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Naloxone Therapy in Opioid Overdose Patients: Intranasal or Intravenous?

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**NALOXONE THERAPY IN
OPIOID OVERDOSE
PATIENTS: INTRANASAL
OR INTRAVENOUS?
A RANDOMIZED CLINICAL TRIAL**

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OVERVIEW

- There is an opioid crisis in the United States
- Naloxone is the drug of choice for reversing a suspected opioid overdose
- The intranasal route could be a viable option for the use of naloxone
- Intranasal could prove to be quicker with less skill needed to give while putting the healthcare workers, police, and firefighters at less risk of blood borne pathogen exposure

KEY TERMS

- Opioid – a class of drug that interacts with the opioid receptors in the brain and body, often causing a euphoric state to the user
- Overdose – when too much of a drug is in a users system - can cause severe negative physiologic effects (coma, respiratory/cardiac arrest, death)
- Congener – a variant of a common chemical structure
- Antagonist – interferes with the physiological action of another substance
- Receptors – a cell that accepts and transmits a signal to sensory nerves
- Glasgow Coma Scale (GCS) – method for evaluating conscious level impairment
- Intravenous – administered through a vein
- Intranasal – administered through the nasal cavity
- Intramuscular – administered in a muscle

OPIOID OVERDOSE EPIDEMIC

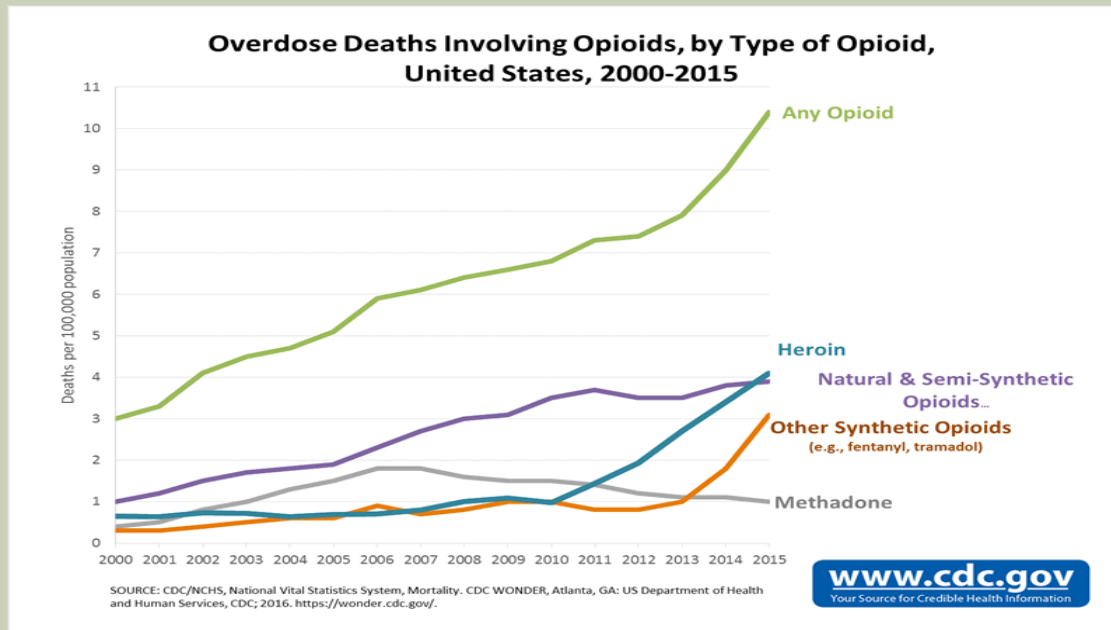
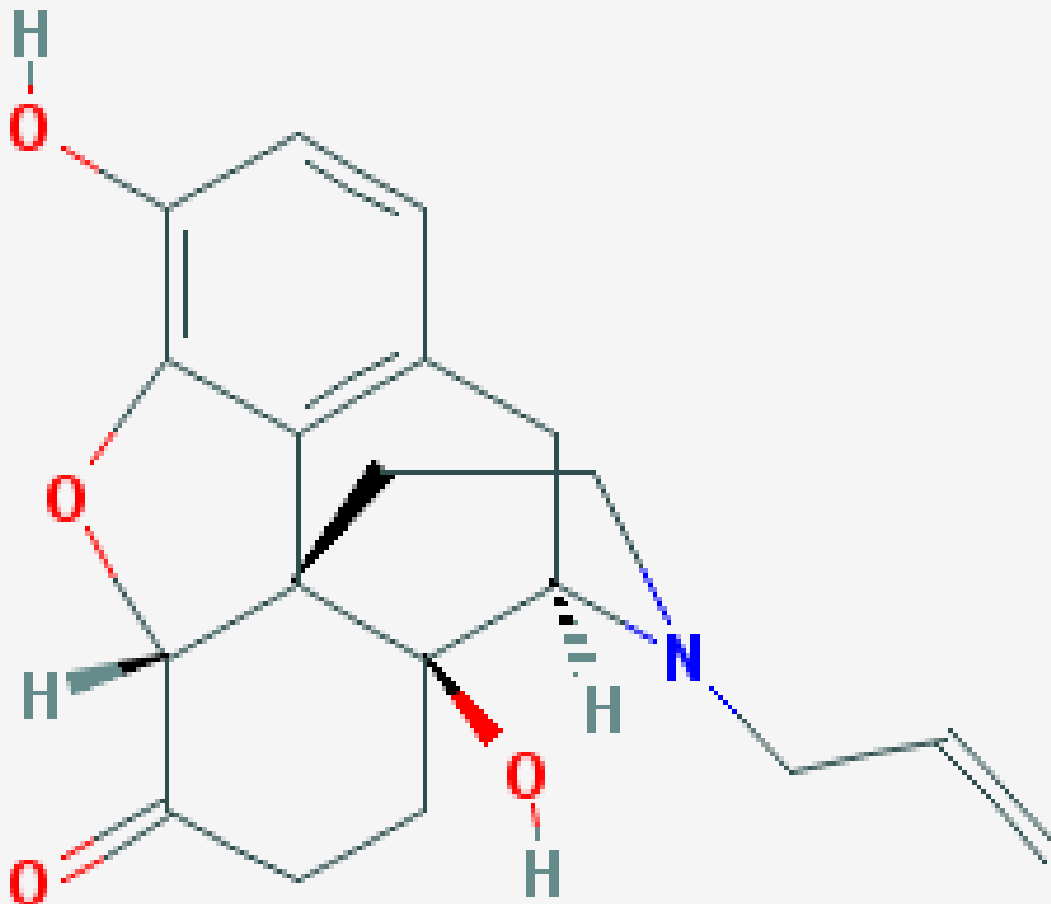


Chart of Overdose Deaths²

- In 2015, 33,000 people died from an opioid overdose
- Not just illegal opioids are responsible for deaths
 - Methadone, oxycodone and hydrocodone are the most commonly abused prescription drugs
- Heroin use is on the rise
- One recommended action by the CDC is to allow the use of naloxone to be expanded¹



CHEMICAL STRUCTURE OF NALOXONE³

Molecular
formula:
C₁₉H₂₁N₀₄

Molecular
weight:
327.38 g/mol

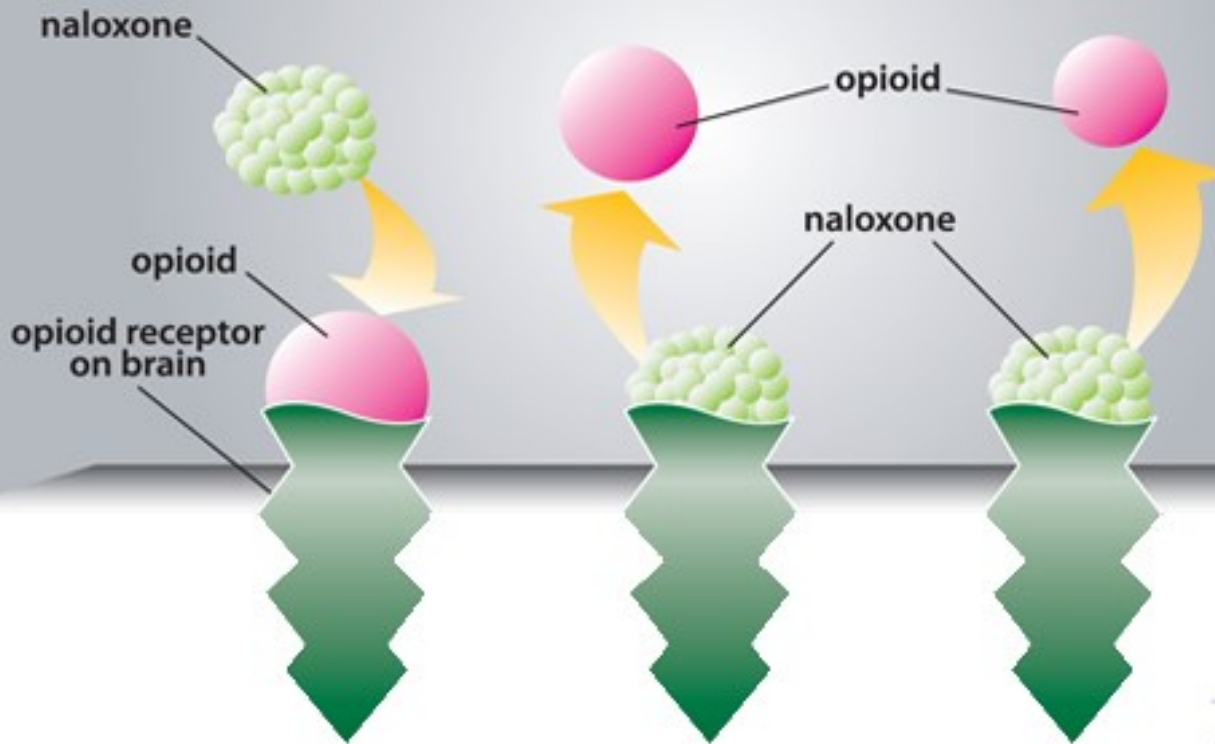
WHAT IS NALOXONE

- Naloxone is an opioid antagonist and is used for treatment of opioid overdose
 - It is a competitive antagonist for the opioid (mu) receptors in the brain
 - The mu receptors are where opioids bind themselves
 - Naloxone displaces the opioid and attaches to the receptors, not allowing the opioid to reattach
 - The effects of Naloxone last for ~30-90 minutes (re-dosing may be required) allowing for the respiratory depression caused by the opioid to be suppressed
 - Naloxone is a very safe drug with no risk for dependency
 - Routes for delivery include intranasal (IN), intravenous (IV), intramuscular (IM)⁴

Naloxone reversing an overdose

Naloxone has a stronger affinity to the opioid receptors than opioids, such as heroin or oxycodone, so it knocks the opioids off the receptors for a short time (30-90 minutes).

This allows the person to breathe again and reverse the overdose.



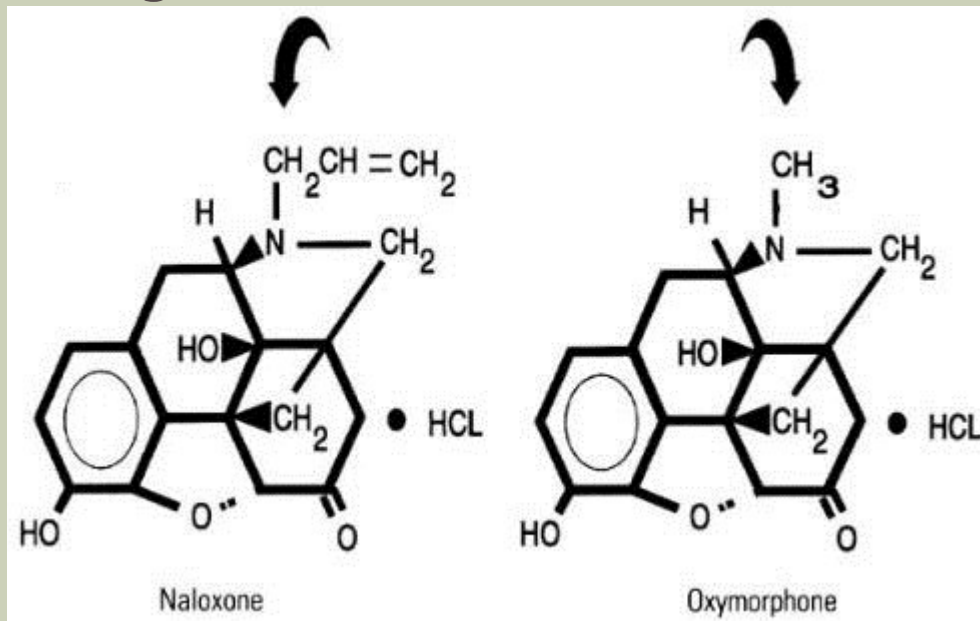
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INSTITUTE

HOW
NALOXONE
WORKS⁵

MORE ABOUT NALOXONE

- Naloxone is a “synthetic congener of oxymorphone”
- The difference is an allyl group replaces the methyl group that is on the nitrogen atom⁶



Chemical Structure Naloxone/Oxymorphone⁷

INTRODUCTION TO THE STUDY

- Generally speaking, IV access can be difficult in IV drug users resulting in a delay in IV naloxone treatment
- Patients who have cardiovascular compromise also are difficult to obtain IV access
- There is a need for alternative delivery methods
- Other drugs have been proven effective when delivered IN route⁷

THE CLINICAL TRIAL

- The trial was designed to compare the effects of IN vs IV administration
- They looked at 100 patients, ages 15-50, who had an opioid overdose
 - There were 2 groups that were both given 0.4 mg naloxone either IV or IN
 - Patient who failed to respond after the first dosing were re-dosed via the same route with another 0.4 mg
 - Responses were gauged using the Glasgow coma scale (GCS) and level of consciousness (LOC), vital signs, arterial blood oxygen saturation, side-effects and how long they patient was hospitalized with LOC being the primary measure⁷

RESULTS OF THIS STUDY

- There was not significant difference between the IN route and the IV route of administration
 - They were both effective
- The IN route resulted in a better response with regards to LOC
- There was less agitation reported amongst the IN patients⁷

LIMITATIONS AND DISCREPANCIES

- There are some discrepancies between this study and other studies of this type
 - Kerr et al. does not show there to be enough evidence to support first line IN dosing whereas this, and other studies, disagree
 - Merlin et al. reported no significant difference between IV or IN dosing
- Further studies need to be performed as this was a single institution and may not be representative of the population as a whole⁷

BOTTOM LINE

- Thousands of people die every year related to the opioid overdose epidemic
- There is evidence that supports the use of IN naloxone administration
- IV access is sometimes very difficult if not impossible in some patients
- IV access potentially puts healthcare workers at risk for blood borne pathogens
- It is possible to give IN naloxone without specialized training meaning that lay people could be able to give IN naloxone if needed
- More research needs to and should be done⁷

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