

Medical Student Screening for Naloxone Eligibility in the Emergency Department: A Value-Added Role to Fight the Opioid Epidemic

P. Quincy Moore, MD*, Navneet Cheema, MD, Sarah Follman, MD, Laura Celmins, PharmD, BCPS, BCCP, Greg Scott, PhD, Mai T. Pho, MD, MPH, Jeanne Farnan, MD, MHPE, Vineet M. Arora, MD, MAPP, Keme Carter, MD

*Corresponding author: pmoore8@medicine.bsd.uchicago.edu

Abstract

Introduction: Opioid overdose education and naloxone distribution (OEND) for use by laypersons are safe and effective at preventing deaths from opioid overdose, but emergency department (ED) implementation is challenging. Curricula addressing OEND could enable students to serve in value-added roles on the clinical team, overcome challenges of naloxone distribution, and improve patient care.

Methods: We created a 1-hour didactic session on opioid use disorder and OEND for first-year medical students in the emergency medicine elective. During two clinical shifts, students used this knowledge to perform screenings to identify patients at high risk of overdose. If a patient screened positive, students performed patient education and then notified the physician, who ordered a naloxone kit. **Results:** Thirty students received the didactic and conducted screening shifts. Of 147 patients screened, 40% ($n = 59$) were positive for naloxone eligibility, 21% ($n = 31$) reported that someone close to them used opioids, 18% ($n = 26$) had witnessed an opioid overdose, 12% ($n = 17$) had previously overdosed themselves, and 12% ($n = 18$) previously knew what naloxone was. Fifty-nine naloxone kits were distributed over the 3-month pilot versus 13 naloxone prescriptions for patients discharged from the ED the prior year. **Discussion:** Through didactic training and structured patient engagement, medical students gained knowledge of and hands-on experience with addiction medicine, discussed sensitive topics with patients, and identified a high volume of patients eligible to receive naloxone. Medical student screening for OEND in ED patients is feasible and adds significant value to the clinical team.

Keywords

Opioid Use Disorder, Naloxone, Overdose Education, Naloxone Distribution, Harm Reduction, Patient Safety, Substance Abuse, Addiction, Opioids

Educational Objectives

By the end of this curriculum, first-year medical students will be able to:

1. List risk factors for patients at high risk for experiencing or witnessing an opioid overdose.
2. Actively screen and identify emergency department (ED) patients at high risk for experiencing or witnessing an opioid overdose.
3. Teach ED patients how to use naloxone under the supervision of a pharmacist or physician.

4. Assess ED patients' understanding of naloxone administration under the supervision of a pharmacist or physician.

Introduction

In 2020, the US had more than 69,000 people die from opioids, including heroin, prescription pain relievers, and synthetic opioids like fentanyl.¹ This represents a record death toll and a dramatic increase from 2019. Despite expanded efforts to recognize and mitigate the damage of the opioid epidemic, death rates remain high, fueled by highly potent fentanyl and fentanyl analogues as well as exacerbated by the COVID-19 pandemic.¹⁻³

The emergency department (ED), as the safety net for the health care system, acts as a common source of health care for many patients with opioid use disorder, whether they present after an overdose or for other complaints. ED patients who are treated for substance use disorder are six times more likely to die from opioid overdose in the subsequent year than patients seen in

Citation:

Moore PQ, Cheema N, Follman S, et al. Medical student screening for naloxone eligibility in the emergency department: a value-added role to fight the opioid epidemic. *MedEdPORTAL*. 2021;17:11196. https://doi.org/10.15766/mep_2374-8265.111196

the ED for other reasons.⁴ Furthermore, patients treated for opioid overdose in the ED have a 6% mortality rate at 1 year, with mortality highest in the first month, making the ED a critical intervention point for harm reduction.⁵

In an effort to address risk for opioid-related death in ED patients, many evidence-based interventions have been developed and adopted, such as opioid prescribing guidelines, ED-initiated buprenorphine, and overdose education and naloxone distribution (OEND). OEND is a harm-reduction strategy that includes education on recognizing and responding to opioid overdose and the distribution of naloxone to laypersons for use outside of the health care setting.³⁻⁶ OEND has been shown to reduce opioid overdose mortality and is now endorsed by the Surgeon General, Centers for Disease Control and Prevention, American Medical Association, American College of Emergency Physicians, and the three major professional associations of toxicology.⁶⁻¹⁰ The ED is a critical access point for OEND, but there are many challenges to implementation, and uptake remains limited.^{11,12} Barriers exist at the administrative level and also for individual providers, who may have difficulty integrating OEND into their clinical workflow due to time constraints.¹²

Given the ongoing devastation of the opioid epidemic, it is critical that medical students are well versed in recognizing and treating opioid use disorder, regardless of their future specialty choice. In 2016, as part of an effort to address the opioid epidemic, the White House asked medical schools to pledge to add content related to safe opioid prescribing to their curricula.¹³ The literature on substance use training for medical students is growing, but it remains limited in its scope, quality, and ability to offer specific guidance for curriculum development.^{14,15} Medical school curricula generally include little formalized exposure to opioid use disorder, highlighting an important discordance between a pressing public health need and the training of future physicians. A 2019 scoping review of literature describing substance use education in medical schools found 43 articles that met inclusion criteria, only one of which focused on opioid use disorder. Our intervention addresses five of the six areas of improvement identified in the review: (1) education on harm reduction, (2) focus on substances with the greatest morbidity, mortality, and public health concerns, (3) education on opioid use disorders, (4) incorporation of direct clinical exposure to patients, and (5) creation of opportunities for interprofessional learning.¹⁶

The Liaison Committee on Medical Education's 2020 report on the functions and structure of a medical school offers guidance to ensure that "the medical curriculum includes instruction in

the diagnosis, prevention, appropriate reporting, and treatment of the medical consequences of common societal problems."¹⁷ Thus, it is important for medical schools to develop innovative ways to educate their students on the challenges and solutions to the opioid epidemic, which has a devastating impact across many facets of society.¹⁸⁻²⁰ While curricular initiatives focused on opioid use disorder are growing in number, we are not aware of any other curriculum that offers teaching on OEND with a direct application of learning in the clinical environment.²¹⁻²⁴ This novelty of our curriculum provides an engaging learning experience and a real impact for the clinical team.

We developed the Outpatient Principles in Addiction Training and Education (OPIATE) initiative to address a shortage in addiction medicine education in the Pritzker School of Medicine curriculum and create a value-added role for medical students to assist in ED-based OEND. This initiative offered medical students preclinical exposure to addiction medicine while also supporting harm-reduction efforts and patient care in our ED. Here, we evaluate the feasibility and present the necessary resources of a medical student-driven screening program used to identify and train patients eligible for OEND in the ED. This study was determined to be a quality improvement study by the University of Chicago Medicine's Chief Quality Determination Reviewer.

Methods

A multidisciplinary team—including faculty across departments, hospital leaders, pharmacists, medical students, and residents—was assembled to identify ways to improve the ED's approach to addressing the opioid epidemic. OEND was identified as an evidence-based practice that was not yet standardized in our ED's typical workflow. The working group, which included faculty leaders within undergraduate medical education, also identified the need for improvement in medical student education in addiction medicine. We viewed this as an opportunity for a mutually beneficial partnership between our health system and our medical school that would enable a value-added role for our medical students.

The team of opioid content experts performed a literature review to develop inclusion and exclusion criteria (Appendix A) for the naloxone distribution protocol. These criteria focused on characteristics that were associated with an elevated risk of overdose and easily identifiable in the ED. Badge cards (Appendix B) with a mnemonic identifying the inclusion criteria were made and distributed to residents for reference. The experts used an iterative process to develop a four-question survey (Appendix C) designed to capture the most important

inclusion criteria. The workflow was developed with input from ED providers and medical students, piloted by a medical student involved with the initiative, and approved by the Office of Compliance.

In the spring of their first year, medical students had the opportunity to enroll in the Introduction to Emergency Medicine elective, which included didactics covering core content in emergency medicine and shadowing shifts in the ED. With the addition of OPIATE to the elective curriculum, all enrolled students received didactic education consisting of a 1-hour lecture (Appendix D) addressing the opioid epidemic, harm-reduction strategies, recognition and response to overdose, and naloxone distribution. The opioid training was given by an ED faculty member who was familiar with the materials presented, which allowed him to respond to questions and expand on themes of interest. There was no prerequisite knowledge needed by learners to participate in the initiative.

Students completed two 4-hour shadowing shifts under the supervision, through normal staffing procedures, of ED residents, attendings, and pharmacists. During the first hour of their shadowing shifts and using a predeveloped script (Appendix C), students conducted universal screenings of patients in the ED (excluding those located in the triage, psychiatric, trauma, or resuscitation areas) to identify patients at risk of experiencing or witnessing opioid overdose. First, students introduced themselves and the screening process. If patients agreed to proceed, students then used the four-question survey (Appendix C) to complete the screening. Answers to survey questions were collected using REDCap 9.5.35 long-term support software (Vanderbilt University) on school-issued iPads. If one or more questions in the survey indicated risk of overdose, students used their iPads to show patients a 6-minute educational video (Appendix E) instructing them on how to recognize and respond to an overdose, including how to administer naloxone. After the video was viewed, students referred back to the predeveloped script (Appendix C) to confirm patient understanding through the teach-back method and invited patients to ask questions. Students were prepared to answer common questions about naloxone use by the didactic training (Appendix D) and the required review of preparatory resources (Appendix C). The entire screening and teaching process took a maximum of 10-12 minutes, with negative screens being quicker. The students then notified one of the primary providers, who ordered a take-home naloxone kit to be dispensed at the bedside. All eligible patients being discharged from the ED were offered naloxone. When naloxone was dispensed, an ED pharmacist

or nurse again confirmed patient understanding of naloxone administration and offered to answer and address the patient's questions and concerns. The costs of the student iPads and naloxone for patients who were uninsured were covered with grant funding. Students had the option to complete a survey assessing their attitudes toward the experience (Appendix F).

Results

All 30 first-year medical students enrolled in the elective received the didactic and completed screening during their shifts. Learner behavior was demonstrated by our students collectively screening 147 patients, with 40% ($n = 59$) identified as eligible for naloxone. Of all patients screened, 21% ($n = 31$) reported that someone close to them used opioids, 18% ($n = 26$) had witnessed an opioid overdose, 12% ($n = 17$) had previously overdosed themselves, and 12% ($n = 18$) previously knew what naloxone was.

As a measure of impact on the community, we compared naloxone distribution during OPIATE implementation with a historical 12-month period in the prior calendar year. We found that 59 naloxone kits were distributed over the 3-month OPIATE pilot compared to 13 naloxone prescriptions for patients discharged from the ED in the year prior. The impact was also evident in the small proportion of patients (12%) who were familiar with naloxone prior to participating in the initiative. Our initiative received the 2019 AAMC Curricular Innovation Award.²⁵

Selected quotes from the open-ended portion of the optional postexperience survey included the following:

- “Screening patients in the ED ... helped put a face to an epidemic that is usually taught through graphs and citations. Not only was I able to listen to the experiences of patients and families affected by the opioid crisis, but I also felt like a useful member of the care team by providing education and potentially life-saving medication.”
- “I really enjoyed the opportunity to speak directly with patients and help the medical team with an important task. It was rewarding to be adding to the team rather than merely shadowing.”
- “Almost all of the patients who I talked to responded very positively—I think this was a great idea! Even if the patient did not accept the naloxone kit, they were more aware of naloxone, what an opioid overdose looks like, etc., than they were before. Most of the patients whom I talked to did not know what naloxone was.”

Discussion

We believe the OPIATE initiative at the University of Chicago Pritzker School of Medicine can serve as a model for other medical schools to create similar value-added roles for students to address the opioid epidemic. Policy changes in recent years have allowed for implementation of OEND, and many EDs have developed formal protocols to encourage prescribing.

The impact of the OPIATE initiative was fourfold. First, medical students were provided with early didactic instruction and clinical exposure to facilitate a better understanding of the opioid epidemic. The OPIATE program offered this experience at a very early stage of learning, allowing students to incorporate concepts in addiction medicine throughout their training. Second, students gained early experience developing rapport and discussing sensitive issues with patients. Third, exposure to principles of addiction medicine strengthened student interest in a field in which critical workforce shortages impact access to treatment.^{26,27} Lastly, the recent American Medical Association's Accelerating Change in Medical Education consortium highlighted the importance of value-added roles to engage medical students as active health system champions in a way that benefits both their education and patient care. In a busy ED, it can be difficult for physicians to explore risk factors for opioid overdose and discuss the benefits of naloxone with patients. Student involvement enables more comprehensive screening and training of patients presenting to the ED. Ultimately, we believe the OPIATE initiative represents a significant value-add for both patients and students, increasing patient knowledge and access to naloxone while improving student exposure to challenging clinical encounters and concepts in addiction medicine. We believe that any department that has implemented an ED-based OEND program could easily implement our model of medical student-led screening and training into its workflow. While our program was able to secure funding to cover the cost of medication for uninsured patients, we do not believe this is integral to the replication of a similar program at external sites.

We learned several lessons during the implementation of this initiative. First, it was useful for the students to have access to the educational materials prior to attending the didactic session. Students could then familiarize themselves with the survey, the training video, and the logistical components of the intervention, with time to ask questions during the didactic. Given the limited clinical experience of first-year medical students, we provided very thorough instructions on their role in the ED and a predeveloped script for the patient encounter. Second, it was useful for students to be assigned to a point person during their

screening shifts. In our case, the ED pharmacist and teaching resident were used. Third, we found it important to notify our residents and attendings that the students would be completing this experience in the ED and might ask them for assistance or request that they order a naloxone kit if a patient screened positive. Lastly, we would have benefited from collecting more immediate student-oriented data evaluating students' knowledge and experience.

Our curriculum had limitations. First, this curriculum was implemented with only one cohort of students, and the outcomes measured were clinical process outcomes, with limited feedback on student perceptions and without efficacy evaluation of student-delivered teaching. Second, although the initiative was a short-term intervention that allowed for easy incorporation into other student experiences such as electives or clinical rotations, it did not provide the depth of more longitudinal curricula. Additionally, the didactic was lecture-based with some prompts for discussion, and while our experience was that students were active in discussion, the learning format was largely passive. Lastly, we did not track which eligible patients accepted naloxone and which patients declined, so we were not able to do a comparative analysis between the two groups.

In summary, we describe the successful implementation of a value-added role for medical students to assist in screening for ED patients who would benefit from take-home naloxone. Our next steps will be fourfold. First, we will continue offering this initiative to students involved in the Introduction to Emergency Medicine elective. With annual review and efforts toward quality improvement, we will evaluate the effectiveness of student teaching through direct observation and the assessment of patient perceptions and understanding. Second, we will use follow-up surveys to track the students who participate in the program as they progress through medical school to better understand knowledge retention and how the experience affects their education and practice. Third, we will expand the experience to include the fourth-year medical student rotation. Lastly, we are tracking ED OEND and its cost to inform a sustainability plan for the hospital.

Appendices

- A. Inclusion and Exclusion Criteria.docx
- B. Badge Card.pdf
- C. Student Script and Instructions.docx
- D. OUD Didactic.pptx

E. Naloxone Training.mp4

F. Student Evaluation Survey.docx

All appendices are peer reviewed as integral parts of the Original Publication.

P. Quincy Moore, MD: Assistant Professor of Medicine, Section of Emergency Medicine, University of Chicago Pritzker School of Medicine; ORCID: <https://orcid.org/0000-0002-8281-0677>

Navneet Cheema, MD: Assistant Professor of Medicine, Section of Emergency Medicine, University of Chicago Pritzker School of Medicine

Sarah Follman, MD: Resident Physician, Section of Emergency Medicine, University of Chicago Medicine

Laura Celmins, PharmD, BCPS, BCCP: Clinical Pharmacist Specialist, Department of Pharmacy, University of Chicago Medicine

Greg Scott, PhD: Professor, Department of Sociology, DePaul University

Mai T. Pho, MD, MPH: Associate Professor of Medicine, Section of Infectious Diseases and Global Health, University of Chicago Pritzker School of Medicine

Jeanne Farnan, MD, MHPE: Professor of Medicine, Section of Hospital Medicine, University of Chicago Pritzker School of Medicine

Vineet M. Arora, MD, MAPP: Herbert T. Abelson Professor of Medicine, Section of Hospital Medicine, University of Chicago Pritzker School of Medicine

Keme Carter, MD: Associate Professor of Medicine, Section of Emergency Medicine, University of Chicago Pritzker School of Medicine

Disclosures

None to report.

Funding/Support

None to report.

Prior Presentations

Moore PQ, Cheema N, Follman S, et al. Medical student screening for naloxone eligibility in the emergency department: a value added role to fight the opioid epidemic. Presented at: Learn Serve Lead 2020: The Virtual Experience; November 16-18, 2020.

Ethical Approval

Reported as not applicable.

References

1. Ahmad FB, Rossen LM, Sutton P. Provisional drug overdose death counts. National Center for Health Statistics. Updated September 15, 2021. Accessed September 17, 2021. <https://www.cdc.gov/nchs/nvss/vsrr/drug-overdose-data.htm>
2. Overdose deaths accelerating during COVID-19. Centers for Disease Control and Prevention. December 17, 2020. Accessed July 20, 2021. <https://www.cdc.gov/media/releases/2020/p1218-overdose-deaths-covid-19.html>
3. Issue brief: nation's drug-related overdose and death epidemic continues to worsen. American Medical Association. Updated August 4, 2021. Accessed September 17, 2021. <https://www.ama-assn.org/system/files/issue-brief-increases-in-opioid-related-overdose.pdf>
4. Krawczyk N, Eisenberg M, Schneider KE, et al. Predictors of overdose death among high-risk emergency department patients with substance-related encounters: a data linkage cohort study. *Ann Emerg Med.* 2020;75(1):1-12. <https://doi.org/10.1016/j.annemergmed.2019.07.014>
5. Weiner SG, Baker O, Bernson D, Schuur JD. One-year mortality of patients after emergency department treatment for nonfatal opioid overdose. *Ann Emerg Med.* 2020;75(1):13-17. <https://doi.org/10.1016/j.annemergmed.2019.04.020>
6. U.S. Surgeon General's advisory on naloxone and opioid overdose. U.S. Department of Health and Human Services. April 5, 2018. Accessed September 17, 2021. <https://www.hhs.gov/surgeongeneral/priorities/opioids-and-addiction/naloxone-advisory/index.html>
7. Berg S. Lifesaving naloxone should be available almost everywhere. American Medical Association. June 11, 2019. Accessed May 10, 2020. <https://www.ama-assn.org/delivering-care/opioids/lifesaving-naloxone-should-be-available-almost-everywhere>
8. Doyon S, Aks SE, Schaeffer S. Expanding access to naloxone in the United States. *J Med Toxicol.* 2014;10(4):431-434. <https://doi.org/10.1007/s13181-014-0432-1>
9. Houry D, Adams J. Emergency physicians and opioid overdoses: a call to aid. *Ann Emerg Med.* 2019;74(3):436-438. <https://doi.org/10.1016/j.annemergmed.2019.07.020>
10. Mueller SR, Walley AY, Calcaterra SL, Glanz JM, Binswanger IA. A review of opioid overdose prevention and naloxone prescribing: implications for translating community programming into clinical practice. *Subst Abuse.* 2015;36(2):240-253. <https://doi.org/10.1080/08897077.2015.1010032>
11. Follman S, Arora VM, Lyttle C, Moore PQ, Pho MT. Naloxone prescriptions among commercially insured individuals at high risk of opioid overdose. *JAMA Netw Open.* 2019;2(5):e193209. <https://doi.org/10.1001/jamanetworkopen.2019.3209>
12. Eswaran V, Allen KC, Bottari DC, et al. Take-home naloxone program implementation: lessons learned from seven Chicago-area hospitals. *Ann Emerg Med.* 2020;76(3):318-327. <https://doi.org/10.1016/j.annemergmed.2020.02.013>
13. Fact sheet: Obama administration announces additional actions to address the prescription opioid abuse and heroin epidemic. The White House: Office of the Press Secretary. March 29, 2016.

- Accessed May 10, 2020. <https://obamawhitehouse.archives.gov/the-press-office/2016/03/29/fact-sheet-obama-administration-announces-additional-actions-address>
14. Kothari D, Gourevitch MN, Lee JD, et al. Undergraduate medical education in substance abuse: a review of the quality of the literature. *Acad Med*. 2011;86(1):98-112. <https://doi.org/10.1097/ACM.0b013e3181ff92cf>
 15. Muzyk A, Smothers ZPW, Andolsek KM, et al. Interprofessional substance use disorder education in health professions education programs: a scoping review. *Acad Med*. 2020;95(3):470-480. <https://doi.org/10.1097/ACM.0000000000003053>
 16. Muzyk A, Smothers ZPW, Akrobetu D, et al. Substance use disorder education in medical schools: a scoping review. *Acad Med*. 2019;94(11):1825-1834. <https://doi.org/10.1097/ACM.0000000000002883>
 17. *Functions and Structure of a Medical School: Standards for Accreditation of Medical Education Programs Leading to the MD Degree*. Liaison Committee on Medical Education; 2020. https://lcme.org/wp-content/uploads/filebase/standards/2021-22_Functions-and-Structure_2021-04-16.docx
 18. Oldfield BJ, Tetrault JM, Wilkins KM, Edelman EJ, Capurso NA. Opioid overdose prevention education for medical students: adopting harm reduction into mandatory clerkship curricula. *Subst Abus*. 2020;41(1):29-34. <https://doi.org/10.1080/08897077.2019.1621241>
 19. Klimas J, Ahamad K, Fairgrieve C, et al. Impact of a brief addiction medicine training experience on knowledge self-assessment among medical learners. *Subst Abus*. 2017;38(2):141-144. <https://doi.org/10.1080/08897077.2017.1296055>
 20. Dumenco L, Monteiro K, Collins S, et al. A qualitative analysis of interprofessional students' perceptions toward patients with opioid use disorder after a patient panel experience. *Subst Abus*. 2019;40(2):125-131. <https://doi.org/10.1080/08897077.2018.1546262>
 21. Jawa R, Luu T, Bachman M, Demers L. Rapid naloxone administration workshop for health care providers at an academic medical center. *MedEdPORTAL*. 2020;16:10892. https://doi.org/10.15766/mep_2374-8265.10892
 22. Monteiro K, Dumenco L, Collins S, et al. Substance use disorder training workshop for future interprofessional health care providers. *MedEdPORTAL*. 2017;13:10576. https://doi.org/10.15766/mep_2374-8265.10576
 23. Klapheke M, Pasarica M. Opioid risk mitigation strategies and overdose resuscitation. *MedEdPORTAL*. 2017;13:10621. https://doi.org/10.15766/mep_2374-8265.10621
 24. Jennings L, Warner T, Bacro-Duverger B. Identification and treatment of opioid withdrawal and opioid use disorder in the emergency department. *MedEdPORTAL*. 2020;16:10899. https://doi.org/10.15766/mep_2374-8265.10899
 25. AAMC Curricular Innovation Awards. Association of American Medical Colleges. Accessed October 12, 2021. <https://www.aamc.org/what-we-do/aamc-awards/curricular-innovation-awards>
 26. Institute of Medicine. *Improving the Quality of Health Care for Mental and Substance-Use Conditions*. National Academies Press; 2006. <https://doi.org/10.17226/11470>
 27. Institute of Medicine. *The Mental Health and Substance Use Workforce for Older Adults: In Whose Hands?* National Academies Press; 2012. <https://doi.org/10.17226/13400>
- Received:** April 29, 2021
Accepted: August 17, 2021
Published: December 9, 2021