

Naloxone: An Opportunity for Another Chance

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ABSTRACT

Naloxone, an opioid antagonist, used clinically for decades, is now becoming available in the homes of those with potential for opioid overdose. When opioid levels are too high, respiratory depression occurs. This can be temporarily reversed with naloxone, extending survival until medical help can arrive. By providing patients with naloxone information, an overdose victim's family or friends can potentially save their life. Information highlighted includes the need for naloxone, how opioids and naloxone work in the body, what an overdose looks like, the forms of naloxone with directions for use, and what needs to be done in an overdose.

Keywords: drug abuse, naloxone, opioids, overdose

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INTRODUCTION

Naloxone [also known as Narcan (Du Pont Pharma) or Evzio (Kaléo, Inc.)] is an opioid antagonist that has been approved by the United States Food and Drug Administration (FDA) for opioid overdoses since 1971: why are we hearing so much about it right now? Opioid overdoses and deaths continue to increase. To reduce these deaths, legislation is regularly being passed at the state level to get naloxone in the hands of the family and friends of those at risk for overdose. Currently, there are 37 jurisdictions with laws regarding naloxone access to individuals at risk of an opioid overdose (Figure 1).¹ Beyond state legislation, both the US Senate and House of Representatives again introduced the Comprehensive Addiction Recovery Act (CARA) of 2015, which would provide resources and incentive programs for drug treatment at the state and local level. This includes recovery efforts such as increasing naloxone availability to law enforcement agencies and other emergency personnel.² In addition, the Department of Justice published a naloxone toolkit for law enforcement in its efforts to reduce opiate overdoses.³ The push for naloxone is growing at all levels; from medical staff, to law enforcement, to family and

friends, naloxone is gaining attention for its life-saving implications.

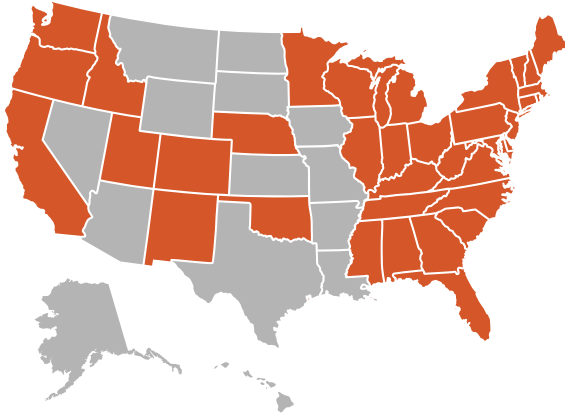
BACKGROUND

According to the US Centers for Disease Control and Prevention, prescriptions for opioids in 2013 were 4 times higher than in 1999, with no increase in the amount of pain reported by patients. Since 1999, drug overdose deaths have more than doubled in the US, reaching 43,982 in 2013 alone, with 16,235 attributed to prescription opioid analgesics and 8,257 to heroin.^{3,4} Seventy-one percent of overdose deaths, secondary to prescription medications in 2013, involved opioids, with heroin overdoses increasing 4-fold from 2002 to 2013.^{3,4} In response to these rising numbers, several state laws now allow naloxone kits to be provided to laypersons by medical clinics and pharmacies.¹ Although many organizations have been providing naloxone kits to laypersons for several years, the number of drug overdose programs and organizations providing these kits nearly doubled between January 2013 and June 2014 alone. In July 2014, the Harm Reduction Coalition surveyed 140 managers of such organizations in the US regarding naloxone kits provided and overdose reversals between 1996 and June 2014. Laypersons receiving

Figure 1. Naloxone access laws.¹

Naloxone Access Laws

As of July, 2015, thirty-seven jurisdictions in the U.S. have laws regarding naloxone access to individuals at risk of an opioid overdose.



37 JURISDICTIONS:

AL, CA, CO, CT, DC, DE, FL, GA, ID, IL, IN, KY, MA, MD, ME, MI, MN, MS, NC, NE, NH, NJ, NM, NY, OH, OK, OR, RI, UT, TN, PA, SC, VA, VT, WA, WI, WV

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kits numbered 152,283, and 26,463 overdose reversals using naloxone were reported. The study concluded that naloxone kits given to laypersons with appropriate opioid overdose training can help reduce mortality associated with opioid overdose.⁵

OPIOIDS

Mechanism of Action

Opioids bind the mu receptors in the central nervous system (CNS). Mu receptors mediate analgesia and addiction centers of the brain. When opioids bind to mu receptors, there are numerous physiologic effects, including pain relief, mood changes, drowsiness, strong feelings of elation or unease, decreased respiration, cough, constricted pupils, decreased peristalsis in the gastrointestinal tract, and stimulation of the chemoreceptors that control nausea and vomiting. As higher amounts of opioid are ingested and more mu receptors become bound, an increase in opioid physiologic effects may be seen.⁶ Common opioids are listed in [Table 1](#).

Adverse Effects

Opioids can bind mu receptors throughout the body or to many receptors within the CNS, increasing the likelihood of undesired side effects, which most

Table 1. Common Opioids¹¹

Generic	Brand Name ^a	Half-life (hours)
Buprenorphine	Buprenex, Butrans	24-60
Codeine	Tylenol with Codeine #3, Tylenol with Codeine #4, Capital/Codeine	4
Fentanyl	Abstral, Actiq, Duragesic, Fentora, Ionsys, Lazanda, Onsolis, Subsys	2-4
Hydrocodone	Lorcet, Lortab, Maxidone, Norco, Stagesic, Verdrocet, Vicodin, Xodol, Zydol/budone, Reprexain, Vicoprofen, Xylon	3-5
Hydromorphone	Dilaudid	2-3
Meperidine	Demerol, Meperitab	2.5-4
Methadone	Dolophine, Methadose	8-59
Morphine	MSContin, Astramorph, Duramorph, Infumorph	2-4
Oxycodone	Roxicodone, Endocet, Magnacet, Percocet, Primlev, Roxicet, Endodan, Percodan	2-4
Oxymorphone	Opana	7-9

The illicit drug heroin is also an opioid that can be treated with naloxone.

^a Brand name (US only).

commonly include nausea, vomiting, dizziness, headache, fatigue, pruritus, constipation, pinpoint pupils, urinary retention, and respiratory depression.⁶ An overdose from opioids leads to significant depression of the respiratory centers in the brain, resulting in very slow or complete cessation of breathing.

Signs and Symptoms of Opioid Overdose

Symptoms of a person that has overdosed include: making snoring or choking sounds; diminished and shallow breathing; unresponsiveness even when shaken or upon sternal rub; a slow pulse or low blood pressure; and pale, clammy skin that may even turn a blue-gray color. Another sign of opioid overdose can be pinpoint pupils ([Table 2](#)).⁷ Overdoses can occur in patients who are prescribed too high of a dose, accidentally take too much of the prescribed opioid, accumulate opioids due to changes in metabolism, take medications prescribed to someone else, or use illegal drugs like heroin. Anyone taking

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