

Expanded Access to Naloxone Among Firefighters, Police Officers, and Emergency Medical Technicians in Massachusetts

Naloxone is a medication that reverses respiratory depression from opioid overdose if given in time. Paramedics routinely administer naloxone to opioid overdose victims in the pre-hospital setting, and many states are moving to increase access to the medication. Several jurisdictions have expanded naloxone administration authority to nonparamedic first responders, and others are considering that step. We report here on policy change in Massachusetts, where several communities have equipped emergency medical technicians, law enforcement officers, and firefighters with naloxone. (*Am J Public Health*. Published online ahead of print June 12, 2014: e1–e3. doi:10.2105/AJPH.2014.302062)

Corey S. Davis, JD, MSPH, Sarah Ruiz, MSW, Patrick Glynn, MA, Gerald Picariello, and Alexander Y. Walley, MD, MSc

FATAL POISONINGS, MORE

than 90% of which are drug overdoses, have increased by nearly 600% in the past 3 decades to become the leading cause of injury death in the United States.¹

This rise has been driven largely by opioid analgesic medications, which now account for more overdose deaths than heroin and cocaine combined.² Although first responders are not always contacted in time to reverse overdose, emergency department encounters associated with opioids and other sedatives have increased markedly over the past decade.³

To address this epidemic, many states are moving to increase community access to the opioid antagonist naloxone, which can reverse opioid overdose if administered in time.^{4,5} Nearly 200 community-based overdose prevention programs dispensed naloxone as of 2010, and participants reported reversing more than 10 000 overdoses.⁶ In Massachusetts, communities participating in a community naloxone access program had lower opioid overdose death rates than those that did not, strongly suggesting that increased access to naloxone can reduce fatal opioid overdose.⁷

Naloxone is the standard medication for reversing opioid overdose, and is routinely administered by paramedics for that purpose. Although paramedics typically administer naloxone intramuscularly (IM) or intravenously (IV), it can

also be administered intranasally (IN) via a needleless atomizer. IN administration of naloxone has been shown to be similarly effective as IV administration in the prehospital setting,^{8–10} and in one study, IN naloxone administration was faster, better accepted, and perceived to be safer than IV administration.¹¹

In many areas, the first emergency personnel to respond to overdose calls are not paramedics but law enforcement officers, firefighters, and emergency medical technicians (EMTs; medical first responders who have a lower level of training than paramedics). The National Drug Control Strategy has called for equipping first responders to recognize and manage overdoses since 2010, and the Office of National Drug Control Policy has stated that naloxone “should be in the patrol cars of every law enforcement professional across the nation.”¹² Although these first responders in most states are not authorized to administer naloxone, this is rapidly changing; in 2013, 5 states changed law or policy to permit EMTs to administer naloxone, bringing the total up to 13 states.¹³

Access to emergency prehospital care, including the provision of naloxone, may be an important piece in the overdose prevention puzzle. Nationwide, EMTs outnumber paramedics by approximately 3-to-1, and law enforcement officers are even more numerous.¹⁴ In rural areas, EMTs

may be the only medical first responders, and hospital transport times can be long.¹⁵ A study in one large county demonstrated that EMT nasal naloxone administration could reduce time to naloxone delivery by between 5.7 and 10.2 minutes.¹⁶ In tiered EMS departments with high overdose call volume, efficiencies may be created by dispatching EMTs instead of paramedics to overdose calls, reducing response time, and making paramedics available to respond to emergencies that require a higher level of skill and training.^{16,17}

We provide an overview of policy change in 3 communities in Massachusetts that expanded naloxone access to firefighters, EMTs, and police officers, and offer some brief thoughts on what this change might mean for other jurisdictions.

EMERGENCY MEDICAL SERVICES

In Massachusetts, EMS treatment protocols are set by the Office of Emergency Medical Services (OEMS) in the Massachusetts Department of Public Health (MDPH). EMS personnel are licensed at the EMT, EMT-Intermediate (EMT-I), and paramedic levels, although Boston fields only EMTs and paramedics. During peak periods, Boston EMS fields approximately 19 ambulances staffed by EMTs and 5 staffed by paramedics.

Until 2012, OEMS protocols permitted only paramedics to administer naloxone. In response to increases in opioid overdose calls, in 2005, Boston EMS requested and received a special project waiver from OEMS to permit trained EMTs to carry and administer IN naloxone under the Boston EMS Medical Director's standing order. Between 2005 and 2011, several additional EMS services also acquired special project waivers for administration of IN naloxone by EMT and EMT-I personnel.

In 2012, OEMS changed the statewide EMS Pre-Hospital Treatment Protocol to allow municipal EMS medical directors to issue standing orders for IN naloxone administration by EMTs and EMT-I's without requiring a waiver. In 2013, the Boston EMS service responded to 1207 overdose calls, and EMTs administered naloxone in 458 cases. Serious adverse reactions were uncommon, although with generally short transport times, it was possible that not all adverse reactions were captured.

FIREFIIGHTERS AND POLICE

MDPH operates an Overdose Education and Naloxone Distribution (OEND) pilot program for potential opioid overdose bystanders. Program participants are trained in opioid overdose prevention, recognition, and response, including the administration of IN naloxone under the program medical director's oversight and standing order.

Firefighters—Revere, Massachusetts. In 2010, a community coalition in Revere, Massachusetts, that included the mayor and local government officials, fire and police departments, EMS

service, and community advocates requested that Revere firefighters be permitted to administer naloxone through the OEND program. In Revere, a coastal city of approximately 51 000 individuals north of Boston, the fire department is dispatched to all 911 medical calls and often arrives before the publicly contracted private EMS service. After meeting and planning with the local fire department, police department, EMS service, and public health agency, MDPH partnered with Revere to become the first fire department to join the OEND program. All Revere firefighters were trained by MDPH on the proper use of naloxone, and all firefighting vehicles were equipped with IN naloxone kits. Between 2010 and 2013, Revere firefighters administered naloxone 114 times.

Police Officers—Quincy, Massachusetts. As in Revere, community advocates and leaders in Quincy, Massachusetts, requested that the Quincy police department be permitted to participate in the OEND program. In 2010, the department, which serves a coastal city of approximately 92 000 people south of Boston, became the first police department to join the program. Quincy police officers are dispatched to all 911 medical calls. The locally contracted ambulance service has only 2 stations, whereas police officers are much more numerous and continuously patrol the city. Police officers are therefore usually the first responders to arrive at overdose calls. MDPH trained all Quincy officers on overdose recognition and naloxone administration, and all police vehicles and the headquarters building were equipped with naloxone rescue kits. Naloxone is stored in the glove compartment of patrol

cars, which are in use, and therefore kept at a relatively steady temperature 24 hours per day. Between 2010 and 2013, Quincy police administered naloxone 201 times.

As of January 2014, 1 additional police and 2 additional fire departments have joined the OEND program. MDPH supplies naloxone kits, each containing 2 doses of naloxone and an intranasal applicator, to each participating department, provides medical direction, and coordinates training. Each kit costs MDPH approximately \$43. New hire and annual continuing education trainings on overdose response and IN naloxone administration have been incorporated into the education programs of all involved services.

REVIEW

We reported on several communities in Massachusetts that took action to reduce overdose response times by equipping nonparamedic first responders with naloxone. We do not have evidence yet as to whether this policy change reduced opioid overdose death rates or anoxic brain injury, although the community naloxone program in which the police and firefighters participate has been associated with reduced overdose deaths.⁷

Expanding naloxone access to nonparamedic first responders might have positive effects in addition to possibly saving lives. In particular, police involvement in the program expanded the officers' public safety role to include directly enhancing public health. The Quincy police lieutenant who oversees the program believes that departmental participation, combined with a state law that provides limited

immunity to "Good Samaritans" who summon aid in the event of overdose, helps to change public perception of police and encourages individuals to seek help for overdose victims.¹⁸ Active substance users have sought out Quincy police officers to rescue individuals actively overdosing by administering naloxone on numerous occasions since the program was initiated and publicized, which is a change from previous practice.¹⁹

Although naloxone is a relatively safe medication, significant negative effects from administration, while rare, do occur.^{20–22} Chief among these is precipitated withdrawal, which can occur in opioid-dependent individuals. Such withdrawal can cause individuals to become agitated or combative.⁴ However, non-naloxone interventions, including ventilation with a bag valve mask, carry their own risks.²³ Further research on whether complications vary with dose and method of administration, and whether outcomes are improved by reduced time to naloxone administration, is indicated.

CONCLUSIONS

Since nonparamedic first responders are typically the first, and sometimes the only, source of prehospital emergency care, training and authorizing them to administer naloxone under medical direction and as medically indicated is a promising strategy to improve overdose response. The initial experience in several Massachusetts communities with first responder naloxone provides models for other jurisdictions to permit agency medical directors to use their clinical judgment to expand naloxone administration to nonparamedic first responders as

medically appropriate. In most states, policy change to permit this decision to be made at the level of the agency medical director can be accomplished without legislative action. Further study is warranted to determine the public health benefits and cost-effectiveness of expanding naloxone administration authority to first responders. ■

About the Authors

Corey S. Davis is with the Network for Public Health Law—Southeastern Region, Carrboro, NC. Sarah Ruiz is with the Massachusetts Department of Health, Bureau of Substance Abuse Services, Boston. Patrick Glynn is with the Special Investigations and Narcotics Unit, Quincy, MA. Police Department. Gerald Picariello is with the Revere, MA, Fire Department. Alexander Y. Walley is with the Clinical Addiction Research and Education Unit, Boston University School of Medicine and the Massachusetts Department of Health, Opioid Overdose Prevention Pilot Program, Boston.

Correspondence should be sent to Corey S. Davis, Network for Public Health Law—Southeastern Region, 101 E Weaver St G-7, Carrboro, NC 27510 (e-mail: cdavis@networkforphl.org). Reprints can be ordered at <http://www.ajph.org> by clicking the "Reprints" link.

This article was accepted April 15, 2014.

Contributors

C. S. Davis conceptualized the article. C. S. Davis and A. Y. Walley wrote the first draft. S. Ruiz provided data and reviewed drafts. P. Glynn and G. Picariello provided data and insight.

Acknowledgments

We thank Sophia Dyer, MD, for providing data and reviewing drafts of the article.

Human Participant Protection

No institutional review board approval was necessary for this study because it did not involve human participants.

References

- Warner M, Chen LH, Makuc DM, Anderson RN, Minino AM. Drug poisoning deaths in the United States, 1980–2008. *NCHS Data Brief*. 2011;81:1–8.
- Centers for Disease Control and Prevention. Vital signs: overdoses of prescription opioid pain relievers—United States, 1999–2008. *MMWR Morb Mortal Wkly Rep*. 2011;60(43):1487–1492.
- Coben JH, Davis SM, Furbee PM, Sikora RD, Tillotson RD, Bossarte RM. Hospitalizations for poisoning by prescription opioids, sedatives, and tranquilizers. *Am J Prev Med*. 2010;38(5):517–524.
- Kim D, Irwin KS, Khoshnood K. Expanded access to naloxone: options for critical response to the epidemic of opioid overdose mortality. *Am J Public Health*. 2009;99(3):402–407.
- Davis C, Webb D, Burreis S. Changing law from barrier to facilitator of opioid overdose prevention. *J Law Med Ethics*. 2013;41(suppl 1):33–36.
- Centers for Disease Control and Prevention. Community-based opioid overdose prevention programs providing naloxone - United States, 2010. *MMWR Morb Mortal Wkly Rep*. 2012;61(6):101–105.
- 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.
- Merlin MA, Saybolt M, Kapitanyan R, et al. Intranasal naloxone delivery is an alternative to intravenous naloxone for opioid overdoses. *Am J Emerg Med*. 2010;28(3):296–303.
- Kerr D, Kelly AM, Dietze P, Jolley D, Barger B. Randomized controlled trial comparing the effectiveness and safety of intranasal and intramuscular naloxone for the treatment of suspected heroin overdose. *Addiction*. 2009;104(12):2067–2074.
- Barton ED, Colwell CB, Wolfe T, et al. Efficacy of intranasal naloxone as a needleless alternative for treatment of opioid overdose in the prehospital setting. *J Emerg Med*. 2005;29(3):265–271.
- McDermott C, Collins NC. Prehospital medication administration: a randomised study comparing intranasal and intravenous routes. *Emerg Med Int*. 2012;2012:476161.
- The White House. *Announcing the Opioid Overdose Toolkit*. Washington, DC: Office of National Drug Policy; 2013.
- Davis CS, Southwell J, Niehaus V, Walley A, Dailey M. Emergency medical service naloxone access: a national systematic legal review. *Acad Emerg Med*. In press.
- National Highway Traffic Safety Administration. *EMS Workforce for the 21st Century: A National Assessment*. Washington, DC: National Highway Traffic Safety Administration; 2008.
- Rawlinson C, Crews P. *Access to Quality Health Services in Rural Areas Emergency Medical Services: A Literature Review*. College Station, TX: Texas A&M University System Health Science Center, School of Rural Public Health, Southwest Rural Health Research Center; 2003.
- Belz D, Lieb J, Rea T, Eisenberg MS. Naloxone use in a tiered-response emergency medical services system. *Prehosp Emerg Care*. 2006;10(4):468–471.
- Tintinalli JCP, Hilliman J. *EMS: A Practical Global Guidebook*. Shelton, CT: People's Medical Publishing House; 2010.
- Glynn P. Police report naloxone highly effective at reducing drug deaths. In: Simon S, ed. *Weekend Edition Saturday*: National Public Radio. February 15, 2014.
- Leger D. Police carry special drug to reverse heroin overdoses. *USA Today*; February 3, 2014. Available at: <http://www.usatoday.com/story/news/nation/2014/01/30/police-use-narcan-to-reverse-heroin-overdoses/5063587>. Accessed March 4, 2014.
- Chamberlain JM, Klein BL. A comprehensive review of naloxone for the emergency physician. *Am J Emerg Med*. 1994;12(6):650–660.
- Hsu W, Rao RB, Nelson LS. Naloxone hazards overstated. *J Toxicol Clin Toxicol*. 1997;35(2):215–217, 219–220.
- Osterwalder JJ. Naloxone—for intoxications with intravenous heroin and heroin mixtures—harmless or hazardous? A prospective clinical study. *J Toxicol Clin Toxicol*. 1996;34(4):409–416.
- Aufderheide TP, Sigurdsson G, Pirralo RG, et al. Hyperventilation-induced hypotension during cardiopulmonary resuscitation. *Circulation*. 2004;109(16):1960–1965.