Making Naloxone Rescue Part of Basic Life Support Training for Medical Students

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ABSTRACT

As opioid overdose deaths in the United States continue to climb, medical students must be prepared to prevent and treat opioid use disorder and opioid overdose. The administration of naloxone is an evidence-based way to reverse overdoses and save lives. At our medical school, a coalition of medical students, emergency medicine educators, and administrators worked together to permanently integrate naloxone rescue training into the Basic Life Support (BLS) curriculum required of all first-year medical students. This article outlines an argument for the integration of naloxone rescue into BLS training and an introduction to emergency medical care for medical students. The authors then describe the steps that students took to transform this program from an original pilot to a formally integrated curriculum offered to all first-year medical students. The article highlights the role of medical student advocacy in curriculum design and its potential to align medical training with community health needs, such as the ongoing opioid epidemic.

Opioid overdose deaths in the United States continue to climb.[1] In Massachusetts, opioid overdoses kill more than five people daily.[2] Timely and adequate administration of naloxone reverses an opioid overdose, ending a potentially fatal respiratory depression with no adverse effects beyond precipitated withdrawal. The distribution of naloxone at a community level is an evidence-based way to save lives,[3] and naloxone rescue is becoming a standard competency for emergency medical service personnel[4] and law enforcement officers in the United States.[5]

Early in medical school, students undergo Basic Life Support (BLS) training, which includes instruction on cardiopulmonary resuscitation (CPR) and use of a defibrillator for cardiac arrest. Arguably easier to learn and practice than CPR, naloxone rescue should be part of this basic, universally taught package of lifesaving skills. However, although the New York University School of Medicine integrated naloxone rescue into BLS training for medical students in 2014,[6] this innovation has not been broadly adopted elsewhere. A qualitative study examining barriers to medical student attitudes toward naloxone rescue identified lack of knowledge and stigma of naloxone as barriers to naloxone prescription.[7] Incorporating naloxone into BLS training may help address some of these concerns and fits within broader national calls for improved substance use disorder (SUD) education.[8] Overall, SUD undergraduate medical education can shift student knowledge and attitudes,[9,10] and the single study examining naloxone rescue in BLS for medical students showed that it developed knowledge of overdose response.[6]

In light of this evidence base and the national opioid crisis, a coalition of our institution's (Harvard Medical School [HMS]) students, educators, and

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administrators worked together to permanently integrate naloxone rescue training into the BLS curriculum required of all medical students. Below, we describe the rationale and objectives for incorporating naloxone training into BLS and the journey of student advocacy that enabled this training at our medical school.

RATIONALE AND OBJECTIVES FOR NALOXONE RESCUE INCLUSION IN BLS TRAINING

Cardiac arrest typically results from underlying chronic cardiac disease. It is a life-threatening medical emergency to which medical providers are trained to respond. Like coronary artery disease (CAD), addiction is a chronic disease with acute, life-threatening exacerbations: overdoses. Whereas CAD yields changes in coronary vasculature predisposing to cardiac arrest, addiction is mediated by changes in the brain. These changes are characterized by increased responsiveness of the subcortical drive, reward, and memory pathways to the drug and associated places, people, or objects ("triggers").[11] For many drugs, such as opioids, use leads to an increase in tolerance and decrease in reward over time, resulting in escalation in the quantity used, predisposing patients to life-threatening overdose.[12] Like other chronic diseases, SUD arises from a complex interaction of genetic predisposition, environment, and behavior. Drawing a parallel between cardiac arrest and opioid overdose begins to mainstream the medical management of SUD and reduce the stigma and perceived futility that often accompany SUD care.

Accordingly, integrating naloxone training into BLS has three objectives. First, it raises awareness about the frequency and mortality of overdose and empowers students to respond to opioid-related emergencies alongside other emergencies, which may help reduce SUD stigma. Second, it ensures that all medical students know how to administer naloxone to patients in the hospital or community, a lifesaving skill on par with CPR. This skill may be particularly valuable as over 35 states currently have either naloxone available without a prescription or a standing order allowing pharmacists to dispense naloxone without a prescription.[13] Medical students may be in a situation to administer naloxone outside the hospital, as they live and work in the broad range of communities at risk for overdose.[14] Third, it introduces the idea that students can talk with high-risk patients about obtaining and using naloxone for themselves or their friends or family.

FROM PILOT TO PERENNIAL: INTEGRATING NALOXONE TRAINING AS A PERMANENT PART OF BLS

In 2016, a group of students at HMS convened to advocate for the integration of naloxone training into our school's BLS curriculum. We approached the HMS office that arranges BLS education with a proposal to implement an initial, optional training ourselves as a pilot. Our partners in the administration were receptive to the idea and invested in 10 naloxone practice kits for the training. Relative to the overall cost of BLS training, reusable practice naloxone rescue kits are low cost (about $20 per kit).

We designed a 5-minute curriculum (Table 1) and invited internal medicine residents from a nearby hospital to join us on the day of the trainings to supervise and provide feedback on clinical relevance and teaching strategies. We centered this curriculum around the American Heart Association's (AHA's) "Opioid-associated life-threatening emergency (adult) algorithm," which the AHA has made available as an optional part of BLS training for first-responders.[15] We then recruited student trainers, practiced teaching the curriculum, and bought cookies to incentivize participation. As third-year medical students emerged from their required BLS session, we asked them to join an optional naloxone training. To our surprise, 98% of the nearly 200 students invited to participate in our completely optional training chose to do so. We did

Table 1
Components of the Five-minute Naloxone Training Within Basic Life Support

Epidemiology of the opioid crisis in Massachusetts: mortality and risk factors
Pharmacology of naloxone: rapidly binding competitive opioid antagonist
Recognizing signs of an opioid overdose
Steps taken prior to naloxone administration
Naloxone administration demonstration and practice
Counseling patients on naloxone: patients who should be receiving naloxone (for instance, patients on large doses of prescription opioids or on opioids and benzodiazepines concurrently) and how to introduce naloxone to patients and their friends or family

After the session, students were provided a one-page handout with this information in writing.

not measure other outcomes, but the high rate of voluntary participation suggests that our training satisfied an unmet need in the medical curriculum.

While we appreciated the opportunity to pilot the trainings, we realized that student-led optional trainings would not be sustainable. Emphasizing the low cost in terms of time and money, the medical students who led the naloxone trainings successfully petitioned an existing faculty working group to include BLS-integrated naloxone training in their proposal for our school's new SUD curriculum. The public and media attention on the opioid epidemic and governor's recent mandate to improve opioid education in medical schools likely contributed to the administration's enthusiasm.[16] With the support of school leadership, the BLS trainers (typically emergency medicine faculty and staff) have permanently incorporated naloxone rescue training into their standard BLS session for all first-year medical students. (Between the pilot and the permanent integration, the medical school shifted the first BLS training from the beginning of third year to the beginning of first year, as part of broader curricular reforms.) While the pilot was conducted with third-year students, it is equally appropriate for first-year students, as naloxone rescue can be conducted by lay people and first-responders.

In this way, our institution is taking an active response to the opioid epidemic that we witness daily in our hospitals and communities. Future studies are necessary to monitor the implementation and sustainability of this curriculum and to assess its effect on student attitudes and clinical knowledge. However, we hope that this brief, inexpensive, and accessible training can be replicated at other health professions schools, helping naloxone rescue become a standard part of BLS training and as ubiquitous as community defibrillators for cardiac arrests.

THE ROLE OF STUDENT ADVOCACY

What is noteworthy about this effort—and what we also hope will be replicated elsewhere—is the strong leadership and advocacy demonstrated by medical students. Like much of clinical medicine, advocacy can be taught, but it is better learned through practice. Advocacy may be particularly relevant in emergency medicine teaching, as many of the most vulnerable patients with unmet health care needs receive their care through emergency departments. Medical educators can take steps to promote student advocacy through offering advocacy training courses; considering advocacy experience and successes in faculty hiring; providing students with advocacy role models; including students on committees responsible for curriculum design, strategic direction, and faculty hiring; and helping students feel empowered to voice their concerns. Our experience with BLS training reform also has a number of specific lessons for future student advocates in this area, such as the importance of working in coalitions, conducting a pilot prior to asking for full administration support, and initiating advocacy during a time of SUD curricular reform, when change is easier and faculty may be looking for student input. By fostering student advocacy, medical schools will help prepare a future generation of astute clinicians who can effectively utilize their knowledge and skills to not only deliver individual patient care but also advocate for broader change on behalf of their patients and communities.

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References

1. Rudd RA, Aleshire N, Zibbell JE, Gladden RM. Increases in drug and opioid overdose deaths–United States, 2000-2014. MMWR Morb Mortal Wkly Rep 2016;64:1378–82.
2. Massachusetts Department of Public Health. Data Brief: Opioid-related Overdose Deaths Among Massachusetts Residents. 2017. Available from: http://www.mass.gov/eohhs/docs/dph/stop-addiction/current-statistics/data-brief-overdose-deaths-may-2017.pdf. Accessed May 14, 2017.
3. Walley AY, Xuan Z, Hackman HH, et al. Opioid overdose rates and implementation of overdose education and nasal naloxone distribution in Massachusetts: interrupted time series analysis. BMJ 2013;346:f174.
4. Davis CS, Southwell JK, Niehaus VR, Walley AY, Dailey MW. Emergency medical services naloxone access: a national systematic legal review. Acad Emerg Med 2014;21:1173–7.
5. Davis CS, Carr D, Southwell JK. Engaging law enforcement in overdose reversal initiatives: authorization and liability for naloxone administration. Am J Public Health 2015;105:1530–7.
6. Berland N, Fox A, Tofighi B, Hanley K. Opioid overdose prevention training with naloxone, an adjunct to basic life support training for first-year medical students. Subst Abus 2017;38:123–8.

7. Gatewood AK, Van Wert MJ, Andrada AP, Surkan PJ. Academic physicians' and medical students' perceived barriers toward bystander administered naloxone as an overdose prevention strategy. Addict Behav 2016;61:40–6.
8. Antman KH, Berman HA, Flotte TR, Flier J, Dimitri DM, Bharel M. Developing core competencies for the prevention and management of prescription drug misuse. Acad Med 2016;91:1348–51.
9. el-Guebaly N, Toews J, Lockyer J, Armstrong S, Hodgins D. Medical education in substance-related disorders: components and outcome. Addiction 2000;95:949–57.
10. Cape G, Hannah A, Sellman D. A longitudinal evaluation of medical student knowledge, skills and attitudes to alcohol and drugs. Addiction 2006;101:841–9.
11. Volkow ND, Baler RD, Goldstein RZ. Addiction: pulling at the neural threads of social behaviors. Neuron 2011;69:599–602.
12. Volkow ND, Koob GF, McLellan AT. Neurobiologic advances from the brain disease model of addiction. N Engl J Med 2016;374:363–71.
13. National Drug Early Warning System. Naloxone: State Legislation and Standing Orders. 2016. Available from: https://ndews.umd.edu/resources/naloxone-state-legislation-and-standing-orders. Accessed Jan 21, 2018.
14. Cicero TJ, Ellis MS, Surratt HL, Kurtz SP. The changing face of heroin use in the United States. JAMA Psychiatry 2014;71:821–6.
15. Part 10: Special Circumstances of Resuscitation – ECC Guidelines. Dallas: American Heart Association, 2015.
16. Governor's Medical Education Working Group on Prescription Drug Misuse. Medical Education Core Competencies for the Prevention and Management of Prescription Drug Misuse. Boston: Massachusetts Department of Public Health, 2015.