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COVID-19: A catalyst for change in telehealth service delivery for opioid use disorder management

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ABSTRACT

Background: COVID-19 has exacerbated income inequality, structural racism, and social isolation—issues that drive addiction and have previously manifested in the epidemic of opioid-associated overdose. The co-existence of these epidemics has necessitated care practice changes, including the use of telehealth-based encounters for the diagnosis and management of opioid use disorder (OUD).

Methods: We describe the development of the “Addiction Telehealth Program” (ATP), a telephone-based program to reduce treatment access barriers for people with substance use disorders staying at San Francisco’s COVID-19 Isolation and Quarantine (I&Q) sites. Telehealth encounters were documented in the electronic medical record and an internal tracking system for the San Francisco Department of Public Health (SFDPH) COVID-19 Containment Response. Descriptive statistics were collected on a case series of patients initiated on buprenorphine at I&Q sites and indicators of feasibility were measured.

Results: Between April 10 and May 25, 2020, ATP consulted on the management of opioid, alcohol, GHB, marijuana, and stimulant use for 59 I&Q site guests. Twelve patients were identified with untreated OUD and newly prescribed buprenorphine. Of these, all were marginally housed, 67% were Black, and 58% had never previously been prescribed medications for OUD. Four self-directed early discharge from I&Q—1 prior to and 3 after initiating buprenorphine. Of the remaining 8 patients, 7 reported continuing to take buprenorphine at the time of I&Q discharge and 1 discontinued. No patients started on buprenorphine sustained significant adverse effects, required emergency care, or experienced overdose.

Conclusions: ATP demonstrates the feasibility of telephone-based management of OUD among a highly marginalized patient population in San Francisco and supports the implementation of similar programs in areas of the U.S. where access to addiction treatment is limited. Legal changes permitting the prescribing of buprenorphine via telehealth without the requirement of an in-person visit should persist beyond the COVID-19 public health emergency.

KEYWORDS

Telehealth; COVID-19; opioid use disorder; low-barrier; buprenorphine

Introduction

Preceding the COVID-19 epidemic, the United States (U.S.) was in the throes of a national crisis of pre-mature deaths due to drug overdose—particularly illicit opioid-associated mortality.¹ Both epidemics have exposed the precarious state of our social safety net and disproportionately affected marginalized patient populations.^{2–5} During the months of April and May, estimated deaths from COVID-19 in the U.S. varied between 1000 and 3000 per day.⁶ Daily opioid-related deaths also varied throughout the U.S.; yet, in some areas of the country, daily deaths due to opioid overdose were higher than that of COVID-19. Such was the case in San Francisco, where, during the first six months of 2020, there had been a total of 50 documented deaths due to

COVID-19.⁷ By that point, there had been 125 deaths among people experiencing homelessness in 2020—more than twice as many deaths as by the same date in 2019.⁸ While formal cause of death data for 2020 is not yet available, most of these deaths are thought to have been due to drug overdoses⁸—which accounted for more than one death per day in San Francisco during 2019, the majority of which were related to fentanyl.⁹

The collision of the COVID-19 and drug overdose epidemics has created unique challenges in the treatment of opioid use disorder (OUD) (Figure 1).¹⁰ At the patient-level, social isolation has exacerbated loneliness and stress, increasing the likelihood of risky drug use and overdose due to an inability to use with others—an unintended byproduct of social distancing laws.^{11,12} The stay-at-home orders

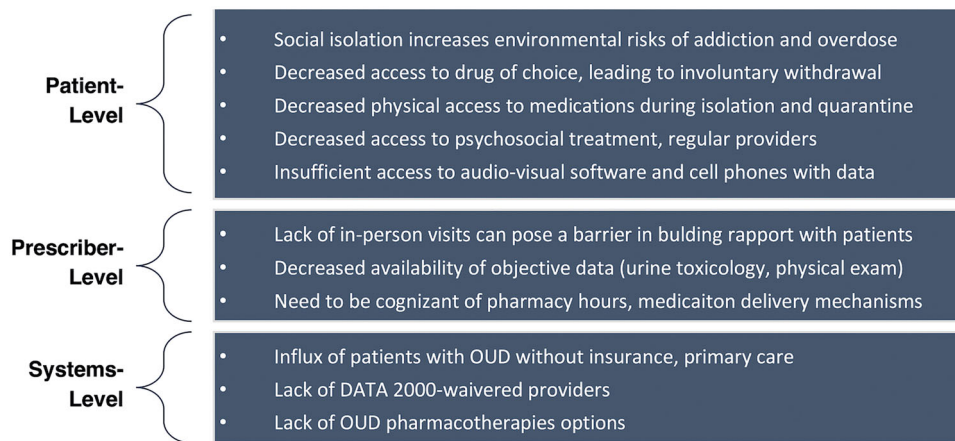


Figure 1. Challenges of treating opioid use disorder during the COVID-19 pandemic.

associated with the COVID-19 pandemic have also created barriers in physically accessing psychosocial treatment programs, many of which are available only virtually on audio-visual platforms inaccessible to many marginalized groups. At the prescriber-level, the inability to regularly see patients in-person has caused barriers in building rapport and collecting objective data to support diagnosis and management, including urine toxicology screens and physical examinations.¹³ At the systems level, decreased access to illicit opioids in some parts of the country, coupled with job loss and the loss of employer-based insurance, may lead to increases in the numbers of patients requiring treatment who do not have primary care providers or health insurance.¹⁴

These challenges necessitated a shift in OUD management in the era of COVID-19, permitted by changes to legal requirements related to the use of telephone- and telehealth-based encounters.^{15,16} Prior to the national declaration of COVID-19 as a “Public Health Emergency,” the Ryan Haight Online Pharmacy Consumer Protection Act of 2008 had required that practitioners prescribing controlled substances conduct at least one in-person medical evaluation prior to prescribing via telehealth. In the context of the public health emergency, this requirement was temporarily lifted by the Drug Enforcement Administration (DEA) on March 16, 2020 if tele-medicine was utilized with an “audio-visual, real-time, two-way interactive system.” Later that month, recognizing that the audio-visual requirement promoted a digital divide and posed access barriers for patients,¹⁷ the Substance Abuse and Mental Health Services Administration (SAMHSA) and the DEA clarified that telephone-only encounters could be used for the initiation of buprenorphine for OUD.

In San Francisco, the early promotion of social and physical distancing in March 2020 led to the anticipation of decreased access to regular drug supplies among people who use drugs in addition to decreased access to primary care and addiction treatment services among people seeking treatment for OUD.^{18,19} A group of addiction-trained physicians at the University of California, San Francisco (UCSF), developed the “Addiction Telehealth Program” (ATP) in attempt to alleviate some of these access barriers. ATP was

initially designed as a telehealth referral system available to medical providers of primary, urgent, and emergency care within the San Francisco Department of Public Health (SFDPH) network. The model was later adapted to address un-met addiction treatment needs at Isolation & Quarantine (I&Q) sites—city-sponsored hotels provided to people with confirmed or suspected COVID-19 who could not safely isolate elsewhere due to homelessness or congregate living. Regardless of the setting, ATP’s goal was to provide immediate assistance with direct clinical care for patients with any substance use disorder (SUD), with a focus on expanding access to buprenorphine for OUD treatment.

Of note, the patient-to-nursing ratio at I&Q sites was high, between 30 and 50 patients to each on-site nurse, which significantly limited the supervision capabilities of on-site nursing staff. Alcohol and cigarette use were permitted on-site in I&Q hotel rooms if these substances could be delivered to the patients and patients did not need to leave the sites to acquire them. A pilot managed alcohol program was also created to serve patients with alcohol use disorder who were at greatest risk. Though illicit drug use was not explicitly permitted, efforts were made to demonstrate to guests that an advanced harm-reduction approach was being promoted and that illicit drug use would not be criminalized at I&Q sites. For example, patients were told on I&Q admission that they could request harm reduction supplies such as needles and syringes or more frequent check-ins by nursing staff to minimize potential harms from drug use.

Methods

Development of the addiction telehealth program (ATP)

ATP was created under the existing framework of the Bridge Clinic at Zuckerberg San Francisco General (ZSFG) Family Health Center. At baseline, Bridge offers both appointments and drop-in addiction care services to patients discharged from the city’s public hospital or referred from primary care. The clinic’s providers and other addiction-trained faculty and fellows volunteered to staff ATP Monday–Friday, 8am–5pm. A designated ATP pager number served as a single access point and was forwarded to the

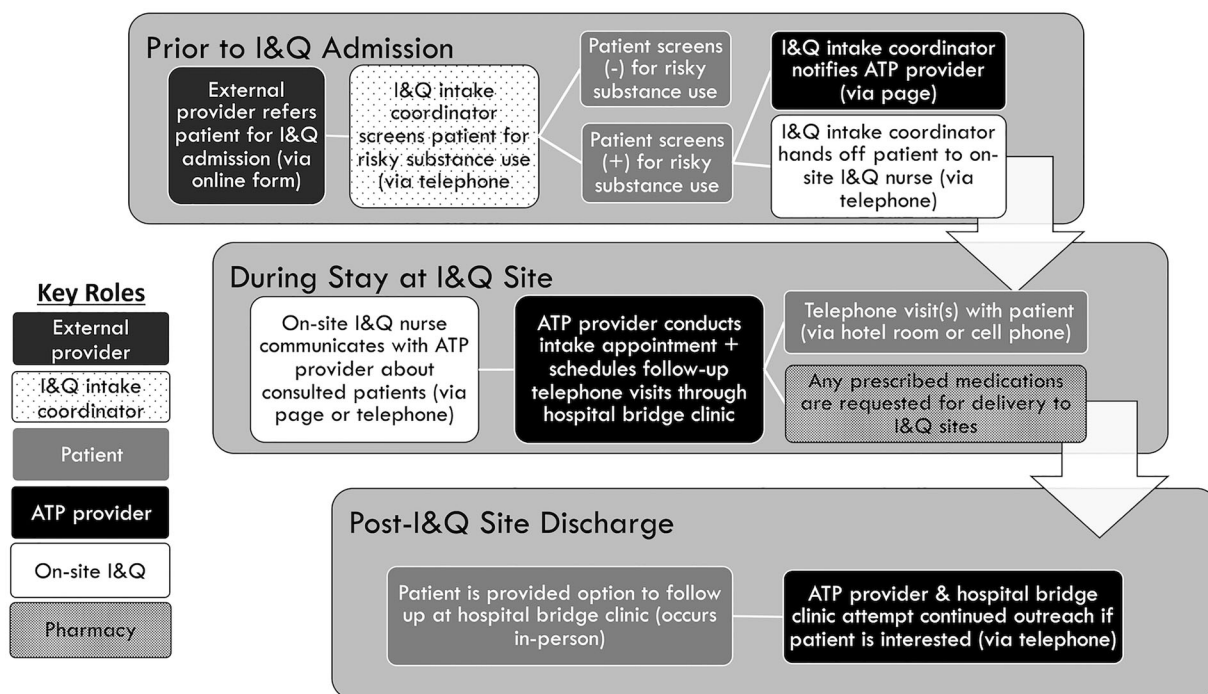


Figure 2. Addiction Telehealth Program (ATP) workflow & referral protocol at COVID-19 isolation & quarantine (I&Q) sites.

on-call provider. Documentation of telephone visits occurred within the Bridge Clinic electronic medical record (EMR). ATP and its associated pager number were advertised to in-network medical providers through emails to leaders at primary care clinics, urgent care clinics, and the emergency department. If an in-network staff member identified a possible need for OUD treatment, they would page the ATP pager requesting a real-time consult. Within 15 minutes, the ATP provider would call the referring provider to hear their brief clinical consult question, collect patient contact information, then contact the patient via telephone, take a SUD history, and assess their current needs. Based on patient history, the ATP provider developed an assessment and plan, communicated this to the patient and referring provider, then made arrangements to have any medications sent to the patient via same- or next-day delivery.

Adapted design: Addiction telehealth consultation for guests at SFDPH isolation & quarantine sites

By early April 2020, repeated COVID-19 outbreaks in San Francisco's homeless shelters and other congregated living spaces compelled the city to convert hundreds of hotel rooms into I&Q sites to temporarily house people with confirmed or suspected COVID-19. Guests were typically asked to stay at these facilities for between 7 and 14 days if undergoing isolation or quarantine, or for shorter periods of time if they are awaiting COVID-19 test results that ultimately returned negative. A major concern in I&Q settings was the heightened risk of overdose due to an increased likelihood of using drugs alone. The ATP model was thus adapted to address addiction treatment and harm reduction needs at the I&Q sites (Figure 2). The ATP pager number was provided to the centralized I&Q Intake Coordination Team

(who consisted of registered nurses) as well as the distinct on-site nursing staff at each I&Q hotel. For each patient being considered for admission to I&Q, a member of the I&Q Intake Coordination Team took a brief history prior to patient arrival at the I&Q site. If there was concern about SUD management needs, the Intake Coordinator would page the ATP provider directly. On-site registered nurses at I&Q sites could also page ATP for follow up questions, new consult requests when a significant SUD was missed upon intake, and other addiction treatment needs. The ATP provider would subsequently contact the patient (either via cell phone or the hotel room phone) to discuss needs, develop an assessment and plan, and communicate this to on-site RNs and document in the I&Q online internal tracking system and Bridge Clinic EMR before making arrangements to have medications delivered to the site (Figure 2).

If it was determined that an I&Q guest met criteria for unmanaged OUD and was interested in starting buprenorphine for treatment, the ATP provider would provide the patient with verbal instructions on how to conduct a "home induction" onto buprenorphine. Patient teach-back was used to promote clarity in this process. The specific induction plan and buprenorphine dosage selected for each patient was created at the discretion of the ATP provider and was individually tailored based on the opioid substances the patient had been using, time since last use, prior history of buprenorphine use and other factors.

All patients started on buprenorphine by the ATP provider received a second telephone-based visit within 24-72 hours of medication initiation and, if they remained at I&Q, generally received additional telephone-based check-ins every 72 hours (or more frequently as needed) thereafter. Due to programmatic limitations, other than motivational interviewing with the ATP provider during telephone-based

Table 1. Characteristics of I&Q guests prescribed buprenorphine via telehealth.

Characteristic	Number of patients, <i>n</i> = 12 (%)
COVID-19 status	
Confirmed positive	2 (17%)
Close contact of positive patient; asymptomatic	3 (25%)
Person under investigation; symptomatic	7 (58%)
Housing status prior to I&Q admission	
Homeless – unsheltered	2 (17%)
Homeless – sheltered	9 (75%)
Incarcerated	1 (8%)
Race/Ethnicity	
Black	8 (67%)
LatinX	1 (8%)
White	4 (33%)
Sex	
Female	4 (33%)
Male	8 (67%)
Age	
Under 30	0 (0%)
30–50	10 (83%)
Over 50	2 (17%)
Prior history of treatment with medications for OUD	
Methadone	4 (33%)
Buprenorphine	2 (17%)
None	7 (58%)
Current opioids used	
Heroin	8 (67%)
Fentanyl	5 (42%)
Opioid pain pills	0 (0%)
Route of use	
Injection	5 (42%)
Intranasal	3 (25%)
Inhalation	4 (33%)

visits, extensive psychosocial treatment for OUD was not provided to patients during their time at I&Q sites. Patients were verbally provided follow up information on how and where to access ongoing buprenorphine-based care for OUD through the Bridge Clinic at Zuckerberg San Francisco General (ZSFG) Hospital post-I&Q discharge.

Local partnerships

ATP partnered with two pharmacies operated by the SFDPH to fill and deliver the majority of prescriptions to patients during regular business hours, while commercial pharmacies were used during after-hours. For OUD, medications prescribed included sublingual formulations of buprenorphine and ondansetron and oral formulations of clonidine, hydroxyzine, and loperamide. Prescriptions could be written electronically or called in, with a message requesting the pharmacy to deliver the prescription to the address of the I&Q hotel site in San Francisco. Delivery was free and generally same-day, within hours of prescription receipt. If an uninsured or under-insured patient was identified, the partnering pharmacist would provide assistance with enrollment in the San Francisco Mental Health Plan—a pharmaceutical payment program that provides access to behavioral health medications for patients receiving care in safety net programs.

Data tracking & evaluation

All telephone encounters with patients were documented in the Bridge Clinic EMR at ZSFG Family Health Center, and

all demographic and clinical information for guests of I&Q sites was additionally documented in an internal tracking system created as part of the SFDPH COVID-19 Containment Response. Given the pilot nature of this telehealth program, descriptive statistics were collected on a case series of patients newly initiated on buprenorphine at I&Q sites through ATP. Programmatic success was defined as logistical feasibility of telehealth implementation for OUD management at I&Q sites. Indicators of feasibility included identification of patients entering I&Q with untreated OUD, successful initiation of these patients on buprenorphine for treatment of OUD, and avoidance of significant harm or the unsafe use of buprenorphine, including the risk of overdose. This study was designated as part of a quality improvement program for evaluation of ongoing program development, and IRB exemption was provided by the Institutional Review Board (IRB) at the University of California, San Francisco.

Results

In the two weeks prior to the adaptation of ATP for use in San Francisco's Isolation & Quarantine (I&Q) sites on April 10, 2020, fewer than 10 consults had been made to ATP among in-network primary, urgent, and emergency care providers. Of the few consults made, none necessitated the prescribing of medications for the treatment of OUD and the majority did not require any direct clinical care from ATP. This prompted the adaptation of the ATP model to serve I&Q sites.

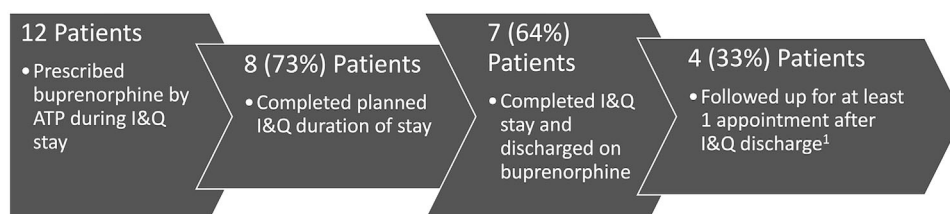


Figure 3. Care cascade of isolation & quarantine (I&Q) patients maintained on buprenorphine as of May 25, 2020. ¹This does not include potential follow-up appointments that may have occurred outside of the San Francisco Department of Public Health network. Of the four patients with known follow up for buprenorphine continuation, two followed up with existing primary care doctors and two followed up at the Bridge Clinic at Zuckerberg San Francisco General Family Health Center via connection through the Addiction Telehealth Program.

Between April 10 and May 25, ATP consulted on the management of substance use disorders among 59 guests at San Francisco's I&Q sites. Though some patients met criteria for multiple substance use disorders, in each of these cases there was one predominant substance of choice, which was the focus of the ATP consult. The reasons for ATP consult included the management of predominant alcohol use (25 patients), opioid use (19 patients), stimulant use (10 patients), cannabis use (4 patients), and gamma-hydroxybutyrate use (1 patient). Among the 19 patients consulted on for the management of predominant opioid use, 12 were diagnosed with OUD and prescribed buprenorphine for treatment, 2 did not meet criteria for OUD, and 5 were already taking buprenorphine or methadone for OUD treatment.

Of the 12 patients diagnosed with OUD and prescribed buprenorphine, all were unstably housed prior to I&Q admission, 8 were Black, and 7 had never previously been prescribed medications for OUD (Table 1). One patient self-directed early discharge from I&Q prior to arrival of prescribed buprenorphine at the site, 3 self-directed early discharge after initiating treatment, and, of the remaining 8 patients, 7 reported continuing to take buprenorphine at the time of their planned I&Q discharge (Figure 3). Four of these patients are known to have followed up for ongoing OUD care after I&Q discharge. Of the four patients who had left I&Q prior to planned discharge, no specific reasons for their early departure had been recorded. No patients experienced serious adverse events such as overdose, death, or need for urgent or emergent medical services during their time at the I&Q sites. Though data on adverse effects were not formally collected, based off of review of electronic medical records, there was no mention of any patients having experienced precipitated withdrawal during buprenorphine induction. However, at least two patients noted increased anxiety on buprenorphine, both of whom were found to have been taking larger doses of buprenorphine than prescribed. Average length of stay at I&Q sites among people initiated on buprenorphine was 16.1 days.

At the time of publication, among the over 2000 total guests at the five different I&Q sites served by ATP, there have been no overdose deaths and only one known case of opioid overdose, which was successfully reversed with naloxone by an on-site RN. The patient who overdosed had been prescribed buprenorphine by ATP at intake but decided not to start it. His partner, who was staying in the same I&Q room and did initiate buprenorphine at intake did not

experience an overdose after using the same batch of fentanyl. She was thus able to alert the on-site RN when the overdose occurred.

Conclusions

The implementation of the Addiction Telehealth Program (ATP) pilot has demonstrated the feasibility of providing low-threshold, direct telehealth services to treat opioid use disorder among people staying at municipally-sponsored I&Q sites during the COVID-19 pandemic. ATP was found to be effective at initiating I&Q guests on buprenorphine for the treatment of OUD and the program's associated harms were minimal, even when implemented in the midst of a global pandemic.

The majority of patients started on buprenorphine in our pilot had never before been prescribed medications for the treatment of opioid use disorder (OUD) and, notably, 67% of patients were Black and 100% were unstably housed. This has important public health implications, as these populations face several barriers to addiction care, including lack of trust in the healthcare system due to stigma and experiences of discrimination, as well as stressful living conditions that may impede the ability to prioritize one's physical and mental health.²⁰⁻²² These findings suggest that the DEA's expansion of telehealth to allow for telephone-mediated buprenorphine prescribing without the requirement for an in-person initial visit may lead to increased accessibility to medications for OUD among populations that have historically experienced decreased healthcare access. However, it should be recognized that ATP's ability to initiate buprenorphine in this context at I&Q sites would not have been possible without the city's provision of temporary housing to these patients in the form of I&Q hotel rooms.

While additional studies are needed to evaluate the efficacy of ATP in reducing the risk of people leaving I&Q sites prior to planned discharge dates, our initial data suggest that people started on buprenorphine were as likely to complete planned I&Q admissions (73%, Figure 3) as all other San Francisco I&Q guests, for whom internal estimates averaged at 70% as of May 25, 2020. The average length of stay among patients started on buprenorphine was also nearly twice that of other patients (16.1 vs. 9.6 days overall). This is likely a reflection of increased prevalence of unstable housing and congregate living among patients in our case series compared to others at I&Q sites, as patients who complete their planned I&Q admissions remain at I&Q sites to await

placement elsewhere when they do not have an alternative location to safely shelter-in-place. Nonetheless, the longer duration of stay might also suggest that treating OUD with buprenorphine improves I&Q tolerability and may thereby prolong the effective periods during which people with confirmed or suspected COVID-19 are able to remain in isolation. This, in turn, may help indirectly reduce risk of community transmission of COVID-19—rendering buprenorphine a form of harm reduction at the population level in addition to chronic disease treatment at the individual level.

There have been no ED visits or observed diversion among patients prescribed buprenorphine, and there have been no overdose deaths among the over 2000 people who have stayed at the city's 5 I&Q sites at the time of publication. This is notable, as this has not been the case in San Francisco's Shelter-in-Place (SIP) hotels, where at least 15 deaths have occurred among guests, many of which are thought to have been associated with drug overdose.^{8,23} Like I&Q sites, SIP hotels provide temporary housing for people experiencing homelessness in the context of the COVID-19 epidemic, but they are designed for individuals at high-risk for COVID-19, such as older adults and people with comorbidities, rather than those with known or suspected COVID-19. It is unclear why the prevalence of overdose events has differed between the I&Q and SIP sites. Unlike guests of I&Q sites, SIP hotel guests do not have 24-hour access to on-site RNs and they cannot, as of yet, access support from ATP. However, they do receive on-site medical support, including that from volunteer clinicians and concerted efforts have been made to increase harm reduction supplies, including naloxone and fentanyl test strip availability, in SIP hotels. Potentially differential drug use patterns between residents of I&Q and SIP sites could have also contributed to differential overdose events, as many I&Q residents had known COVID-19 and/or were experiencing symptoms.

The ATP pilot is still in early stages and has experienced a number of iterative changes in its protocol. Thus, we cannot currently make conclusions as to the efficacy of buprenorphine induction via telephone encounters at I&Q sites in promoting long-term follow up for OUD treatment post-I&Q discharge. However, the fact that even a few patients whose first experiences with buprenorphine occurred at I&Q sites have followed up in more traditional addiction clinic settings after I&Q discharge demonstrates the utility of telehealth as a low-threshold route to increase OUD treatment initiation and retention rates.

Challenges

While this pilot demonstrated feasibility of telephone-based addiction care delivery in COVID-19 I&Q sites, there were many challenges. One must balance the goal of reducing community transmission of SARS-CoV-2 by helping patients safely isolate or quarantine with the critical requirement of prescribing controlled substances responsibly. Tools such as in-person examinations and routine urine drug screening,

which are not easily attainable under the current ATP model, can be valuable in improving treatment adherence. In addition, ATP had been afforded a number of resources which may not be available elsewhere—including direct partnerships with public health pharmacies and the ability to enroll under-insured patients in locally available safety net insurance programs. Ultimately, the ATP model could likely function effectively without such bundling of resources, though it is difficult to individually measure their contributions to programmatic success.

To date, only a third of patients in this pilot have confirmed to have followed up in traditional clinic settings for buprenorphine maintenance post-discharge. There are likely a variety of reasons for this. Some patients may have accepted buprenorphine for withdrawal relief to improve I&Q tolerability for a defined period but may not be interested in long-term treatment. However, even among treatment-seeking patients, a variety of barriers during the post-I&Q discharge period are likely to have made follow up challenging. These barriers might include the loss of housing and stability, difficulty in physically accessing clinics, or a possible lack of effective communication among providers to patients that buprenorphine could not be prescribed exclusively via telehealth for extended periods of time. Possible interventions to mitigate these issues or reduce the need for in-person clinic visits could include integration of urine drug screening within specialty pharmacies as a requirement for medication pick-up or, in lieu of urine drug screening, the collection of oral fluid drug tests that may more easily be monitored via audio-visual telehealth interfaces. If fiscally and logistically possible, the implementation of long-acting injectable buprenorphine for the treatment of OUD in I&Q settings may also minimize concern for medication diversion. Future iterations of the ATP model will include patient-facing education and information at the time of buprenorphine induction outlining expectations regarding follow up and continuation of buprenorphine prescription after isolation or quarantine is complete.

Other challenges are associated with the nature of telehealth communication itself. Building rapport with patients via telephone-only encounters can be difficult, particularly when discussing highly sensitive topics. In addition, under the model of volunteer clinicians staffing ATP, patients often had to interact with several different addiction medicine providers over the course of any given week. Lastly, not all people with OUD staying at I&Q sites will be interested in treatment, and telehealth programs like ATP should be prepared to provide harm reduction supplies and naloxone to all patients who may require them. To this end, the SFDPH I&Q sites partnered with local harm reduction organizations that provided staff training and harm reduction supplies to each site.

Policy implications

The success of the ATP pilot in aiding OUD treatment among marginalized patient populations staying at San Francisco's COVID-19 I&Q sites supports the

implementation of similar telehealth services for substance use management in other cities and rural areas within the U.S.—particularly in places where access to addiction medicine providers is limited at baseline.^{24–30} Moreover, the expansion of telehealth capabilities for OUD management temporarily permitted by the DEA, including the ability to initiate buprenorphine treatment via telehealth and telephonic visits, is an equity issue and should remain available in the post-COVID era.³¹ The opioid overdose epidemic preceded the COVID-19 pandemic as a nationally declared public health emergency, and effective policies that increase OUD treatment access must remain, even as COVID-19 risks decline. Programs such as the ATP pilot can increase equitable access to addiction medicine for marginalized populations by providing low-threshold and low-tech coordinated care.

Author contributions

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Jessica T. Ristau, MD – program design, data collection, manuscript editing

Hannah Snyder, MD – program design lead, manuscript editing

Colleen Suryln, MD – medical director/supervisor of COVID-19 I&Q sites, manuscript editing

Joanna Eveland, MD – medical director/supervisor of COVID-19 I&Q sites, manuscript editing

Shannon Smith-Bernardin, PhD RN – harm reduction expertise, manuscript editing

Kelly R. Knight, PhD – harm reduction expertise, manuscript writing oversight/editing

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