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Western Journal of Emergency Medicine:

Special Issue on Substance Misuse and Addiction Disorders

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AMERICAN COLLEGE OF EMERGENCY PHYSICIANS

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Western Journal of *Emergency Medicine*:

Integrating Emergency Care with Population Health

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JOURNAL FOCUS

Emergency medicine is a specialty which closely reflects societal challenges and consequences of public policy decisions. The emergency department specifically deals with social injustice, health and economic disparities, violence, substance abuse, and disaster preparedness and response. This journal focuses on how emergency care affects the health of the community and population, and conversely, how these societal challenges affect the composition of the patient population who seek care in the emergency department. The development of better systems to provide emergency care, including technology solutions, is critical to enhancing population health.

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Substance Use and Addiction Disorders : A Call for Increased Screening and Treatment in the Emergency Department

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We are very pleased to present the *Western Journal of Emergency Medicine* (WestJEM) Special Issue on Substance Use and Addiction Disorders. The emergency department (ED) is on the front line in the battle to combat the impact that drugs and alcohol have on the lives of individuals. Each of the articles included in this issue reflects the work and dedication that the authors have devoted to improving the care of patients with substance use and addiction disorders. It is our honor to promote these articles by compiling them under the single banner of a special issue.

According to the 2023 National Survey on Drug Use and Health (NSDUH)[1] released by the US Department of Health and Human Services' Substance Abuse and Mental Health Services Administration, there are an estimated 48.5 million individuals ≥12 years of age living with a substance use disorder. This is an astounding 17.1% of the population, or more than 1 in every 6 individuals. The NSDUH also found that alcohol use disorder impacts 10.2% of those ≥12. The impact of these disorders leads to high healthcare resource utilization, poor health outcomes, and increased mortality. The average annual number of deaths attributable to excessive alcohol use reached 178,307 during 2020-2021.[2] Drug overdose deaths have steadily risen every year through 2022 when 107,941 deaths were reported.[3] This has largely been driven by opioids. In 2022, there were 82,136 opioid-related overdose deaths.[4]

The ED bears witness to a multitude of other conditions that are directly related to substance use and addiction disorders. In 2020, there were 11,654 people in the US killed in motor vehicle collisions involving a driver under the influence of alcohol.[5] Many more were injured and required care in our EDs. Chronic alcohol use leads to fibrosis and cirrhosis of the liver, which in turn leads to the development of ascites and esophageal varices. Patients may present critically ill with spontaneous bacterial peritonitis or upper gastrointestinal bleeding. Patients who inject drugs are at risk for development of skin and soft tissue infections, endocarditis, spinal epidural abscesses, HIV, and hepatitis C.

Thanks to pioneers in emergency medicine, our specialty no longer waits for the complications to occur. Rather, we try to reduce the risk of harm related to drug and alcohol use and promote initiation of treatment. In the last decade, it has become common practice for emergency physicians to initiate treatment of opioid use disorder with buprenorphine thanks to the pivotal research showing better retention in treatment when it was initiated in the ED.[6] Many EDs are now using peer recovery coaches and the SBIRT (Screening, Brief Intervention, and Referral to Treatment) process to identify patients with opioid addiction and either initiate treatment in the ED or have a rapid referral to treatment programs.[7] In addition to initiating treatment with buprenorphine, EDs are distributing the opioid receptor antagonist, naloxone, to at-risk individuals. The American College of Emergency Physicians has supported increased access to this life-saving medication since 2015.[8]

Research is ongoing regarding how to best support patients with substance use and addiction disorders. We hope that this special issue contributes in some way to protecting the health and saving the lives of our patients.

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Implementation and Evaluation of a Bystander Naloxone Training Course

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Introduction: Bystander provision of naloxone is a key modality to reduce opioid overdose-related death. Naloxone training courses are available, but no standardized program exists. As part of a bystander empowerment course, we created and evaluated a brief naloxone training module.

Methods: This was a retrospective evaluation of a naloxone training course, which was paired with Stop the Bleed training for hemorrhage control and was offered to administrative staff in an office building. Participants worked in an organization related to healthcare, but none were clinicians. The curriculum included the following topics: 1) background about the opioid epidemic; 2) how to recognize the signs of an opioid overdose; 3) actions not to take when encountering an overdose victim; 4) the correct steps to take when encountering an overdose victim; 5) an overview of naloxone products; and 6) Good Samaritan protection laws. The 20-minute didactic section was followed by a hands-on session with nasal naloxone kits and a simulation mannequin. The course was evaluated with the Opioid Overdose Knowledge (OOKS) and Opioid Overdose Attitudes (OOAS) scales for take-home naloxone training evaluation. We used the paired Wilcoxon signed-rank test to compare scores pre- and post-course.

Results: Twenty-eight participants completed the course. The OOKS, measuring objective knowledge about opioid overdose and naloxone, had improved scores from a median of 73.2% (interquartile range [IQR] 68.3%–79.9%) to 91.5% (IQR 85.4%–95.1%), $P < 0.001$. The three domains on the OOAS score also showed statistically significant results. Competency to manage an overdose improved on a five-point scale from a median of 2.5 (IQR 2.4–2.9) to a median of 3.7 (IQR 3.5–4.1), $P < 0.001$. Concerns about managing an overdose decreased (improved) from a median of 2.3 (IQR 1.9–2.6) to median 1.8 (IQR 1.5–2.1), $P < 0.001$. Readiness to intervene in an opioid overdose improved from a median of 4 (IQR 3.8–4.2) to a median of 4.2 (IQR 4–4.2), $P < 0.001$.

Conclusion: A brief course designed to teach bystanders about opioid overdose and naloxone was feasible and effective. We encourage hospitals and other organizations to use and promulgate this model. Furthermore, we suggest the convening of a national consortium to achieve consensus on program content and delivery. [West J Emerg Med. 2025;26(1.1)3–7.]

INTRODUCTION

Time is a critical contributing factor in patient outcomes in many emergencies. In the United States, the average response time by emergency medical services to a 9-1-1 call is seven minutes.[1] To bridge this gap, many efforts have been launched to empower laypersons, who are typically first on the scene, to intervene and employ skills ranging from cardiopulmonary resuscitation (CPR) and automated external defibrillator (AED) use to bleeding control interventions.[2] Basic Life Support (BLS) course content is based upon rigorous and frequently updated consensus (ie, American Heart Association [AHA] Guidelines Update for CPR and Emergency Cardiovascular Care).[3,4] These courses are taught in a standardized fashion by the AHA and the American Red Cross. Likewise, the Stop the Bleed (STB) program, a national initiative launched in 2015 focused on empowering the public and public safety professionals to recognize and control life-threatening bleeding, has several types of courses, the most prominent being the American College of Surgeons' (ACS) Basic Hemorrhage Control Course (BCon).[5,6]

While CPR, AED and STB training focus on preventable deaths, another significant source of preventable deaths is the opioid overdose epidemic, which remains one of the most pressing public health issues of our time, having claimed about 1,000,000 lives in the US since 1999.[7] The number of overdose deaths has increased greatly in recent years, with yet another record number in 2021, predominantly due to fentanyl.[8] Bystander naloxone administration, which can be used to reverse an opioid overdose, has been introduced as one potential mitigating factor. In 2018, the US Surgeon General issued an advisory on naloxone and opioid overdose that encourages community members who come into contact with people at risk for opioid overdose to know how to use naloxone and keep it within reach.[9] Likewise, the US Department of Health and Human Services' overdose prevention strategy includes harm reduction, with a goal to widen access to opioid overdose reversal treatments.[10]

Unlike CPR, there is no one standardized course for bystander naloxone training. Online courses are offered by agencies such as the Centers for Disease Control and Prevention (CDC),[11] the American Red Cross,[12] individual states (eg, Massachusetts[13] and New York[14]), and other non-profits (eg, GetNaloxoneNow[15]). The courses lack a standardized core content, measures of effectiveness, or agreed-upon delivery methods (in person, hybrid, remote, simulation, didactic, etc). Although anecdotes exist of layperson use, we have a limited understanding of an effective, layperson naloxone-empowerment curriculum, and gaps remain in knowledge about training parameters and strategies.[16]

In this study, we evaluated an overdose-response naloxone training program administered to laypersons. We emphasized the structure and curriculum of the course and evaluated efficacy with a validated screening tool.

METHODS

The naloxone course was designed to be a brief intervention with 20 minutes of didactics and 20 minutes of practical experience with a mannequin. The course was bundled with the ACS BCon course as part of a bystander empowerment program. Course instructors were three board-certified emergency physicians. The session took place at a professional office building. Although the participants worked in an organization related to healthcare, all worked as office staff and none were clinicians. Two identical sessions were offered, and both took place in June 2018 during normal business hours. Participants were not compensated specifically for participating but attended in lieu of their normal duties. We administered anonymous pre- and post-course evaluations. The project was determined to not meet the criteria for human subject research by the Mass General Brigham Human Research Office.

Curriculum

Created by the course instructors, the curriculum included the following topics: 1) background about the opioid epidemic; 2) how to recognize the signs of an opioid overdose; 3) actions not to take when encountering an overdose victim; 4) the correct steps to take when encountering an overdose victim; 5) an overview of naloxone products; and 6) Good Samaritan protection laws. Content was created by first searching for existing training resources online, including training manuals from the states of New York (https://www.dhses.ny.gov/naloxone-information-first-responders) and Texas (https://txoti.org), and Canadian province Manitoba (https://www.gov.mb.ca/health/publichealth/docs/training_manual_overdose.pdf). This information was integrated with additional content from course instructor expertise into a didactic module containing 30 slides (Appendix 1), and participants were provided with a hard copy of the slides. The practical module entailed small groups around a simulation mannequin with a course instructor. Participants were able to practice with two types of naloxone kits (pre-packaged nasal naloxone spray and an autoinjector) on the mannequin. Discussion was encouraged until all participants' questions and concerns were addressed.

Course Evaluation

To evaluate the efficacy of the course, we used the Opioid Overdose Knowledge (OOKS) and Opioid Overdose Attitudes (OOAS) scales for take-home naloxone training evaluation.[17] The first half of this validated tool (OOKS) asks objective questions about opioid overdose to evaluate trainee knowledge, including indicators of opioid overdose, how to manage an overdose, the mechanism of action of naloxone, and its duration of action. The second part (OOAS) asks questions pertaining to perceptions of competencies to manage an opioid overdose, concerns about managing an overdose, and readiness to intervene in an opioid overdose.

Statistical Analysis

All participants completed pre- and post-evaluations on paper forms. Subjects were asked to write the same random four-digit number on each of the two evaluations for paired analysis purposes. Responses were transferred to a spreadsheet, and a second investigator confirmed the accuracy of the transcription. The OOKS scale is a series of true/false statements, and the correct answers were summed, with a total possible 41 points. We modified the original 45-point version slightly, as multiple points were possible for several individual questions (eg, "What is naloxone used for?" and "How can naloxone be administered?") and we counted them only as one point each. There was also a choice of "don't know" for several questions, and that was considered an incorrect answer as indicated in the scoring instructions. The OOAS scale is 28 questions divided into three domains and measured on a five-point Likert scale (5 = completely agree and 1 = completely disagree). Although the post-test OOKS results and one of the domains on the OOAS were normally distributed as determined by the Shapiro-Wilk test, the remainder of results were non-normal. Thus, all results, including the scales on each domain of the OOAS and the overall score on the OOKS, are described with medians and interquartile range (IQR) and compared with the paired Wilcoxon signed-rank test. We analyzed data with JMP v16 (JMP Statistical Discovery LLC, Cary. NC).

RESULTS

Twenty-eight participants took the course. All completed the pre-test and the post-test, although three participants did not answer all questions on the pre-test OOAS scale. Therefore, the corresponding answers in the domains for these three individuals on the post-test were not included in the analysis. The OOKS, measuring objective knowledge about opioid overdose and naloxone, had improved scores from a median of 73.2% (IQR 68.3%–79.9%) to 91.5% (IQR 85.4%–95.1%), $P < 0.001$. The three domains on the OOAS score also showed statistically significant results. Competency to manage an overdose improved from a median of 2.5 (IQR 2.4–2.9) to a median of 3.7 (IQR 3.5–4.1), $P < 0.001$. Concerns about managing an overdose decreased (improved) from a median of 2.3 (IQR 1.9–2.6) to median 1.8 (IQR 1.5–2.1), $P < 0.001$. Readiness to intervene in an opioid overdose improved from a median of 4 (IQR 3.8–4.2) to a median of 4.2 (IQR 4–4.2), $P < 0.001$.

DISCUSSION

In creating and evaluating a naloxone training program for bystanders, we found improvement in both subjective attitudes and objective knowledge about opioid overdose and naloxone. The training is relatively brief (lasting under an hour) and effective. We have subsequently taught this curriculum several times to local community organizations, including those who work with people who use drugs. Although we did not measure objective outcomes subsequently, the concept of bystander empowerment, teaching both naloxone and STB skills, has been well received and represents important outreach from our hospital to the local community.

One key question that remains is whether this training is necessary for bystanders. In our previous research, we found that 49 of 50 bystanders were able to correctly administer naloxone in a simulated experience on a public sidewalk with guidance by a simulated 911 dispatcher.[18] However, not everyone will have the guidance of a dispatcher when using naloxone, and there may be confusion about how to use the kit and the timing of a second dose (if needed) without that assistance. Bystander training may also be valuable as a way to foster self-efficacy, increasing the likelihood that a layperson will recognize and respond to an overdose. In our course, we also cover when bystanders should administer naloxone and dispel myths about any harm that can be caused by giving it, as well as how to access naloxone.

Naloxone for bystanders is currently available via standing order in several states, meaning that individuals can obtain it from pharmacies without a prescription.[19–22] Standing orders are associated with reductions in fatal overdoses in the community.[23] The current packaging of prescription nasal naloxone has a flap that opens giving just-in-time (JIT) instructions to the bystander, but that may not be sufficient. The US Food and Drug Administration (FDA) recently approved making nasal naloxone an over-the-counter medication, even though its briefing document described several cases of incorrectly administered naloxone, including an individual who did not place the tip of the dispenser fully in the nostril, someone who squeezed the device but did not push the plunger, another who placed the device upside down so that the plunger was in the nostril, and several individuals who did not wait 2-3 minutes before administering a second dose.[24] While the FDA advisors voted unanimously to make naloxone available without a prescription,[25] these errors in administration indicate the need for a bystander course that could further improve outcomes.

Another reason to teach such a course is to address stigma, which is pervasive when considering opioid use disorder (OUD).[26] A recent study of individuals who did not use illicit opioids themselves but knew others who did reported stigma about OUD and misinformation about opioid-related risks.[27] Naloxone-based interventions can introduce the concept of harm reduction, empower bystanders, and encourage individuals to carry naloxone in case they encounter an overdose victim.[28]

Although not a part of our study, despite the positive results on our objective and subjective testing, we do encourage the creation of standardized training. The STB BCon portion of our course was created and endorsed by the ACS, using standardized content and certified trainers.

A similar process could be used for naloxone, either as part of a BLS training, such as from the AHA or American Red Cross, from a specialty society, such as the American Academy of Emergency Medicine, the American College of Emergency Physicians, or the American Society of Addiction Medicine, or from a national advocacy group such as Shatterproof. Such branding and promotion may empower more bystanders to become trained and further reduce stigma and misconceptions about OUD among the general population.

While CPR training for laypersons is the gold standard, many gaps in implementing bystander training remain, and an investment in the study of the effectiveness of the relatively simple steps of naloxone administration may help us learn and improve techniques of CPR and STB training as well. For example, despite educational initiatives that began in the 20th century, only one-third of out-of-hospital cardiac arrest patients receive bystander CPR. Time, location, and duration have all been perceived by the public as barriers to CPR classes.[29] Blacks and Hispanics are less likely than Whites to receive CPR at home or in public.[30] In the last decade, there have been many initiatives with variable efficacy, in most cases not measured, to use JIT tools like flashcards, video or talking kits to provide users with real-time instructions for the use of automated external defibrillators or STB equipment. While the agreement of course content and identifying efficacy is a first step, future work should also focus on developing, trialing, and scaling effective JIT naloxone-administration tools.

LIMITATIONS

There are limitations to our study. We taught this course to a small sample of administrative professionals in a suburb of Massachusetts, a state with a high burden of opioid-related overdose. It is possible that bystanders from different backgrounds and geographic locations would have answered the questions differently. We also did not collect any demographic data about our study participants to protect confidentiality. However, this information might have determined the characteristics of individuals who may benefit most from the training. The content of the practical session of the course was not standardized. Finally, we did not measure knowledge retention or use of naloxone following the course.

CONCLUSION

A brief course designed to teach bystanders about opioid overdose and naloxone was feasible and effective. We encourage hospitals and other organizations to use and promulgate this model. Furthermore, we suggest convening of a national consortium to achieve consensus on program content, delivery, and opportunities for development of just-in-time tools to administer naloxone.

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Harm Reduction in the Field: First Responders' Perceptions of Opioid Overdose Interventions

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Introduction: Recent policy changes in Washington State presented a unique opportunity to pair evidence-based interventions with first responder services to combat increasing opioid overdoses. However, little is known about how these interventions should be implemented. In partnership with the Research with Expert Advisors on Drug Use team, a group of academically trained and community-trained researchers with lived and living experience of substance use, we examined facilitators and barriers to adopting leave-behind naloxone, field-based buprenorphine initiation, and HIV and hepatitis C virus (HCV) testing for first responder programs.

Methods: Our team completed semi-structured, qualitative interviews with 32 first responders, mobile integrated health staff, and emergency medical services (EMS) leaders in King County, Washington, from February–May 2022. Semi-structured interviews were recorded, transcribed, and coded using an integrated deductive and inductive thematic analysis approach grounded in community-engaged research principles. We collected data until saturation was achieved. Data collection and analysis were informed by the Consolidated Framework for Implementation Research. Two investigators coded independently until 100% consensus was reached.

Results: Our thematic analysis revealed several perceived facilitators (ie, tension for change, relative advantage, and compatibility) and barriers (ie, limited adaptability, lack of evidence strength and quality, and prohibitive cost) to the adoption of these evidence-based clinical interventions for first responder systems. There was widespread support for the distribution of leave-behind naloxone, although funding was identified as a barrier. Many believed field-based initiation of buprenorphine treatment could provide a more effective response to overdose management, but there were significant concerns that this intervention could run counter to the rapid care model. Lastly, participants worried that HIV and HCV testing was inappropriate for first responders to conduct but recommended that this service be provided by mobile integrated health staff.

Conclusion: These results have informed local EMS strategic planning, which will inform roll out of process improvements in King County, Washington. Future work should evaluate the impact of these interventions on the health of overdose survivors. [West J Emerg Med. 2025;26(1.1)8–17.]

INTRODUCTION

The public health crisis of opioid use disorder (OUD) and opioid overdose continues unabated, with rates continuing to rise.[1–3] Survivors of non-fatal overdose have a significantly greater risk of repeat overdose and overdose-related mortality within the following year, emphasizing the importance of first responder interventions.[4–7] These trends are mirrored locally in King County, Washington, where the annual 9-1-1 call volume of probable overdoses and other opioid use-related incidents increased by more than 20% from 2018–2021.[8] A critical window for intervention exists, as approximately 40% of individuals who died of an overdose in 2018 had at least one emergency medical services (EMS) encounter during the preceding year.[9]

Recent legislative changes in Washington State presented a unique opportunity to pair evidence-based interventions with first responder services to address the rise in opioid overdoses. Specifically, in February 2021, the Washington State Supreme Court struck down the statute that made possession of controlled substances a class C felony. The state government responded by passing a temporary law that expanded the role of first responders (eg, firefighters, paramedics, and police officers) to connect adults found with small amounts of controlled substances to case management instead of the criminal legal system.[10] In 2023 the legislature rolled back some of these changes with a permanent bill that increased criminal penalties for drug possession and public use and made pre-trial diversion to treatment programs contingent on the prosecutor's consent.[11]

While first responders have historically provided important referrals to community resources,[12] such programs have not historically offered harm-reduction resources or treatment initiation. Specifically, there are three medical services that are known to reduce overdose death and increase access to care for people who use drugs: leave-behind naloxone[13,14]; field-based initiation of buprenorphine treatment[14–19]; and HIV and hepatitis C virus (HCV) testing.[20] These interventions have documented efficacy in emergency departments[13,15] and community clinics[14,20] while demonstrating promising results during brief encounters with street medicine teams and paramedics.[16–19] In particular, the distribution of naloxone kits is cost effective[21,22] and significantly reduces opioid-related fatalities.[23–25] Buprenorphine treatment for OUD may decrease all-cause and opioid-related mortality by up to 50%,[26–29] and HIV and HCV testing improves access to care for people who use drugs.[30] However, there is a paucity of literature on the implementation of these three evidence-based programs in first responder systems.

Grounded in community engaged research (CEnR) principles,[31] our team partnered with the Research with Expert Advisors on Drug Use (READU), a group of academically trained and community-trained researchers with lived and living experience of substance use, to address this gap. The primary objective was to examine the facilitators and barriers to the adoption of leave-behind naloxone, field-based initiation of buprenorphine treatment, and HIV and HCV testing for first responder programs. The secondary objective was to inform local EMS overdose response policy and programming.

Population Health Research Capsule

What do we already know about this issue?
First responders have not historically offered harm reduction services that are known to reduce overdose death and increase access to care for people who use drugs.

What was the research question?
What are the facilitators and barriers for first responders to provide harm reduction services in the field?

What was the major finding of the study?
Perceived facilitators were tension for change, relative advantage, and compatibility, while barriers were limited adaptability, lack of evidence,and prohibitive cost.

How does this improve population health?
Participants experienced a tension for change and were activated to implement leave-behind naloxone, field-based buprenorphine, and HIV and hepatitis C virus testing.

METHODS

Study Design and Setting

From March–June 2022, we conducted 32 semi-structured interviews with first responders, mobile medical clinicians, and EMS leaders working in King County, Washington. The study was approved by the University of Washington Institutional Review Board.

Theoretical Framework

This study was informed by the Consolidated Framework for Implementation Research (CFIR).[32] By providing a consistently applied set of analytical categories, consisting of "constructs" situated within "domains," the CFIR[32] simplifies processes, highlights barriers, and identifies potential areas of improvement (Figure). As described below, this framework provided the scaffolding for the interview guides, deductive coding, and thematic analysis, which highlighted various constructs as perceived facilitators

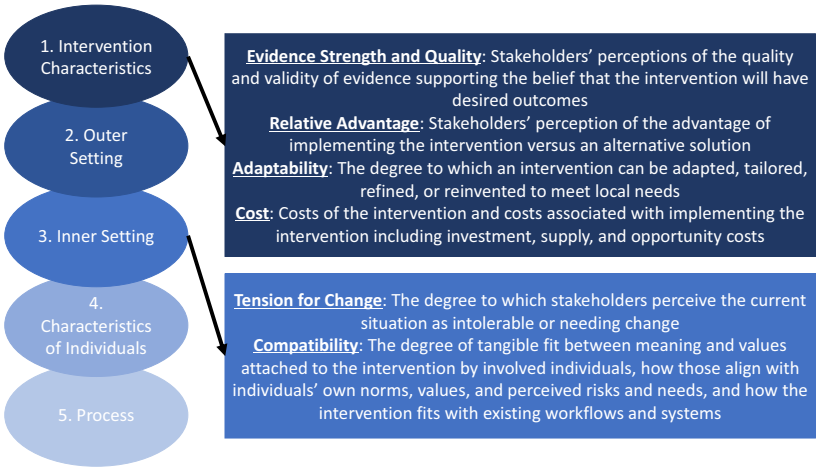

Figure. Adapted Consolidated Framework for Implementation Research (CFIR) with numbered domains and selected constructs.

(ie, tension for change, relative advantage, compatibility) and barriers (ie, adaptability, evidence strength and quality, and cost).

Reflexivity and Partnership

Our study team was composed of harm reductionists, including both academically trained researchers with advanced degrees in public health, psychology, and medicine, and community-trained researchers with lived and living experience of drug use and EMS system involvement. Together, we embraced CEnR principles,[31] practiced reflexivity,[33] and centered the perspectives of people who use drugs in the study's design, execution, and analyses. Prior to starting data collection, we engaged in bidirectional training during which community-trained READU members educated the academically trained researchers on effective outreach strategies and experiences with past studies, while academically trained researchers shared knowledge about qualitative study design and analysis.

Participant Recruitment

Participants were recruited through convenience and snowball sampling. We emailed recruitment materials to leaders and administrators at a variety of first responder agencies in King County to disseminate information to potential participants, including paramedics, firefighters, police officers, mobile integrated health staff (ie, co-responding social workers and firefighters engaged in community paramedicine), and mobile medical clinicians (ie, social workers, nurses, physician assistants, and nurse practitioners performing street outreach). Interested individuals contacted the study team through our study phone or email, and they were screened for eligibility. Inclusion criteria included experience working as a first responder, a mobile medical clinician, or in a management/leadership position in a first responder organization in King County; being over 18 years of age; and speaking English.

Data Collection

Demographic information collected from participants included age, gender, race and/or ethnicity, employment, and highest level of educational attainment. Separate but related interview guides informed by the CFIR[32] framework were developed for first responders, mobile medical clinicians, and EMS leaders. Topics covered in the interviews included participants' perceived role within the opioid epidemic; perceptions of services provided to people who use drugs; and the perceived feasibility, acceptance, and appropriateness of leave-behind naloxone, field-initiated buprenorphine, and HIV and HCV testing. The interview guides were iteratively refined, and the final guides are included as an appendix. An academically trained researcher with prior experience in qualitative methods was paired with a community trained READU member to conduct each interview.

Thematic Analysis

We used an integrated deductive and inductive thematic approach[34,35] to analysis. Once the initial interviews were completed, we familiarized ourselves with the data, reviewed the transcripts for accuracy, and noted initial impressions together. We grouped emergent observations into inductive codes and situated them in our preliminary codebook with the pre-existing deductive CFIR codes.[32] We applied the codebook to a single interview transcript, engaged in line-by-line coding as a group, and reconciled any disagreements in code applications to finalize the codebook. Individual team members then primarily applied the revised codebook to each transcript, and another conducted secondary coding, addressing any differences.

Subsequent semi-structured interviews were conducted until thematic saturation was reached. Interviews were recorded, transcribed, deidentified, uploaded to the qualitative data management software Dedoose (SocioCultural Research Consultants, LLC, Manhattan Beach, CA), and coded deductively using existing CFIR codes[32] and inductively using codes created from reviewing a

sample of transcripts.[36] We summarized coded data to identify barriers and facilitators to adopting leave behind naloxone, field-based buprenorphine initiation, and HIV and HCV testing for first responder programs, and we extracted prototypical examples of each.

RESULTS

Participant Demographics

We interviewed 32 first responders, mobile medical clinicians, and EMS leaders who worked in seven different cities located in King County, Washington (Table 1). Participants included Basic Life Support professionals (ie, firefighter/emergency medical technicians), Advanced Life Support professionals (ie, paramedics), police officers, nurses, and advanced registered nurse practitioners, social workers, and EMS leaders. Of the first responders interviewed, 19 (59%) had been in their current role for more than 10 years. Participants were 31.3% female and 12.5% racially/ethnically diverse, and most were above the age of 36 with at least some college education.

Table 1. Interviewees' demographic information.

Age	n (%)
20–25	2 (6.3%)
26–35	5 (15.6%)
36–45	11 (34.4%)
46–55	6 (18.8%)
56–65	8 (25%)
Gender	n (%)
Male	20 (62.5%)
Female	10 (31.3%)
Trans, non-binary, or gender non-conforming	2 (6.3%)
Race and/or ethnicity	n (%)
White	28 (87.5%)
Asian or Pacific Islander	2 (6.3%)
Hispanic	1 (3.1%)
Mixed race	1 (3.1%)
Employment	n (%)
Basic Life Support professionals (ie, firefighter/emergency medical technicians)	8 (25%)
Advanced Life Support professionals (ie, paramedics)	6 (18.8%)
Police officers	5 (15.6%)
Nurses and advanced registered nurse practitioners	3 (9.4%)
Social workers	5 (15.6%)
Emergency medical services leaders	5 (15.6%)
Number of years in current role	n (%)
<1	2 (6.3%)
1–4	8 (25%)
5–9	3 (9.4%)
10–19	8 (25%)
>20	11 (34.4%)
Highest level of educational attainment	n (%)
Associate's degree	8 (25%)
Bachelor's degree	8 (25%)
Master's degree	10 (31.3%)
Doctoral degree	2 (6.3%)
Unspecified	4 (12.5%)

Qualitative Results

Through the lens of the CFIR framework,[32] our thematic analysis revealed several perceived facilitators (ie, tension for change, relative advantage, and compatibility) and barriers (ie, limited adaptability, lack of evidence strength and quality, and prohibitive cost) to the adoption of three evidence-based clinical interventions for first responder systems: 1) leave behind naloxone; 2) field-based initiation of buprenorphine treatment; and 3) HIV and HCV testing.

Leave-behind Naloxone

There was widespread support for the distribution of leave-behind naloxone with many acknowledging a tension for change and finding the intervention relatively advantageous and compatible within existing systems (Table 2). Many interviewees recognized that naloxone is a safe, easy-to-use, indispensable medication that should be accessible to patients, their loved ones, and other community responders. Implementation of leave- behind naloxone was also largely thought to be feasible with several interviewees explaining that distribution could be effortlessly integrated into current workflows.

A smaller group of individuals expressed concern about potential barriers, particularly limited adaptability, lack of evidence strength and quality, and prohibitive cost. Some police officers thought that naloxone distribution may encourage unsafe behaviors (eg, using larger amounts or more potent substances) and felt that it was incongruous with their departments' current approach to controlling drug use through legal penalties and incarceration. Other service professionals worried that increased access to naloxone would lead to community members, rather than first responders, managing more overdose responses and consequently decreasing the likelihood of connecting people to treatment and other resources. Lastly, several interviewees in leadership or management roles were skeptical about the relative benefit of naloxone, explaining that they believed there ought to be more evidence on the efficacy of leave-behind naloxone programs. They also worried about the resources and training required for implementation.

Table 2. Interviewees' perceived facilitators and barriers to implementing a leave-behind naloxone program.

Facilitators	
Tension for change	"And I think, yes, certainly the fire department should play a role in having access to that and being able to hand it out and providing education on how to use it and when to use it."—Paramedic (ID #25)
Relative advantage	"I think that naloxones are [a] lifesaving intervention, and it's relatively easy for people to administer to their friends or bystanders can administer to people they don't know. So, I do think naloxone is very important and it should be out there and there should be access to it. And us leaving it behind with people, I think is a good idea."—Paramedic (ID #7)
Compatibility	"I think that's probably the easiest one … We could absolutely get the Narcan … First responders definitely can provide [those] as an intervention."—Mobile integrated health social worker (ID #20)
Barriers	
Limited adaptability	"I feel like it'd be a psychological thing for officers, especially officers who've been around for 10 plus years, where we used to arrest drug dealers and put them in jail. And now we're ignoring the crimes they're committing and we're giving them naloxone so that they can further just continue to use drugs. So, I can see someone who is maybe not looking at the full picture or just has their personal beliefs." —Police officer (ID #1)
Lack of evidence strength and quality	"I worry that we're just put[ting] more people in withdrawal and sort of miss[ing] the opportunities to do something about it."—Interviewee in leadership or management role (ID #28)
Prohibitive cost	"But I also have some skepticism that sort of just throwing out naloxone kits is gonna make a big difference. I'm not opposed to it, but it does require more effort and time and energy, and there's a cost to it. And quite frankly, we have [a] limited budget, and so, who's going to pay for those things? I don't know. So I'm measured in my support for that program, but if there's evidence that it saves lives, then we will work towards that."—Interviewee in leadership or management role (ID #27)

Field-based Initiation of Buprenorphine Treatment

Despite having less familiarity with the medication compared to naloxone, most interviewees recognized a tension for change and approved of the implementation of field-based initiation of buprenorphine treatment, considering it evidence-based, appropriate, and relatively advantageous for their settings (Table 3). Many felt unprepared to address withdrawal, particularly when a patient's overdose may have been fully reversed with bystander naloxone, but buprenorphine was seen as a "destigmatizing" tool that relieves symptoms, demonstrates compassion, and builds trust between patients and first responders. Additionally, participants described how the recent uptick in overdose responses, occasionally with the same individuals, led to burnout and a desire to address the upstream causes of substance use. Several highlighted how field-based initiation of buprenorphine treatment could bridge vulnerable individuals to ongoing treatment, potentially preventing future overdoses, decreasing overall call volumes, and saving lives.

Those opposed were largely concerned with this intervention's limited **adaptability** to the rapid service delivery model of emergency services, emphasizing that the time needed for the intervention may overburden an already overwhelmed system. However, others suggested that the deployment of specialized teams (eg, mobile integrated health or mobile medical clinic teams) dedicated to treating this patient population may be a way to offset these demands. Finally, some police officers worried about the **evidence strength and quality** of buprenorphine, speculating that it could be diverted for non-prescribed use and could encourage ongoing risky behaviors by curbing withdrawal symptoms.

HIV and Hepatitis C Virus Testing

Interviewees observed the tension for change in their organizations and generally supported increasing access to HIV and HCV testing (Table 4). Some felt that first responder encounters could serve as relatively advantageous opportunities to engage individuals who may not feel comfortable seeking care in more traditional settings. Providing HIV and HCV testing in a trauma-informed manner was seen to increase education around prevention and improve linkage to care.

Many, however, were concerned about the adaptability, appropriateness, and feasibility of HIV and HCV testing during an EMS response. Some worried that it would be inconsistent with the rapid service delivery model of emergency services since point-of-care testing takes at least 20 minutes to complete.[37,38] Others voiced that testing may feel compulsory and coercive if completed immediately after an unnerving overdose event. Like field-based buprenorphine starts, some interviewees alternatively proposed having first responders hand off these patients to a specialized team that would have more time to conduct the tests, provide the appropriate counseling, and arrange follow-up as needed for confirmatory diagnosis and treatment.

Table 3. Interviewees' perceived facilitators and barriers to field-based initiation of buprenorphine treatment.

Facilitators	
Tension for change	"I think the opioid issue that we have in our kind of city right now, it's big and it takes a big toll on people. And I think that if there is evidence that shows that Suboxone or buprenorphine can help, and ... especially if we're following in the footsteps of another agency or agencies that have used it and have some data on what works and what doesn't, then I would be all for it."—Mobile medical nurse (ID #15) "Suboxone is good stuff. If we're truly trying to help people transition out of addiction, it's a great tool to help manage withdrawals. As far as in the field, I think if we could provide them access to it, absolutely, I would be 100% behind that."—Firefighter (ID #4) "I think EMS is often the first interaction of a pretty traumatic chain of events leading to the ED. And so, I think if that engagement were positive, there'd be less hesitation to call 911, number one, for overdose. And then number two, every chance we can give someone to decrease or stop their opioid use is well worth it. It feels a little more like we're making a difference than giving the naloxone, the Narcan, 'cause here it's like, 'This is going to help you wean your body off this stuff.'"—Mobile medical social worker (ID #11)
Relative advantage	"I would say, absolutely any way that we can expand our reach to our community and get them more support, and for addictions and for recovery, I would think would be optimal. And I think that the fire service is a great way to allow that to happen ... I'm in full support. I think that would be advantageous in our community."—Paramedic (ID #25) "And it seems far more of a viable option to me than the leave at home [naloxone]. So the [leave behind naloxone] was just gonna solve the problem in the minute. But it does not take away the next problem, which is I need more, whereas buprenorphine does address that ... But the better option [is] to how to get that medicine to people."—Interviewee in leadership or management role (ID #28)
Barriers	
Limited adaptability	"That would be potentially good ... [But] we're [a] busy unit ... how much out of service time would that add to the unit to do that?"—Paramedic (ID #22)
Lack of evidence strength and quality	"We've made life easier for all these [people who use drugs] out in Seattle, and it hasn't made things better. It's actually made things worse. I mean, we're looking at like 270 deaths so far just in this first quarter. That is four times more than three or four years ago. So, I don't know if giving suboxone is actually helpful."—Police officer (ID #1)

EMS, emergency medical services; *ED*, emergency department.

Table 4. Interviewees' perceived facilitators and barriers to HIV and hepatits C virus testing.

Facilitators	
Tension for change	"This is one of those things that is in our realm of ... responsibility. Our primary goal is to help people with what's happening right now, but if we can also help them out with like, 'Well, what is the next step for you?'"—Mobile integrated health social worker (ID #17)
Relative advantage	"Hundred percent like the idea of being able to have an agency that has a contract that this is what they do. You go out, and you provide somebody an HIV test. We have people that are specially trained to deal with all the ramifications of somebody who finds out they have HIV, 'cause that's gonna be a horrible feeling."—Firefighter (ID #4)
Barriers	
Limited adaptability	"That wouldn't be something useful for first responders because our priority is not necessarily testing and trying to diagnose whether individuals have [a] specific disease."—Firefighter (ID #2) "I just think that'd be horrible to do to somebody ... Like HIV or hepatitis C, like those are huge things. So, you just don't want to just drop a bomb on somebody on top of them being ... During a drug overdose, for example."—Paramedic (ID #25)

DISCUSSION

Working on the frontlines of the opioid epidemic, first responders, mobile medical clinicians, and EMS leaders are confronted with skyrocketing overdose responses. Many want to improve the care of patients who use drugs, beyond acute overdose reversal, but feel uncertain about how to proceed. People who use drugs have also expressed a need for improved care with many refusing EMS transport following

overdose due to law enforcement's presence at overdose scenes,[39] unmanaged withdrawal symptoms, and anticipated stigmatizing treatment by EMS and emergency clinicians.[40] Our thematic analysis informed by the CFIR framework[32] identified several perceived facilitators (ie, tension for change, relative advantage, and compatibility) and barriers (ie, limited adaptability, lack of evidence strength and quality, and prohibitive cost) to the adoption of three evidence-based clinical interventions for first responder systems: 1) leave-behind naloxone; 2) field-based initiation of buprenorphine treatment; and 3) HIV and HCV testing. However, there are few examples of implementing these evidence-based interventions in first responder systems with one narrative review finding only 27 programs out of nearly 22,000 EMS agencies nationally described in the literature, with many providing naloxone distribution and community referrals while few facilitated linkage to medications for OUD.[41]

Many recognized the tension for change in their community and the relative advantage of distributing naloxone kits and treating OUD with buprenorphine in the field. Leave-behind naloxone is a cost-effective,[21,22] widely accepted[42–44] tool that reduces opioid overdose-related mortality[45,46] and does not increase risky drug use behavior.[47] Existing EMS programs distributing naloxone kits demonstrated feasibility[48] and increased connection to other resources.[49] Most interviewees believed leave-behind naloxone was compatible with and could be easily integrated into their workflows, yet several highlighted the importance of securing sustainable funding to address costs and receiving additional training to address the perceived lack of evidence strength and quality before implementation. Participants were similarly enthusiastic about the prospect of treating opioid withdrawal and OUD with buprenorphine. In addition to an initial case series describing treating withdrawal from naloxone administration with buprenorphine,[18] a pilot study examining prehospital buprenorphine treatment for OUD showed 50% retention in treatment at seven days and 36% in 30 days.[19]

Notably, participants working in law enforcement were more skeptical of harm reduction than those employed in healthcare and social services. Some expressed frustration with recent legislation that curtailed criminal penalties for drug possession and public use. Other law enforcement officers expressed sentiments similar to those of healthcare and social services workers but questioned what their role in addressing the opioid epidemic could be under the new laws. Importantly, police officers still regularly respond to medical emergencies involving drug use, including overdoses, highlighting the urgent need for targeted education on how to use these evidence-based interventions effectively in the field.

Lastly, the most discussed barrier to all three interventions, particularly field-based initiation of buprenorphine and HIV and HCV testing, was a feeling from frontline professionals that implementation had limited adaptability to the rapid service delivery model of emergency services. However, others recommended either deploying a specialized team to the scene or transporting the patient to a diversion facility that could provide wraparound services. Local mobile medical clinic teams have successfully integrated harm reduction services into their care of those experiencing homelessness,[50] and the creation of mobile integrated health response units have expanded case management and referrals through multidisciplinary collaborations in fire departments.[51] With longer dispatch time and the ability to do longitudinal follow-up, these teams may be well suited to provide post-overdose care.

The Philadelphia Fire Department has an alternative response unit ("AR-2") equipped with Advanced Life Support capabilities, which is located in an area heavily impacted by opioid overdoses. It responds to those resuscitated with naloxone but who refuse transportation to the hospital, and early data demonstrates that 84% of patients accepted services, including treatment facility placement, resources, and/or naloxone kits.[52] Diversion facilities offering low-barrier access to treatment and other services could also operate as an alternative to a prolonged EMS response or emergency department visits; in fact, a former hospital facility in Columbus, Ohio, now equipped with 60 beds dedicated to addiction stabilization serves as the primary post-overdose receiving center for individuals seeking treatment and deemed medically stable by EMS.[53]

LIMITATIONS

Our objective in this study was to examine the facilitators and barriers to the adoption of leave-behind naloxone, field-based initiation of buprenorphine treatment, and HIV and HCV testing for first responder programs. However, the results may only be applicable to the geographic location of the interviewees, which included first responders, mobile medical clinicians, and EMS leaders working in King County, Washington. Racial and ethnic minorities were notably poorly represented in our study. Because there is no publicly available data on the demographic information of EMS professionals locally, we were unable to assess whether our sample was representative. Our convenience and snowball sampling may have also introduced bias. Most participants described being in their current role for more than 10 years, which is likely much higher than the general first responder population. Finally, we did not track the decline-to-be interviewed rate.

CONCLUSION

Without the tools to address the uptick in opioid overdoses, first responders, mobile medical clinicians, and

EMS leaders in King County experienced a tension for change and are now activated to implement leave- behind naloxone, field-based initiation of buprenorphine treatment, and HIV and HCV testing through new EMS protocols, post-overdose response teams, and diversion facilities. In this study we took a team-based approach and centered the perspectives of people with lived and living experience of drug use to ensure that this research led to action. Members of READU highlighted our work's relevance to the community and framed these findings to inform policy, particularly with the recent changes in Washington State legislation. Future works should evaluate the impact of these interventions on the health of overdose survivors.

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Pragmatic Emergency Department Intervention Reducing Default Quantity of Opioid Tablets Prescribed

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Introduction: The opioid epidemic is a major cause of morbidity and mortality in the United States. Prior work has shown that emergency department (ED) opioid prescribing can increase the incidence of opioid use disorder in a dose-dependent manner, and systemic changes that decrease default quantity of discharge opioid tablets in the electronic health record (EHR) can impact prescribing practices. However, ED leadership may be interested in the impact of communication around the intervention as well as whether the intervention may differentially impact different types of clinicians (physicians, physician assistants [PA], and nurse practitioners). We implemented and evaluated a quality improvement intervention of an announced decrease in EHR default quantities of commonly prescribed opioids at a large, academic, urban, tertiary-care ED.

Methods: We gathered EHR data on all ED discharges with opioid prescriptions from January 1, 2019–December 6, 2021, including chief complaint, clinician, and opioid prescription details. Data was captured and analyzed on a monthly basis throughout this time period. On March 29, 2021, we implemented an announced decrease in EHR default dispense quantities from 20 tablets to 12 tablets for commonly prescribed opioids. We measured pre- and post-intervention quantities of opioid tablets prescribed per discharge receiving opioids, distribution by patient demographics, and inter-clinician variability in prescribing behavior.

Results: The EHR change was associated with a 14% decrease in quantity of opioid tablets per discharge receiving opioids, from 14 to 12 tablets ($P = <.001$). We found no statistically significant disparities in prescriptions based on self-reported patient race ($P = 0.68$) or gender ($P = 0.65$). Nurse practitioners and PAs prescribed more opioids per encounter than physicians on average and had a statistically significant decrease in opioid prescriptions associated with the EHR change. Physicians had a lesser but still significant drop in opioid prescribing in the post-intervention period.

Conclusion: Decreasing EHR defaults is a robust, simple tool for decreasing opioid prescriptions, with potential for implementation in the 42% of EDs nationwide that have defaults exceeding the recommended 12-tablet supply. Considering significant inter-clinician variability, future interventions to decrease opioid prescriptions should examine the effects of combining EHR default changes with targeted interventions for clinician groups or individual clinicians. [West J Emerg Med. 2025;26(1.1)18–25.]

INTRODUCTION

The opioid epidemic is a major cause of morbidity and mortality in the United States, including in California.[1] Opioid prescriptions initiated in the emergency department (ED) and other clinical care settings can increase the incidence of opioid use disorder (OUD) in a dose-dependent manner—the more tablets prescribed, the greater the risk of future development of OUD.[2–4] In addition, the presence of excess opioid tablets in the home is linked to diversion and overdose.[5] Decreasing the total quantity of tablets prescribed from the ED may help decrease the risk of these harms.

Many interventions attempt to decrease and alleviate the risks of opioid prescriptions in ED settings, from electronic clinical decision support alerts to co-prescription of naloxone, but most existing ED interventions focus on decreasing prescription rates rather than decreasing the quantity of opioid tablets prescribed when ED patients are discharged with opioids.[6–8] Prior research has shown that decreasing the default quantity of tablets prescribed in the electronic health record (EHR) without announcing the change to clinicians can decrease the number of opioids per prescription given at discharge. In these studies, clinicians were not notified of altered EHR default prescriptions either for convenience or to test the effect of a default change alone, or due to concern that clinicians would consciously override the defaults.[9–13]

Because protocol changes in the ED are commonly arrived at by consensus and are usually implemented transparently rather than unannounced, studying the effect of an announced EHR change more closely mirrors real-world scenarios. An announcement about the change may have the added benefit of educating clinicians about opioid prescribing guidelines, the risks of prescribing opioids, and signals what other clinicians are thinking about opioid prescriptions. Further, there is evidence that nurse practitioners (NP) and physician assistants (PA) are more likely than physicians to prescribe opioids in primary care settings,[14] but the relationship between clinician type and opioid-prescribing behavior in the ED setting remains unknown. In addition, prior work has not shown whether these different types of clinicians respond similarly to default-directed attempts to decrease opioid prescribing.

To address these gaps, we implemented a quality improvement (QI) intervention decreasing EHR default quantities of commonly prescribed opioids at a large, academic, urban, tertiary-care center. Our goal was to determine whether this EHR change was associated with decreased opioid prescribing and whether this association varied by clinician type.

Population Health Research Capsule

What do we already know about this issue?
Emergency department opioid prescriptions increase the incidence of opioid use disorder in a dose-dependent manner, potentially exacerbating the opioid epidemic.

What was the research question?
This study evaluated the impact of a quality improvement intervention decreasing default opioid quantities in the EHR from 20 pills to 12, on average opioids prescribed at discharge.

What was the major finding of the study?
The EHR change was associated with a 14% decrease in quantity of opioid tablets per discharge receiving opioids ($P < .001$), driven mostly by nurse practitioners' and physician assistants' changes.

How does this improve population health?
We demonstrate a simple intervention other emergency departments can immediately implement to reduce the burden opioid prescribing has on the opioid epidemic.

METHODS

Design

We implemented a single-site, QI intervention at a large, academic, urban tertiary-care ED altering the default quantity of six commonly prescribed opioids. This was a prospective QI study where data was pulled from chart review and analyzed both during study design and continuously during implementation. We collected pre-intervention data on all ED discharges receiving these six opioids at discharge from January 1, 2019–March 28, 2021, and compared this with post-intervention data from March 29, 2021–December 5, 2021. This work was considered QI activity according to the University of California, San Francisco institutional review board policy. As a result, the requirement for individual research HIPAA authorization and signed consent forms was waived for all subjects as the research presented no more than minimal risk of harm to the subjects' privacy.

Intervention

We decreased the pre-populated ED discharge dispense quantities in the EHR from 20 tablets to 12 tablets for the following six commonly prescribed opioids: oxycodone 5 milligrams (mg); oxycodone-acetaminophen 5–325 mg; oxycodone 10 mg; tramadol 50 mg; hydrocodone-acetaminophen 5–325 mg; and hydrocodone-acetaminophen 10–325 mg. Changes were made at the system level and applied to all ED patients and clinicians. Clinicians decided

for whom to prescribe opioids and could choose any quantity by altering the default setting. Clinicians in the ED were informed of the study and quantity changes using two communication methods: by two email announcements sent to all physicians, PAs, and NPs; and by two in-person announcements during the weekly all-staff ED meetings attended by 10–12 total physicians, PAs, and NPs. The email and weekly all-staff announcements were made over a period of two weeks prior to the intervention.

Participants

We included ED patient encounters in which patients were discharged from the ED with a prescription for one of the six opioid medications included in the intervention. We also recorded the total number of patients discharged from the ED each month during the period of our study, regardless of whether they were given a prescription at the end of their visit. Each encounter was recorded as an observation, regardless of whether these patients had other ED visits.

Outcomes

From all ED encounters that had an opioid medication prescribed at discharge, we extracted the following data from the EHR: date of visit; patient demographics (race, age, gender, insurance type); acuity (based on the assigned Emergency Severity Index score in the EHR), chief complaint, prescribing clinician type, opioid medication prescribed and quantity of tablets. Insurance type was categorized as Medicaid, Medicare, commercial, self-pay, or other. Chief complaints were classified into the four most common chief complaints seen in our ED over the study period (back pain, abdominal pain, flank pain, falls), with the remaining chief complaints grouped as "other." Prescribing clinician types were categorized as physician, NP, or PA.

Our primary outcome measure was the difference in mean number of opioid tablets prescribed at discharge before and after our intervention. Our secondary outcomes included differences in this measure given the patient's self-reported race and self-reported gender, as well as prescribing clinician type for the encounter (physician, NP, PA). We also tested the difference in mean morphine milligram equivalents (MME) prescribed at discharge before and after our intervention.

Analysis

We calculated MMEs using the conversion factors provided by the US Centers for Disease Control and Prevention (CDC).[4] Frequency tables were generated for categorical variables. Median and interquartile range were generated for age and means, and standard deviations were calculated for all other continuous variables. We performed two sample *t*-tests to compare mean opioid tablets prescribed before and after our intervention and calculated 95% confidence intervals (CI). Given the effect of the COVID-19 pandemic on the volume of ED discharges during our pre-intervention data collection, we performed sensitivity analyses restricting the study period to different start times, including after the start of the COVID-19 pandemic (in March 2020). We performed chi-square tests of independence for age, race, insurance type, and acuity before and after intervention, and the Fisher exact test for gender. Two-way analysis of variance (ANOVA) was performed to analyze the interaction between clinician type and intervention on mean opioid tablets prescribed. P values < 0.05 were reported as significant. We performed all analyses using Python 3 (Python Software Foundation, Wilmington, DE).

RESULTS

There were 3,575 ED discharges with an opioid prescribed during the study period, of which 3,274 (91.6%) had prescriptions for one of the six opioids targeted by our intervention, including 2,666 discharges pre-intervention and 608 discharges post-intervention. **Opioids not targeted** by our intervention included morphine (2.5%), hydromorphone (1.4%), **oxycodone** (1.3%), hydrocodone (<1%), codeine (<1%), **tramadol** (<1%), methadone (<1%), and fentanyl (<1%). The patient population seen in the ED pre- and post-intervention had similar distributions of discharge diagnoses, age, gender, self-reported race, acuity, insurance type, and prescribing clinician type (Table 1). There were no statistically significant differences in prescriptions between individuals with different self-reported races (chi-squared $P = 0.68$) or between genders (Fisher exact $P = 0.65$) before and after implementation of our intervention.

The number of ED encounters associated with an opioid prescription upon discharge was proportional to the total number of discharges from the ED throughout the study period, although both experienced a precipitous decline at the start of the COVID-19 pandemic (Figure 1).

Decreasing the EHR default quantity of commonly prescribed opioids was associated with a decrease from 14.01 to 12.00 tablets per discharge prescription with opioids from the ED, a difference of 2.01 tablets (95% CI 1.44–2.58) (Table 2). Sensitivity analysis showed there was a statistically significant difference in tablets prescribed regardless of how many months were included in the pre-intervention dataset (Supplemental Table 1). This decrease in tablets is mirrored by an 11.0 MME decrease per discharge prescription with opioids (95% CI 5.74–16.22) from 94.25 to 83.27 (Table 2).

For 2,666 pre-intervention encounters in the dataset, physicians wrote 47.6% of study prescriptions, NPs wrote 26.8%, and PAs wrote 25.6% of study prescriptions. For the 608 post-intervention encounters in the dataset, physicians wrote 50% of study prescriptions, NPs wrote 24.3%, and PAs wrote 25.7% of study prescriptions. All clinician types prescribed significantly fewer opioids per encounter after the intervention compared to prior, with PAs and NPs affected

Table 1. Patient demographics of opioid prescriptions in the emergency department.

Patient demographics	All	Pre	Post	*P* value
Age, median (IQR)	48 (27)	48 (27)	48 (29)	0.88
Gender, n (%)				0.65
Female	1,707 (0.522)	1,395 (0.5242)	312 (0.514)	
Male	1,561 (0.478)	1,266 (0.4758)	295 (0.486)	
Race, n (%)				0.69
White	1,719 (0.525)	1,393 (0.5225)	326 (0.536)	
Black	423 (0.129)	353 (0.1324)	70 (0.115)	
Asian	467 (0.143)	382 (0.1433)	85 (0.14)	
Other	665 (0.203)	538 (0.2018)	127 (0.209)	
Acuity, n (%)				0.29
Emergent	286 (0.087)	243 (0.0912)	43 (0.071)	
Urgent	2,013 (0.615)	1,618 (0.6071)	395 (0.65)	
Less urgent	947 (0.289)	781 (0.2931)	166 (0.273)	
Non-urgent	27 (0.008)	23 (0.0086)	4 (0.007)	
Insurance, n (%)				0.53
Commercial	1,448 (0.442)	1,172 (0.4396)	276 (0.454)	
Medicaid	801 (0.245)	662 (0.2483)	139 (0.229)	
Medicare	702 (0.214)	571 (0.2142)	131 (0.216)	
Self-pay	167 (0.051)	140 (0.0525)	35 (0.058)	
Other	156 (0.048)	121 (0.0454)	27 (0.044)	
Clinician, n (%)				0.42
Physician	1,573 (0.481)	1,269 (0.476)	304 (0.5)	
NP	862 (0.263)	714 (0.268)	148 (0.243)	
PA	839 (0.256)	683 (0.256)	156 (0.257)	
Discharge diagnosis, n (%)				0.38
Abdominal pain	425 (0.130)	345 (0.129)	80 (0.131)	
Back pain	324 (0.0990)	258 (0.0968)	66 (0.109)	
Flank pain	292 (0.0892)	248 (0.0930)	44 (0.0724)	
Fall	190 (0.0580)	41 (0.0559)	149 (0.0674)	
Other	2,043 (0.624)	1,666 (0.624)	377 (0.620)	

IQR, interquartile range; *NP*, nurse practitioner; *PA*, physician assistant.

the most (Figure 2, Table 3). A two-way ANOVA of the clinician type and intervention confirmed statistically significant effects of the intervention, clinician type, and interaction between intervention and clinician type on the number of tablets per discharge prescription with opioids ($P < 0.001$).

DISCUSSION

We implemented an announced decrease in EHR default quantities of six commonly prescribed opioids at a large, academic, urban, tertiary-care ED. The analysis of our primary outcome showed that this QI intervention was associated with a statistically significant decrease in opioid tablets per discharge prescription with opioids from the ED, from 14 to 12 tablets, and a corresponding 11-point decrease in mean MMEs prescribed. While no studies have precisely quantified the clinical significance of this level of decrease, prior literature and CDC guidelines note a dose-dependent relationship between prescriptions and risk of developing OUD, suggesting that every pill matters at a population level.[2–4] Further, given that this center's pre-intervention mean tablets per ED discharge opioid prescription was only 14, the maximum expected decrease from a default change to 12 was only a decrease of two tablets per discharge prescription. However, these interventions might confer a larger clinical significance at other institutions with a higher

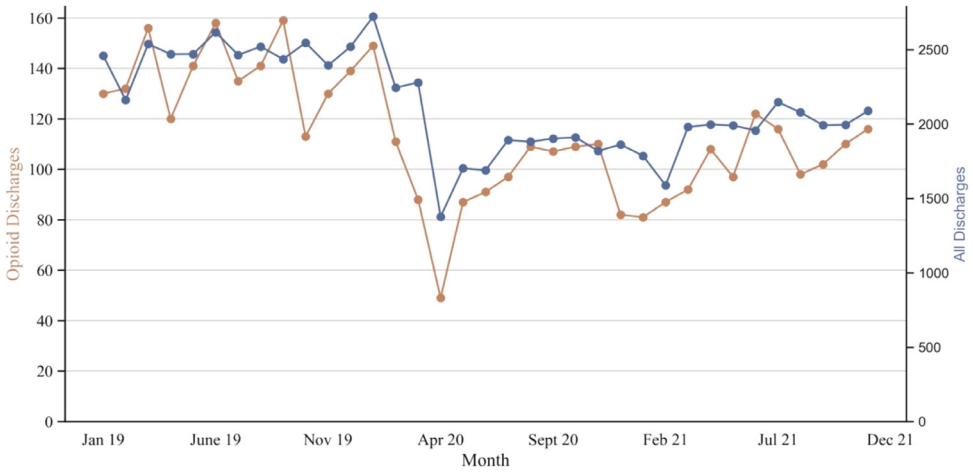

Figure 1. Decreasing default opioid quantities in the electronic health record is associated with lower ED prescription of opioids in the emergency department. Number of total discharges (blue) and discharges in which opioids were prescribed (orange) over the study timeline. The intervention began on March 19, 2021.

Table 2. Tablets and morphine milligram equivalents per discharge prescription with opioids.

Opioid prescriptions	All Mean (SD)	Pre Mean (SD)	Post Mean (SD)	Δ (95% CI)	*P* value
Tablets per opioid discharge	13.63 (6.54)	14.01 (6.75)	12.00 (5.22)	−2.01 (−2.58, −1.44)	<.001
MME per opioid discharge	92.21 (59.60)	94.25 (62.18)	83.27 (45.60)	−11.0 (−16.22, −5.74)	<.001

CI, confidence interval; *MME*, morphine milligram equivalent.

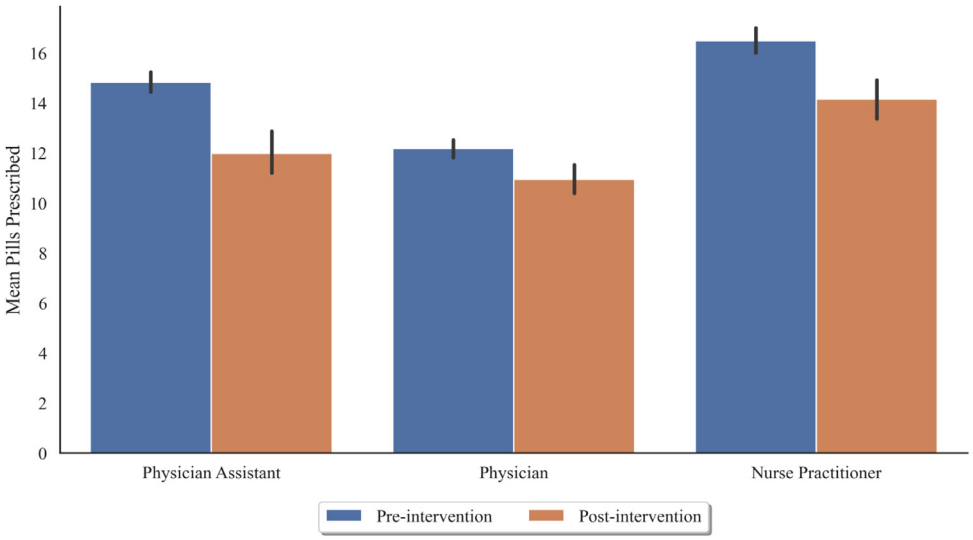

Figure 2. Clinician type is associated with opioid prescription quantities in the emergency department. Average number of tablets per discharge in which opioids were prescribed, grouped by clinician type and intervention time (blue = pre-intervention, orange = post-intervention).

Table 3. Number of tablets per discharge prescription with opioids, by clinician type.

Clinician type	All	Pre	Post	Δ (Post minus Pre)	95% CI
NP	16.09	16.49	14.16	−2.33	(−3.40, −1.08)
Physician	11.93	12.17	10.95	−1.22	(−2.08, −0.46)
PA	14.30	14.83	11.99	−2.84	(−3.80, −1.88)

NP, nurse practitioner; *PA*, physician assistant; *CI*, confidence interval.

starting mean tablets per discharge. Importantly, we observed that NPs and PAs in the ED setting are more likely than physicians to prescribe higher levels of opioids at baseline, consistent with previous results in primary care settings.[14]

Our results suggest that a universal default change is associated with decreased opioid prescriptions across all clinicians, with larger decreases for NPs and PAs compared to the change observed for physicians. The higher rates of opioid prescriptions among NPs and PAs could be due to a variety of factors, including differences in the acuity or types of illnesses and injuries evaluated. Additionally, even after the intervention, the high average opioids prescribed in the NP group was driven by a few clinicians still far exceeding the default (Supplemental Figure 1). The existence of inter-clinician variability in prescriptions may provide opportunities for more targeted future interventions, such as NP- or PA-specific interventions in conjunction with EHR-driven interventions.

We chose to analyze the average number of tablets prescribed per encounter in which opioids were prescribed rather than per ED visit or per month. Average number of tablets aligns more directly with our intervention, which was aimed at reducing the quantity of opioids prescribed after a clinician had already determined a need for opioid analgesia. Additionally, the number of tablets prescribed per opioid encounter is less impacted by temporal and seasonal variation in prescribing patterns and visit acuity, including the effect of the COVID-19 pandemic.

In most prior studies, clinicians were not notified of altered EHR default prescriptions either for convenience or to test the effect of a default change alone, or due to concern that clinicians would consciously override the defaults.[9–13] However, we found that decreasing default EHR opioid quantities to 12 tablets coupled with informing clinicians of the EHR change resulted in a decrease in the total number of opioids prescribed at ED discharge. We observed decreases in the average number of tablets prescribed per patient and the average MME of tablets prescribed per patient. This suggests that transparency with clinicians regarding best practices in opioid prescribing does not negate the effect of altering EHR defaults. It is possible that an announcement to clinicians about the EHR change and the rationale behind it may serve as an educational feedback component to the intervention. Clinicians who appreciate the purpose of the default change may be more likely to use the default, go lower than the default, or even write fewer prescriptions as they see fit for each clinical scenario, consistent with prior work demonstrating that audit and feedback approaches can decrease opioid prescribing.[15]

Because prior work has demonstrated the existence of racial disparities in opioid prescribing, we investigated whether clinicians' opioid prescribing behavior differed based on patient demographics.[16] Our analysis showed that there was no statistically significant disparity in opioid prescription amounts based on patient demographics, including age, race, and gender, for both the pre- and post-intervention data.

It is also important to note that the COVID-19 pandemic started during our pre-intervention phase, which resulted in an overall decrease in ED utilization.[17] However, our outcome is somewhat insulated from changes in ED volume, as tablets per prescription should not be dependent on the number of patient discharges. The COVID-19 pandemic may have led to other more subtle changes in prescribing behavior secondary to changing patient populations seen, but the major chief complaints did not differ in the pre- and post-intervention period, and the results of our sensitivity analysis confirmed that the effect seen was still present even after restricting our data to an entirely post-COVID-19 timeframe.

Ultimately, we recognize that opioids remain first-line treatments for certain indications such as short-term pain relief for acute fractures and cancer pain and are often necessary at discharge from the ED. However, given the risks of diversion, overdose, and OUD associated with discharging patients with large quantities of opioid tablets, it is important to encourage emergency clinicians to discharge patients with a clinically appropriate yet safe quantity of tablets. It is also important to use discretion as opioids are often not indicated for certain other causes of pain in patients presenting to the ED, including the common chief complaints of abdominal pain and lower back pain.[18] Recommendations for acute pain suggest discharging patients with a three-day supply of opioid medications, which corresponds to 12 tablets or less.[19] Our approach is a pragmatic, transparent, and scalable intervention that offers a tool that can be implemented in

the 42% of EDs nationwide that currently have defaults exceeding 12 tablets.[19]

LIMITATIONS

Our study design of a single-site, pre/post study does not allow for a causal interpretation and limits generalizability. Much of the project occurred during the COVID-19 pandemic, in which opioid prescribing increased nationwide; however, patterns for ED discharge prescriptions have not been studied.[20] Our design did not allow us to measure associated harms or benefits, such as whether pain control was adequate or whether diversion decreased.[21] Neither did our design allow us to test for differences in whether patients were prescribed opioids, which is also an important consideration for opioid stewardship. Additionally, the 12-tablet default quantity was chosen to approximate a three-day supply, but this length may vary based on the frequency prescribed of a given opioid, and there is limited evidence to support the optimal time course of opioids at discharge.[22]

Finally, the study design did not allow us to measure the precise number of clinicians who were exposed to the clinician-facing announcement, differentiate whether the effects observed were attributable to the EHR changes alone, the clinician-facing announcement alone, or a combination of the two.

CONCLUSION

We demonstrated that a quality improvement intervention coupling decreased default opioid quantities in the electronic health record with informing clinicians of the EHR change was associated with a decrease in the total number of opioids prescribed from the ED. While all clinician types (NPs, PAs, and physicians) decreased their quantities of opioids prescribed per discharge following the default change, NPs and PAs prescribed more opioids than physicians initially and experienced a larger decrease in opioid prescriptions. Future interventions seeking to address ED opioid prescribing should measure the total quantity of opioids leaving the ED over longer periods of time, use a robust, patient-centered metric for pain management follow-up, and attempt to correlate ED opioid prescriptions with negative opioid-associated outcomes in both individual patients and their communities.

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Bystanders Saving Lives with Naloxone: A Scoping Review on Methods to Estimate Overdose Reversals

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Introduction: People who use drugs in community settings are at risk of a fatal overdose, which can be mitigated by naloxone administered via bystanders. In this study we sought to investigate methods of estimating and tracking opioid overdose reversals by community members with take-home naloxone (THN) to coalesce possible ways of characterizing THN reach with a metric that is useful for guiding both distribution of naloxone and advocacy of its benefits.

Methods: We conducted a scoping review of published literature on PubMed on August 15, 2022, using PRISMA-ScR protocol, for articles discussing methods to estimate THN reversals in the community. The following search terms were used: *naloxone AND ("take home" OR kit OR "community distribution" OR "naloxone distribution")*. We used backwards citation searching to potentially find additional studies. Overdose education and naloxone distribution program-based studies that analyzed only single programs were excluded.

Results: The database search captured 614 studies, of which 14 studies were relevant. Backwards citation searching of 765 references did not reveal additional relevant studies. Of the 14 relevant studies, 11 were mathematical models. Ten used Markov models, and one used a system dynamics model. Of the remaining three articles, one was a meta-analysis, and two used spatial analysis. Studies ranged in year of publication from 2013–2022 with mathematical modeling increasing in use over time. Only spatial analysis was used with a focus on characterizing local naloxone use at the level of a specific city.

Conclusion: Of existing methods to estimate bystander administration of THN, mathematical models are most common, particularly Markov models. System dynamics modeling, meta-analysis, and spatial analysis have also been used. All methods are heavily dependent upon overdose education and naloxone distribution program data published in the literature or available as ongoing surveillance data. Overall, there is a paucity of literature describing methods of estimation and even fewer with methods applied to a local focus that would allow for more targeted distribution of naloxone. [West J Emerg Med. 2025;26(1.1)26–32.]

INTRODUCTION

People who use drugs in community settings have the risk of a fatal overdose, which can be mitigated by naloxone administered via bystanders during overdose incidents. Currently, there is some public health infrastructure in place to track naloxone distribution. In California, the Department of Health Care Services (DHCS) acts as a hub for dissemination of naloxone to community-based organizations.[1] These organizations are, in turn, charged with maintaining distribution and use data. However, the DHCS is not the only distributor of naloxone, nor do programs that distribute naloxone have any way to require individuals to report use. Further, naloxone in Narcan nasal spray form has recently been approved (in March 2023) by

the US Food and Drug Administration for over-the-counter (OTC) distribution. Due to this multitude of factors, it is not known how frequently community-distributed naloxone is administered to treat overdose.

While naloxone distribution is an effective, evidence-based intervention, and OTC formulations are approved, there is still pushback against highly visible and available naloxone distribution points from policymakers and community members due to the stigma associated with drug use and, by extension, the legal landscape.[2,3] In this study we sought to investigate methods of estimating and tracking opioid overdose reversals by community members with take-home naloxone (THN) to coalesce possible ways of characterizing THN reach with a metric that is useful for guiding both distribution of naloxone and advocacy of its benefits.

Population Health Research Capsule

What do we already know about this issue?
Administration of naloxone mitigates the risk of a fatal overdose in community settings; however, surveillance of community naloxone and its administration is weak.

What was the research question?
What methods exist for tracking or estimating opioid overdose reversals by community members with naloxone?

What was the major finding of the study?
The scoping review yielded 14 studies: 11 mathematical models, one meta-analysis, and two spatial analyses.

How does this improve population health?
Few methods have been published to estimate community naloxone administration; methods must be adapted for local use before informing policy or advocacy.

METHODS

With PRISMA-ScR protocol using the PubMed database,[4] we conducted a scoping review on methods to estimate opioid overdose reversals by community members using THN, before any potential intervention by first responders or clinicians. The database search was followed by backwards citation searching to identify relevant articles omitted in the database search. PubMed, a database provided by the National Center for Biotechnology Information at the US National Library of Medicine, was used for the scoping review due to its coverage of 35 million citations contained within the literature compilations of MEDLINE, PubMed Central, and Bookshelf.[5]

Search Strategy

We performed a search on August 15, 2022, using PubMed to find articles that discussed surveillance or estimation of THN administration. The search was restricted to articles published in the English language, but it was not restricted by year of publication. The terms used for the search strategy were selected to ensure that relevant studies found in pilot searches were all included. Since there has been an evolving lexicon surrounding "take-home" naloxone, alternative terms had to be included in the search, even though this diluted the proportion of relevant studies in the final search. We used the following search terms: *naloxone AND ("take home" OR kit OR "community distribution" OR "naloxone distribution")*.

Articles from the PubMed search that discussed THN and were possibly related to surveillance or estimation were sorted into methodology buckets for possible further review based on title and abstract, or review of full articles where uncertainty existed. These methodology buckets included the following: 1) mathematical models; 2) meta-analysis; 3) spatial analysis; 4) other possibly relevant articles; 5) opioid overdose education and naloxone distribution (OEND) program-based studies; and 6) other articles deemed not relevant.

The articles sorted into the first four buckets—mathematical models; meta-analysis; spatial analysis; and other possibly relevant articles—were read in full for confirmation of final inclusion. We excluded from further review bucket 5 (OEND program-based studies) because these studies have straightforward methodology and are already a well-known method of tracking THN administration, which is evidenced by the number of OEND program-based studies (59 studies captured with our database search strategy). These OEND program-based studies are discussed further in the *Discussion* section. After selection of PubMed articles for final inclusion, we performed backwards citation searching on these articles using titles, with abstracts as needed. The full text of possibly relevant articles was reviewed for final inclusion.

Data Extraction and Synthesis

We extracted the following data using a standardized table: method (bucket); model type; data sources; location (country, location – community); and funding sources. Method corresponded to the bucket categories discussed above. Model type was relevant for studies in bucket 1 (mathematical models), and the recorded model type was based on how authors self-described their studies. These self-

descriptions for mathematical models included Markov modeling and system dynamics modeling. Data was synthesized through concept mapping.

RESULTS

The database search resulted in the capture of 614 studies. Of these, 108 studies were marked as possibly relevant based on titles or abstracts discussing THN programs, surveillance, or estimation. Using full articles as needed, 39 studies were categorized into buckets of interest (1–4). Following categorization, full article review resulted in 14 articles for final inclusion. Backwards citation searching of the 765 references contained within the 14 articles resulted in three articles for full review. All three were excluded from final analysis leaving 14 articles for final inclusion. These 14 articles were from buckets 1–3. Figure 1 presents a flowchart of the captures and the review of literature.

Study Characteristics

The included studies varied in their objectives. Developing a way to identify how much naloxone was administered by bystanders was often a contributor to the overall goals of the studies instead of the primary objective. This section presents a synthesis of study objectives and the methods employed to surveil or estimate community naloxone use. The Table presents an overview of the studies by method.

Mathematical Models

Of the 14 studies, 11 employed mathematical models. Of these, 10 used Markov models and were published between 2012–2022. Markov models define several non-overlapping statuses (ie, chronic opioid use, cessation of opioid use, overdosing, dead) and represent each individual within a simulated population as a member of one of the statuses.[6] Individuals transition from one state to another, not necessarily linearly, based on probability parameters that represent change in individual statuses over time. This means that model output of any prior or subsequent population distribution within the system can be derived from any given population distribution. The one remaining mathematical modeling study used a system dynamics model and was published in 2022. System dynamics modeling represents different variables (ie, population, treatment availability, overdose deaths) within a system and the relationships between them, factoring in temporal delay as appropriate.[7] This means that the model output of any subsequent population distribution within the system may be based on both the given population distribution and the changes preceding the given population distribution.

Studies employing mathematical models varied in their primary objectives. Five of the studies employing Markov models were designed to evaluate the cost effectiveness of naloxone distribution. Four of these cost-effectiveness studies use variations of the same Markov model, which was originally developed in 2013 by Coffin and Sullivan, who authored two of the four articles.[8–11] The one remaining cost-effectiveness study, by Uyei et al, was unique in that it also investigated naloxone distribution in conjunction with other interventions, including pre-exposure prophylaxis for HIV prevention.[12]

Of the remaining five Markov model studies, all modeled the effects of naloxone distribution on opioid overdose death rates. Coffin et al (2022) modeled the US population using the Markov model developed previously by Coffin and Sullivan in 2013.[13] Irvine et al (2018) and Irvine et al (2019) modeled the population of British Columbia using a model developed by Irvine et al in 2018.[14,15] Irvine et al (2022) modeled the US population, and Linas et al (2021) modeled

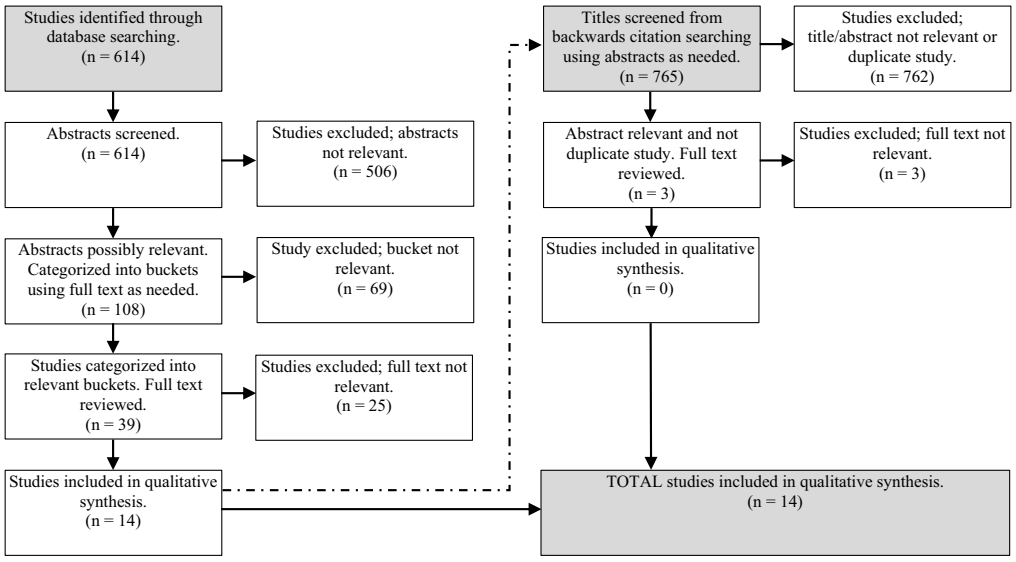

Figure 1. PRISMA flowchart.

Table. Study characteristics by method.

Method (bucket)	Model type	First author	Year	Data sources	Location country	Location community	Funding sources
Mathematical models	Markov model	Acharya M	2020	Literature, Surveillance data, Assumption	US	US	Not reported
		Coffin PO	2022	Literature, Assumption	US	US	National Institutes of Health
		Coffin PO	2013	Literature, Expert input, Assumption	US	US	National Institute of Allergy and Infectious Diseases (National Institutes of Health)
		Coffin PO	2013	Literature, Assumption	Russia	Russia	Open Society Foundation
		Irvine MA	2018	Surveillance data, Literature, Expert input, Assumption	Canada	British Columbia	Canadian Institutes of Health Research, Natural Science and Engineering Research Council of Canada
		Irvine MA	2019	Surveillance data, Literature, Expert input, Assumption	Canada	British Columbia	British Columbia Government, Canadian Institutes of Health Research, Natural Science and Engineering Research Council of Canada, Michael Smith Foundation for Health Research, National Institutes of Health
		Irvine MA	2022	Literature, Modified-Delphi panel	US	US	National Institute on Drug Abuse (National Institutes of Health)
		Langham S	2018	Literature, Assumption	UK	UK	Mundipharma International Ltd.
		Linas BP	2021	Surveillance data, Literature, Assumption	US	Rural, urban Massachusetts	National Institute on Drug Abuse (National Institutes of Health)
		Uyei J	2017	Surveillance data, Literature, Assumption	US	Connecticut	Connecticut Department of Public Health, National Institute of Mental Health (National Institutes of Health)
	System dynamics model	Stringfellow EJ	2022	Surveillance data, Literature, Expert input, Assumption	US	US	US Food and Drug Administration
Meta-analysis		McAuley A	2015	OEND program studies	Canada, UK, US	n/a	National Health Service Scotland
Spatial analysis		Rowe C	2016	Surveillance data	US	San Francisco	National Institute on Drug Abuse (National Institutes of Health)
		Yi G	2022	Surveillance data	US	Baltimore	Not reported

urban and rural Massachusetts populations also using the 2018 Irvine et al model.[16,17]

The one study using a system dynamics model was conducted by Stringfellow et al in 2022 and investigated the effects of different interventions, including naloxone distribution, on opioid overdose death rates.[18]

Mathematical models employed various data sources to inform the parameters used. These sources included parameters from published literature and surveillance data (ie, public health department records, coroner reports, insurance claims). When sources of data were not available, authors used their own assumptions or expert input,

including a modified-Delphi panel in the 2022 Irvine et al study.[16] The studies do not apply the mathematical models to any specific cities or smaller communities, although the 2021 Linas et al study models a generalized rural city and a generalized urban city in Massachusetts.[17] Adopting the mathematical models employed in these studies to estimate bystander naloxone administration in a particular community of interest would require the input of local parameters, which could be an intensive effort if surveillance infrastructure is not established.

Meta-analysis

One study by McAuley et al, published in 2015, consisted of a meta-analysis of nine OEND program studies, synthesizing their outcomes and accounting for participants lost to follow-up to report the proportion of naloxone kits that are likely to be used in the first three months after distribution.[19] The studies that comprised the meta-analysis were from Canada, the United Kingdom, and the US. Adopting a meta-analysis methodology to estimate bystander naloxone administration in a particular community of interest would involve synthesizing data from OEND programs in the community.

Spatial Analysis

Two studies, by Rowe et al (2016) and Yi et al (2022), used geographic system information (GSI) mapping technology to conduct spatial analysis of naloxone overdose incidents. The studies determined the relationship between proximity of the census tract in which naloxone was administered and the nearest naloxone distribution site.[20,21] Rowe et al conducted an analysis of San Francisco, California, and Yi et al conducted an analysis of Baltimore, Maryland. Surveillance data was used to establish this relationship. The GSI mapping and spatial analysis methodology used in these studies could be adopted in other jurisdictions to estimate bystander naloxone administration in a particular neighborhood of interest based in part on distance from naloxone distribution points.

DISCUSSION

Limited Methods to Estimate Take-home Naloxone Use

The limited number of studies captured in this scoping review evidences the lack of surveillance and estimation methods for the administration of THN, outside of OEND program records based on self-reports. Of the methods used, mathematical modeling and meta-analysis provided direct estimations of the proportion of distributed naloxone administered; however, both methods were applied only over large geographic areas (entire countries, states or provinces, amalgamating different cities around the globe) or theoretical cities representing a large geographic area ("urban city of Massachusetts").

Mathematical modeling was the most popular form of estimating administration of naloxone by community members. Further, the popularity of modeling increased relative to the other methods. While making up 79% of study methodologies found overall, it comprises 89% of studies in the five years from 2018–2022, as shown in Figure 2. Reasons for the popularity of mathematical models may be convenience, including the use of expert input and assumptions for unknown parameters, and the ability to tailor models to different geographic areas by adjusting parameters. Nine of the 11 modeling studies used one of two model bases, Coffin and Sullivan (2013) and Irvine et al (2018).[9,14]

The relative disuse of meta-analysis may be explained by the lower practical value of naloxone administration data averaged over multiple locations, as opposed to applying local data to inform program growth and gauge impact. Meta-analysis of naloxone use in other communities may be informative in jurisdictions lacking their own surveillance data, but care must be exercised in selecting which communities and programs to use as references. The spread of OEND programs, however, may provide an opportunity for more applicable comparisons. Further, large proportions of follow-up loss are evidenced in some OEND programs, adding uncertainty to meta-analysis results; three of the nine OEND programs that McAuley et al (2015) used in their analysis had three-month follow-up rates of less than 70% (eg, 34%, 30%, 23%).[19]

Spatial analysis yielded a relationship between naloxone administration and distance from naloxone distribution point. Both studies included in this scoping review (Rowe et al 2016, and Yi et al 2022) were reliant upon self-reported data from OEND programs. This data, which is needed to construct a GSI map, may be useful for identifying geographic areas for intervention but may be less useful for extrapolation to unreported THN use. Further, only the study by Yi et al (2022) characterized the relationship between probability of bystander naloxone administration at

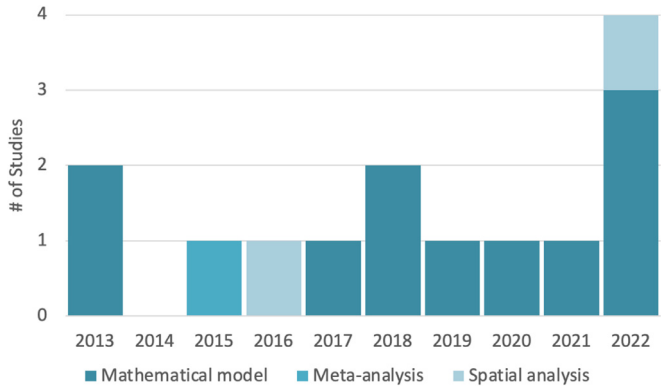

Figure 2. Methods used over time.

an overdose and distance from distribution point.[21] Rowe et al (2016) instead reported total number of administration events as a function of distance, further limiting external validity of the results.[20]

Opioid Education and Naloxone Distribution Programs

While we excluded individual OEND program-based studies from this scoping review, they are important for discussion and comprised 59 of the captured articles in the systematic search. Data from these programs, whether or not published in peer-reviewed journals, is the foundation for the parameters in mathematical models, the component studies of meta-analysis, and the location data for spatial analysis. The accuracy of all methods to estimate naloxone administration by bystanders wraps back around to the quality of self-reported data from OEND programs. When estimations of THN use are put forward to inform policy, the methods behind the estimate must be justifiably better than local OEND data, if available. Amalgamated data provided by government institutions and national coalitions may also be available but will lack local specificity.[22,23]

LIMITATIONS

There are limitations to this scoping review and its applicability. In our study we did not attempt to include methods published in the gray literature in our initial search strategy. This limitation was addressed in part through informal preliminary searches, correspondence with public health personnel at the California Department of Public Health and the CA Bridge program, and citation searching. Further, it was not expected that methods for estimation of bystander naloxone use would exist without being published in peer-reviewed journals.

A related limitation of this study is that the initial search for relevant articles was limited to the PubMed database. This decision was based on the PubMed search terms comprehensively capturing all studies identified by previous informal preliminary searches and correspondence with public health personnel. Additionally, the search strategy attempted to capture any potentially missed literature through backwards citation searching, and the absence of any new relevant articles supported the parameters of the initial search.

Another limitation to this scoping review is that it did not attempt to ascertain the comparative value of methods used in estimating bystander naloxone use. It is possible that preferred methods for determining bystander naloxone use will be dependent upon intended use of the analysis and preference for risk. Methods highly influenced by OEND program data will inherently provide underestimation, while others may cause overestimation. Finally, the environment surrounding harm reduction is constantly changing. The recent approval of OTC naloxone is a new policy that the studies captured in our review do not address.

CONCLUSION

The present scoping review describes the available methods for estimating bystander administration of naloxone. Mathematical models, particularly Markov models, are most common. System dynamics modeling, meta-analysis, and spatial analysis have also been used. All methods are heavily dependent upon OEND program data published in the literature or available as ongoing surveillance data. Overall, there is a paucity of literature describing methods of estimation, and of these few have been applied with a local focus. This is of concern as harm reduction is still regarded with stigma. Further, even as naloxone distribution becomes more normalized, both politically and socially, effective distribution will remain important in a landscape of funding and resource scarcity with complementary interventions and competing policy priorities.

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Attitudes, Beliefs, Barriers, and Facilitators of Emergency Department Nurses Toward Patients with Opioid Use Disorder and Naloxone Distribution

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Introduction: As opioid overdose deaths continue to rise, the emergency department (ED) remains an important point of contact for many at risk for overdose. In this study our purpose was to better understand the attitudes, beliefs, and knowledge of ED nurses in caring for patients with opioid use disorder (OUD). We hypothesized a difference in training received and attitudes toward caring for patients with OUD between nurses with <5 years and ≥6 years of clinical experience.

Methods: We conducted a survey among ED nurses in a large academic medical center from May–July 2022. All ED staff nurses were surveyed. Data entry instruments for the nursing surveys were programmed in Qualtrics, and we analyzed results R using a chi-square test or Fisher exact test to compare nurses with <5 years and ≥6 years of clinical experience. A *P*-value of < 0.05 was considered statistically significant.

Results: We distributed 74 surveys, and 69 were completed (93%). Attitudes toward naloxone distribution from the ED were positive, with 72% of respondents reporting they were "very" or "extremely" supportive of distributing naloxone kits to individuals at risk of overdose. While attitudes were positive, barriers included limited time, lack of system support, and cost. Level of comfort in caring for patients with OUD was high, with 78% of respondents "very" or "extremely" comfortable. More education is needed on overdose education and naloxone distribution (OEND) with respondents 38% and 45% "a little" or "somewhat" comfortable, respectively. Nurses with <5 years of experience reported receiving more training on OEND in nursing school compared to those with ≥6 years of experience ($P = 0.03$). There were no significant differences in reported attitudes, knowledge, or comfort in caring for patients with OUD.

Conclusion: In this single-center survey, we found ED nurses were supportive of overdose education and naloxone distribution. There are opportunities for targeted education and addressing systemic barriers to OEND. All interventions should be evaluated to gauge impact on knowledge, attitudes, and behaviors. [West J Emerg Med. 2025;26(1.1)33–37.]

INTRODUCTION

Opioid use disorder (OUD) is associated with a 20-fold risk of early death due to overdose, infection, trauma, or suicide.[1] Nationally, an estimated 68,000 people died of opioid-related overdose in 2020, and 2.7 million suffered from OUD.[2] The impact of non-medical opioid use and OUD can be seen in many healthcare settings, including the emergency department (ED), as opioid-related visits in the ED had an estimated cost of $1.47 billion per year between 2016–2017.[2,3]

Patients presenting to the ED for opioid-related encounters, including opioid overdose, are at high risk for negative outcomes. Emergency department-based interventions such as overdose education and naloxone distribution (OEND) can have a significant impact on opioid-related morbidity and mortality. Naloxone is an opioid receptor antagonist that is used to quickly reverse the effects of opioid overdose. In 2018, the US Surgeon General recommended increasing access to naloxone for those who are at an increased risk of an opioid overdose.[4] The American College of Emergency Physicians also recommends providing naloxone for patients at increased risk of opioid overdose, including those discharged from the ED after an opioid-related visit as well as any patient with a history of OUD.[5]

Emergency department-based take-home naloxone programs have been an effective means of distributing naloxone to patients at risk for future overdose[6,7]; and OEND from the ED has been shown to have positive impact on trained laypersons in addition to patients and their social network.[8] Large-scale OEND has been shown to be an effective public health intervention.[9] Patient education related to overdose prevention and naloxone distribution can be provided by ED nurses who routinely spend more time with patients than the treating clinician. Clinical nurse specialist-led OEND in the ED have been effective across an integrated healthcare system.[10] While much is known about the beliefs, attitudes, and barriers of prescribers toward naloxone distribution, including time, cost, and clinical decision support, less is known about nurse perspectives in the ED.[6,7,11–15] We sought to evaluate nurse attitudes, beliefs, barriers, and facilitators to naloxone distribution in an academic ED in the Midwest.

Population Health Research Capsule

What do we already know about this issue?
Emergency departments play a crucial role in caring for patients with opioid use disorder (OUD) with interventions such as overdose education and naloxone distribution.

What was the major research question?
What are attitudes of ED nurses related to caring for patients with OUD, and training in overdose education and naloxone distribution (OEND)?

What is the major finding of the study?
ED nurses have positive attitudes (72%) toward naloxone distribution. Early career nurses (<5 years) had more OEND training.

How does this study improve population health?
Results highlight opportunities for targeted nursing education, addressing barriers and facilitators to OEND in the ED, thereby improving care for patients with OUD.

METHODS

From May–July 2022 we conducted a survey of ED nurses at a quaternary-care, academic ED in the Midwest that sees approximately 60,000 patients per year. The research team, which included an emergency physician and an addiction medicine physician, created a survey tool in collaboration with survey methodology experts from the University of Wisconsin Survey Center. Most items on the survey were developed by the team, but the stigma questions were adapted from a validated mental health stigma survey.[15–17] Research coordinators in the ED distributed 74 paper surveys to full and part-time ED staff nurses at daily staff huddles during the study period. Each respondent was allowed to complete only one survey. A $5 pre-incentive was included with the survey at the time of distribution.

We used a chi-square test or Fisher exact test to assess the difference in nurse attitudes, based on relative job experience (≤5 years v ≥6 years), regarding perception, knowledge, and barriers for naloxone distribution and caring for patients with OUD. All analyses were done in R v 4.1.1 2021 (R Foundation for Statistical Computing, Vienna, Austria). A P-value of <0.05 was considered statistically significant.

Disclosures

This study was reviewed by the University of Wisconsin-Madison Minimal Risk Research Institutional Review Board and deemed exempt. None of the authors have any financial conflicts of interest to disclose.

RESULTS

Surveys were distributed to 74 ED nurses, with a 93% response rate. Respondents had a breadth of clinical experience, with 60% having been a practicing nurse for six years or more. Of that group, 21% had been a practicing

nurse for ≥16 years. The majority of the ED nurses reported completing their nursing training in the Midwest (83%). Other regions represented were the West (7.6%), Southwest (1.5%), Southeast (4.5), and Northeast (3%).

Overall, the level of training on OEND during nursing school was low, with 77% reporting no or a little education received. Nurses with 0–5 years of experience reported receiving more education compared to nurses with ≥6 years of experience ($P = 0.03$). When asked about level of comfort providing education related to naloxone for overdose prevention immediately following nursing school, 67% felt "not at all" or "only a little" prepared. Despite more recent nursing school graduates reporting more education in nursing school, there were no differences in how prepared they felt to provide OEND ($P = 0.63$).

Responses were mixed when they were asked about the perceived effectiveness of naloxone kits as a public health intervention, with 55% of all nurses reporting naloxone kits are "a little" or "somewhat" effective. However, the majority (66%) felt that naloxone kits would not increase behavior that put people at risk for overdose. Additional responses to questions about attitudes, beliefs, barriers, and facilitators to naloxone distribution from the ED are available in the Table. Responses to all questions were compared between the nurses with 0–5 years' experience to those with ≥6 years' experience, and no statistically significant differences were appreciated.

Overall comfort level for caring for patients who use non-prescribed opioids was high, with 78% of respondents very or extremely comfortable. Again, no differences were appreciated between nurses with 0–5 years' experience and those with ≥6 years' experience.

Barriers and facilitators to naloxone distribution in the ED are varied and related to time, education, and cost concerns. Staff reported the most significant barrier was limited staff time, with 47% reporting this was an "extremely" impactful barrier. These are similar to previously described barriers and facilitators that prescribers report facing; responses are included in the Table.[14–18]

DISCUSSION

Emergency department nurses are critical to the effectiveness of ED-based OEND programs. Although there have been multiple studies looking at emergency clinician attitudes, beliefs, barriers, and facilitators to naloxone distribution, little is known about ED nurse-specific factors for OEND. Although nurses in practice for ≤5 years reported receiving more education on naloxone for overdose prevention while in nursing school, the additional education did not relate to statistically significant differences in attitudes, comfort, or perceived barriers or facilitators. Further research is needed to provide a better understanding of why receiving more education did not lead to increased

Table. Responses of emergency department nurses to questions about attitudes, beliefs, barriers, and facilitators to naloxone distribution from the ED.

		Not at all	A little	Somewhat	Very	Extremely
Attitudes	How much do you support giving naloxone kits to individuals who might be at risk for opioid overdose?	1.5% (1)	10.3% (7)	16.2% (11)	29.4% (20)	42.6% (29)
	How effective is giving a naloxone kit to people who use drugs as a public health intervention?	0.0% (0)	24.6% (17)	30.4% (21)	29.0% (20)	14.5% (10)
	How likely is giving a naloxone kit to people who use drugs going to lead to behaviors that increase risk for overdose, eg, using more opioids or using in combination with other drugs?	41.8% (28)	23.9% (16)	25.4% (17)	9.0% (6)	0.0% (0)
Comfort	Asking screening questions about non-prescribed opioid use?	0.0% (0)	2.9% (2)	10.1% (7)	47.8% (33)	39.1% (27)
	Caring for patients who use non-prescribed opioids?	0.0% (0)	1.4% (1)	20.3% (14)	46.4% (32)	31.9% (22)
	Offering a naloxone kit to be able to reverse an overdose?	1.4% (1)	5.8% (4)	33.3% (23)	31.9% (22)	27.5% (19)
	Teaching a layperson to administer naloxone?	2.9% (2)	10.1% (7)	27.5% (19)	34.8% (24)	24.6% (17)
	Providing care to a person with an opioid use disorder compared to helping a person with a physical illness?	3.0% (2)	4.5% (3)	26.9% (18)	47.8% (32)	17.9% (12)
	Educating patients about opioid overdose prevention?	0.0% (0)	5.8% (4)	36.2% (25)	44.9% (31)	13.0% (9)
	Educating patients about overdose response and naloxone administration?	4.3% (3)	15.9% (11)	29.0% (20)	37.7% (26)	13.0% (9)
	Educating patients about overdose prevention?	2.9% (2)	18.8% (13)	30.4% (21)	34.8% (24)	13.0% (9)

(*Continued on next page*)

Table. Continued.

		Not at all	A little	Somewhat	Very	Extremely
Barriers	Limited staff time?	0.0% (0)	4.5% (3)	18.2% (12)	30.3% (20)	47.0% (31)
	Lack of systems supporting it to happen in a time efficient way?	1.5% (1)	4.6% (3)	21.5% (14)	43.1% (28)	29.2% (19)
	Lack of clinical decision support to ensure consistent process?	31.% (2)	10.9% (7)	25.0% (16)	39.1% (25)	21.9% (14)
	How much of a barrier to dispensing naloxone kits from the ED is lack of insurance or limited insurance coverage leading to high costs to patients?	9.4% (6)	10.9% (7)	17.2% (11)	39.1% (25)	23.4% (15)
	Concerns about being able to identify patients at risk for overdose?	21.2% (14)	28.8% (19)	40.9% (27)	9.1% (6)	0.0% (0)
	Concerns that a layperson won't be able to administer it appropriately?	28.8% (19)	37.9% (25)	27.3% (18)	6.1% (4)	0.0% (0)
	Concerns that providing a naloxone kit will lead to more or riskier drug use?	48.5% (32)	15.2% (10)	16.7% (11)	18.2% (12)	1.5% (1)
	Concerns that patients will be offended by it being offered?	40.9% (27)	19.7% (13)	31.8% (21)	6.1% (4)	1.5% (1)
Facilitators	Funding to ensure patients don't have to pay co-pays for cost of the naloxone kit?	3.1% (2)	7.8% (5)	20.3% (13)	32.8% (21)	35.9% (23)
	Clinical decision support that makes the prescription an automated process?	0.0% (0)	9.4% (6)	26.6% (17)	48.4% (31)	15.6% (10)
	Education for staff?	1.6% (1)	3.1% (2)	43.8% (28)	35.9% (23)	15.6% (10)
	How much of a facilitator to discharging a patient from the ED with a naloxone kit is patient education materials to teach about overdose prevention and naloxone administration?	3.2% (2)	7.9% (5)	27.0% (17)	44.4% (28)	17.5% (11)

ED, emergency department.

comfort or knowledge and whether offering more targeted education can improve these metrics. Despite receiving more education, early career nurses have had less experience caring for patients with OUD, which may have contributed to the results.

Overall, most respondents were comfortable caring for patients with OUD, including asking OUD screening questions. Slightly less than half felt naloxone is a "very" or "extremely" effective public health intervention, which is an important area for future educational efforts and evaluation. Additional areas for educational foci include trainings on overdose prevention education and naloxone training for patients and their friends/family while in the ED. This data provides a baseline understanding and can be re-assessed after further educational initiatives.

We found nursing-identified barriers were similar to previously described prescriber barriers including limited time, cost, and lack of efficient system support.[18–20] Some of these barriers can be addressed with clinical decision support, including prompts to order naloxone for patients with opioid-related diagnostic codes. Providing standardized, easy-to-follow instructions on overdose prevention and naloxone administration can benefit both the patients and the staff member providing the education. Although handouts are helpful, regular education by content experts would provide continued education to ensure all staff are comfortable with overdose prevention education and naloxone use moving forward.

Overall, ED nurses were open to receiving more education, and most nurses identified this as a facilitator to expanding naloxone distribution in the ED. Using baseline surveys like the one our team used can guide ED leadership when developing educational and systems interventions for nursing staff.

LIMITATIONS

Limitations of this study include evaluating a single, academic Level I trauma center; so results may not apply more broadly to other EDs. We did not evaluate for nursing experience in areas outside the ED. Additionally, the number of ED nurses surveyed was small (69); so it is possible that the sample size was too small to enable us to identify differences between the nurses with less experience as compared to those with more experience.

CONCLUSION

Understanding attitudes, beliefs, barriers, and facilitators of naloxone distribution among ED nurses is important for successful implementation of overdose education and prevention programming. Emergency department nurses surveyed were generally supportive of naloxone distribution and comfortable caring for patients with OUD. There are opportunities for addressing systemic barriers and providing targeted education to facilitate ED-based naloxone distribution. These results show opportunities to improve care for patients with OUD, although future research is needed to determine whether education impacts knowledge, attitudes, and behaviors.

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Improving Healthcare Professionals' Access to Addiction Medicine Education Through VHA Addiction Scholars Program

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Introduction: The seemingly inexorable rise of opioid-related overdose deaths despite the reduced number of COVID-19 pandemic deaths demands novel responses and partnerships in our public health system's response. Addiction medicine is practiced in a broad range of siloed clinical environments that need to be included in addiction medicine training beyond the traditional fellowship programs. Our objective in this project was to implement a knowledge-based, live virtual training program that would provide clinicians and other healthcare professionals with an overview of addiction, substance use disorders (SUD), and clinical diagnosis and management of opioid use disorder (OUD).

Methods: The Veterans Health Administration (VHA) Emergency Department Opioid Safety Initiative (ED OSI) offered a four-day course for healthcare professionals interested in gaining knowledge and practical skills to improve VHA-based SUD care. The course topics centered around the diagnosis and treatment of SUD, with a focus on OUD. Additionally, trainees received six months of support to develop addiction medicine treatment programs. Evaluations of the course were performed immediately after completion of the program and again at the six-month mark to assess its effectiveness.

Results: A total of 56 clinicians and other healthcare professionals participated in the Addiction Scholars Program (ASP). The participants represented nine Veteran Integrated Service Networks and 21 different VHA medical facilities. Nearly 70% of participants completed the initial post-survey. Thirty-eight respondents (97.4%) felt the ASP series contained practical examples and useful information that could be applied in their work. Thirty-eight respondents (97.4%) felt the workshop series provided new information or insights into the diagnosis and treatment of SUD. Eleven capstone projects based on the

information acquired during the ASP were funded (a total of $407,178). Twenty participants (35.7%) completed the six-month follow-up survey. Notably, 90% of respondents reported increased naloxone prescribing and 50% reported increased prescribing of buprenorphine to treat patients with OUD since completing the course.

Conclusion: The ASP provided healthcare professionals with insight into managing SUD and equipped them with practical clinical skills. The students translated the information from the course to develop medication for opioid use disorder (M-OUD) programs at their home institutions. [West J Emerg Med. 2025;26(1.1)38–42.]

INTRODUCTION

The national opioid epidemic is one of the leading preventable causes of morbidity and premature death in the United States. In 2017, the US Department of Health and Human Services (HHS) declared the opioid crisis a public health emergency.[1] The COVID-19 pandemic has exacerbated this crisis with an increased prevalence of opioid use disorder (OUD) and deaths from prescription and non-prescription opioids.[2] Veterans are at nearly twice the risk of fatal drug overdose when compared to non-veterans.[3] As part of the five priorities to combat the opioid crisis HHS highlighted the importance of improving access to prevention, treatment, and recovery support services.[1] However, there remain critical shortages of healthcare professionals who can provide these life-saving services.[4] Improving access to substance use disorder (SUD) care at any time, any place is an important part of the Veterans Health Administration's (VHA) strategy. As a result, there is a growing need for training healthcare professionals outside the traditional addiction medicine specialty on key components of addiction medicine and SUD.

The VHA is America's largest integrated healthcare system, providing care at 1,298 healthcare facilities including 171 medical centers and 1,113 VHA outpatient clinics. More than nine million enrolled veterans are served by the VHA each year.[5] Despite its size, the VHA system has a shortage of addiction specialists and SUD clinics. As a result, the responsibility of providing SUD care falls on a variety of specialties, including pharmacy and mental health, and primary care and emergency medicine. However, the education opportunities for these practitioners to obtain advanced training in addiction medicine is limited.

Currently, addiction medicine is not a required graduate medical education course for internal medicine, family medicine, or emergency medicine residencies. As a result, trainees receive variable exposure to SUD care during residency, leading to suboptimal preparation managing patients with addiction when practicing independently.[6,7] The traditional pathway for addiction medicine training is to complete a 12-month dedicated fellowship at one of the 90 sites accredited by the Accreditation Council for Graduate Medical Education.[8] This significant commitment limits the ability for frontline clinicians to obtain further training in addiction medicine. There is a need to create accessible didactic and practical clinical education in addiction medicine to increase frontline clinician comfort.

Lack of basic training in SUD is a significant barrier to physician engagement of medication for opioid use disorder (M-OUD) programs.[9,10] As a result, the Addiction Scholars Program (ASP) was developed to provide additional training for physician assistants, nurse practitioners, clinical pharmacists, academic detailing pharmacists, and physicians. The educational topics included a foundational understanding of the treatment of OUD, complex pain, and complex persistent opioid dependence. Our objective in this study was to measure the effectiveness, immediately and at six months, of a hybrid educational intervention paired with creation of multidisciplinary teams on knowledge retention and willingness to prescribe M-OUD.

METHODS

This was a post-implementation study of the ASP, a novel hybrid educational approach and facilitated, team-based quality improvement (QI) project. Surveys were performed at the conclusion of the course and at the six-month mark. The surveys focused on the course's effectiveness and the trainee's willingness to initiate an addiction medicine project at their site. We used descriptive statistics to interpret the results of the survey. The Emergency Department Opioid Safety Initiative (ED OSI) program was designated as a QI project through the Office of Pharmacy Benefits Management Academic Detailing Service from the institutional review board of the Edward Hines, Jr. VA Hospital and approved by the Rocky Mountain Regional VA Medical Center Research and Development service.

Addiction Scholars Program

The ASP is a part of the VHA ED OSI and was developed as an intensive course for clinicians interested in understanding VHA-based SUD care. Frontline clinicians

and other healthcare professionals who were current employees of the VHA were invited to apply to attend the ASP. Forty were accepted to attend the program. The course consisted of four virtual sessions that were each four hours long. Each session covered fundamental and advanced topics of addiction medicine for emergency and acute care settings.

The entire course was delivered virtually using the Microsoft Teams (Microsoft Corp, Redmond, WA) application. Topics included clinical management of OUD, opioid overdose management, buprenorphine induction, naloxone distribution, pain management in patients with OUD, and opioid-induced chronic pain syndrome. The program used a combination of lectures and case-based breakout sessions to reinforce key concepts. Lecturers were selected based on their experience and expertise in specific areas of addiction medicine. Interdisciplinary groups were strategically assembled for the case-based breakout sessions with members from the same VHA site and Veteran Integrated Service Networks (VISN). This allowed for a networking opportunity where group members could build connections that would lead to the development of M-OUD programs locally at their VHA site or at their VISN. The groups were paired with a member of the VHA ED OSI team who would facilitate discussion of the cases.

After successful completion of the course, trainees received six months of support to develop and implement addiction medicine treatment programs. Trainees were also encouraged to submit capstone projects, which were eligible for funding up to $50,000 (up to two years) to help implement addiction medicine projects at their local VHA site.

Table 1. Scholar characteristics.

	Scholars (%) ($N = 32$)
Profession	
Physician	15 (46.9)
Nurse practitioner	6 (18.8)
Nurse	1 (3.1)
Physician assistant	3 (9.4)
Pharmacist	7 (21.9)
Years out of training	
0–5 years	13 (40.6)
6–10 years	6 (18.8)
10+ years	10 (31.3)
Missing	3 (9.4)
Clinical Area	
Emergency department or urgent care	6 (18.8)
Mental health, substance use treatment, or psychiatry	14 (43.8)
Pain management	3 (9.4)
Primary care	5 (15.6)
Pharmacy	1 (3.1)
Missing	3 (9.4)

RESULTS

A total of 56 individuals participated in the ASP, including 32 clinicians, 10 clinical pharmacy practitioners, and 14 academic detailing pharmacists. The clinicians represented nine VISNs and 21 different VHA facilities. The class was composed of 15 physicians, seven nurses and nurse practitioners, 31 pharmacists, and three physician assistants. Participants ranged in age from 30–65 (mean 46.2 years) and had been in clinical practice for an average of 11 years (Table 1). Additionally, attendees represented numerous clinical service areas including emergency medicine, urgent care, primary care, pain management, mental health, and substance use treatment.

Of the 56 participants, 39 (almost 70%) responded to the initial post-survey. Thirty-eight respondents (97.4%) reported that the ASP series contained practical examples and useful information that could be applied in their work. Thirty-eight respondents (97.4%) felt that the workshop series provided new information or insights into the diagnosis and treatment of SUD. Thirty-five respondents (89.7%) were very or somewhat satisfied with the ASP series.

Twenty individuals who participated in the ASP responded to the six-month follow-up survey. The majority of respondents (85.0%) reported feeling "comfortable" or "very comfortable" initiating M-OUD since completing the ASP. Fourteen (70% of follow up respondents) pursued additional M-OUD training since completing the ASP. Of the 20 respondents, four worked in departments without an active M-OUD program; three of the four (75%) are currently working to develop an M-OUD program. Eighteen (90%) of the respondents reported increased naloxone prescribing since completing the ASP. Ten (50%) of the respondents increased prescribing of buprenorphine to treat patients with OUD since completing the course (Table 2).

At the conclusion of the ASP, 11 capstone projects were submitted and awarded a total of $407,178. Seven (63.6%) of the projects focused on the development of naloxone or buprenorphine programs. Other projects were focused on harm reduction with the development of a syringe service program, the use of fentanyl testing strips, development of a VISN-wide virtual learning program for SUD training, urine point-of-care testing for controlled medications, and music- and movement-based interventions to engage high-risk veterans in substance use treatment.

DISCUSSION

Our study demonstrated the ASP successfully provided additional addiction medicine training to clinicians and other healthcare professionals and that there is a desire for additional addiction medicine training within the VHA

Table 2. Results of initial and six-month follow-up survey.

	Initial follow-up (N = 39)
The ASP series contained practical examples and useful information that can be applied in their work.	38 (97.4%)
The workshop series provided new information or insights into the diagnosis and treatment of SUD.	38 (97.4%)
"Very" or "somewhat" satisfied with the ASP series.	35 (89.7%)
	6-month follow-up (n = 20)
"Comfortable" or "very comfortable" initiating M-OUD since completing the ASP.	17 (85%)
Pursued additional M-OUD training since completing the ASP.	14 (70%)
Work in departments without an active M-OUD program.	4 (20%)
Increased naloxone prescribing since completing the ASP.	18 (90%)
Increased prescribing of buprenorphine to treat patients with OUD since completing the ASP.	10 (50%)

ASP, Addiction Scholars Program; *SUD*, substance use disorder; *OUD*, opioid use disorder; *M-OUD*, medication for opioid use disorder.

system. The ASP was designed as an educational program with an emphasis on promoting facility-level team building to enhance cross-functional clinical care. These findings are encouraging as, after completing the ASP, healthcare professionals without formal addiction medicine training were able to advocate for OUD treatment in non-SUD specialty clinical settings at their local VHA site. Successful treatment of patients with OUD requires a multidisciplinary approach involving both the addiction medicine service and the outpatient primary care team. Empowering non-SUD specialty clinics with the knowledge and practical skills to treat OUD is essential in implementing the "no wrong door" approach to OUD treatment.[11] The support and networking opportunities provided by the ASP successfully led to the development of local addiction medicine programs at VHA sites as evidenced by the 11 capstone projects that were funded.

The success of the ASP was due in part to the blended learning structure of the course. Lectures were curated and delivered by experts in the field and ranged from basic addiction medicine topics to more advanced topics. This allowed for engagement of all learners regardless of their specialty or level of training. The course also leveraged a team-based learning approach through the breakout sessions, which reinforced key components of treating complex patients with OUD. Team-based learning has been shown to have positive outcomes for students in terms of student experience.[12]

The e-learning platform also allowed for engagement by a wider audience than would have otherwise been possible by an in-person course. The ASP gave additional addiction medicine training to those who would otherwise not have been eligible for a fellowship by the traditional pathway. This allowed for engagement of key stakeholders who could implement programs at local facilities in areas that are separate from dedicated SUD clinics. The ASP is a scalable program that can be further developed and replicated outside of the VHA system.

LIMITATIONS

Although the program did receive favorable ratings, it is important to note that attendees did self-select to attend; as a result, they may have been more biased in their ratings of an addiction medicine program. Future efforts will be made to recruit clinicians and other healthcare professionals who may be resistant or hesitant to the addition of substance use and opioid safety measures in their practice. Further studies are needed to assess actual interest in additional addiction medicine training throughout the VHA system. It should be noted, too, that this study provided only a six-month follow-up, at which point the participants' survey response rate was low. Additionally, the results of this study are survey based, and thus the limitations that apply to surveys also apply here.

The survey did not contain knowledge-based questions to assess retention of knowledge. Future iterations of the course will contain knowledge-based questions to assess for acquisition of knowledge. Future studies will also need to look at how the ASP influenced the development of addiction medicine programs in the VHA system. Studies will also need to examine how successful the management of OUD is in nontraditional settings that are outside the SUD clinics. Future studies can also be conducted to compare long-term outcomes for patients whose healthcare professionals participated in ASP compared to those who did not.

CONCLUSION

This feasibility study has shown that ASP equipped clinicians and other healthcare professionals with an intensive overview of addiction medicine. The students translated the information from the course to develop M-OUD programs at their home institutions.

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Initiation of Buprenorphine in the Emergency Department: A Survey of Emergency Clinicians

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Introduction: Initiation of buprenorphine for opioid use disorder (OUD) in the emergency department (ED) is supported by the American College of Emergency Physicians and is shown to be beneficial. This practice, however, is largely underutilized.

Methods: To assess emergency clinicians' attitudes and readiness to initiate buprenorphine in the ED we conducted a cross-sectional, electronic survey of clinicians (attendings, residents, and non-physician clinicians) in a single, academic ED of a tertiary-care hospital, which serves a rural population. Our survey aimed to assess emergency clinicians' attitudes toward and readiness to initiate buprenorphine in the ED and identify clinician-perceived facilitators and barriers. Our survey took place after the initiation of the IMPACT (Initiation of Medication, Peer Access, and Connection to Treatment) project.

Results: Our results demonstrated the level of agreement that buprenorphine prescribing is within the emergency clinician's scope of practice was inversely correlated to average years in practice ($R^2 = 0.93$). X-waivered clinicians indicated feeling more prepared to administer buprenorphine in the ED $R^2 = 0.93$. However, they were not more likely to report ordering buprenorphine or naloxone in the ED within the prior three months. Those who reported having a family member or close friend with substance use disorder (SUD) were not more likely to agree buprenorphine initiation is within the clinician's scope of practice ($P = 0.91$), nor were they more likely to obtain an X-waiver ($P = 0.58$) or report ordering buprenorphine or naloxone for patients in the ED within the prior three months ($P = 0.65$, $P = 0.77$). Clinicians identified availability of pharmacists, inpatient/outpatient referral resources, and support staff (peer recovery support specialists and care managers) as primary facilitators to buprenorphine initiation. Inability to ensure follow-up, lack of knowledge of available resources, and insufficient education/preparedness were primary barriers to ED buprenorphine initiation. Eighty-three percent of clinicians indicated they would be interested in additional education regarding OUD treatment.

Conclusion: Our data suggests that newer generations of emergency clinicians may have less hesitancy initiating buprenorphine in the ED. In time, this could mean increased access to treatment for patients with OUD. Understanding clinician-perceived facilitators and barriers to buprenorphine initiation allows for better resource allocation. Clinicians would likely further benefit from additional education regarding medications for opioid use disorder (MOUD), available resources, and follow-up statistics. [West J Emerg Med. 2025;26(1.1)43–49.]

INTRODUCTION

More than 564,000 individuals died of opioid overdose in the US from 1999–2020,[1] according to the US Centers for Disease Control and Prevention; more recent, provisional data suggests that annual overdose rates continued to rise in 2021.[2] As would be expected, with increased rates of overdose, emergency department (ED) visits for opioid overdose also increased in 2020.[3] Patients with opioid use disorder (OUD) are frequently seen in the ED with both overdose and other less emergent conditions. Patients seen in the ED after a non-fatal opioid overdose have >5% one-year mortality rat.[4] The ED is a low-barrier access point to the healthcare system, and ED visits represent a valuable opportunity to engage patients with OUD in potentially lifesaving treatment.

Buprenorphine, a US Food and Drug Administration (FDA)-approved medication for OUD (MOUD), has been shown to be effective in decreasing overall opioid use, reducing risk of opioid overdose, and reducing both opioid-associated and all-cause mortality.[5] Buprenorphine has been available to emergency clinicians for the treatment of opioid withdrawal since 2002, and research has shown the benefits of buprenorphine initiation in the ED.[6] Specifically, in comparison to referral to treatment or brief ED intervention, initiation of buprenorphine in the ED results in increased rates of engagement in addiction treatment at 30 days and decreased illicit opioid use.[7] The American College of Emergency Physicians (ACEP) recommends the initiation of buprenorphine in appropriate patients. Additionally, the ACEP consensus states: "Detecting and offering evidenced-based treatments for patients with opioid use disorder is aligned with the goals of emergency medicine to intervene on high-mortality disease processes."[8]

Unfortunately, MOUDs including buprenorphine are largely underutilized, and the majority of people with OUD do not received treatment with MOUDs.[9] Substance use disorders (SUD) are one of the most highly stigmatized medical conditions in the world among clinicians and the general public.[10,11] A study looking at emergency physicians' attitudes toward patients with SUD found that emergency physicians had a lower regard for patients with SUD than other medical conditions with behavioral components.[12] The MOUDs, including buprenorphine, are also stigmatized, which impacts treatment access and prescribing practices for these medications.[13] Previous findings identify the most significant barriers to prescribing buprenorphine in the ED include logistical or systemic factors as well as perceived patient factors (ie, social barriers and lack of interest in treatment).[14] Clinician lack of knowledge, as well as their attitudes and biases, can impact willingness to prescribe medications such as buprenorphine for patients with OUD, despite MOUD being a well studied and effective treatment.[6,15] Not only are patients on MOUD stigmatized but the prescribers who provide them with medications are also stigmatized.[16]

Population Health Research Capsule

What do we already know about this issue?
Initiation of buprenorphine in the Emergency Department (ED) for opioid use disorder (OUD) has been shown to be beneficial, but is largely underutilized.

What was the research question?
What are clinicians' attitudes toward initiating buprenorphine in the ED, and what are the barriers to prescribing?

What was the major finding of the study?
Clinician likelihood of initiating treatment in the ED was inversely correlated to years in practice. The primary barrier to initiating buprenorphine was inability to ensure follow-up.

How does this improve population health?
Eliminating barriers and improving clinician readiness to initiate buprenorphine in the ED could increase access to care for patients with OUD.

To promote engagement in and referral to treatment for OUD, our academic ED initiated the IMPACT project (Initiation of Medication, Peer Access, Connection to Treatment) in 2020. Key elements of the IMPACT project included electronic health record (EHR) prompts and order sets, peer recovery support specialists in the ED, and availability of inpatient and outpatient referral, all of which are barriers identified in previous studies.[15,17–18] Additionally, when the IMPACT project was introduced to the ED, clinicians were offered a financial incentive to obtain a US Drug Enforcement Administration X-waiver. The primary goal of our study was to assess emergency clinicians' attitudes toward and readiness to initiate buprenorphine in the ED, as well as identify perceived facilitators and barriers to initiating buprenorphine treatment in an academic ED, after implementation of the IMPACT project and its associated resources.

METHODS

This study was part of a State Opioid Response Implementation project called IMPACT. The primary objective of the project was to integrate peer recovery

support specialists (PRSS) in the ED, to increase buprenorphine prescribing for patients with OUD, and to increase engagement and referrals to treatment for all patients with SUD. We extracted data from the EHR regarding patient demographics, PRSS interaction with patients, and prescribing practices over a two-year period from March 2020–March 2022. A mixed-methods model was used to evaluate the data. This project was approved by the institutional review board.

We conducted a cross-sectional electronic-based survey regarding buprenorphine prescribing in the ED with all potential ED prescribers including attending physicians, resident physicians, physician assistants, and nurse practitioners. We developed the survey, adapting from previously published research.[15,17–18] Prior surveys had been conducted in large urban areas but had not been deployed in a more rural setting. Our survey was designed to identify prescribers' attitudes toward and readiness to initiate buprenorphine in the ED and identify perceived facilitators and barriers to initiating buprenorphine treatment in an academic ED of a large, tertiary-care hospital, which serves a rural population. Clinicians were made aware of the study through an initial email, two email reminders, a one-time announcement at our weekly didactic conference, and flyers posted throughout the ED. Participants were incentivized, as the first 100 participants received a $10 gift card, and all participants were entered for a chance to win a $100 gift card.

The survey completed by emergency clinicians included 10 questions focusing on years in practice, X-waiver status, prescribing practices in the ED in the prior three months, comfort with treatment of OUD and prescribing buprenorphine in the ED, and personal experience with SUD. Two additional Likert-scale questions assessed for barriers and facilitators to prescribing buprenorphine. (See Appendix A for full survey). The survey was published March 23, 2022, and closed May 15, 2022. Survey responses were recorded via Qualtrics (Qualtrics, Provo, UT), and the data was exported to a secure Excel file (Microsoft Corp, Redmond, WA) for analysis. We then organized and analyzed the data using SAS 9.4 (SAS Institute Inc, Cary, NC) with chi-squared or Fisher exact tests. We de-identified and extracted additional operational patient data on the IMPACT program on a rolling basis from the EHR.

RESULTS

A total of 95 surveys were distributed to all emergency clinicians (attending physicians, residents, physician assistants, and nurse practitioners) There were a total of 43 respondents and a response rate of 45% (16/50 attendings, 21/30 residents, 6/15 physician assistants and nurse practitioners). Three surveys were partially completed. We included two that had >50% of the questions answered and excluded one survey with only two questions completed as the latter respondent's intent to complete was interpreted as questionable. Of those who responded, their years in practice ranged from 1-50 with an average of 7.3 years. Of the 43 respondents, 31 indicated they were familiar with the IMPACT project and 12 said they were not. All the respondents who indicated they were not familiar with the IMPACT project were ED residents. (See Tabl.) Notably, 83% of all respondents indicated they would be interested in additional education related to medication and resources for OUD treatment.

A five-point Likert scale was used to assess respondents' level of agreement that prescribing buprenorphine was within their scope of practice. While 78.6% of respondents agreed that prescribing buprenorphine was within their scope, the level of agreement was found to be inversely correlated with average years in practice ($R^2 = 0.93162$) (Figure 1). Regarding X-waiver status, 16 individuals identified as having their X-waiver and 26 indicated they were not X-waivered. When asked why they were not waivered, four individuals indicated they were "not interested," three said cost was a barrier, seven said time was a barrier, and 12 responded "other." In the "other" category, two responded they were unsure how to obtain the waiver; two questioned whether it was needed; one said "in the process"; three said "just haven't done it"; one indicated they had completed the training but were not yet licensed; and one said "I know the data shows it works, but I

Table. Data summary of emergency clinicians who participated in a survey regarding ED-initiated buprenorphine.

	Count	Percentage
Participants (total)	42	
Attending physicians	16	38.1%
Non-physician clinicians	6	14.3%
Residents	20	47.6%
Years in practice		
Minimum	1	
Maximum	50	
Average	7.31	
Median	4	
Familiar with IMPACT		
Yes	31	73.8%
No	11	26.2%
X-waivered		
Yes	16	38.1%
No	26	61.9%
Family/friend with substance use disorder		
Yes	18	42.9%
No	24	57.1%

IMPACT, initiation of medication, peer access, and connection to treatment.

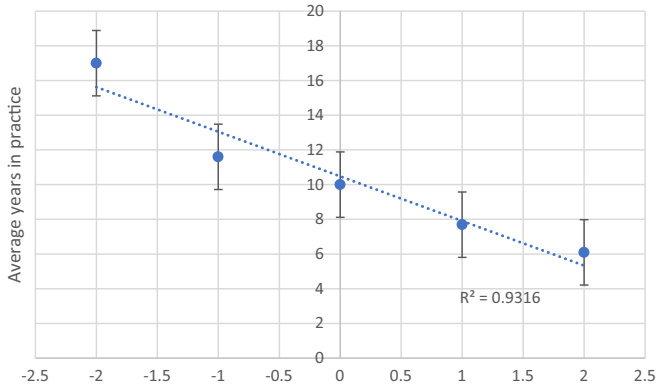

Figure 1. Agreement that buprenorphine is within the emergency clinician's scope of practice as assessed on a 5-point Likert scale in comparison to average years in practice.

still feel like a drug dealer." We found that those who had an X-waiver, in comparison to those who did not, were more likely to feel prepared to administer buprenorphine in the ED ($P = 0.02$).

To enable us to describe prescribing practices, prescribers were also asked whether they had ordered naloxone for patients in the ED in the prior three months; 29 said "yes" and 13 said "no." When asked whether they had ordered buprenorphine for patients in the ED in the prior three months, 18 said "yes" and 24 said "no." We also observed that those who had an X-waiver were not more likely to have reported ordering buprenorphine or naloxone for patients in the ED within the prior three months ($P = 0.17$), ($P = 0.51$).

Sixty-seven percent of clinicians agreed that they felt prepared to administer buprenorphine in the ED, 53.7% agreed that they felt prepared to prescribe buprenorphine as a bridge to outpatient treatment, and 47.6% agreed that they felt prepared to prescribe buprenorphine for home induction. Sixty-two percent of all respondents agreed that they had all the resources needed to initiate buprenorphine in the ED. Barriers and facilitators to initiating buprenorphine in the ED are identified in Figure 2 and Figure 3, respectively.

To assess possible personal barriers and facilitators of buprenorphine prescribing the following was asked: "Have you had, or do you currently have a family member or close friend with SUD?" Responses indicated 43% said "yes" and 57% said "no." Those who reported having a family member or close friend with SUD were not more likely to 1) agree that buprenorphine initiation is within the emergency clinician's scope of practice ($P = 0.91$); 2) obtain an X-waiver ($P = 0.58$); or 3) report ordering buprenorphine or naloxone for patients in the ED within the prior three months ($P = 0.65$), ($P = 0.77$).

IMPACT Project Qualitative Results

Over the two-year period, 1,205 patients were seen in the ED by PRSSs, 13% of whom were diagnosed with OUD or opioid withdrawal. A total of 377 were referred for buprenorphine treatment by the PRSSs within the ED; 168 of those patients received buprenorphine treatment, and 42 were given a take-home prescription. At the start of the study there were three X-waivered physicians; during the course of the project, 12 additional clinicians obtained their X-waiver, for a total of 15.

DISCUSSION

Our survey aimed to evaluate emergency clinicians' attitudes toward and preparedness to initiate buprenorphine in the ED as well as identify perceived facilitators and barriers to initiating buprenorphine treatment after the implementation of the IMPACT project and its associated resources. Our results showed that 78.6% of clinicians agreed that prescribing buprenorphine in the ED was within their scope of practice. As shown in Figure 1, the level of agreement that buprenorphine is within the emergency

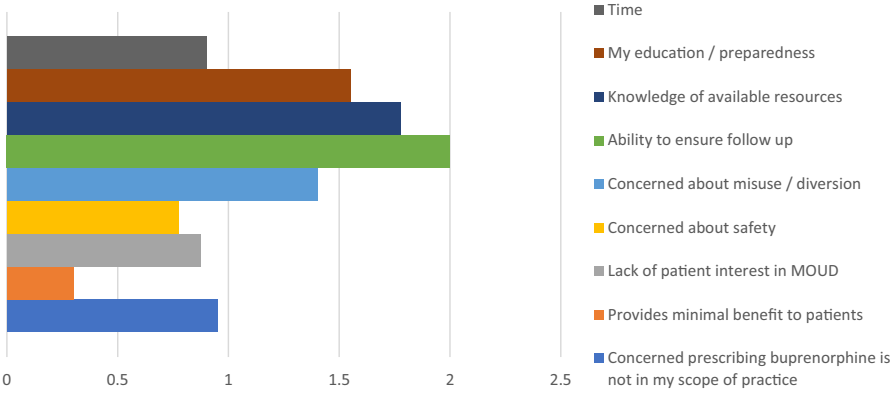

Figure 2. Clinician-perceived barriers to initiating buprenorphine in the emergency department. Identified barriers were graded with a 3-point Likert scale: somewhat a barrier, moderate barrier, significant barrier.
MOUD, medication for opioid use disorder.

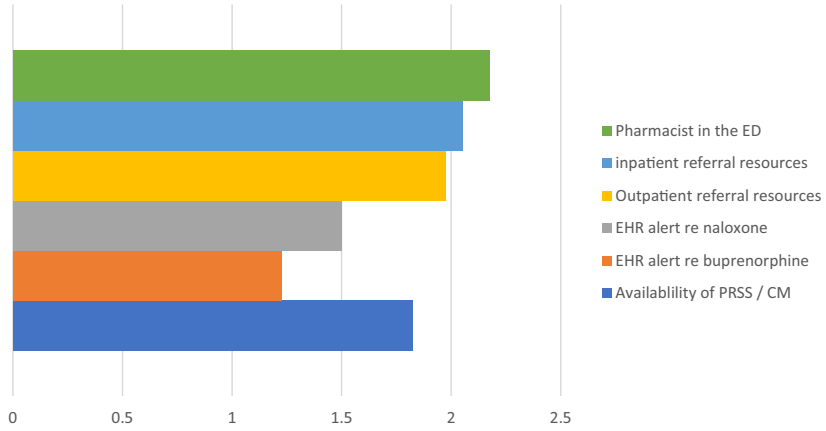

Figure 3. Clinician-perceived facilitators to initiating buprenorphine in the emergency department. Identified facilitators were graded with a 3-point Likert scale: somewhat a facilitator, moderate facilitator, significant facilitator.
ED, emergency department; *EHR*, electronic health record; *PRSS*, peer recovery support specialist; *CM*, case manager.

clinician's scope of practice was inversely correlated to years in practice. Another study found that clinicians with fewer years in practice were more likely to believe that OUD is like other chronic diseases and were more likely to approve of ED-initiated buprenorphine.[18] Other studies have identified emergency medicine residents as enthusiastic and eager to incorporate care for OUD into their practice.[17,19] We believe these results are encouraging and demonstrate that newer generations of clinicians may have less hesitancy toward initiating MOUD treatment in the ED setting. This change will, in time, likely increase access to care for those with OUD.

Sixty-seven percent of all clinicians agreed that they felt prepared to administer buprenorphine in the ED. We suspect clinicians' level of preparedness could be improved with continuing education lectures and feedback. Notably, the majority of respondents reported they would be interested in additional education related to medication and resources for OUD treatment.

We found that those with an X-waiver, in comparison to those who did not have an X-waiver, were more likely to feel prepared to administer buprenorphine in the ED. Other studies have found that X-waivered clinicians reported higher levels of readiness or preparedness to initiate buprenorphine in the ED in comparison to those who were not X-waivered.[14,17] Previously, an eight-hour training course was required to obtain an X-waiver; this training requirement, and the hassle of obtaining a waiver, was previously identified as a barrier to initiating buprenorphine in the ED.[14,17–18,20] However, finding that X-waivered clinicians felt more prepared to administer buprenorphine in the ED may reflect the value that was associated with the previously required education course. Notably, we also found that those who had an X-waiver were not more likely to have reported ordering buprenorphine or naloxone for patients in the ED within the prior three months. This finding potentially supports the idea that simply increasing the number of X-waivered clinicians does not significantly improve access to care if X-waivered clinicians are not actively prescribing MOUDs.[21,22] Notably, our data was collected prior to the recent elimination of the national X-waiver requirement.

When we asked whether having had a friend or family member with SUD would affect clinicians' attitudes toward buprenorphine in the ED, we found that 42.8% of clinicians reported having had a family member or close friend with SUD. This personal relationship, however, did not make clinicians statistically more likely to 1) agree that prescribing buprenorphine was within the emergency clinician's scope of practice; 2) obtain an X-waiver; or 3) report ordering buprenorphine or naloxone for patients in the ED within the prior three months. To our knowledge, a prescriber's personal relationships to individuals with SUD has not been evaluated in prior studies.

Sixty-two percent of clinicians indicated they have the resources they need to initiate buprenorphine in the ED. With the IMPACT project, as described above, clinicians have resources such as peer recovery support specialists in the ED, EHR prompts, and close outpatient follow-up available. Additionally, our academic ED is staffed with pharmacists and case managers/social workers 24/7. Given the number of resources available, we would have expected that more clinicians would have felt they have the resources necessary to initiate buprenorphine in the ED. We suspect it is possible that many clinicians felt they did not have the resources necessary because they were simply unaware of the available resources. Notably, less than 75% of respondents were familiar with the IMPACT project. All of those who were unfamiliar with the IMPACT project were residents; this highlights an opportunity for additional education.

A number of studies have been conducted looking at facilitators and barriers to buprenorphine initiation in the

ED.[14,17–18] Previously identified barriers to initiating buprenorphine in the ED include the following: lack of training/experience; concerns regarding misuse/diversion/harm; patient interest; time/competing priorities in the ED; concerns regarding follow-up; concerns regarding increased ED volume; and feeling as if prescribing buprenorphine was not within their scope of practice.[14,17–18]

Notably, with the implementation of the IMPACT project and its associated resources, several systemic/logistical barriers have been eliminated as PRSSs are available in the ED, outpatient follow-up can be ensured, and the EHR is equipped with prompts and order sets regarding both buprenorphine and outpatient referrals.

Our clinicians identified inability to ensure follow-up, limited knowledge of available resources, and lack of education/preparedness as the top three barriers to initiating buprenorphine in the ED. Although the COAT (comprehensive opioid addiction treatment) clinic has a standing appointment for ED referrals, and PRSSs work to facilitate these appointments, and even accompany patients to these appointments, concern regarding follow-up was still the primary barrier identified by clinicians. A recent study validated these concerns as it found that less than 30% of patients who fill buprenorphine prescriptions from the ED fill subsequent buprenorphine prescriptions.[23] Currently we do not have data regarding ED follow-up rates or rates of subsequent buprenorphine refills; however, this is an area of interest for future investigation to better evaluate the effectiveness of our IMPACT program.

Previously identified facilitators to buprenorphine initiation in the ED include ability to ensure follow-up; support staff – PRSSs/social work/care managers; department protocols; EHR order sets; pharmacist consultation; and feedback on patient experiences.[14,17–18] Our clinicians identified availability of pharmacists and of both inpatient and outpatient resources, and the presence of PRSSs and care managers as primary facilitators to buprenorphine initiation in the ED. The fact that clinicians identified pharmacist availability as a significant facilitator likely highlights underlying clinician discomfort with the pharmacology of buprenorphine and again highlights an opportunity for ongoing education and experience. Notably, time was not a primary barrier identified by our clinicians, and this may be due to the presence of additional support staff in the ED.

LIMITATIONS

Our study has several limitations. Overall we had a small sample size, and our respondents all work at the same academic center. Additionally, nearly half of respondents were residents with fewer than three years in clinical practice. Our data was collected prior to the elimination of the X-waiver requirement. It is possible that this new legislation has since influenced prescribers' attitudes toward buprenorphine as well as prescribing practices. Results related to facilitators and barriers may not be generalizable to community-based, non-academic EDs that do not have similar resources. Additionally, our results may not be generalizable to academic EDs in urban areas.

CONCLUSION

The results of our survey identified the following: 1) agreement that buprenorphine is within the emergency clinician's scope of practice was inversely correlated to years in practice; 2) >80% of clinicians were interested in additional education regarding MOUDs and resources for OUD treatment; 3) those with an X-waiver were more likely to report feeling more prepared to administer buprenorphine in the ED in comparison to those who were not X-waivered; and 4) clinicians who reported having had a family member or close friend with SUD were not more likely to agree that buprenorphine initiation is within the emergency clinician's scope of practice, nor were they more likely to obtain an X-waiver or report ordering buprenorphine or naloxone for patients in the ED within the prior three months. We also identified clinician-perceived barriers and facilitators to initiating buprenorphine in the ED. Our clinicians identified inability to ensure follow-up as a primary barrier to initiating buprenorphine in the ED.

More research is needed on retention in treatment following ED referral to identify what factors are associated with successful transitions of care from ED-initiated MOUD to community-based treatment. Education/preparedness was also identified as a significant barrier. We plan to address this with additional didactics and program updates. Time was less of a barrier, likely secondary to the availability of pharmacists, support staff, and inpatient and outpatient resources, which were identified as facilitators. A better understanding of facilitators and barriers allows for better resource allocation.

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A Novel Use of the "3-Day Rule": Post-discharge Methadone Dosing in the Emergency Department

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Introduction: Methadone is a medically necessary and lifesaving medication for many patients with opioid use disorder. To adequately address these patients' needs, methadone should be offered in the hospital, but barriers exist that limit its continuation upon discharge. The code of federal regulations allows for methadone dosing as an inpatient as well as outpatient dispensing for up to three days to facilitate linkage to treatment. As a quality initiative, we created a new workflow for discharging patients on methadone to return to the emergency department (ED) for uninterrupted dosing.

Methods: Our addiction medicine team changed hospital methadone policy to better allow hospitalization as a window of opportunity to start methadone. This necessitated the creation of a warm-handoff process to link patients to methadone clinics if that linkage could not happen immediately on discharge. Thus, our team created the "ED Bridge" process, which uses the "3-day rule" to dispense methadone from the ED post hospital discharge. We then followed every patient we directed through this workflow as an observational cohort for outcomes and trends.

Results: Of the patients for whom ED bridge dosing was planned, 40.4% completed all bridge dosing and an additional 17.3% received at least one but not all bridge doses. Established methadone patients made up 38.1% of successful linkages, and 61.9% were patients who were newly started on methadone in the hospital.

Conclusion: Improving methadone as a treatment option remains an ongoing issue for policymakers and advocates. Our ED bridge workflow allows us to expand access and continuation of methadone now using existing laws and regulations, and to better use hospitals as a point of entry into methadone treatment. [West J Emerg Med. 2025;26(1.1)50–55.]

INTRODUCTION

There are many regulatory barriers to initiating medications for opioid use disorder (MOUD) in traditional healthcare settings. Since treatment with methadone, an opioid agonist, or with buprenorphine, a partial opioid agonist, remains the standard of care for patients with opioid use disorder (OUD), there has been much focus recently on easing or circumnavigating barriers to facilitate linkage to treatment. While the passage of the 2023 Consolidated Appropriations Act removed the X-waiver requirement for buprenorphine prescribing,[1] methadone dispensing remains restricted to opioid treatment programs (OTP). Given these

restrictions on prescribing and other legal considerations, many hospitals are often hesitant to start and titrate methadone for inpatients with OUD.

Every year drug-related deaths continue to increase, and in 2021 over 80,000 people died of an opioid overdose.[2] Underuse of MOUD is common among patients seen in the hospital despite evidence supporting emergency department (ED) and inpatient initiation as beneficial opportunities to start treatment.[3,4] To address this deficit, our tertiary medical center created the Substance Use Intervention Team (SUIT) in 2018.[5] The SUIT is comprised of emergency physicians who are dual- or triple-boarded in medical toxicology and/or addiction medicine, psychiatric nurse practitioners, social workers, a recovery support specialist, and a pharmacist; SUIT is available during business hours, Monday through Friday. The team is a comprehensive addiction medicine consult service, working toward increasing the recognition, treatment, and linkage to outpatient care for all substance use disorders. The SUIT offers all forms of MOUD, including buprenorphine and methadone. For patients who requested or preferred methadone, the dose titration was guided by the 2019 version of the California [CA] Bridge in-hospital methadone start protocol,[6] tailored to each patient, with the most aggressive possible titration being 40 milligrams (mg) on day 1, 50 mg on day 2, and 60 mg on day 3, at which point, the dose was not increased until every five days.

Population Health Research Capsule

What do we already know about this issue?
Federal regulations allow EDs to dispense methadone for opioid use disorder, and hospitals can use the 3-day rule to assist with linkages to methadone maintenance programs.

What was the research question?
We looked at the feasibility of using the ED as a post-acute care landing site to bridge patients' methadone treatment in discharging hospitalized patients.

What was the major finding of the study?
Forty percent of patients (21/54) completed all bridge dosing, of whom 62% were newly initiated on methadone in the hospital.

How does this improve population health?
This workflow is a novel use of the 3-day rule to expand access to methadone via the ED.

Starting more patients on methadone necessitated the crafting of new policies and procedures at our center that would allow a warm handoff to methadone OTPs. The Code of Federal Regulations Title 21 restricts the dispensing of methadone to OTPs and specifies that methadone may be administered for three days in a healthcare setting for the purpose of alleviating withdrawal while arrangements are made to refer to treatment.[6] It does not limit treatment to three days; however, if the patient is in the hospital for reasons other than withdrawal, MOUD can be used "to maintain or detoxify a person as an incidental adjunct to medical or surgical treatment of conditions other than addiction."[7] Therefore, methadone, if started while an inpatient, can be continued for the entirety of the stay. Prior to SUIT's creation, our tertiary medical hospital had an internal policy that if methadone was started for a patient not previously enrolled in an OTP, the patient had to be weaned prior to discharge because of the prescribing limitation. Because weaning without further maintenance treatment only addresses the physical dependence in the short term while neglecting the chronic disease of OUD, it increases risk of relapse, fatal overdose, and all-cause mortality.[8–11] This policy, although compliant with the law, was not evidence-based best practice.

The SUIT created a new policy and workflow that allowed the start of an inpatient titration of methadone for patients not previously enrolled in an OTP, arranged linkage to OTPs while still inpatient, and avoided weaning prior to discharge; if patients could not immediately be treated at an OTP upon discharge (due to gaps in treatment, including weekend or holiday closures), the ED is used as a post-discharge setting for continued dosing under the three-day rule to complete a warm handoff. This workflow was reviewed by our hospital's pharmacy, compliance, and legal departments, all of which agreed that it complied with existing laws and helped us enact the change in hospital policy. Once this process was built, our team realized that it was also helpful for those patients in established OTPs who were discharged on weekends or holidays and couldn't return to their OTP for dosing until the next business day.

Having the ED as a post-acute care landing site for methadone continuation helped avoid disruption of established MOUD as well as newly initiated MOUD. Because the new-start methadone titration was more aggressive than a typical outpatient initiation of methadone, when patients returned to the ED, the dose administered was their discharge dose and was not titrated in the ED to keep them at steady-state and to avoid a need for observation in the ED after dosing. During the timeframe this workflow was built and used, the OTPs in our city independently underwent changes. One OTP in particular agreed to honor hospital titrations on day 1 in their clinic if the patient brought discharge paperwork with them. The program became a

preferred option for this workflow, although many patients either already used or requested other OTPs.

This article serves as a proof of concept and an observational cohort of all patients that SUIT directed to return to the ED for methadone dosing.

METHODS

The setting of this study was our tertiary urban medical center. Patients identified as being in need of an "ED bridge" were included in this study if they were seen by the SUIT consult service; if they were identified as either already in a methadone OTP or newly started on methadone during the hospitalization and in need of enrollment in an OTP; and if the primary team determined that they would be discharged on a day where the patient would not immediately be able to get outpatient methadone dosing but with a plan in place for linking to an OTP within 72 hours of discharge. This identification usually happened on a Thursday or Friday in anticipation of a weekend discharge or for new methadone starts when an OTP appointment could not be made for the day after discharge. Social workers on the SUIT team made clear follow-up plans by contacting cooperating OTPs ahead of time. Patients were excluded from the study if they ended up not discharging as planned and the ED bridge was no longer required, or if patients declined to return. These patients were manually tracked by chart review to determine whether they returned to the ED for dosing over the period from July 2019–July 2022.

The "ED bridge" process consisted of 1) instructing the patient to return to the ED every day starting the morning following the day of discharge for methadone administration until the day of planned OTP intake or return (maximum three days); 2) writing a care plan note in the chart notifying the ED of the dosing plan, days of dosing, and policy; 3) entering an expected arrival notification on the ED track board; and 4) triaging the patient on arrival to a low-acuity part of the ED for methadone dosing and immediate discharge as long as they did not appear to be intoxicated or have another complaint.

A templated note for the "ED bridge" care plan (Appendix 1) was approved by the hospital's Pharmacy and Therapeutics Committee to provide consistency for the process. It included a dot phrase for a note template that the emergency clinician could also use when the patient returned. The electronic health record (EHR) used in our hospital is Epic (Epic Systems Corporation, Verona WI). Our hospital's methadone policy was amended to include the ED bridge pathway and approved by our hospital's compliance and legal offices. The pharmacy department disseminated hospital-wide notification about the policy updates and provided education about the new process to prescribers, pharmacists, nurses, and clinical staff. This study received institutional review board approval.

The primary outcome measurements were the patient return rate to the ED for dosing and the number of doses completed. An ED bridge was considered successful if the patient came for dosing on all planned days; partially successful if they came for dosing on some of the planned days but missed days of dosing; and unsuccessful if they did not come for any of the planned days of dosing. Outcomes and demographic data are expressed by descriptive statistics.

RESULTS

There were 53 planned ED bridges set up for 47 unique patients. One ED bridge was excluded after the patient stayed through the weekend and didn't require it. Several patients used the ED bridge workflow more than once due to repeated hospitalizations: three patients used it twice, and one patient used it three times. Demographic characteristics of the 52 planned bridges are summarized in the Table. All the patients with OUD who used this workflow were using heroin.

Of the 52 planned ED bridges, 21 patients completed all necessary bridge doses (40.4%). Nine patients (17.3%) returned to the ED for at least one day but didn't present for all planned days. The remaining plans were not successful because 22 patients (42%) either did not return to the ED or left the ED before receiving one dose. In total, 94 visits for methadone dosing in the ED were planned via the ED bridge workflow, and 40 visits actually occurred. The average ED length of stay (LOS) from triage to discharge was 120 minutes, with a range of 36-682 minutes. Six of the 40 visits required full evaluations for additional complaints. Excluding these six visits, the average ED LOS was 89 minutes. Of the 52 planned ED bridges, the average number of days required to complete linkage to treatment was 1.8 days. For patients who successfully completed all necessary bridge doses, the average number of days for linkage was 1.3 days.

Patients were linked to one of 10 methadone clinics, all of which accepted patients with Medicaid. Eight patients who were already established in a methadone clinic accounted for 38.1% of successful linkages.

DISCUSSION

For the purposes of this study, a patient was defined as a "new" methadone patient if they were not enrolled in a clinic prior to their admission to the hospital and as an "established" patient if they were. The terms "new" and "established" were not descriptors of stability in treatment because occasionally even established patients needed to be newly restarted on methadone due to missing doses at their established OTP, and the outcomes of whether they complied with the ED bridge plan were essentially similar between the two groups. Because our project lacked follow-up with patients at a later timepoint, we were unable to discern the reason for patients not returning to the ED.

Table. Characteristics of participants in the emergency department bridge program for post-discharge methadone dosing.

Characteristics (at time of ED bridge)	Total (n = 52)	Successful bridge (n = 21)	Partially successful (n = 9)	Unsuccessful (n = 22)
Age				
Average (years)	44.6	47.9	45.1	40.5
Range (years)	29 – 69	29 – 69	31 – 61	29 – 64
Housing status				
Unhoused	25%	28.6%	11.1%	27.3%
Race				
White	48%	28.6%	44.4%	68.2%
Black	42.3%	52.4%	55.6%	27.3%
Hispanic/LatinX	7.7%	19%	0%	0%
Other	1.9%	0%	0%	0%
Gender				
Female	46.2%	38.1%	44.4%	54.5%
Male	58.3%	61.9%	55.6%	45.5%
Route of opioid use				
Stable recovery/ no active drug use	3.8%	4.8%	11.1%	0%
Intranasal only	48.1%	57.1%	44.4%	40.9%
Intravenous	48.1%	38.1%	44.4%	59.1%
Insurance				
Government	98.1%	100%	100%	95.5%
Uninsured	1.9%	0%	0%	4.5%
Methadone program status				
New	76.9%	61.9%	100%	81.8%
Established	23.1%	38.1%	0%	18.2%
Average # of bridge days planned (days)	1.8	1.3	2.8	1.9
Average # of bridge days completed (days)	0.8	1.3	1.3	0

ED, emergency department.

"Success" was defined as the patient returning for all planned days. There didn't appear to be any demographic factor that correlated with the success of the bridge, although this study was not powered to look for any statistical trends. The clearest explanation from the data we were able to collect is that if a bridge plan was shorter, it was more likely to be successful. On average, patients returned for approximately one day. Plans longer than one day were less likely to be successful. Nearly half of the 10 unsuccessful bridge plans occurred within a relatively short four-month time span (September–December 2021). Emergency department wait times and the COVID-19 pandemic may have contributed to this high rate of unsuccessful bridge doses during that time.

Prior to instituting the ED bridge process in our center, we would routinely hold patients committed to treatment in the hospital to ensure linkage to a methadone clinic with no missed doses to decrease the patients' risk of relapse, overdose, and death upon discharge. The ED bridge process allowed greater flexibility: patients who were committed to treatment but were ready for discharge otherwise could leave and come back for dosing; patients who were getting placed in post-acute care settings but needed to transport for methadone could now transport back to the ED for dosing, thereby allowing weekend discharges; and even patients who were leaving against medical advice were offered the opportunity to dose in the ED to reinforce the message that MOUD is a priority. While it is difficult to determine whether every ED bridge plan decreased LOS, the fact that 40 visits to our ED for methadone dosing did occur via the ED bridge process suggests that we did decrease inpatient hospital days and that this mitigated the increased use of ED resources for these visits.

Instituting the ED bridge workflow was an adjustment for the ED staff. Since there was no pop-up in the EHR, the

triage nurses at times needed to be reminded to look for an expected arrival note and to be reminded that these patients could be triaged to the low acuity part of the ED. Most clinicians wrote standard ED notes and did not use the preformed templated note for a methadone visit. It took some time for all staff members to get used to the new workflow, which likely explained the average LOS being approximately 1.5 hours when a full evaluation was not required. The LOS also accounted for time spent in the waiting room and clinicians ordering methadone and providing discharge instructions. It was not 1.5 hours of observation after the dose was given. Based on our team's experiences with teaching the workflow, it appeared that the ED staff was receptive to the overall idea, in part because our institution had gotten used to the culture of the emergency physician-led SUIT team. During the COVID-19 pandemic, there was also turnover in the ED nurse workforce that necessitated retrainings on the workflow, which could have also contributed to the wide variation in LOS.

This study took place in a large urban environment from 2019–2022, a period that not only encompassed the COVID-19 pandemic but also the continued worsening of the opioid epidemic. During that time, there were significant and evolving changes to how OTPs functioned due to COVID-19 emergency conditions and to the desire to reduce barriers to treatment. The OTPs changed their intake process, sometimes several times throughout that period, at first to be more restrictive[12] and then later to allow flexibility. Prior to this period, a typical OTP had specific days designated for intake appointments. Intakes could take approximately one hour, and a patient may not have actually started dosing on that day. Patients were often instructed to return a few days later to then meet with the clinician to start their methadone titration.

The typical initial dosing schedule is daily dosing Monday through Saturday with a take-home dose dispensed on Saturday for use on Sunday when the OTP was closed. Initially our SUIT program was able to help patients complete phone intakes while hospitalized; however, this protocol later evolved to match the changes in OTPs, which developed expanded days for walk-in intakes. Several OTPs also changed their workflows regarding day of intake and day of first dose, and sometimes we had to use our ED bridge protocol to keep dosing patients during the gap between the day of their intake and the day of their first dose. During this period, OTPs also permitted more take-home methadone doses, sometimes switching to Monday-Wednesday-Friday dosing schedules with every other day take-home doses, weekly dosing schedules with six days of take-home doses, or even monthly dosing with 27 days of take-home doses. This allowed patients to not have to go to the OTP as often, facilitating social distancing, but it also led to greater access to diverted methadone. The goal of our "ED bridge" workflow was to decrease dose disruption by providing a way for patients to obtain methadone safely while complying with dispensing restrictions. It is possible patients obtained methadone through other means and, thus, did not return for the ED bridge.

One OTP in our urban area decreased the barriers to entry significantly over this time period: they expanded intakes to Monday through Friday; allowed dosing even before full completion of intake; did not require photo ID as long as the patient had identifying paperwork (including hospital discharge papers); and accepted all forms of government insurance. This OTP ended up becoming the default option that we could rely on when setting up our ED bridge plans, even though we still did use the workflow for linking to other OTPs as well. In areas of the country with more limited and restrictive access to methadone OTPs, our three-day ED bridge model may not be as feasible.

LIMITATIONS

This study took place in an urban area with federal and state support for OTPs. We did not look at patient follow-through for OTP intakes or retention in long-term treatment. Another limitation is that feedback from ED staff on this new workflow was not collected to fully assess attitudes and barriers.

CONCLUSION

Expanding access to methadone remains an issue for policymakers and advocates. Ideas such as mobile clinics, new guidelines suggesting limited dispensing, and proposals to allow standard commercial pharmacies to dispense methadone are all ongoing considerations.[13] Our ED bridge workflow, however, allows us to expand access and continuation of methadone using existing laws and regulations, and to better use hospitals as a point of entry into methadone treatment.

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Variability in Practice of Buprenorphine Treatment by Emergency Department Operational Characteristics

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Introduction: We sought to describe emergency department (ED) buprenorphine treatment variability among EDs with varying operational characteristics.

Methods: We performed a retrospective cohort study of adult patients with opioid use disorder discharged from 12 hospital-based EDs within a large healthcare system as a secondary data analysis of a quality improvement study. Primary outcome of interest was buprenorphine treatment rate. We described treatment rates between EDs, categorized by tertile of operational characteristics including annual census, hospital and intensive care unit (ICU) admission rates, ED length of stay (LOS), and boarding time. Secondary outcomes were ED LOS and 30-day return rates.

Results: There were 7,469 unique ED encounters for patients with opioid use disorder between January 2020–May 2021, of whom 759 (10.2%) were treated with buprenorphine. Buprenorphine treatment rates were higher in larger EDs and those with higher hospital and ICU admission rates. Emergency department LOS and 30-day ED return rate did not have consistent associations with buprenorphine treatment.

Conclusion: Rates of treatment with ED buprenorphine vary according to the operational characteristics of department. We did not observe a consistent negative relationship between buprenorphine treatment and operational metrics, as many feared. Additional funding and targeted resource allocation should be prioritized by departmental leaders to improve access to this evidence-based and life-saving intervention. [West J Emerg Med. 2025;26(1.1)56–62.]

INTRODUCTION

The opioid crisis is a worsening public health emergency, with over 80,000 opioid-involved overdose deaths in the US in 2021, and it is unlikely to abate in the absence of effectively implemented harm reduction and treatment strategies.[1] Buprenorphine is an effective, evidence-based treatment resulting in increased abstinence from illicit opioid use and decreased opioid-related mortality.[2,3] Emergency department (ED) buprenorphine treatment is an evidence-based practice and has been associated with increased follow-up and reduced illicit drug use and medical costs.[4,5] Although buprenorphine prescribing from EDs has increased in recent years, prescribing still lags far behind the apparent need, with disparities by payer status, race, and ethnicity.[6,7]

Improved implementation relies on identification and removal of barriers, providing resources for patients and clinicians, and dispelling stigma and misperceptions.[8] Emergency department operational considerations,

including perceptions of insufficient time and increased ED return visits, are commonly cited as perceived barriers to implementation.[9] However, the real-world interplay between ED buprenorphine initiation and ED operations is not well described. Understanding the impact of ED buprenorphine treatment on ED clinical operational outcomes can inform decisions on resource allocation for ED buprenorphine program development. Conversely, barriers to implementation likely vary depending on the baseline operational performance of the department. Identification of operational characteristics of EDs with lower buprenorphine treatment rates would allow for targeted interventions.

We sought to describe the knowledge gap regarding ED buprenorphine treatment variability and operational barriers to implementation by 1) quantifying treatment rates between hospital EDs with different baseline operational characteristics, and 2) measuring the impact of ED buprenorphine treatment on operational metrics.

Population Health Research Capsule

What do we already know about this issue?
Understanding the impact of emergency department (ED) buprenorphine on operations can inform resource allocation decisions for ED buprenorphine program development.

What was the research question?
How does ED buprenorphine impact operations? How do ED operational characteristics impact treatment rates?

What was the major finding of the study?
A small number of patients with opiod use disorder were prescribed buprenorphine (2.5% in small hospitals, 11.6% in large hospitals). ED length of stay and 30-day return did not differ based on buprenorphine treatment.

How does this improve population health?
Departmental leadership can prioritize ED buprenorphine program development without fear of negative operational impact to increase access to life saving treatment.

METHODS

We performed a retrospective cohort study of adult (age ≥18) ED patients with opioid use disorder (OUD) discharged from any of the academic (one) or community (11) hospital-based EDs within a large healthcare system between January 2020–May 2021. The study was approved by our institutional review board for secondary data analysis of a completed quality improvement project.

To identify ED patients with OUD who may benefit from buprenorphine treatment, we applied an electronic health record (EHR) computable phenotype previously developed and validated by Chartash et al.[10] Data were extracted by querying an ED analytics data mart populated by a nightly extract from the Epic Clarity (Epic Systems Corporation, Verona, WI) database. Patients were identified by searching from phenotype-specific diagnosis codes and ED chief complaints. Pertinent codes included International Classification of Diseases, 10th Rev, Clinical Modification (ICD-10) diagnostic codes relating to opioid use (T40.0*, T40.1*, T40.2*, T40.3*, T40.4*, T40.6*, and F11*) coded by either the treating clinician or subsequently by a medical coder. We additionally included patients not identified by ICD-10 diagnostic code ED chief complaints relating to opioid use. Chief complaint data is entered into the EHR at time of ED encounter from a prepopulated list, limiting our selection of search terms. Within the limits of our database, inclusion of encounters containing "opioid" or "naloxone" most closely reflected original phenotype terminology. Per phenotype, patients with the terms "benzodiazepine" or "alcohol" in their ED discharge diagnosis were excluded to limit false positive inclusion.

Encounter-level data extracted included the following: patient demographics; chief complaint; disposition; ED length of stay (LOS); doses of medications administered and prescribed; and follow-up information, including 30-day ED return rate and number of days until ED return within the same health system. All data was deidentified for analysis by the research team.

The primary outcome of interest was ED buprenorphine treatment, defined as percentage of patients administered buprenorphine during and/or prescribed buprenorphine as part of the ED visit among all patients with OUD identified by the EHR phenotype. After consulting with key administrative leaders and system stakeholders, we partitioned EDs based on operational characteristics including annual ED census; hospital and intensive care unit (ICU) admission rates; median ED LOS (time from ED arrival to ED departure); and median boarding time (time from admission order placed to ED departure). Hospitals were divided into tertiles for each characteristic. As no power or sensitivity analyses were performed, and our goal was descriptive and hypothesis-generating, we did not perform hypothesis-testing comparative analyses. Statistical analyses were performed using RStudio version 4.0.5 (RStudio PBC, Boston, MA) and IBM SPSS 26 (SPSS, Inc, Chicago, IL).

RESULTS

The 2021 annual census for the 12 EDs ranged from 8,934 to 103,381 patients. Among 541,962 total unique ED

Table 1. Characteristics of cohort of patients with opioid use disorder.

		ED buprenorphine treatment	
		Yes	No
Total encounters	541,962	759	6,710
Gender			
Male	243,961 (46.9)	436 (57.4)	3,528 (52.6)
Female	286,504 (52.9)	323 (42.6)	3,182 (47.4)
Not reporting	1,497 (0.3)	0	0
Race			
Black	55,975 (10.3)	91 (12)	610 (9.1)
White	374,736 (69.1)	537 (70.8)	5,094 (75.9)
Another race	111,251 (20.5)	131 (17.3)	1,006 (15)
Insurance status			
Self-pay	62,124 (11.5)	3 (0.4)	22 (0.3)
Medicare/Medicaid	307,513 (56.7)	589 (77.6)	4,955 (73.8)
Other insurer	163,489 (30.2)	162 (21.3)	1,648 (24.6)
VA	8,836 (1.6)	5 (0.7)	85 (1.3)
Average buprenorphine dose (mg)			
Administered	N/a	76.28	N/a
Prescribed	N/a	103.42	N/a
Encounters with naloxone prescription	N/a	268 (45.5)	1,041 (21)
*Percentages noted in parentheses			

ED, emergency department; *VA*, Veterans Administration; *mg*, milligrams.

encounters across sites from January 1, 2020–May 31, 2021, 7,469 (1.4%) visits were phenotype positive and constituted our study population, representing 5,637 unique patients, with a mean of 622 visits per ED site (range 51–2,547). Phenotype-positive patients were predominantly White (75.4%) and male (53.1%) (Table 1). A minority (759, 10.2%) were treated with buprenorphine during the ED encounter, 695 of whom (91.6%) received buprenorphine administered in the ED, 301 (40%) received a buprenorphine prescription, and 237 (31.2%) received both.

Buprenorphine was administered in the ED more frequently than it was prescribed at discharge, irrespective of operational characteristics. Larger hospitals and those with higher hospital and ICU admission rates had higher buprenorphine treatment rates (Table 2). EDs experiencing longer boarding times also trended toward higher rates of treatment.

Median ED LOS was similar among patients treated with buprenorphine versus not treated, although confidence intervals were wide (Table 3). Lower admission rate, smaller ED size, and smaller volume were associated with longer ED LOS for patients treated with buprenorphine. Proportion of patients returning to the ED within 30 days and time to ED return did not differ consistently based on treatment with buprenorphine.

DISCUSSION

Within this single health system, we observed that ED buprenorphine treatment rates varied according to the baseline operational characteristics of the ED, which may be a proxy for the progressiveness or philosophical approach of a given ED's local champions and leadership team. We observed lower rates of buprenorphine treatment in EDs with smaller annual census and lower acuity (as measured by overall and ICU admission rates), which are presumably practice settings where there may be less perception of insufficient time. However, smaller EDs are less likely to have multiple prescribing clinicians working simultaneously. Prior studies have suggested that practice variation portends lower quality care and inequities in access to effective treatment for OUD.[11,12] Our data supports the need for interventions designed to promote buprenorphine treatment in smaller, lower acuity EDs to narrow this variation.

Buprenorphine treatment did not appear to have a consistent association with ED LOS, in contrast to commonly cited barriers.[9] Thirty-day return rates and time to ED return were similar between patients with OUD, regardless of their treatment with buprenorphine, a far cry from cited fears of EDs becoming "overrun" by patients seeking buprenorphine refills.[13]

Table 2. Buprenorphine administration and prescription, categorized by emergency department operational characteristics.

	Average value per quantile (SD)	OUD visits (n = 7,469)	Buprenorphine administered (n = , %)	Buprenorphine prescribed (n = , %)	Administered and prescribed (n = , %)	Any buprenorphine (n = , %)	No buprenorphine (n = , %)
Annual ED census volume	Patients						
Small (n = 4)	11,424 (±2,413)	245	6 (2.4%)	1 (0.4%)	1 (0.4%)	6 (2.5%)	239 (97.6%)
Middle (n = 4)	29,351.5 (±5,715)	1,245	61 (4.9%)	2 (0.2%)	2 (0.2%)	61 (4.9%)	1,184 (95.1%)
Large (n = 4)	69,739 (±30,656)	5,979	628 (10.5%)	298 (5%)	234 (3.9%)	692 (11.6%)	5,287 (88.4%)
ED number of beds	Beds						
Small (n = 4)	10.25 (±2.5)	245	6 (2.4%)	1 (0.4%)	1 (0.4%)	6 (2.5%)	239 (97.6%)
Middle (n = 4)	21 (±4.34)	1,245	61 (4.9%)	2 (0.2%)	2 (0.2%)	61 (4.9%)	1,184 (95.1%)
Large (n = 4)	49.5 (±17.23)	5,979	629 (10.5%)	298 (5%)	234 (3.9%)	692 (11.6%)	5,287 (88.4%)
Hospital admission rate	Rate						
Low (n = 4)	7.90% (±4.7%)	527	26 (4.9%)	1 (0.2%)	1 (0.2%)	26 (4.9%)	501 (95.1%)
Middle (n = 4)	16.98% (±1.8)	1,745	115 (6.6%)	6 (0.3%)	4 (0.2%)	117 (6.7%)	1,628 (93.3%)
High (n = 4)	27.41% (±3.2%)	5,197	554 (10.7%)	294 (5.7%)	232 (4.5%)	616 (11.9%)	4,581 (88.2%)
ICU admission rate	Rate						
Low (n = 4)	0.2% (±0.4%)	245	6 (2.5%)	1 (0.4%)	1 (0.4%)	6 (2.5%)	239 (97.6%)
Middle (n = 4)	1.8% (±0.3%)	2,027	135 (6.7%)	6 (0.3%)	4 (0.2%)	137 (6.8%)	1,890 (93.2%)
High (n = 4)	3.1% (±0.6%)	5,197	554 (10.7%)	294 (5.7%)	232 (4.5%)	616 (11.9%)	4,581 (88.2%)
ED length of stay	Minutes						
Short (n = 4)	106.3 (±8.6)	245	6 (2.5%)	1 (0.4%)	1 (0.4%)	6 (2.5%)	239 (97.6%)
Middle (n = 4)	149.8 (±4.7)	4,216	587 (13.9%)	287 (6.8%)	225 (5.3%)	649 (15.4%)	3,567 (84.6%)
Long (n = 4)	160.5 (±2.1)	3,008	102 (3.4%)	13 (0.4%)	11 (0.4%)	104 (3.5%)	2,904 (96.5%)
Median ED boarding time	Minutes						
Short (n = 4)	59.5 (±10.2)	245	6 (2.5%)	1 (0.4%)	1 (0.4%)	6 (2.5%)	239 (97.6%)
Middle (n = 4)	78.4 (±4.6)	1,437	91 (6.3%)	2 (0.1%)	2 (0.1%)	91 (6.3%)	1,346 (93.7%)
Long (n = 4)	110.5 (±24)	5,787	598 (10.3%)	298 (5.2%)	234 (4%)	662 (11.4%)	5,125 (88.6%)

ED, emergency department; *ICU*, intensive care unit; *OUD*, opioid use disorder.

Support from key departmental stakeholders is a repeatedly identified facilitator for implementing ED buprenorphine programs, and our observations corroborate this finding.[13] If LOS and ED return rate are relatively unaffected by ED buprenorphine treatment, this has important implications that might allow departmental leaders to promote greater resourcing and mitigate some of their apprehensions to facilitate buprenorphine treatment without fear of negative operational impacts.

LIMITATIONS

Our study intent was descriptive and should be considered hypothesis-generating. The use of secondary data limited our ability to power the study, and 95% confidence intervals were

Table 3. Emergency department operational outcomes by ED operational characteristics.

	ED OUD length of stay (minutes)			30-Day ED OUD return visits			Days before ED OUD return			
	Buprenorphine	95% CI	No buprenorphine	95% CI	Buprenorphine	No buprenorphine	Buprenorphine	95% CI	No buprenorphine	95% CI
Annual ED census volume										
Small (n = 4)	264	(148.2, 379.8)	181.6	(159.4, 203.8)	1 (0.1%)	81 (1.2%)	7	N/a	8.5	(6.8, 10.3)
Middle (n = 4)	250.4	(211.8, 289)	263.7	(251.1, 276.3)	14 (1.8%)	318 (4.7%)	8.7	(4.7, 12.8)	11.2	(10.2, 12.2)
Large (n = 4)	238	(216.9, 259.1)	275.6	(268.4, 282.7)	203 (26.8%)	1525 (22.7%)	11.5	(10.2, 12.67)	11	(10.6, 11.5)
ED number of beds										
Small (n = 4)	264	(148.2, 379.8)	181.6	(159.4, 203.8)	1 (0.1%)	81 (1.2%)	7	N/a	8.5	(6.8, 10.3)
Middle (n = 4)	250.4	(211.8, 289)	263.7	(251.1, 276.3)	14 (1.8%)	318 (4.7%)	8.7	(4.7, 12.8)	11.2	(10.2, 12.2)
Large (n = 4)	238	(216.9, 259.1)	275.6	(268.4, 282.7)	203 (26.8%)	1525 (22.7%)	11.5	(10.2, 12.7)	11	(10.6, 11.5)
Hospital admission rate										
Low (n = 4)	258	(212.4, 303.7)	245.2	(225.1, 265.3)	6 (0.8%)	156 (2.3%)	7.8	(4.7, 11)	10.4	(9.1, 11.8)
Middle (n = 4)	266	(224.9, 306.1)	287	(276.1, 297.9)	33 (4.4%)	461 (6.9%)	9.3	(6.3, 12.2)	10.2	(9.4, 10.9)
High (n = 4)	233.4	(210.7, 256.1)	266.8	(259.1, 274.6)	179 (23.6%)	1307 (19.5%)	11.7	(10.4, 13)	11.3	(10.8, 11.7)
ICU admission rate										
Low (n = 4)	264	(148.2, 379.8)	181.6	(159.4, 203.8)	1 (0.1%)	81 (1.2%)	7	N/a	8.5	(6.8, 10.3)
Middle (n = 4)	264.1	(228.8, 299.5)	289.2	(278.9, 299.6)	38 (5%)	536 (8%)	9.1	(6.5, 11.7)	10.5	(9.8, 11.2)
High (n = 4)	233.4	(210.7, 256.1)	266.8	(259.1, 274.6)	179 (23.6%)	1307 (19.5%)	11.7	(10.4, 13)	11.3	(10.8, 11.7)
ED length of stay										
Short (n = 4)	264	(148.2, 379.8)	181.6	(159.4, 203.8)	1 (0.1%)	81 (1.2%)	7	N/a	8.5	(6.8, 10.3)
Middle (n = 4)	225.8	(205.2, 246.3)	279.7	(271.6, 287.9)	187 (24.6%)	1059 (15.8%)	11.3	(10.1, 12.6)	11.1	(10.6, 11.6)
Long (n = 4)	321.7	(261.8, 381.6)	265.5	(255.8, 275.3)	30 (4%)	784 (11.7%)	11	(7.9, 14.1)	11	(10.4, 11.6)
Median ED boarding time										
Short (n = 4)	264	(148.2, 379.8)	181.6	(159.4, 203.8)	1 (0.1%)	81 (1.2%)	7	N/a	8.5	(6.8, 10.3)
Middle (n = 4)	285.9	(242.6, 329.2)	300.6	(285.8, 315.4)	27 (3.6%)	370 (5.5%)	9	(6, 12)	11.4	(10.5, 12.3)
Long (n = 4)	232.6	(211, 254.1)	266.2	(259.3, 273.1)	190 (25%)	1473 (22%)	11.6	(10.3, 12.9)	11	(10.5, 11.4)

ED, emergency department; *ICU*, intensive care unit; *OUD*, opioid use disorder.

often wide. Treatment rates may be falsely lowered by the presence of patients already on treatment and, therefore, not offered ED-based buprenorphine, although this would be unlikely to impact comparison between sites. Our dataset is also limited by size and confinement to a single health system as well as lack of patient diversity, which may limit generalizability. Importantly, unmeasured operational and cultural factors may prompt any given ED's leadership team to support buprenorphine treatment, and many of those same factors likely influence the general operational characteristics of the ED.

While this health system operates on a common EHR, clinicians are all employed by the health system, and incentives at all sites are tied to relative value units, there is a strong element of local control over the operations of each local ED, with little admixing of staff or operational processes between them. Nevertheless, clinicians may have moved between sites or worked at multiple sites. There may be unmeasured temporal trends during the study period, and a minority of more progressive EDs (including only one academic ED) may have contributed disproportionately to our findings. Finally, our partitioning of EDs by organizational metrics was based on internal comparisons specific to our healthcare system. Attempts to use national benchmarking data from the Academy of Administrators in Academic Emergency Medicine or Emergency Department Benchmarking Alliance were unsuccessful, as national mean and median metrics created severely uneven group sizes. While our approach may limit generalizability to other healthcare systems, it still may have implications for future hypothesis-testing research.

CONCLUSION

The evidence supporting the societal benefit of ED initiation of buprenorphine for patients with opioid use disorder is clear, but ED operational leadership and stakeholder buy-in is key to increasing implementation. Based on our study results, we hypothesize that ED buprenorphine treatment rates varied based on operational characteristics of EDs, with lower treatment rates at smaller, lower acuity facilities. We did not observe consistent differences in length of stay or return visits. Future research will allow departmental leadership to continue prioritizing the evidence-based practice of ED buprenorphine treatment to decrease variability while improving quality of care and access to life-saving treatment for patients with OUD. This is particularly important given the recent removal of the X-waiver requirement.

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Impact of Emergency Department-Initiated Buprenorphine on Repeat Emergency Department Utilization

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Introduction: Recent studies have demonstrated the promise of emergency department (ED)-initiated buprenorphine/naloxone (bup/nx) for improving 30-day retention in outpatient addiction care programs for patients with opioid use disorder (OUD). We investigated whether ED-initiated bup/nx for OUD also impacts repeat ED utilization.

Methods: We performed a retrospective chart review of ED patients discharged with a primary diagnosis of OUD from July 2019–December 2020. Characteristics considered included age, gender, race, insurance status, domicile status, presence of comorbid Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) diagnosis, presenting chief complaint, and provision of a bup/nx prescription and/or naloxone kit. Primary outcomes included repeat ED visit (opioid or non-opioid related) within 30 days, 90 days, and one year. Statistical analyses included bivariate comparison and Poisson regression.

Results: Of 169 participants, the majority were male (67.5%), White (82.8%), uninsured (72.2%), and in opioid withdrawal and/or requesting "detox" (75.7%). Ninety-one (53.8%) received ED-initiated bup/nx, which was independent of age, gender, race, insurance status, presence of comorbid DSM-5 diagnosis, or domicile status. Naloxone was more likely to be provided to patients who received bup/nx (97.8% vs 26.9%; $P < 0.001$), and bup/nx was more likely to be given to patients who presented with opioid withdrawal and/or requested "detox" (63.3% vs 36.7%; $P < 0.001$). Bup/nx provision was associated with decreased ED utilization for opioid-related visits at 30 days ($P = 0.04$). Homelessness and lack of insurance were associated with increased ED utilization for non-opioid-related visits at 90 days ($P = 0.008$ and $P = 0.005$, respectively), and again at one year for homelessness ($P < 0.001$). When controlling for age and domicile status, the adjusted incidence rate ratio for overall ED visits was 0.56 (95% confidence interval [CI] 0.33–0.96) at 30 days, 0.43 (95% CI 0.27–0.69) at 90 days, and 0.60 (95% CI 0.39–0.92) at one year, favoring bup/nx provision.

Conclusion: Initiation of bup/nx in the ED setting was associated with decreased subsequent ED utilization. Socioeconomic factors, specifically health insurance and domicile status, significantly impacted non-opioid-related ED reuse. These findings demonstrate the ED's potential as an initiation point for bup/nx and highlight the importance of considering the social risk and social need for OUD patients. [West J Emerg Med. 2025;26(1.1)63–70.]

INTRODUCTION

According to the Substance Abuse and Mental Health Services Administration, nearly 5.6 million residents of the United States had opioid use disorder (OUD) in 2021, accounting for 2% of the US population.[1] From 2020 to 2021, there were an estimated 1.8 million new users of prescription pain relievers and 26,000 new heroin users, or nearly 5,000 new opioid users per day.[1] Correspondingly, the US Centers for Disease Control and Prevention observed a record high drug overdose mortality in 2021, with over 107,000 drug overdose deaths in the US, more than 80,000 of which involved opioids.[2]

The state of Alabama has been particularly affected by the opioid epidemic. Since 2014, Alabama has led the nation with the highest rate of opioid prescriptions in the country (80.4 prescriptions for every 100 persons in 2020), approximately twofold greater than the national average.[3] Jefferson County, the state's most populous county, had the highest number of opioid overdose deaths in Alabama in 2021, with 342 confirmed opioid overdose deaths, a 44.7% increase from 2020.[4] The opioid epidemic is an ongoing, significant public health emergency as evidenced by the rising incidence of opioid misuse, OUD, and opioid-related deaths in the US.

Emergency physicians are uniquely positioned to help combat the growing opioid crisis by screening and initiating care for patients presenting to the emergency department (ED) with OUD. Opioid-related ED visits have increased, representing nearly one in 80 ED visits, and escalated dramatically during the coronavirus disease 2019 (COVID-19) pandemic when non-opioid-related ED visits decreased.[5,6] Importantly, screening for opioid misuse and dependence in the ED has been proven to positively affect the prognosis of these patients. In a landmark randomized clinical trial in 2015, D'Onofrio and colleagues demonstrated that ED screening, brief intervention, and referral to treatment (SBIRT) for OUD, including ED-initiated medications for OUD (MOUD) with buprenorphine/naloxone (bup/nx), significantly increased 30-day retention in outpatient addiction treatment, decreased the use of opioids, and decreased utilization of inpatient addiction services.[7] As MOUD has been recognized as an effective treatment option to reduce mortality, overdose, and cost, EDs are increasingly engaged in OUD treatment initiation.[8–14] Further, a recent community-based study by Le et al demonstrated decreased subsequent healthcare utilization at 12 months after initiation of MOUD in the ED.[15]

Most ED-initiated MOUD studies have focused on treatment retention in large, urban, academic medical centers outside the Southeast or subsequent healthcare utilization in community hospitals.[7,11,12,15,16] Our large, urban, academic ED in the Southeast offers a unique perspective on the impact of ED-initiated MOUD on healthcare utilization in a resource-limited region characterized by persistent Medicaid non-expansion, high poverty rates, and healthcare access challenges.[13] In this study, we investigated whether ED-initiated bup/nx also impacts acute healthcare utilization, specifically repeat ED visits, for ED OUD patients.

Population Health Research Capsule

What do we already know about this issue?
Emergency department (ED)-initiated buprenorphine/naloxone (bup/nx) improves 30-day retention in outpatient addiction programs for opioid use disorder (OUD).

What was the research question?
Does ED-initiated bup/nx for OUD also impact acute healthcare utilization, specifically repeat ED visits, for OUD patients?

What was the major quantitative finding of the study?
Bup/nx decreased ED utilization at 30 days (37.5% vs. 62.5%, $P < 0.05$). Homelessness and lack of insurance increased ED utilization at 90 days ($P < 0.01$).

How does this improve population health?
Findings show the ED's potential as an initiation point for bup/nx and highlight the importance of social risk and need for OUD patients.

METHODS

Study Design and Setting

We conducted a retrospective chart review of patients who presented to our urban academic medical center ED at the University of Alabama at Birmingham (UAB) and were discharged from the ED with a diagnosis of OUD, using International Classification of Diseases, 10th Revision, (ICD-10) code documentation.[17] We obtained UAB Institutional Review Board approval. Our 48-bed, tertiary care ED evaluates over 75,000 patients annually. The UAB Hospital has 1,157 licensed beds and serves as the primary hospital for north-central Alabama and surrounding areas. We selected the study period July 2019–June 2020 because it marked the inaugural year of the hospital's ED-initiated OUD program, where patients with a diagnosis of OUD were to be discharged with a bridge bup/nx prescription, naloxone take-home kit, and referral to outpatient addiction treatment. However,

emergency clinicians' uptake and utilization of the bup/nx prescription was not universal during that first year. Prior to July 2019, bup/nx was not routinely prescribed from the ED.

Study Variables

The primary outcomes of interest were repeat ED utilization within 30 days, 90 days, and one year of the initial ED visit. Repeat ED visits were further classified as either opioid-related or non-opioid-related, as defined by ICD-10 documentation.[17] When analyzing opioid-related ED visits and non-opioid-related ED visits separately, we considered outcomes at each time point as binary variables. The number of opioid-related repeat ED visits was added to the number of non-opioid-related ED visits within 30 days, 90 days, and one year to obtain the composite outcome of total repeat ED visits at each time point of interest. We used composite value for Poisson regression analysis. The primary exposure of interest was whether the patient was discharged with a bup/nx prescription, which was a binary variable coded as yes or no.

Other variables in the analysis included age, gender, race, health insurance status, domicile status, provision of a naloxone kit, comorbid Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) diagnosis, and presenting chief complaint at the initial ED visit. Age was measured in years and was examined as a continuous variable. Gender was determined by data recorded in the electronic health record (EHR) at the time of ED registration, typically dictated by available legal identification (eg, driver's license) or self-reported in absence of ID. Gender was a nominal variable classified as male, female or other, per EHR limitations. Race was categorized as White or Black. (Other racial categories were not considered due to low numbers.) Health insurance was defined as private, public (Medicare and/or Medicaid), or self-pay (uninsured). Domicile status was a binary variable and classified as either homeless or not homeless. The provision of a naloxone kit upon discharge from initial visit was included as a dichotomous yes or no variable, as was the presence of a comorbid DSM-5 mental health diagnosis. Concomitant mental health diagnosis was determined by presence in "past medical history" during chart review. Chief complaint at the initial ED visit was noted and was manually classified by reviewers as opioid withdrawal/detoxification ("detox") request, opioid overdose, psychiatric complaint, or medical complaint.

Statistical Analysis

We carried out all analyses using SAS 9.4 (SAS Institute, Cary, NC), and $P < 0.05$ was considered statistically significant.[18] Frequencies and proportions were tabulated for categorical variables, which included gender, race, health insurance, naloxone kit provision, buprenorphine prescription, comorbid DSM-5 diagnosis, and ED chief complaint. We calculated mean and standard deviation for age, which was treated as a continuous variable. Chi-square and Fisher exact tests were used to compare the categorical demographic and medical characteristics of those with vs those without a repeat opioid-related ED visit within 30 days, 90 days, or one year. We used *t*-tests to assess differences in age by outcome status. Identical methods were used for the non-opioid-related ED visit outcomes (at 30 days, 90 days, and one year). Crude and adjusted Poisson models were constructed to estimate changes in the number of total repeat ED visits as well as the associated 95% confidence interval (CI) between those who were prescribed bup/nx and those who were not at the index ED visit for each of the time periods (30 days, 90 days, and one year). Separate models were generated for each outcome. Although no overdispersion in the 30-day model was observed, overdispersion in the 90-day and one-year models was detected and was accounted for by scaling by the deviance. Secondary analyses examined whether the association between bup/nx prescription and total number of repeat ED visits varied based on whether the patient also received a naloxone kit at their initial ED visit. To accomplish this, we included an interaction term between bup/nx prescription and naloxone kit in each of the models. All adjusted models included age and domicile status as covariates.

RESULTS

This study included 169 OUD patients. Of these, approximately 67.5% were male and 82.8% were White. Most patients did not have health insurance (72.2%), and 27 (15.9%) were homeless (Tables 1, 2). Additionally, over 75% of patients presented to the ED at their initial visit in opioid withdrawal or requesting "detox." Ninety-one patients (53.8%) received ED-initiated bup/nx (suboxone), and 110 (65.1%) were given a naloxone kit to take home at their initial ED visit. A bup/nx prescription was more likely to be given to patients who presented in opioid withdrawal and/or requested "detox" (63.3% vs 36.7%; $P < 0.001$), but bup/nx prescription did not show significant associations with age, gender, race, insurance status, presence of co-morbid DSM-5 diagnosis, or domicile status. A naloxone kit was more likely to be provided to patients who received bup/nx (97.8% vs 26.9%; $P < 0.001$).

At 30 days, 32 patients (18.9%) had a repeat opioid-related ED visit (Table 1). No significant differences emerged in terms of age, gender, race, health insurance status, homelessness, ED chief complaint, or comorbid DSM-5 diagnosis rates. However, bup/nx prescription and naloxone kit provision were associated with decreased ED utilization for opioid-related visits at 30 days ($P = 0.04$ and $P < 0.001$, respectively). By 90 days, 30.2% of the study sample had a repeat opioid-related ED visit. In this time frame, male patients ($P < 0.05$) and those who did not receive a naloxone kit ($P = 0.001$) were more likely to have a repeat visit;

Table 1. Comparison of patient characteristics by whether the patient had a repeat opioid-related emergency department visit.

	30-Day repeat ED visit			90-Day repeat ED visit			1-Year repeat ED visit		
Variables	**No (n = 137)**	**Yes (n = 32)**	***P*-value**	**No (n = 118)**	**Yes (n = 51)**	***P*-value**	**No (n = 102)**	**Yes (n = 67)**	***P*-value**
Age, mean (SD)	36.5 ± 9.6	37.8 ± 8.0	0.49	36.5 ± 9.6	37.3 ± 8.8	0.62	37.0 ± 10.0	36.4 ± 8.4	0.71
Gender, n (%)									
Female	49 (35.8)	6 (18.8)	0.06	44 (37.3)	11 (21.6)	<0.05*	35 (34.3)	20 (29.8)	0.54
Male	88 (64.2)	26 (81.2)		74 (62.7)	40 (78.4)		67 (65.7)	47 (70.2)	
Race, n (%)									
White	113 (83.7)	27 (84.4)	0.79	97 (83.6)	43 (84.3)	0.64	86 (86.0)	13 (19.4)	0.33
Black	22 (16.3)	5 (15.6)		19 (16.4)	8 (15.7)		14 (14.0)	54 (80.6)	
Health Ins, n (%)									
Private	18 (13.1)	2 (6.2)	0.49	15 (12.7)	5 (9.8)	0.86	14 (13.7)	6 (9.0)	0.43
Public	23 (16.8)	4 (12.5)		19 (16.1)	8 (15.7)		18 (17.6)	9 (13.4)	
Self-pay	96 (70.1)	26 (81.3)		84 (71.2)	38 (74.5)		70 (68.6)	52 (77.6)	
Homeless, n (%)									
No	117 (85.4)	25 (78.1)	0.31	103 (87.3)	39 (76.5)	0.08	90 (88.2)	52 (77.6)	0.07
Yes	20 (14.6)	7 (21.9)		15 (12.7)	12 (23.4)		12 (11.8)	15 (22.4)	
Naloxone kit given, n (%)									
No	39 (28.5)	20 (62.5)	<0.001*	32 (27.1)	27 (52.9)	0.001*	28 (27.4)	31 (46.3)	0.01*
Yes	98 (71.5)	12 (37.5)		86 (72.9)	24 (47.1)		74 (72.6)	36 (53.7)	
Buprenorphine Rx, n (%)									
No	58 (42.3)	20 (62.5)	0.04*	51 (43.2)	27 (52.9)	0.24	45 (44.1)	33 (49.2)	0.51
Yes	79 (57.7)	12 (37.5)		67 (56.8)	24 (47.1)		57 (55.9)	34 (50.8)	
Comorbid DSM-5 Dx, n (%)									
No	116 (84.7)	28 (87.5)	0.68	98 (83.0)	46 (90.2)	0.23	84 (82.4)	60 (89.6)	0.20
Yes	21 (15.3)	4 (12.5)		20 (17.0)	5 (9.8)		18 (17.6)	7 (10.4)	
ED chief complaint, n (%)									
Opioid WD/detox request	102 (74.4)	26 (81.2)	0.52	88 (74.6)	40 (78.4)	0.23	77 (75.5)	51 (76.1)	0.30
Opioid OD	21 (15.3)	2 (6.2)		19 (16.1)	4 (7.8)		15 (14.7)	8 (11.9)	
Psychiatric complaint	9 (6.6)	2 (6.2)		8 (6.8)	3 (5.9)		8 (7.8)	3 (4.5)	
Medical complaint	5 (3.7)	2 (6.2)		3 (2.5)	4 (7.8)		2 (2.0)	5 (7.5)	

Race information was missing for two patients.
ED, emergency department; *Detox*, detoxification; *DSM-5*, Diagnostic and Statistical Manual of Mental Disorders, 5th Edition; *Dx*, diagnosis; *Ins*, insurance; *OD*, overdose; *Rx*, prescription; *WD*, withdrawal.
*Denotes statistical significance where $P < 0.05$.

however, ED-prescribed bup/nx was no longer significantly associated with having a repeat visit ($P = 0.24$).

Within one year, 67 patients (40.0%) had a repeat opioid-related ED visit. In this time frame, the only variable showing a significant association with repeat ED visit was naloxone kit provision ($P = 0.01$). Of those who received a naloxone kit, 32.7% had a repeat visit; however, among those who did not receive a kit, 52.5 % had a repeat visit. Thus, naloxone kit provision was associated with decreased ED utilization for opioid-related visits at 30 days, 90 days, and one year ($P < 0.001$, $P = 0.001$, and $P = 0.01$, respectively). Of the 169 patients, only 11 (6.5%) had a non-opioid-related repeat ED visit within 30 days (Table 2), compared with 32 (18.9%) who had an opioid-related repeat ED visit in that same time frame. Increasing age was associated with a repeat non-opioid-related visit at 30 days (43.8 ± 8.9 years vs 36.3 ± 9.2 years; $P = 0.009$). At this time point, no significant differences emerged in terms of gender, race, health insurance, homelessness, naloxone kit provision, bup/nx prescription, comorbid DSM-5 diagnosis, or ED chief complaint.

By 90 days, the number of patients with a non-opioid-related repeat ED visit increased to 23 (13.6%). Those with a repeat visit were older ($P = 0.004$), more likely to be

Table 2. Comparison of patient characteristics by whether the patient had a repeat non-opioid-related ED visit.

	30-Day repeat ED visit			90-Day repeat ED visit			1-Year repeat ED visit		
Variables	**No (n = 158)**	**Yes (n = 11)**	***P*-value**	**No (n = 146)**	**Yes (n = 23)**	***P*-value**	**No (n = 125)**	**Yes (n = 44)**	***P*-value**
Age, mean (SD)	36.3 ± 9.2	43.8 ± 8.9	0.009*	36.0 ± 9.0	41.9 ± 9.8	0.004*	35.5 ± 9.1	40.3 ± 9.3	0.003*
Gender, n (%)									
Female	53 (33.5)	2 (18.2)	0.51	50 (34.2)	5 (21.7)	0.23	43 (34.4)	12 (27.3)	0.39
Male	105 (66.5)	9 (81.8)		96 (65.8)	18 (78.3)		82 (65.6)	32 (72.7)	
Race, n (%)									
White	130 (83.3)	10 (90.9)	0.75	121 (84.0)	19(82.6)	0.83	103 (83.7)	37 (84.1)	0.70
Black	26 (16.7)	1 (9.1)		23 (16.0)	4 (17.4)		20 (16.3)	7 (15.9)	
Health ins, n (%)									
Private	18 (11.4)	2 (18.2)	0.68	17 (11.6)	3 (13.0)	0.005*	15 (12.0)	5 (11.4)	0.36
Public	25 (15.8)	2 (18.2)		18 (12.3)	9 (39.1)		17 (13.6)	10 (22.7)	
Self-pay	115 (72.8)	7 (63.6)		111 (76.0)	11 (47.8)		93 (74.4)	29 (65.9)	
Homeless, n (%)									
No	134 (84.8)	8 (72.7)	0.39	127 (87.0)	15 (65.2)	0.008*	112 (89.6)	30 (68.2)	0.001*
Yes	24 (15.2)	3 (27.3)		19 (13.0)	8 (34.8)		13 (10.4)	14 (31.8)	
Naloxone kit given, n (%)									
No	55 (34.8)	4 (36.4)	0.92	46 (31.5)	13 (56.5)	0.02*	41 (32.8)	18 (40.9)	0.33
Yes	103 (65.2)	7 (63.6)		100 (68.5)	10 (43.5)		84 (67.2)	26 (59.1)	
Buprenorphine Rx, n (%)									
No	73 (46.2)	5 (45.4)	0.96	64 (43.8)	14 (60.9)	0.13	58 (46.4)	20 (45.4)	0.91
Yes	85 (53.8)	6 (54.6)		82 (56.2)	9 (39.1)		67 (53.6)	24 (54.6)	
Comorbid DSM-5 Dx, n (%)									
No	134 (84.8)	10 (90.9)	0.58	123 (84.2)	21(91.3)	0.53	108 (86.4)	36 (81.8)	0.46
Yes	24 (15.2)	1 (9.1)		23 (15.8)	2 (8.7)		17 (13.6)	8 (18.2)	
ED chief complaint, n (%)									
Opioid WD /detox request	118 (74.7)	10 (90.9)	0.62	109 (74.7)	19 (82.6)	0.29	93 (74.4)	35 (79.6)	0.32
Opioid OD	22 (13.9)	1 (9.1)		21 (14.4)	2 (8.7)		20 (16.0)	3 (6.8)	
Psychiatric complaint	11 (7.0)	0 (0.0)		11 (7.5)	0 (0.0)		8 (6.4)	3 (6.8)	
Medical complaint	7 (4.4)	0 (0.0)		5 (2.4)	2 (8.7)		4 (3.2)	3 (6.8)	

Race information was missing for two patients.
ED, emergency department; *Detox*, detoxification; *DSM-5*, Diagnostic and Statistical Manual of Mental Disorders, 5th Edition; *Dx*, diagnosis; *Ins*, insurance; *OD*, overdose; *Rx*, prescription; *WD*, withdrawal.
*Denotes statistical significance where $P < 0.05$.

uninsured ($P = 0.005$), more likely to be homeless ($P = 0.008$), and less likely to have received a naloxone kit at the initial visit ($P = 0.02$). By one year, 44 patients (26%) had a repeat non-opioid-related ED visit. Again, patients with a repeat visit were older ($P = 0.003$) and more likely to be homeless ($P < 0.001$), although insurance status and naloxone provision no longer showed a significant association ($P = 0.36$).

Next, the total repeat all-cause ED visits were considered. Within 30 days of their index ED visit, 23.1% of patients had at least one repeat all-cause ED visit (range 1–4 visits). By 90 days, this percentage increased to 35.5% (range 1–12 visits). At one year from the initial visit, 50.3% of patients had a repeat visit (range 1–36 visits). In the unadjusted models, bup/nx prescription provision was significantly associated with a reduction in the number of repeat all-cause ED visits at 90 days (but not 30 days or one year) (Table 3). Given that significant association was also observed between older age and homelessness and all-cause repeat ED visits, the bup/nx association findings were re-evaluated after adjusting for age and domicile status. After adjusting for age and domicile status, a stronger association emerged between bup/nx

Table 3. Count ratios and 95% confidence intervals for the association between buprenorphine/naloxone prescription given and number of all-cause repeat emergency department visits.[+]

	Repeat ED visit within 30 days		Repeat ED visit within 90 days		Repeat ED visit within 1 year	
	Crude (95% CI)	Adjusted[1] (95% CI)	Crude (95% CI)	Adjusted[1] (95% CI)	Crude (95% CI)	Adjusted[1] (95% CI)
Overall						
No bup/nx	Ref	Ref	Ref	Ref	Ref	Ref
Bup/nx given	0.60 (0.35–1.02)	**0.56 (0.33–0.96)**	**0.48 (0.29–0.79)**	**0.43 (0.27–0.69)**	0.66 (0.42–1.05)	**0.60 (0.39–0.92)**
No naloxone kit given						
No bup/nx	Ref	Ref	Ref	Ref	Ref	Ref
Bup/nx given	0.95 (0.13–6.97)	1.10 (0.15–8.13)	0.37 (0.03–4.88)	0.50 (0.04–5.68)	0.39 (0.03–5.66)	0.52 (0.04–6.54)
Naloxone kit given						
No bup/nx	Ref	Ref	Ref	Ref	Ref	Ref
Bup/nx given	1.73 (0.52–5.78)	1.50 (0.45–5.07)	3.46 (0.75–15.97)	2.67 (0.63–11.28)	2.38 (0.76–7.44)	1.85 (0.63–5.44)

[+]Estimates of count ratio and 95% CIs generated from Poisson models.
*__Bold face font__ indicates statistical significance where $P < 0.05$.
[1]Adjusted for age and domicile status.
ED, emergency department; *CI*, confidence interval; *bup/nx*, buprenorphine/naloxone; *ref*, reference.

prescription provision and repeat all-cause ED visits, with bup/nx prescription being associated with a 44% reduction in the number of repeat all-cause ED visits at 30 days (adjusted incidence rate ratio [IRR]:0.56, 95% confidence interval [CI] 0.33–0.96), a 57% reduction at 90 days (adjusted IRR 0.43, 95% CI 0.27–0.69), and a 40% reduction at one year (adjusted IRR 0.60, 95% CI 0.39–0.92) (Table 3).

DISCUSSION

This study highlights the impact of OUD and the opioid epidemic in general on the ED. Over half the patients included in this study had a repeat ED visit within one year. This high level of utilization is likely due, in large part, to the overlapping social risk and social need experienced by this cohort. The general demographic characteristics of this study population are similar to the national opioid epidemic landscape, predominantly White (82.8%) and male (67.5%).[19] However, when considering social factors, such as insurance and domicile status, our OUD population was disproportionately affected by negative social determinants of health (SDoH). More than seven in ten OUD patients were uninsured, compared with the average uninsured rate of 12.7% in non-expansion states in 2021.[20] Further, 16% were homeless, which is nearly 100 times the national rate.[21] Homelessness and lack of insurance were independently associated with increased ED utilization for non-opioid-related visits at 90 days ($P = 0.008$ and $p = 0.005$, respectively), and again at one year for homelessness ($P < 0.001$). This underscores the complex social context of the ED OUD population. If co-occurring SDoH domains are not addressed during the ED visit, MOUD may not be successful in decreasing subsequent healthcare utilization. At UAB Hospital, ED social workers and case managers are available 24/7 to provide housing and healthcare access resources to underserved patients; however, referrals to assistance programs are not consistently documented in the EHR.

Although bup/nx provision was associated with decreased ED utilization for opioid-related visits at 30 days ($P = 0.04$), only 53.8% received ED-initiated bup/nx. Further, bup/nx was more likely to be given to OUD patients who presented in opioid withdrawal and/or requesting "detox" (63.3% vs 36.7%; $P < 0.001$). There are many plausible explanations for why 46.2% of OUD patients did not receive bup/nx at the initial ED visit, although this percentage is much lower than a recently published national retrospective cohort study where 91.5% were not prescribed buprenorphine after an ED visit for opioid overdose.[22] First, in July 2019 (study period start date), the UAB Department of Emergency Medicine had just initiated the Drug Addiction Treatment Act of 2000 (DATA 2000) "X-waiver" training requirement to license emergency clinicians for MOUD prescribing bup/nx through an incentive program, which was strongly encouraged but not mandated for all clinicians.[23]

Further, MOUD program uptake was not universal due to several known barriers to MOUD in the ED, including lack of training and experience in SBIRT, lack of availability of close outpatient follow-up in addiction treatment centers, and limited clinician time in a busy ED.[24] Finally, not every OUD patient presenting to the ED was a candidate for MOUD with bup/nx due to lack of motivation to seek and engage in outpatient treatment, concomitant use of illicit depressive agents, hypersensitivity reaction, and concern for diversion.[25] It is standard practice at the UAB ED for

patients receiving ED-initiated MOUD to be referred to community treatment programs; however, outpatient follow-up rates are not easily measured within our current system.

While roughly half of the patients received MOUD at the initial ED visit, nearly two-thirds received a take-home naloxone kit, which, at the time of the study was provided to patients free of charge with an emergency physician (EP) order via a collaborative project with the Jefferson County Health Department. Importantly, naloxone kit provision was associated with decreased ED utilization for opioid-related visits at 30 days, 90 days, and one year ($P < 0.001$, $P = 0.001$, and $P = 0.01$, respectively) and non-opioid-related visits at 90 days ($P = 0.02$). Naloxone is a potentially life-saving, easy-to-use and, in this instance, free intervention. Several factors might have contributed to incomplete provision: 1) The naloxone kit required a specific EP order to be dispensed, which may not have been prioritized due to competing demands for physician focus and time; 2) EPs may have had misperceptions of time-consuming counseling accompanying naloxone provision; and 3) EPs may have been unaware of the availability of naloxone provided as a take-home kit rather than a prescription.

In general, there was significant collinearity between bup/nx and naloxone kit provision. A naloxone kit was more likely to be provided to patients who received bup/nx (97.8% vs 26.9%; $P < 0.001$). Further, bup/nx was more likely to be given to patients who presented in opioid withdrawal and/or requested "detox: (63.3% vs 36.7%; $P < 0.001$). However, patients who presented in the most severe form of OUD, an acute overdose, were not more likely to receive bup/nx. This may be due to the EP's focus on resuscitation of acute decompensation and respiratory depression, rather than engagement of a brief intervention for MOUD to assess a patient's motivation toward behavioral change.

Our study is unique in assessing whether ED-initiated bup/nx impacts subsequent acute healthcare utilization, while also evaluating the impact of SDoH, such as health insurance and domicile status. Our results showed that when controlling for age and homelessness, initiation of bup/nx in the ED setting was associated with decreased subsequent all-cause ED utilization. Further, socioeconomic factors, specifically insurance and domicile status, appear to have significant impact on non-opioid-related ED reuse. These findings demonstrate the ED's potential as an initiation point for OUD treatment and highlight the importance of considering social risk and social need for OUD patients in the ED.

LIMITATIONS

This study had several limitations. First, the study design was a retrospective chart review, which prevents abstractors from being blinded to the study purpose and drawing conclusions of causality. However, to minimize bias, established emergency medicine chart review study methods were adhered to.[26] Further, the study population was obtained from a single site, which limits generalizability. Revisits to EDs in outside healthcare systems were unable to be tracked, preventing complete capture. However, UAB Hospital is the catchment healthcare system for the state of Alabama providing healthcare access to underserved populations, including the Charity Care Program, Equal Access Birmingham free clinic, Providing Access to Healthcare clinic, and a Comprehensive Urban Underserved and Rural Experience program. Finally, ED visit rates for opioid overdose increased by over 25% in 2020 due to the COVID-19 pandemic, despite a decline in overall ED visits.[27] Thus, expanded community- and hospital-based MOUD interventions were needed to support OUD patients during the COVID-19 pandemic; however, many counseling and treatment clinics were unavailable during that time.

CONCLUSION

Initiation of buprenorphine/naloxone in the ED setting can result in decreased subsequent ED utilization. Socioeconomic factors, specifically health insurance and domicile status, also appear to have a significant impact on ED reuse. These findings demonstrate the ED's potential as an initiation point for prescribing medication for opioid use disorder and highlight the importance of considering social risk and social need for OUD patients.

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Accessibility of Naloxone in Pharmacies Registered Under the Illinois Standing Order

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Introduction: To expand access to naloxone, the state of Illinois implemented a standing order allowing registered pharmacies to dispense the drug without an individual prescription. To participate under the standing order, pharmacies were required to opt in through a formal registration process. In our study we aimed to evaluate the availability and price of naloxone at registered pharmacies.

Methods: This was a prospective, de-identified, cross-sectional telephone survey. Trained interviewers posed as potential customers and used a standardized script to determine the availability of naloxone between February–December, 2019. The primary outcome was defined as a pharmacy indicating it carried naloxone, currently had naloxone in stock, and was able to dispense it without an individual prescription.

Results: Of 948 registered pharmacies, 886 (93.5%) were successfully contacted. Of those, 792 (83.4%) carried naloxone, 659 (74.4%) had naloxone in stock, and 472 (53.3%) allowed purchase without a prescription. Naloxone nasal spray (86.4%) was the formulation most commonly stocked. Chain pharmacies were more likely to carry naloxone (adjusted odds ratio [aOR] 3.16, 95% confidence interval [CI] 1.97–5.01, $P < 0.01$) and have naloxone in stock (aOR 2.72, 95% CI 1.76–4.20, $P < 0.01$), but no more likely to dispense it without a prescription. Pharmacies in higher population areas (aOR 0.99, 95% CI 0.99–0.99, $P < 0.05$) and rural areas adjacent to metropolitan areas (aOR 0.5, 95% CI 025–0.98, $P < 0.05$) were less likely to have naloxone available without a prescription. Associations of naloxone availability based on other urbanicity designations, overdose count, and overdose rate were not significant.

Conclusion: Among pharmacies in Illinois that formally registered to dispense naloxone without a prescription, the availability of naloxone remains limited. Additional interventions may be needed to maximize the potential impact of a statewide standing order. [West J Emerg Med. 2025;26(1.1)71–78.]

INTRODUCTION

The rise of opioid-related overdose has had a devastating effect on communities across the United States. In 2020 alone, over 68,000 people died from opioid-related overdose, of which almost 3,000 occurred in the state of Illinois.[1,2] The rapidly evolving drug market, with the introduction of fentanyl, fentanyl analogues, and xylazine into the illicit drug supply, has contributed to the increasing opioid overdose fatality rates, with 64% of US drug overdose deaths during May 2020–April 2021 involving illicitly manufactured fentanyl.[3–5]

In response to the opioid overdose epidemic, a multi-pronged approach has been enacted to reduce morbidity and mortality. Among these are several harm reduction strategies, including syringe service programs, infectious disease screening, drug checking (eg, fentanyl test-strip distribution), supervised consumption sites, and distribution of naloxone. Multiple studies have demonstrated naloxone's ability to be used effectively and appropriately by people with no formal medical training.[6] For example, Enteen et al found that of the 24% of patients who returned for naloxone refills over a six-year period, 11% of those reported using naloxone during an overdose event, with an 89% success rate of overdose reversal.[7] Further, studies have shown that naloxone distribution does not lead to increased opioid consumption and may even lead to decreased use.[7,8] Recognizing its safety and efficacy, the US Surgeon General issued an advisory notice in 2018 encouraging its use and availability.[9] Despite widespread support by leading healthcare organizations and federal agencies, naloxone access remains limited, and opportunities to help individuals at risk for overdose are frequently missed.[10,11]

As of 2017, all 50 states had passed legislation expanding public access to naloxone.[12] In addition to legislation protecting against civil, criminal, or professional liability for both prescribers and lay administrators of naloxone, some states have introduced policies to increase the accessibility of the life-saving drug. Studies have demonstrated that pharmacists are willing to provide naloxone to the public under a standing order or other similar process (Stewart et al, 2018; Nielsen et al, 2016; Green et al, 2017). To expand access to naloxone, the Illinois Department of Public Health (IDPH) implemented a statewide standing order in 2017 (Public Act 99–0480), allowing registered pharmacies to distribute naloxone to patients without an individual prescription in their name. To register under the Illinois Naloxone Standing Order, licensed pharmacies must participate in a pre-approved training and agree to report any dispensed naloxone to the Illinois Prescription Monitoring Program.[13]

Illinois is now one of 49 states that allow pharmacists to dispense naloxone without a patient-specific prescription from a clinician, 44 of which use a standing order.[14] Despite this, studies from other states have shown limited uptake of these new protocols and wide variations in availability of naloxone at registered pharmacies.[15–22] In this cross-sectional study we aimed to evaluate the accessibility of naloxone at pharmacies registered under the statewide standing order by determining which pharmacies reported routinely carrying naloxone, which pharmacies had naloxone currently in stock, which pharmacies were willing to dispense naloxone without a prescription, which formulations were carried, and the out-of-pocket cost of naloxone. Our primary outcome was to determine which pharmacies had naloxone available without a prescription on the day of the inquiry. We further compared pharmacies' naloxone availability by pharmacy type (chain vs non-chain), urbanicity, population of ZIP Code, and opioid overdose rates in the pharmacies' surrounding region. This study expands on the existing literature by using a sample that included all pharmacies that opted in to registering under the Illinois Naloxone Standing Order. We also analyzed factors that may affect the likelihood that a pharmacy had naloxone available without a prescription, which was rarely done in previous studies.

Population Health Research Capsule

What do we already know about this issue?
Most states offer naloxone at pharmacies without a prescription, but uptake is limited.

What was the research question?
Which pharmacies registered under the Illinois Naloxone Standing Order had naloxone available without a prescription?

What was the major finding of the study?
Only 53.3% of registered pharmacies (1/8th of all Illinois pharmacies) had naloxone in stock and available without a prescription.

How does this improve population health?
Statewide standing orders are an important but insufficient step toward widespread naloxone possession. More effort is needed to improve participation.

METHODS

Study Design

A prospective, anonymous, cross-sectional "secret-shopper" telephone survey sampling all Illinois pharmacies

that had registered under the state-level standing order was performed by six trained callers. The list of pharmacies registered under the standing order was accessed on February 17, 2019 (Chicago) and May 23, 2019 (remainder of Illinois) via the IDPH Opioid Data Dashboard.[2] The list of pharmacies, their cities, and their contact numbers were transposed from the dashboard into an Excel document (Microsoft Corp, Redmond, WA) for tracking purposes. For each pharmacy, we obtained a ZIP Code and evidence of continued operation via Google searches. If a pharmacy was found to no longer be in existence, the pharmacy was marked as unable to contact.

Data Collection

Six study personnel (one attending physician, one resident physician, three medical students, and one master's level research associate) underwent three hours of training consisting of reviewing the call script, discussing the logic behind each question, discussing specific language to use, and conducting at least three pilot calls to pharmacies not included in the study sample. Pilot calls were debriefed as a group.

The callers posed as potential customers and used a standardized script to ask targeted questions. Callers followed automated prompts or requested to be connected to the pharmacy. Callers spoke with whichever pharmacy staff first answered the call and continued to use the script if the call was transferred to other pharmacy staff. If placed on hold, the caller waited up to 10 minutes before terminating the call. If the call was interrupted or the pharmacy was unreachable on the initial attempt, the pharmacy was contacted up to two additional times. If a pharmacy was unreachable three times, it was considered inactive and not included in our analyses. Calls were completed from February–December 2019. Data was collected either directly into REDCap 9.5.35 LTS (Research Data Capture hosted at University of Chicago Medicine) or into Microsoft Excel and later transposed into REDCap.

The script for the calls was created using an iterative process by the group of investigators. We designed the script to address the study questions while maintaining the appearance of a lay caller. The generic name of the medication (naloxone) was used initially. If staff seemed uncertain of the medication in question, the brand name of Narcan was used after first repeating the generic name. See Appendix 1 for the script for the secret-shopper telephone survey of pharmacies that are registered under the Illinois Naloxone Standing Order.

Measures

We collected characteristics for each pharmacy based on pharmacy type, urbanicity, population of pharmacy ZIP Code, and the overdose rate in the pharmacy ZIP Code. Pharmacies were classified as "chain" if they had four or more locations under shared ownership, and "non-chain" if they had fewer than four locations.[15,16] We defined urbanicity using the US Department of Agriculture 2013 Rural-Urban Continuum Codes (RUCC) that assign counties a score on a scale of 1-9 based on county population size and adjacency to a metropolitan area.[17] As commonly practiced elsewhere in the literature, we divided this continuum into three groups: 1) urban; 2) rural adjacent to a metropolitan area; and 3) rural and nonadjacent to a metropolitan area.

We used ZIP Codes corresponding to each pharmacy to analyze the data using overdose rates and population. Number of combined fatal and non-fatal opioid-related overdose events in 2018 by ZIP Code was obtained from the IDPH Opioid Dashboard.[2] We obtained population by ZIP Code for 2018 from the US Census Bureau.[18] Using the population size and the number of overdoses, we calculated a 2018 rate of combined fatal and non-fatal opioid-related overdose per 10,000 people for each ZIP Code in our sample.

Statistical Analyses

We performed bivariate analyses to determine whether differences in naloxone availability on the day of the call were significantly different based on the following covariates: pharmacy type; urbanicity using RUCC code; population of pharmacy ZIP Code; and the 2018 overdose count and overdose rate per 10,000 residents in the pharmacy ZIP Code. We analyzed data using STATA MP v17 statistical software release 15 (StataCorp, LLC, College Station, TX). This study was reviewed by the University of Chicago Investigational Review Board and determined to be exempt from review.

RESULTS

We identified 948 pharmacies registered under the Illinois Naloxone Standing Order and successfully contacted 886 (93.5%) (Figure 1). Of the 886 pharmacies that were successfully contacted, 806 (91.0%) were chain pharmacies and 80 (9.0%) were non-chain. Of the 886 contacted pharmacies, 807 (91.1%) were located in urban ZIP Codes, 57 (6.4%) in rural ZIP Codes adjacent to a metropolitan area, and 22 (2.5%) in rural ZIP Codes that were nonadjacent to a metropolitan area. Additionally, of the contacted pharmacies, 792 (89.4%) reported carrying naloxone, with 659 (74.4%) reporting the medication to be in stock at the time of the call, and 472 (53.3%) responding that the caller did not need a prescription from a doctor to purchase the naloxone. The 472 pharmacies (53.3%) that carried naloxone, had naloxone in stock, and offered naloxone without requiring a prescription were considered positive for the primary outcome. Pharmacy characteristics are summarized in Table 1.

Figure 2 displays the cascade of naloxone availability by pharmacy type and RUCC. Pharmacies in urban RUCC

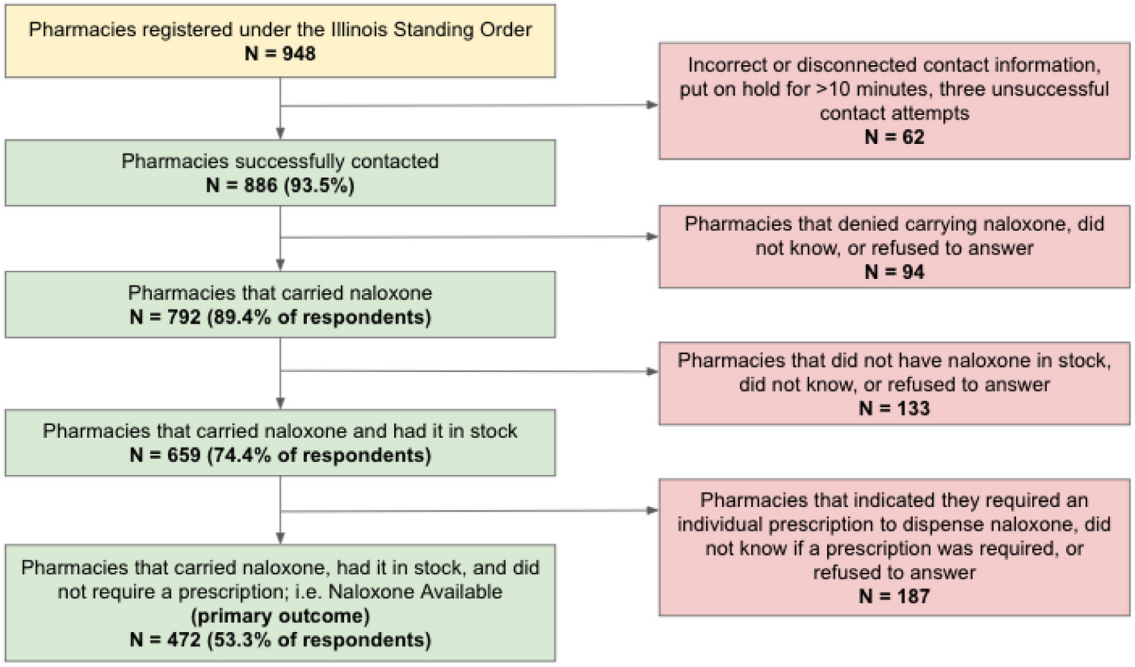

Figure 1. Availability of naloxone and need for a prescription in Illinois pharmacies registered under the Illinois Naloxone Standing Order.

Table 1. Pharmacy type, urbanicity, and naloxone availability of pharmacies registered under the Illinois Naloxone Standing Order that were successfully contacted (n = 886).

	Successfully contacted, n = 886 (Col %)	Carry Naloxone n = 792 (Row %)	Carry Naloxone, in stock n = 659 (Row %)	Naloxone available without a Rx, n = 472 (Row %)
Pharmacy type				
Chain (CVS, Walgreens)	806 (91.0%)	728 (90.3%)	611 (83.9%)	432 (70.7%)
Non-chain (Independent)	80 (9.0%)	64 (80.0%)	48 (75.0%)	40 (83.3%)
RUCC				
Urban	807 (91.1%)	720 (89.2%)	599 (83.2%)	433 (72.2%)
Rural adjacent to a metropolitan area	57 (6.4%)	52 (91.2%)	43 (82.7%)	28 (65.1%)
Rural and nonadjacent to a metropolitan area	22 (2.5%)	20 (90.9%)	17 (85.0%)	11 (64.7%)

Rx, prescription; *RUCC*, Rural-Urban Continuum Codes.

codes had the highest naloxone availability without a prescription (63.7%). A larger proportion of chain pharmacies carried naloxone (90.3%) compared to non-chain pharmacies (80.0%) ($P < 0.01$). Of the 772 pharmacies that stocked naloxone and provided a response to the type of naloxone, 624 (78.8%) carried naloxone nasal spray (see Table 2).

In the adjusted analyses, we found that chain pharmacies had greater odds of carrying naloxone (adjusted odds ratio [aOR] 3.16, 95% confidence interval [CI] 1.97–5.01, $P < 0.01$) and having naloxone in stock (aOR 2.72, 95% CI 1.76–4.20, $P < 0.01$) compared to non-chain pharmacies (Table 3). However, there were no differences between pharmacy type and naloxone availability without a prescription. With regard to RUCC, rural adjacent to a metro area had lower odds compared to urban areas of providing naloxone without a prescription (aOR 0.50, 95% CI 0.25–0.98, $P = 0.05$). We also observed that more densely populated ZIP Codes were less likely to have naloxone available without a prescription (aOR 0.99, 0.99–0.99, $P < 0.01$). Neither overdose (OD) count nor OD rate were associated with naloxone availability.

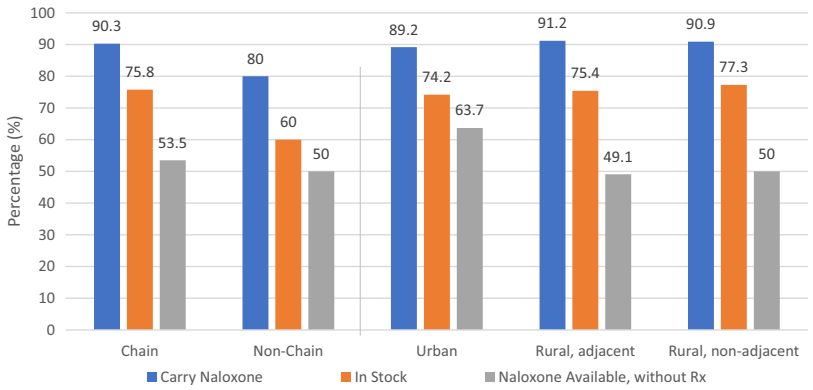

Figure 2. Pharmacy type, county urbanicity, and naloxone availability of pharmacies registered under the Illinois Naloxone Standing Order that were successfully contacted.
Rx, prescription.

Table 2. Of those who carry naloxone, available formulations of naloxone and median price.

Naloxone types	N = 722 (%)	Median price [IQR]
Naloxone nasal spray	624 (86.4)	$135.99 [$89.99, $4,500]
IM vials	71 (9.8)	$39.50 [$21.99. $239.00]
Naloxone autoinjector	27 (3.8)	$4,000 [$399.59, $6,000.00]

IQR, interquartile range; *IM*, intramuscular.

DISCUSSION

Standing orders are an important step toward reducing opioid-related mortality, but our findings suggest this legislation has not had the desired effect in state residents' access to naloxone. In 2019, two years after the implementation of the order, there was an average of 3,861 licensed pharmacies statewide.[19] Of these, only 948 (24.6%) were registered under the standing order at the time of our study. We successfully contacted 91% of the registered pharmacies and found that just over half (53.3%) had naloxone available on the day of contact and appropriately offered it without requiring a prescription. Given that all pharmacies on our contact list underwent pre-approved training to register with IDPH as a naloxone distribution site under the standing order, our findings indicate there is substantial room for improvement.

Studies from other states with comparable statewide naloxone access policies have shown limited uptake with wide variations in availability of naloxone. Across California, Texas, Pennsylvania, Massachusetts, and New York, the proportion of pharmacies that had naloxone in stock ranged from 23.5–70%, with some variation based on state and the specific sample of pharmacies studied.[20–24] Few studies have analyzed specific characteristics that may affect an individual pharmacy's likelihood of having naloxone available.[22,25] In Pennsylvania, Graves et al found that chain

Table 3. Association between predictors and carry naloxone, in stock, and no prescription needed.

	Carry Naloxone		In stock		No Rx	
	aOR (95% CI)	*P-value*	aOR (95% CI)	*P-value*	aOR (95%CI)	*P-value*
Pharmacy type						
Non-chain	*Ref*		*Ref*		*Ref*	
Chain	**3.16 (1.97, 5.01)**	**<0.01**	**2.72 (1.76, 4.20)**	**<0.01**	0.45 (0.20, 1.00)	0.05
RUCC						
Urban	*Ref*		*Ref*		*Ref*	
Rural adjacent to a metro area	1.77 (0.79, 3.98)	0.17	1.27 (0.69, 2.36)	0.44	**0.50 (0.25, 0.98)**	**0.05**
Rural, nonadjacent to a metro area	1.16 (0.41, 3.30)	0.78	1.15 (0.47, 2.82)	0.75	0.48 (0.17, 1.36)	0.17
Population by ZIP Code	1.00 (0.99, 1.00)	0.61	1.00 (0.99, 1.00)	0.40	**0.99 (0.99, 0.99)**	**0.003**
OD count	1.00 (0.99, 1.00)	0.74	1.00 (0.99, 1.00)	0.42	0.99 (0.98, 1.00)	0.09
OD rate	0.99 (0.98, 1.00)	0.16	0.99 (0.99, 1.00)	0.36	0.99 (0.98, 1.00)	0.27

Bold, $P \leq 0.05$; Adjusted analyses include controlling for pharmacy type, RUCC, and population by ZIP Code.
Rx, prescription; *aOR*, adjusted odds ratio; *CI,* confidence interval; *RUCC*, Rural-Urban Continuum Codes; *OD*, overdose.

pharmacies were more likely to carry naloxone, but OD rate and urbanicity did not influence naloxone availability.[22] In Indiana, Meyerson et al found that chain pharmacies, pharmacies with more than one full-time pharmacist, and those where pharmacists had received naloxone-related continuing education were associated with increased likelihood of stocking naloxone.[25]

A systematic review of the topic found that a heterogeneous group of 30 studies had wide-ranging findings, but overall one-third of pharmacies audited did not carry naloxone and almost half did not offer naloxone without a prescription.[26] While previous studies have explored the availability of naloxone under a standing order in different states, analysis of factors that may contribute to the likelihood that a pharmacy has naloxone available without a prescription remains limited. Our study is also unique for its high response rate as well as our use of a sample including all pharmacies that opted in to formalized training and registration under the standing order.

Improved access to naloxone through community pharmacies may come through multiple approaches. First, with less than a quarter of pharmacies registered, our findings highlight the need for more widespread participation in the Illinois Naloxone Standing Order. It appears that the public good and the financial incentives attached to increased dispensing of naloxone are insufficient to incentivize pharmacies to take the steps necessary to register under the standing order. Of note, Illinois Medicaid plans are required to cover at least one formulation of naloxone, with the intranasal formulation the most commonly covered formulation. Illinois Medicaid does not charge a copay for receipt of naloxone. Additional incentives may be necessary to mobilize greater pharmacy participation statewide.

Rural areas appeared to have particularly poor access to naloxone through community pharmacies. While 11.5% of Illinois residents live in rural areas, we found that only 22 (2.3%) of the pharmacies registered under the standing order were in rural areas.[27] While there was no significant difference in the primary outcome in rural vs urban pharmacies, the overall paucity of registered pharmacies in rural areas highlights a lack of access that may put rural people who use drugs at higher risk of death from overdose. This may further exacerbate the disproportionate impact of the opioid crisis on rural areas.[28,29]

Of the registered pharmacies we contacted, our findings highlight specific trends that may inform efforts to improve access to naloxone. We found that chain pharmacies were more likely than non-chain pharmacies to carry naloxone and have it in stock but were no more likely to have it in stock without a prescription required. This suggests that there are policies unique to chain pharmacies that facilitate registering under the standing order and stocking naloxone, but that perhaps training for customer-facing staff has been inadequate. This led ultimately to similar outcomes to non-chain pharmacies when it came to customers seeking to purchase naloxone without a prescription. These findings have some consistency with one Pennsylvania study, which found chain pharmacies to be more likely to carry naloxone and answer questions correctly about the standing order for naloxone.[22] Chain pharmacies may have more standardized training programs for certain staff members, maintain robust supply chains for naloxone, or have a stronger response to public pressure to contribute to reducing opioid-related deaths.

There was no statistically significant association between the number or rate of ODs in a ZIP Code and likelihood of naloxone availability. This finding suggests that there may be additional outreach or incentives necessary to encourage pharmacies in areas with the highest rates of OD to increase access to naloxone via the standing order.

Cost and available formulation may have a significant impact on how likely a customer is to obtain naloxone. In our sample, both cost and formulation were variable. The majority of pharmacies that had naloxone in stock carried the nasal naloxone spray (brand name Narcan) for an average cost of $135.99 for a two-pack. While Illinois Medicaid plans cover at least one formulation of naloxone without copay, private insurance and Medicare Part D plans have variable copay structures and formulation coverage. For uninsured individuals, those who don't want to use their insurance to fill this medication, or those for whom naloxone is not a covered medication, the out-of-pocket cost may be a significant deterrent to obtaining naloxone. Vials of naloxone, which can be used with a needle and syringe and injected intramuscularly, or with an atomizer for nasal administration, had a lower median price of $39.50; however, only 9% of pharmacies had this formulation in stock, and the availability and cost of other necessary supplies such as syringes, intramuscular needles, and/or nasal atomizers was unclear. We do believe that some of the high prices that were reported by pharmacy staff are inaccurate and for this reason we present the median price, which we believe accurately reflects what most consumers would pay out of pocket.

Our study highlights the need for additional strategies to maximize access to naloxone. Given that rural areas are less likely to have community-based naloxone distribution (often a service offered at harm reduction/syringe service programs), this need is particularly great in rural areas.[30–32] Future research is needed to understand whether naloxone availability in pharmacies is associated with increased utilization and, if so, how to increase availability of naloxone via standing order in retail pharmacies. Possible considerations could include the following: public education campaigns that would work to increase demand for naloxone in pharmacies, thereby encouraging pharmacies to register and stock naloxone; offering financial incentives or other public recognition for pharmacies that register for the standing order and stock naloxone formulations; and

improved public health outreach and educational programs (eg, academic detailing) to increase awareness among pharmacies, pharmacists, and pharmacy staff about the purpose of and evidence base of naloxone as it relates to reducing opioid-related mortality at the community level.

Research has found that pharmacists' discomfort dispensing naloxone to customers remains an important barrier and often results from inadequate training (Green, 2017; Thornton, 2017; Rudolph, 2018). As of November 20, 2017, only 19 states had mandated naloxone education for pharmacists (Roberts, 2019).[33] Illinois regulation requires participating pharmacists to complete an Illinois Department of Human Services- approved training module or to "understand the Naloxone Standardized Procedures" and watch two training videos (IDPH Naloxone FAQ), but it is unclear how much of this training is passed along to staff who directly interact with customers. One study comparing training material provided by states found that while most material covered the purpose and use of naloxone as well as the standing order legislation, few provided thorough education on how to communicate this information to customers (Carpenter, 2018). Overall, while there has been an increase in naloxone dispensed across all states with expanded access policies, retail pharmacy naloxone distribution is still underused and varies state by state (Xu, 2018).

LIMITATIONS

Our study has several limitations. We did not clarify the role of the staff member with whom we were speaking. It is possible that if we had asked to speak directly to the pharmacist, we would have obtained more accurate information; however, we felt it was most useful to mimic a more natural consumer interaction. It is possible, however, that responses would vary between staff members at an individual pharmacy. Information may also have been more accurate had we identified ourselves as academic research staff. Five of six callers had at least some medical background, but we believe that other studies could achieve the same goal in an analogous study using staff with no medical background.

We did not call pharmacies that were not listed on the IDPH website; so future research may include analysis of the percentage of total pharmacies in different regions that offer naloxone. We collected only information about out-of-pocket cost, which is likely only relevant to patients without insurance, those who don't want to use insurance when receiving naloxone, or those without naloxone included in their pharmacy benefit. Lastly, and perhaps most relevant to future research, we recognize that availability of naloxone in retail pharmacies may not directly correlate with increased utilization by people who use drugs (PWUD). Future studies should incorporate input from PWUD to delineate preferences in sources of naloxone.

CONCLUSION

We found that two years after implementation of the Illinois Naloxone Standing Order, only one-eighth of all pharmacies had naloxone in stock and available without a prescription. Within this group, chain pharmacies were more likely to carry naloxone and have it in stock but were no more likely to provide it without a prescription. Pharmacies in more densely populated ZIP Codes and those with a Rural-Urban Continuum Code reflecting rural areas that are adjacent to metro areas were less likely to have naloxone available without a prescription. Overdose rates in the surrounding community had no effect on naloxone availability. Our study illustrates a unique sample of all pharmacies statewide that have gone through formal training and registration under the standing order.

Increased access to naloxone in retail pharmacies in Illinois will require improved efforts related to awareness and implementation of the standing order, as well as further investigation into the reasons that a pharmacy that has gone through the process of applying to be able to use the standing order does not reliably stock naloxone and make it available without prescription. Specific attention should be given to areas where there is limited access to naloxone through community-based dispensing programs and where rates of overdose and potential for impact are highest.

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