A Proposal for Digital Supervised Drug Consumption Sites

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Submitted to: JMIR Mental Health
on: February 19, 2024

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Abstract

This paper proposes a novel digital health solution to the ongoing opioid crisis that attempts to address barriers to patient access to Supervised Drug Consumption sites (SDCs). SDCs are facilities where an individual can consume a previously obtained drug substance under supervision of trained staff experienced in rescuing individuals who overdose. SDCs have grown as a public health measure for fatal overdose prevention, with the first sanctioned facilities in the US opening in 2021, yet there is no evidence that SDCs reduce community rates of fatal overdose. SDCs may engage a small subset of people who use drugs, as individuals face barriers of distance, facility capacity, and stigma, thereby limiting their effectiveness in preventing fatal overdose. We suggest instead a digital health solution of 'Tele-SDCs' whereby teams of overdose prevention specialists can virtually monitor individuals who have consumed drugs for signs of an overdose via mobile application, and route emergency medical services to their location if needed. This has the benefit of allowing individuals to consume drugs in their preferred location and reducing access, capacity, and stigma barriers of physical SDCs, while maintaining a similar level of overdose prevention services. Further, this can allow for better clinical data collection for measurement-based care, which is often difficult in the context of overdoses, and the development of more digital health interventions in the future. We believe there may be some limitations of an app-based digital health solution, such as acceptance, recruitment of users, and fewer social resources as an in-person facility, which we discuss.

(JMIR Preprints 19/02/2024:57535)
DOI: https://doi.org/10.2196/preprints.57535

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By

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Competing Interests: Mr. Kumar, Mr. Swaminathan, Mr. Emani, Mr. Howser, and Professor Humphreys declare no conflict of interest.

Author Contribution: All authors contributed to conception of the article, editing and content review was conducted by KH, writing was conducted by WK, AS, SE, and TK. All authors read and approved the final manuscript.

Funding/Support: None

Word Count: 1761

In 2021, an estimated 107,622 individuals died from drug-involved overdose, the highest total in U.S. history.[1] One strategy for preventing drug overdoses from resulting in death are Supervised Drug Consumption sites (SDCs). In SDCs, an individual can consume previously obtained drugs under supervision of staff trained to rescue people who overdose and to provide other services. Data from one unsanctioned SDC operating since 2014 in the United States at the peak of its operation in 2019 had 2,926 injections, with 15 opioid overdoses (5.13 overdoses/1000 injections) and 0 overdose deaths. The first sanctioned SDC in the US opened in New York City in 2021 at two syringe exchange programs. Over a 13-month period, 613 unique individuals used SDC services a total of 5,975 times. During this period there were 125 instances where staff intervened to mitigate overdose risk, and no fatal overdoses. This has led to calls to expand SDC in cities including Los Angeles, Philadelphia, San Francisco, Boston, and Seattle.

However, there is no evidence that SDCs reduce community rates of fatal overdoses.[2] This is unsurprising in that they engage very few individuals who use drugs and because fatal overdose is a rare event. Brick-and-mortar SDCs will never achieve the scale required to affect population overdose rates.

In 2020, there were 84,000 admissions to chemical dependency treatment facilities across New York for opioid use, indicating a minimum need of 274 SDCs in New York to cover just the small subset of the population at risk of opioid overdose that access other services. Canada's network of 39 SDCs may serve as a framework to build from, having seen roughly 35,000 Canadians over a 2-year period.[3] If extrapolated to the United States, this would indicate a network of 3,000 SDCs at minimum to cover the country, with a more conservative need estimate of 7,000 SDCs. This seems an impossibility given that despite having over three decades since the first SDC was founded, all nations combined have managed to open fewer than 200 sites. The cost of building these brick and mortar facilities would also by necessity reduce funds available for other services with stronger evidence of effectiveness, such as buprenorphine treatment and naloxone distribution. Further, there are important considerations such as heightened stigma associated with the presence of SDCs in a neighborhood, and lower access to care for those who may be too far or lack transportation to reach an SDC. In this piece, we propose and outline a strategy to develop virtual supervised drug consumption services ('Tele-SDCs') and assess the impacts thereof.

Tele-SDCs

Telehealth may offer a more tenable path to scaling supervised drug consumption services compared to expanding brick-and-mortar SDCs, as it should be cheaper to set up, provide greater access by eliminating the need to travel to a physical location, and reduced stigma from neighborhood residents due to less apparent substance use. One model of care for digital supervised drug consumption services would be to develop teams of overdose prevention specialists, who are trained as recovery coaches and have experience with spotting symptoms of an overdose, and work to monitor and alert emergency medical services (EMS) if an overdose occurs. Teams would be housed in a centralized hub (the digital overdose prevention center). A team would include 6-8 recovery coaches, each with a panel of 10-15 patients observed over a 3-hour period, allowing each recovery coach to care for a panel of 150 patients per week. In addition, on-site nurses could provide consultation for individuals with wound care or other

medical needs. The team is supervised by a licensed nurse, available to address questions on clinical deterioration and response, and the entire center ran by an Addiction Medicine physician, who functions as an administrator and liaison to healthcare systems (Figure 1). The recovery coaches would have access to multiple computer screens on which they are able to view individuals who log into the system. Clients are able to download an app on their smartphones or computer devices. When the app is launched the client then activates their video stream, which is viewed by the recovery coach, and their location data is collected from their device. The recovery coach would be able to monitor the individual's session and if they suspect an overdose, are able to route EMS to the client's location. In addition, the client would have access to a panic button if they feel an overdose is occurring, which can either directly route them to EMS or alert the recovery coach (Figure 2).

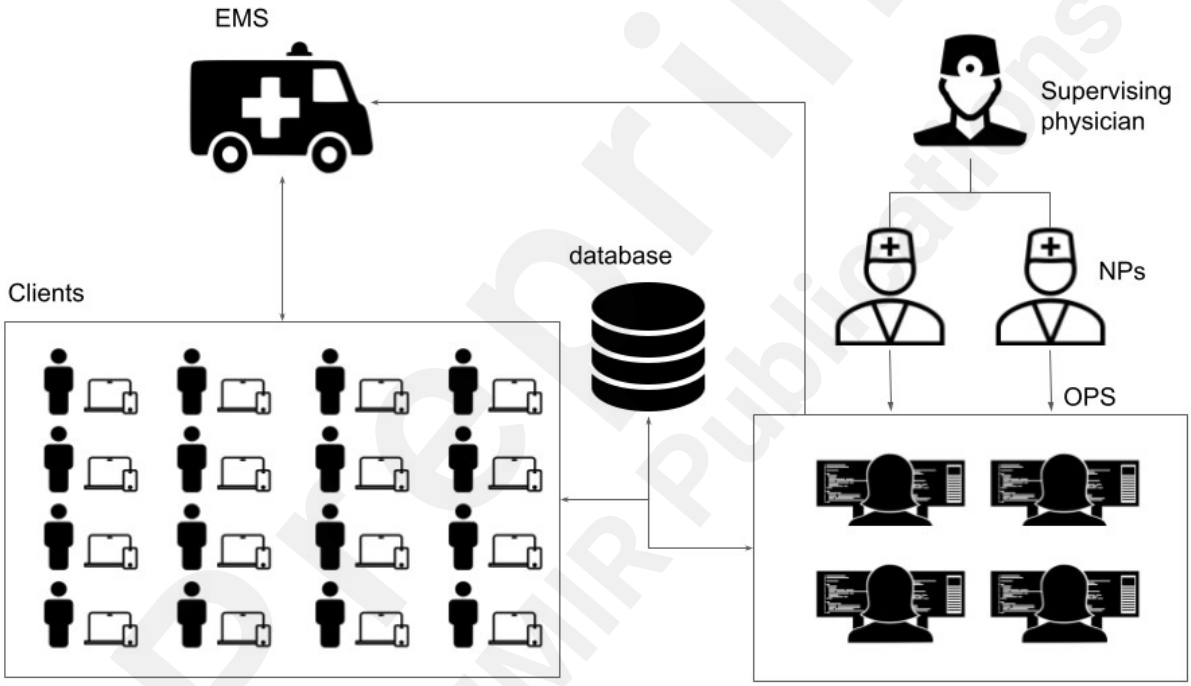

Figure 1: Proposed administrative structure of a tele-SDC

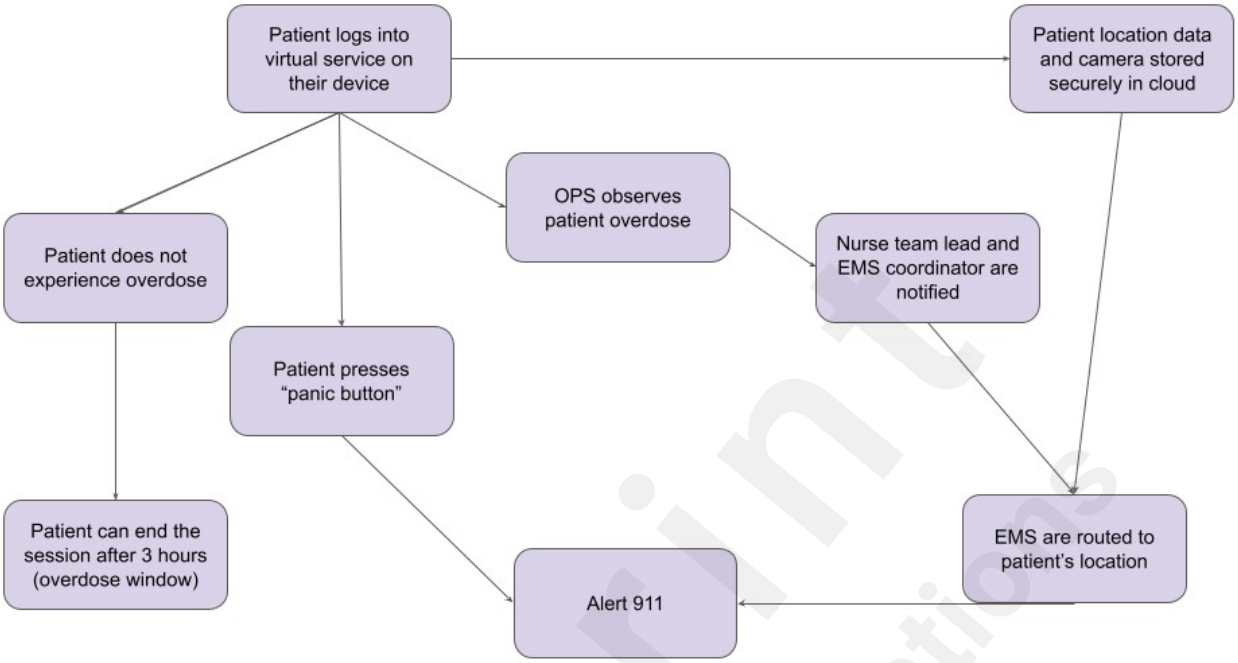

Figure 2: Proposed patient-flow through a tele-SDC

Overdose deaths typically occur 1 to 3 hours after consumption, so if indications of an overdose are observed early, EMS can have enough time to respond. Both the individual monitoring on screens and the person using the substance would be aware that an overdose is occurring. Data would be de-identified and securely stored in a cloud server, in compliance with HIPAA regulations.

Another benefit of using a virtual monitoring system is the prospect of implementing autonomous emergency response mechanisms. Given reliable data collection and incident tracking, models could be trained to recognize signs of overdose, such as respiratory depression, and pupillary responsiveness, ultimately helping a smaller number of coaches monitor a large number of clients. Smartphone-based systems have been used to identify overdoses using respiratory predictive markers,[4] while advances in machine learning have been used to track pupillary dilation[5] and could serve as the basis for algorithms to detect overdose signs.

Using data to improve care delivery

A successful tele-DCS solution must incorporate measurement-based care — the practice of using routinely collected clinical data to inform care delivery. To successfully implement measurement-based care, tele-SDCs will have to get three things right: 1) define key clinical quality indicators (CQIs), 2) build the technological infrastructure to measure CQIs, and 3) design a feedback loop that leverages data for continuous improvement.

CQIs are the metrics for success and include structural, process, and outcome measures. For tele-DCSs, these may include screening rates for opioid use disorder, ratio of patients per clinician,

frequency of overdoses, time from overdose to EMS dispatch call, time from EMS dispatch call to patient intervention, and overdose-induced morbidity and mortality. To measure these indicators, a robust tech infrastructure that can support automated data collection, secure data storage, and easy data retrieval is necessary. Several open-source electronic health record (EHR) software options exist that could be repurposed for tele-SDCs. This system should ideally connect with a database platform that can store and export patient data for subsequent analytics. Aggregate data on patient outcomes could be shared with patients' physicians and insurers and could be analyzed in conjunction with emergency department data to measure the impact of tele-SDCs on downstream healthcare utilization and outcomes. Further, patients who return to the service can be better identified for linkage to healthcare and social benefits.

Barriers

Recruiting individuals can be a difficult task at start, however with increased acceptance over time and greater awareness of the service there is likely to be an increased number of users. Clients likely also want to avoid an overdose becoming fatal, thus there is high likelihood of their participation. If the service is offered through mobile devices, this may further supplement those who have difficulty accessing a laptop or reliable internet connection. There may exist some barriers to accessing this service including access to an internet connection, a device to stream from, and some potential technological knowledge barriers. This may in turn push the service more towards higher income individuals who use drugs. Additionally, there may be stigma associated with using an app that requires video monitoring that would prevent some individuals from joining.

Currently, the healthcare system engages in partnerships with EMS service providers and crisis intervention teams. These partnerships generally work with emergency departments to ensure patients receive care for emergent needs. Similar coordination between the Tele-SDC, EMS provider, and emergency department may be needed to best provide interventions. This may therefore be most effective to pilot in a large city (both in the inner core and in suburbs) with an existing, expansive EMS system and high rates of broadband and cellular connectivity.

In order to understand the role of remotely monitored supervised drug consumption services in the larger landscape of substance use prevention and harm reduction health programs, it is critical to assess the relative strengths and weaknesses of a digital platform compared to brick-and-mortar establishments. The clear benefit of a remote model is the expansion of access to overdose prevention services for individuals who may not otherwise seek out these resources. Lack of access to transportation, fear of punitive action, and stigma associated with such programs create barriers to access which are relieved in a remote model. Expansion of access to overdose prevention not only improves health outcomes, but it reduces the burden on emergency health services and reduces costs of delivering care. Tele-DCSs will only improve access to individuals who have a mobile device or laptop with well-functioning camera, secure internet connection, and a consumption environment where they feel at liberty to enter a video call. For instance, studies have shown lower rates of telehealth access for those with lower income, limited English proficiency and rural location.[6,7,8] This may in turn lead to a bias in usership towards higher income individuals who use drugs.

Moreover, while remote supervised drug consumption sites services are well designed for overdose prevention, they cannot easily deliver holistic multifactorial health and case management services. Resources and treatment programs for substance use disorder may not be easily transferable to a virtual platform, leaving clients without easy options for accessing long-term addiction support. For many individuals, physical SDCs may be the most convenient inlet into the healthcare system and provide avenues for accessing additional resources such as housing support and workforce training. Moreover, physical SDCs provide spaces for shelter from harm inflicted by other users or law enforcement in public spaces.

Finally, given the sensitive and health-related nature of the service, clear guidelines for protecting user privacy would need to be established. Good Samaritan Laws provide protection for those providing aid in an emergency situation, and are often applied to overdose prevention settings, and could be expanded for services rendered through telehealth.[9] Depending on the framework within which the service is implemented, data privacy measures would need to meet legal requirements for HIPAA (like other telemedicine services), while also allowing for the platform to leverage user data to improve the service over time, assess quality, etc. Legal requirements aside, a telehealth model would also need to include a clear framework for communicating data use and privacy measures to clients in order to maintain trust in the system.

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