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Development and evaluation of a pilot overdose education and naloxone distribution program for hospitalized general medical patients

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Abstract

Background—Overdose education and naloxone distribution (OEND) to people at risk of witnessing or experiencing an opioid overdose has traditionally been provided through harm reduction agencies. Expanding OEND to inpatient general medical settings may reach at-risk individuals who do not access harm reduction services and have not been trained. An OEND program targeting inpatients was developed, piloted, and evaluated on two general medicine floors at Montefiore Medical Center, a large urban academic medical center in the Bronx, NY.

Methods—The planning committee consisted of ten resident physicians and two faculty mentors. A consult service model was piloted, whereby the primary inpatient care team paged the consult team (consisting of rotating members from the planning committee) for any newly admitted patient who had used any opioid in the year prior to admission. Consult team members assessed patients for eligibility and provided OEND to eligible patients through a short video training. Upon completion, patients received a take-home naloxone kit. To evaluate the program, a retrospective chart review over the first year (April 2016 -March 2017) of the pilot was conducted.

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Results—Overall, consults on 80 patients were received. Of these, 74 were eligible and the consult team successfully trained 50 (68%). Current opioid analgesic use of 50 morphine milligram equivalents daily was the most common eligibility criterion met (38%). Twenty-four percent of patients were admitted for an opioid-related adverse event, the most common being opioid overdose (9%), then opioid withdrawal (8%), skin complication related to injecting (5%), and opioid intoxication (2%). Twenty-five percent had experienced an overdose, 35% had witnessed an overdose in their lifetime, and 83% had never received OEND previously.

Conclusions—Integrating OEND into general inpatient medical care is possible and can reach high-risk patients that have not received OEND previously. Future research should identify the optimal way of implementing this service.

Keywords

naloxone; opioid analgesics; drug overdose; hospitalization

Introduction

Opioid overdose is an ongoing public health epidemic.¹ In response, public health agencies and community organizations have expanded overdose education and naloxone distribution (OEND) programs to train laypeople to identify and respond to an overdose with the administration of naloxone.^{2,3} While community-based harm reduction agencies (e.g., syringe exchange programs) were early adopters in providing OEND to laypeople in the US, some at-risk individuals (e.g., those prescribed high doses of opioid analgesics) may not access harm reduction services and therefore may not receive OEND in those venues. To maximize reach, providing OEND in other venues such as traditional health care settings is warranted.

Provision of OEND in a variety of health care settings such as inpatient psychiatric units, residential rehabilitation centers, emergency departments, outpatient clinics, and pharmacies has been previously described.^{4–12} However, despite the fact that general medical hospitals serve a medically-ill population at risk of overdose who may not access other sources of care, the potential to provide OEND in the inpatient setting has not been widely explored. Additionally, an inpatient admission offers a unique opportunity to overcome some previously identified barriers to distribution, such as limited time with patients and lack of provider education.^{13–17} Herein, we describe the development, piloting, and evaluation of an OEND program targeting general medical inpatients.

Methods

Program development and description

Motivated by an interest in preventing fatal opioid overdoses after hospital discharge, 10 resident physicians (internal medicine, family medicine, and psychiatry) organized a program planning committee with two faculty mentors (internal medicine). All authors of this paper were members of the planning committee.

We (the planning committee) selected a consult team model for this pilot program because general medical providers are often unfamiliar with OEND and may be uncomfortable with providing it directly. The consult team was composed of resident physician planning committee members who rotated coverage of a dedicated pager. The naloxone kits used in this program were provided free of charge from the New York State Department of Health. The naloxone kits distributed contained detailed instructions, two vials of naloxone, nasal atomizers, and face masks for rescue breathing. For this pilot program, we selected two inpatient general medical floors (77 beds) at Montefiore Medical Center; these floors are core training locations for resident physicians.

Over a span of three months prior to implementation, we completed the following action steps: we 1) drafted a prescribing protocol; 2) registered the hospital to receive naloxone kits from the state; and 3) met with key stakeholders including inpatient pharmacy, health information technology, hospital communications, nursing, and medical leadership. Registering the hospital to receive naloxone kits was straightforward as our medical center was already registered to provide OEND at an outpatient clinic overseen by a faculty mentor. The inpatient pharmacy agreed to receive naloxone kit supplies, assemble the kits, and stock kits on the floors. Health information technology created an order in the electronic health record to allow dispensing of kits to patients. Hospital communications provided a pager and included it in the online paging directory. Nursing provided feedback and agreed to retrieve the kit from the medication dispensing system when the order was placed. Medical leadership, including residency program directors, provided feedback and the necessary approvals to begin implementation.

Our goal was for the primary medical team providers to place a consult for every patient who had taken an opioid (prescription or illicit) in the year prior to admission. The consult team would then assess the patient's eligibility and provide OEND to eligible and interested patients. Eligibility criteria were based on existing New York State and City guidelines: heroin use in the year prior to admission, current opioid analgesic use of 50 morphine milligram equivalents daily for any length of time and for any condition, opioid analgesic misuse (i.e., use in a manner or dose other than prescribed or use of non-prescribed opioid analgesics) within the year prior to admission, current hospitalization for opioid overdose or withdrawal, current methadone or buprenorphine therapy, and current use of opioids with benzodiazepines or alcohol. Patients who were aware of the program could also request and receive OEND irrespective of the eligibility criteria. We did not give the primary medical teams a list of inclusion and exclusion criteria because we believed that this would complicate the process and reduce the number of consults received. Prior to implementation and throughout the pilot program, we engaged the primary medical teams via presentations during scheduled conferences, emails, weekly in-person reminders, and signs posted at computer workstations. These outreach efforts alerted providers to the opioid overdose problem, informed them of the consult team, and explained how to request a consult.

Consult patient encounter

On receiving a consult page, the on-call member of the consult team entered the patient's information into a secure tracking database and reviewed the patient's chart to determine

eligibility. If the patient did not meet criteria based on a brief chart review, the consulting physician would contact a member of the primary medical team to discuss the patient. If the patient met a minimum of one eligibility criteria after chart review alone or after discussion with primary medical team, the consulting physician would approach the patient to ask whether they wanted to receive OEND. If patients volunteered additional information about their substance use history that was not already known, this was used to fulfill eligibility criteria. For patients who already had a naloxone kit, the consulting physician gave the option of doing a refresher training on overdose prevention, recognition, and response. For patients who initially declined, the consulting physician asked if the patient would be willing to be approached later. If so, the consulting physician made a subsequent attempt and documented all attempts in the tracking database. A single patient could be approached up to three times during an admission.

Prior to training, the consulting physician asked the patient if they had any history of witnessing an overdose, a personal history of opioid overdose, or if they had received OEND previously.¹⁸ The training consisted of a 12-minute video from the New York City Department of Health and Mental Hygiene played on a mobile computer (in English or Spanish) which covered overdose prevention through addressing modifiable risk factors, how to identify and respond to a suspected overdose, and how to assemble the kit and administer naloxone. Upon completion of the video, the consulting physician answered all questions and provided a teach-back, in which the patient was asked to describe what they would do step by step if they witnessed someone experiencing an overdose. The consulting physician also encouraged the patient to identify family or friends that could be educated on the use of the naloxone kit, in the event that the patient themselves experienced an opioid overdose. Upon completion of the training, the consulting physician placed the electronic order for the naloxone kit, which was distributed by nursing to the patient. Finally, the consulting physician documented the OEND encounter in the electronic health record. Training was typically available Monday through Friday between 8AM and 6PM. If possible, the consult team accommodated patient requests for training outside of these hours if the initial training was declined.

Evaluation

To evaluate the processes of our OEND program and the patients reached, we conducted a retrospective chart review over one year (April 2016 to March 2017). Using our tracking database, paired with focused medical record review, we extracted patient data (i.e., demographic and clinical information) as well as the outcomes of consults. One resident physician performed the data extractions and was supervised by the faculty mentors. This evaluation was approved by the Montefiore Medical Center/Albert Einstein College of Medicine Institutional Review Board.

Demographic and clinical characteristics

For demographic characteristics, we collected age, sex, race/ethnicity, and primary language. Clinical characteristics included eligibility criteria met, the history of witnessing or experiencing an overdose, previous receipt of OEND, and the primary medical diagnosis leading to the hospital admission. We classified patients as being hospitalized for an opioid-

related adverse event if they were admitted for opioid overdose, withdrawal, intoxication, or skin or soft tissue infections related to injecting.

Outcomes of consults

We categorized the outcomes of patient consults as: 1) received OEND (either a first training or a refresher training if the patient had been trained previously); 2) declined training; 3) discharged, eloped, or left against medical advice before the consult team could see the patient; and 4) unable to consent to training (e.g., due to altered mental status).

Results

Between April 2016 and March 2017, the consult team received consults for 80 patients. Patients' median age was 50 years (range: 21 to 92), 43% were women, 40% were Hispanic, and 40% were Black, non-Hispanic (Table 1). Twenty-four percent of patients were hospitalized for an opioid-related adverse event, the most common being opioid overdose (9%). Current opioid analgesic use of 50 morphine milligram equivalents daily was the most common eligibility criterion met (38%) and 47% of patients met more than one criterion. One quarter (25%) of patients had personally experienced an overdose, 35% had witnessed an overdose in their lifetime, and 83% had never completed OEND previously.

Of the 80 consult patients, 74 (92%) were eligible and the consult team trained 50 (68%) of eligible patients (Table 2). Of those, 43 (86%) were trained on the first attempt.

Discussion

Through collaboration across multiple hospital departments, we piloted an OEND program for general medical inpatients, demonstrating that integration of OEND into hospital care is possible. Furthermore, we found that the patients evaluated by the consult team were at high risk of opioid overdose and the vast majority had not received OEND previously. Surprisingly, only a minority of eligible patients were admitted for an opioid-related adverse event, suggesting a role for universal assessment of patients rather than targeting only those admitted with opioid-related diagnoses. To our knowledge, this is the first description and evaluation of an OEND program specifically for general medical inpatients.

During development and after implementation, we found that people across departments were enthusiastic and interested in an intervention to reduce opioid overdose deaths; multidisciplinary collaboration in the early planning stages was integral to the success of the pilot program. When consults were requested, we found that the vast majority of patients were eligible, suggesting that a minimum threshold for identifying at-risk individuals was appropriate. Furthermore, we provided OEND to approximately two thirds of eligible patients identified, and most patients accepted it during the first training attempt. While we did not systematically collect this information, anecdotally we also found that patients frequently expressed gratitude and excitement for the opportunity to learn how to prevent and treat an overdose, and many wished that they had been trained before.

Patients identified in our pilot program were generally at high risk for opioid overdose: approximately half met more than one eligibility criterion, one quarter had personally experienced an overdose, and over one third had witnessed an overdose. Despite eligible patients' high risk, fewer than one in five had received OEND previously. A large percentage of patients were eligible due to taking high doses of prescribed opioid analgesics; these patients may be less likely to access community harm reduction services (e.g. syringe exchange programs) where OEND is typically provided. Anecdotally, we also encountered several patients with very heavy and risky opioid use whose only regular point of contact with health care was the hospital. Together, our findings indicate significant opportunities to provide OEND in inpatient general medical settings, and future research should determine the best way to implement this service.

Our model of OEND has limitations that may reduce generalizability and pose challenges for future scale-up. First, our reliance on the primary medical team for consults resulted in a low consult volume, suggesting missed opportunities to provide OEND. Second, resident capacity to provide OEND was occasionally limited by conflicting responsibilities, leading to several patients being discharged prior to training. Finally, our naloxone kits were provided free of charge by the New York State Department of Health and financing of kits could be a barrier for programs without this resource.

Our evaluation also has several limitations. First, we could not determine the total number of eligible patients over the study period, therefore we do not know how many eligible patients we missed due to the primary team not consulting our service. Second, we may be underreporting the number of eligibility criteria met by patients since criteria were determined by consultants' chart review in lieu of in-depth in-person assessment for every criterion. Third, data on sex and race/ethnicity were extracted from the electronic health record, which may misclassify some individuals. Finally, we did not collect data on whether patients who received kits used them after discharge; we are planning a follow-up study to describe use patterns after discharge.

Our current goal is to expand this pilot program to the entire hospital. To accomplish this expansion, we have applied for, and received, a grant from the New York City Department of Health and Mental Hygiene to hire a dedicated staff member to actively assess patients and provide OEND rather than depending on consults. The training procedure will also be simplified, as the New York State Department of Health has recently switched from a naloxone kit requiring multi-step assembly to a pre-packaged and simplified nasal spray device.

OEND is a potentially life-saving intervention and inpatient general medical wards provide an opportunity to reach patients at risk for overdose who have not previously received it. During the pilot phase of our program, we successfully provided OEND to two-thirds of patients identified by their primary inpatient care teams as at risk for an overdose. The consult model within a general medical setting presents unique advantages, as well as challenges, and similar interdisciplinary collaborations can be replicated in other hospital systems. Expanding the reach of OEND to inpatient general medical settings can save lives and represents a promising step toward reversing the opioid epidemic.

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Table 1.

Demographic and clinical characteristics of patients evaluated during a pilot inpatient overdose education and naloxone distribution program at an urban academic hospital (n=80)

Characteristic	n (%)
Median age (range)	50 (21 to 92)
Female sex	34 (43)
Race	
Hispanic, of any race	32 (40)
Black, non-Hispanic	32 (40)
White, non-Hispanic	12 (15)
Declined or missing	4 (5)
Language	
English	73 (91)
Spanish	6 (8)
Other	1 (1)
Admitted for an opioid-related adverse event ^a	19 (24)
Opioid overdose	7 (9)
Opioid withdrawal	6 (8)
Skin complication related to injecting	4 (5)
Opioid intoxication	2 (2)
General medical diagnoses ^a	
Pulmonary disease	19 (24)
Acute exacerbation of chronic non-cancer pain	13 (16)
Sickle cell disease	10 (13)
Polysubstance use	10 (13)
Non-liver GI disease	10 (13)
Psychiatric disorder	10 (13)
Skin/soft tissue infections or osteomyelitis ^b	9 (11)
Liver disease	7 (9)
HIV	7 (9)
Alcohol withdrawal	5 (6)
Cardiovascular disease	5 (6)
Gynecologic or urogenital disease	5 (6)
Neurologic disorder	4 (5)
Other	15 (19)
Eligibility criteria met ^a	
Current opioid analgesic use 50 morphine milligram equivalents daily	30 (38)
Current use of opioids with benzodiazepines or alcohol	28 (35)
Heroin use in the year prior to admission	27 (34)
Current methadone or buprenorphine therapy	19 (24)
Hospitalized for opioid overdose or opioid withdrawal	13 (16)

Characteristic	n (%)
Opioid analgesic misuse in the year prior to admission	6 (8)
Patient request	1 (1)
Number of eligibility criteria met	
0	6 (8)
1	37 (46)
2	27 (34)
3	10 (13)
Personal history of opioid overdose (n=60) ^c	15 (25)
History of witnessing opioid overdose (n=60)	21 (35)
No previous receipt of a take-home naloxone kit (n=65)	54 (83)

^aDiagnoses are not mutually exclusive

^bNot related to injection drug use

^cQuestions were added after the program start, the number of patients where this information is available is indicated in parentheses

Table 2.

Outcomes of eligible patients evaluated during a pilot inpatient overdose education and naloxone distribution program at an urban academic hospital (n=74)

Outcome	n (%)
Received overdose education and take-home naloxone kit	50 (68)
Number of training attempts for patients who were trained and/or received kit (n=50)	
1 ^a	43 (86)
2	6 (12)
3	1 (2)
Did not receive overdose education and take-home naloxone kit	24 (32)
Declined ^b	13 (54)
Discharged, eloped or left against medical advice	9 (38)
Unable to consent	2 (8)

^a Percentages are column percentages (e.g. the percentage of patients who were trained in one attempt among those who were trained)

^b Percentages are column percentages (e.g., the percentage of patients who declined among those who did not receive overdose education and a take home naloxone kit)