

Investigators: Jeffrey Lai (1), Peter Chai (1), Kavita Babu (1), Edwin Boudreaux (1), Karla Rodriguez (2), Amy Costigan (1)

(1) Department of Emergency Medicine, (2) Department of Psychiatry, University of Massachusetts Medical School, Worcester, MA

Title: Use of real-time audiovisual streaming technology to facilitate substance use disorder evaluation in the emergency department after opioid overdose

Background: One criticism of emergency care for patients who present after opioid overdose is that the focus is placed on immediate stabilization. Discharge planning, care coordination, and overdose prevention strategies may not be addressed during a typical ED visit. In response, the Governor of Massachusetts enacted legislation (effective July 1, 2016) mandating individuals presenting to an emergency department (ED) with suspected opioid overdose, or having received pre-hospital naloxone undergo a standardized substance use disorder evaluation (SUDE). The SUDE is performed by a licensed mental health professional includes assessment of

- 1) a patient's personal and family history of substance use;
- 2) responses to previous treatment for substance use; and,
- 3) co-occurring psychological disorders. The SUDE includes clearly documented recommendations for further treatment, and necessary level of care. Patients are not mandated to remain in the ED until the SUDE is performed; delay to SUDE availability often leads patients to leave prior to completion of this part of their care. The SUDE improves on previous care coordination plans for these high-risk patients; however, access is often limited or delayed, particularly in community ED settings and even large academic medical centers that are frequently overwhelmed by the sheer volume of psychiatric assessments. Accordingly, we propose teleSUDE - a novel telemedicine based platform that provides timely access to state-mandated substance use counseling, intervention, and referral to treatment.

Audiovisual devices (like tablet computers) have been deployed as a direct connection between patients and providers in home telehealth investigations. Improving access to psychiatric services and behavioral health counseling in the ED may improve the timeliness and feasibility of conducting SUDE in busy EDs as well as remote settings that lack in-person psychiatric and behavioral health consultation services. We have previously demonstrated the feasibility of using mobile video technologies to complete subspecialist consultations in ED settings. Additionally, ED based individuals with active substance abuse are willing to engage technology based interventions including including smartphone apps, wearable biosensors, and ingestible biosensors. We believe that teleSUDE represents an innovative technology-based real-time intervention that can help increase access to behavioral health services for individuals with substance use disorders without placing additional strain on the existing mental health system.

Aims: The overarching goal of our work is prevent recurrent overdose and avert overdose deaths. In this study, we intend to enhance access to focused substance use

disorder evaluation, counseling, and treatment recommendation, through a technology-based intervention.

To accomplish our goals, we will:

1. Evaluate acceptance by mental health providers of teleSUDE. We hypothesize that clinician satisfaction with teleSUDE will be equivalent to traditional in-person evaluation.

Deploy tablet computer-based teleSUDE in the ED and determine effects of teleSUDE on ED performance metrics. We hypothesize that teleSUDE will improve time to completion of ED evaluation, decrease time-to-discharge, and decrease the number of patients who leave prior to SUDE completion.

Methods: Methods:

1. Setting. Overdose deaths have increased 242% since 1999. The state of Massachusetts has been particularly impacted: unintentional opioid-related overdose deaths numbered 25.8 per 100,000 residents, nearly double the 13.7 per 100,000 reported in 2013. Massachusetts emergency medical providers administered naloxone almost 13,000 times during 2015 as well. Massachusetts is one of the only states to have legislation mandating that a substance use disorder evaluation be offered to patients being treated in the emergency department (ED) for opioid overdose. We are in an ideal location in which to conduct research into the nature, availability, and clinical impact of clandestine opioids.

2. Adequacy of the Study Population. We will recruit study participants from individuals receiving care for suspected opioid overdose at the UMass-Memorial Medical Center Emergency Department. This academic medical center is divided into two campuses, which together treat approximately 500 ED patients per year for acute heroin overdose. Following reversal with naloxone, patients are typically observed for a minimum of 4 hours, a time period that allows ample opportunity to consent and complete our study with these patients.

3. Inclusion Criteria. We will include all heroin and prescription opioid users who:

- Receive naloxone, either from first responders (e.g., police, Worcester Emergency Medical Services) or bystanders for reversal of respiratory depression; or
- Present with suspected symptoms of opioid overdose without naloxone administration

4. Exclusion Criteria. Patients will be excluded from participation if:

- Unable to provide informed consent

5. Specific Aim 1. Evaluate acceptance by mental health providers of teleSUDE. In the initial phase of the study, mental health practitioners who routinely perform the SUDE will be consented for participation in this study to determine acceptability of teleSUDE.

6. Specific Aim 2. Deploy tablet computer-based teleSUDE in the ED and determine effects of teleSUDE on ED performance metrics. For the deployment of teleSUDE, all patients meeting inclusion criteria who present to the ED over a period of 3 months will be approached for participation in this study. We will deploy tablet computer-based teleSUDE in the ED at a large academic medical center and subsequently at affiliated

community sites. Specifically, we will utilize a secure HIPAA-compliant platform that leverages tablet computers to provide real-time telemedicine capabilities plus seamless documentation. We will analyze departmental performance metrics pre- and post-intervention to determine effects of implementing teleSUDE on clinical care measures, including ED length of stay, percentage leaving against medical advice prior to completion of SUDE, and cost of the ED visit.

Major Limitations/Questions: The study will be performed within a single academic health system. Further studies at other health systems will yield more information about real-world performance and scalability of remote audiovisual streaming based SUDE. The nature of the study precludes blinding of participants to the intervention, which may contribute to bias.