



Model EMS Protocol Relating to Naloxone Administration by EMS Personnel

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**Naloxone Evidence Based Guideline Development &
Dissemination (DTNH22-17-H-00031)**
Deliverable for Condition B.7

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Opioid Poisoning/Overdose

Aliases

Carfentanil, Darvocet[®], Demerol[®], Dilaudid[®], drug abuse, EVZIO[®], fentanyl, heroin, hydrocodone, hydromorphone, meperidine, methadone, morphine, naloxone, Narcan[®], opiate, opioid, overdose, oxycodone, Oxycontin[®], Percocet[®], Percodan[®], propoxyphene, Suboxone, U-47700, Vicodin[®]

Patient Care Goals

1. Rapid recognition and intervention of a clinically significant opioid poisoning or overdose
2. Prevention of respiratory and/or cardiac arrest

Patient Presentation

Inclusion Criteria

Patients decreased mental status, and respiratory depression of all age groups with known or suspected opioid use or abuse.

Exclusion Criteria

Patients with altered mental status exclusively from other causes (e.g. head injury, or hypoglycemia).

Patient Management

1. Don appropriate PPE^{1, 2}
2. Be aware that unsecured hypodermic needles may be on scene and if so that there is a higher risk of needle sticks during the management of this patient population which may also have an increased incidence of blood-borne pathogens
3. Therapeutic interventions to support the patient's airway, breathing, and circulation should be initiated prior to or simultaneously with the administration of naloxone
4. If possible, identify specific substance (including immediate release versus sustained release), the route and time of exposure, and quantity
5. Obtain and document pertinent cardiovascular history or other prescribed medications for underlying disease
6. Naloxone, an opioid antagonist, should be administered to patients with respiratory depression in a suspected or confirmed opioid overdose
7. Naloxone administration via the intravenous (IV) route provides the most predictable bioavailability, flexibility in dosing/titration, and clinical response
8. Naloxone administration via the intranasal or intramuscular routes provide additional options of medication delivery
9. Intranasal and intramuscular dosing are similarly efficacious. Intranasal is preferred over intramuscular due to:
 - a. ability to titrate multiple smaller doses to avoid precipitating withdrawal
 - b. avoidance of provider risk of needle injury

10. If naloxone was administered to the patient prior to the arrival of EMS, obtain the dose and route through which it was administered and, if possible, bring the devices containing the dispensed naloxone with the patient along with all other medications on scene

Assessment

1. Assess the patient's airway, breathing, circulation, and mental status
2. Support the patient's airway by positioning, oro- or nasopharyngeal airway adjuncts, oxygen administration, and ventilatory assistance with a bag valve mask if necessary
3. Assess the patient for other etiologies of altered mental status including hypoxia (pulse oximetry less than 94%), hypoglycemia, hypotension, and traumatic head injury
4. Legally prescribed opioids are also manufactured as an adhesive patch for transdermal absorption, and if found, should be removed from the skin

Treatments and Interventions

1. Critical resuscitation (opening and/or maintaining the airway, provision of oxygen, ensuring adequate circulation) should be performed prior to or simultaneously with naloxone administration
2. If the patient has respiratory depression from a confirmed or suspected opioid overdose, consider naloxone administration
 - a. The administration of the initial dose or subsequent doses can be incrementally titrated until respiratory depression is reversed
3. Naloxone can be administered via the IV, IM, or IN routes
 - a. Adults: The typical initial adult dose ranges between 0.4-2 mg IV, IM or up to a dose of 4 mg IN
 - b. Pediatrics: The pediatric dose of naloxone is 0.1 mg/kg IV, IM, or IN
 - i. Maximum dose of 2 mg IV or IM
 - ii. Maximum dose of 4 mg IN
 - c. Naloxone provided to laypersons and non-medical first responders via public access programs or prescriptions may be provided in various pre-measured doses via an auto-injector, nasal spray, or in a needleless syringe with a mucosal atomization device
 - d. Naloxone nasal spray is manufactured in a single-use bottle
 - e. For the intranasal route when naloxone is administered via a needleless syringe (preferably with a mucosal atomization device), divide administration of the dose equally between the nostrils to a maximum of 1 mL per nostril
 - f. The administration of naloxone should be titrated until adequate respiratory effort is achieved. Titration is best achieved with IV or atomized syringe IN administration
 - g. Doses may be repeated every 2-5 minutes by the IV, IN and IM routes.
4. High-potency opioids [see **Key Considerations**] may require higher and/or more frequently administered doses of naloxone to reverse respiratory depression and/or to maintain adequate respirations
5. Regardless of the doses of naloxone administered, airway management with provision of adequate oxygenation and ventilation is the primary goal in patients with confirmed or suspected opioid overdose

Patient Safety Considerations

1. Clinical duration of naloxone
 - a. The clinical opioid reversal effect of naloxone is limited and may end within an hour whereas opioids often have a duration of 4 hours or longer
 - b. Monitor the patient for recurrent respiratory depression and decreased mental status
2. Opioid withdrawal
 - a. Patients with altered mental status secondary to an opioid overdose may become agitated or violent following naloxone administration due to acute opioid withdrawal. Therefore, the goal is to use the lowest dose possible to restore spontaneous respirations but avoid precipitating withdrawal
 - b. Be prepared for this potential violent scenario and take the appropriate measures in advance to ensure and maintain scene safety
3. EMS providers should be prepared to initiate airway management before, during, and after naloxone administration and to provide appropriate airway support until the patient has adequate respiratory effort
4. Patient Transport
 - a. Shorter-acting opioids (heroin/fentanyl): patients with a prompt response should be encouraged to allow transport to an emergency department for observation and to begin engagement in treatment for opioid use disorder.
 - b. Longer-acting opioids (particularly overdoses of oral formulations): patients may exhibit a fairly rapid response to naloxone; however, these drugs pose a serious risk of re-sedation after the naloxone is metabolized. All such patients should be transported to an emergency department for monitoring, repeat naloxone, and further support as needed.
 - c. Patients with a slow or only partial response to naloxone may be suspected of ingesting a fentanyl analog or buprenorphine, or of the use of co-ingestants (alcohol, benzodiazepines, etc.). All such patients should be transported to an emergency department for monitoring, repeat naloxone administration, and further support as needed.
 - d. Patients who are alert and are considered to have capacity to refuse transport should all be encouraged to seek care immediately. If he/she refuses transport, a naloxone rescue kit should be left with the patient and family/friends as well as contact information for local treatment resources for opioid use disorder.

Notes and Educational Pearls

Key Considerations

1. The essential feature of opioid overdose requiring EMS intervention is respiratory depression or apnea
2. Some opioids have additional toxic effects (e.g. methadone can produce QT prolongation, and tramadol can produce seizures)
3. Overuse and abuse of prescribed and illegal opioids has led to an increase in accidental and intentional opioid overdoses
4. DEA and Opioids:

- a. Legally prescribed opioids are controlled under the Drug Enforcement Administration (DEA)
 - b. Opioids have a high potential for abuse, but have an accepted medical use in patient treatment and can be prescribed by a physician
 - c. Frequent legally prescribed opioids include codeine, fentanyl, hydrocodone, morphine, hydromorphone, methadone, morphine, oxycodone, and oxymorphone
 - d. Opioid derivatives, such as heroin, are illegal in the United States
5. Opioid combinations:
- a. Some opioids are manufactured as a combination of analgesics with acetaminophen, acetylsalicylic acid (aspirin), or other substances
 - b. In the scenario of an overdose, there is a potential for multiple drug toxicities
 - c. Examples of opioid combination analgesics:
 - i. Vicodin[®] is a combination of acetaminophen and hydrocodone
 - ii. Percocet[®] is a combination of acetaminophen and oxycodone
 - iii. Percodan[®] is a combination of aspirin and oxycodone
 - iv. Suboxone[®] is a combination of buprenorphine and naloxone
6. High-potency opioids:
- a. Fentanyl is 50-100 times more potent than morphine - it is legally manufactured in an injectable and oral liquid, tablet, and transdermal (worn as a patch) forms; however, much of the fentanyl adulterating the heroin supply are illegal fentanyl analogs such as acetyl fentanyl
 - b. Carfentanil is 10,000 times more potent than morphine
 - i. It is legally manufactured in a liquid form; however, a powder or tablet is the most common form of this drug that is illegally produced
 - ii. In the concentration in which it is legally manufactured (3 mg/mL), an intramuscular dose of 2 mL of carfentanil will sedate an elephant
 - c. Synthetic opioids (e.g. W-18, are 10,000 times more potent than morphine) – many synthetic opioids are not detectable by routine toxicology screening assays
7. The IV route most easily allows titration of the dose
8. The IN route has the benefit of no risk of needle stick to the provider
9. An IN dose should be administered while the provider obtains IV access
10. Patients with opioid overdose from fentanyl or fentanyl analogs may rapidly exhibit chest wall rigidity and require positive end expiratory pressure (PEEP), in addition to multiple and/or larger doses of naloxone, to achieve adequate ventilation
11. In responding to most suspected opioid overdoses, standard PPE medical gloves are sufficient protection
12. PPE that provides additional cutaneous, respiratory, or ocular protection (e.g. eye protection, fitted face masks, surgical gowns) may be considered when providing care in scenes where opioids may be present in the powdered, aerosolized, or liquid forms or in jurisdictions experiencing an increased incidence of overdose from high potency opioids.^{1,2}

Pertinent Assessment Findings

1. In the opioid overdose scenario, signs and symptoms include:
 - a. Respiratory depression
 - b. Decreased mental status
 - c. Miosis (pinpoint pupils) with the majority of opioids (e.g. miosis is not a clinical finding in meperidine or propoxyphene overdoses)
2. Additional assessment precautions:
 - a. The risk of respiratory arrest with subsequent cardiac arrest from an opioid overdose as well as hypoxia (pulse oximetry *less than* 94%), hypercarbia, and aspiration may be increased when other substances such as alcohol, benzodiazepines, or other medications have also been taken by the patient
 - b. **Pediatric Considerations:** The signs and symptoms of an opioid overdose may also be seen in newborns who have been delivered from a mother with recent or chronic opioid use. Neonates who have been administered naloxone for respiratory depression due to presumed intrauterine opioid exposure may be narcotic dependent and should be monitored closely for seizures

Quality Improvement

Associated NEMIS Protocol(s) (eProtocol.01)

- 9914219 – Medical-Opioid Poisoning/Overdose

Key Documentation Elements

- Rapid and accurate identification of signs and symptoms of opioid poisoning
- Pulse oximetry (oxygen saturation) and, if available, capnometry or capnography
- Blood glucose assessment
- Naloxone dose and route of administration
- Clinical response to medication administration
- Number of doses of naloxone to achieve a clinical response

Performance Measures

- Increase in pulse oximetry after EMS care
 - Increase in Glasgow Coma Scale (GCS) after EMS care
 - Increase in respiratory rate after EMS care
 - Patients with clinical opioid overdose who did not receive naloxone (under treatment)
 - Patients without clinical opioid overdose who received naloxone (over treatment)
 - Patients with clinical opioid overdose who received naloxone (appropriate treatment)
 - Patients who were treated with naloxone who refused recommended transport to ED
 - Patients with clinical opioid overdose who received ventilatory support within five minutes of first EMS unit's arrival on scene
 - Patients who exhibit adverse effects after naloxone administration
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