **Margaret Lowenstein:** Writing – review & editing, Conceptualization.

Declaration of competing interest

We have no competing interests to declare.

Availability of data and material

To protect the confidentiality of participants, interview transcripts are not publicly available.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.drugpo.2024.104569.

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