



دانشگاه علوم پزشکی و خدمات بهداشتی درمانی مازندران

Pediatric Opium Toxicity

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Definition

- Opioid poisoning is a clinical diagnosis (linking data from the patient's medical and presenting history, physical examination, and, perhaps, response to naloxone therapy)
- Laboratory data (blood and urine testing) are not necessary for the management of patients with opioid poisoning, other than to assess for concurrent medical conditions or to evaluate complications.
- Co-ingestants, such as ethanol and acetaminophen or aspirin, also must be considered, and laboratory testing ordered as indicated.

Clinical effects of Opium

System	Clinical effect
Cardiovascular	Bradycardia, QT interval prolongation (methadone, LAMA) Orthostatic hypotension, Hypotension (histamine release) Peripheral vasodilation Myocardial damage (necrotizing angiitis)
Dermatologic	Flushing, Pruritus
Endocrinologic	Reduced ADH release, Increased Prolactin release, Reduced Gonadotropin release, reduced adrenal function
Gastrointestinal	Increased anal sphincter tone, Nausea and vomiting, Increased biliary tract pressure Reduced gastric acid secretion, Reduced bowel motility, Constipation
Neurologic	Analgesia, Antitussive Euphoria, Dysphoria Sedation, Lethargy, Drowsiness, Coma Seizure (meperidine, propoxyphene, morphine, tramadol but most likely to be caused by hypoxia) Movement Disorders (muscular rigidity, myoclonus)
Ophthalmic	Miosis (except for: meperidine, propoxyphene, pentazocine) Mydriasis or variable pupil (in secondary hypoxic brain injury, diphenoxylate + atropine, scopolamine + heroin, cocaine + heroin)
Pulmonary	Respiratory depression Bronchospasm Acute respiratory distress syndrome (re-expansion)

Comparison of opioid analgesics with respect to dosage and duration of action

Drug	Equianalgesic doses		Plasma half-Life (HR)	Duration of effect (HR)
	(mg)			
	PO	Parenteral		
Codeine	200	100–130	2–4	3–5
Fentanyl (Sublimaze [®])	Variable ^a	0.1	3–4	<1
Heroin (diacetylmorphine)	60	5	0.5	2–3
Hydromorphone (Dilaudid [®])	7.5	1.5	2–3	3–5
Methadone (Dolophine [®])	Variable ^b	Variable ^b	15–40	12–24
Morphine	30	10	2	2–3
Oxycodone	20–30	N/A	2	3–5

Definition

- Miosis is not present in all opioid users and cannot be used diagnostically
- A therapeutic trial in non-addicted patients with depressed respiration or mental status generally is warranted.

Differential diagnosis

- The differential diagnosis of opioid poisoning includes other causes of depressed mental status, such as intracranial hemorrhage; postictal state; sepsis; post-anoxic encephalopathy; hypoglycemia; hypothermia; and poisoning by various agents, including carbon monoxide, clonidine, and other imidazolines, phenothiazines, atypical antipsychotics, and sedative-hypnotics (benzodiazepines and ethanol).
- Of note, some severely hypotensive patients presumed to be septic turn out to be late presenting opioid intoxicated patients.

Prevalence

- For children younger than 6 years, opioids accounted for 94% of the analgesic-related deaths (methadone, 52%; oxycodone or hydrocodone, 26%; fentanyl, 10%; and morphine, 10%).
- In adolescents, opioids accounted for 55% of the analgesic-related deaths (methadone, 22%; oxycodone or hydrocodone, 16%).

Complications

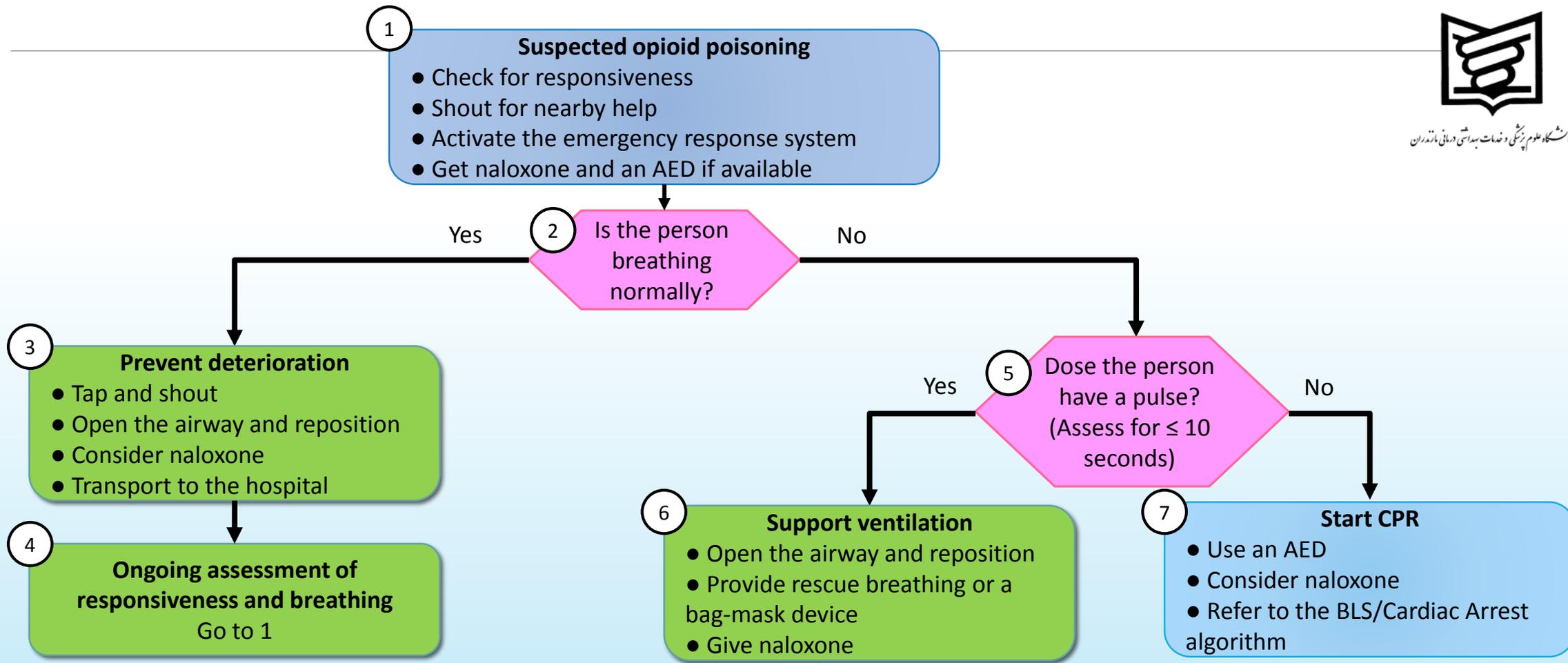
One Pill, Can Kill

New approach (AHA 2020)

Opioid-associated emergency for healthcare providers



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There were no pediatric data supporting these recommendations; however, due to the urgency of the opioid crisis, the adult recommendations should be applied to children.

Treatment

➤ A

➤ B

➤ C

➤ D

➤ Activated charcoal?

➤ Gastric lavage?

Treatment

The only opioid-exposed patients likely to benefit from more aggressive gastrointestinal decontamination are those who are attempting to conceal large amounts of drug in their gastrointestinal tract (e.g., body packers)

Treatment

□ Dosing of Naloxone:

- Opioid dependence unlikely: 0.4 mg IV, escalating to 10 mg
- Opioid dependence possible: 0.04–0.05 mg IV, additional doses every 1–2 min until **response** or signs of withdrawal

- Pediatric doses*: 0.1 mg/kg for birth to 5 years of age (<20 kg weight)
2 mg per dose for weight >20 kg
...not exceeding 10 mg cumulatively

Treatment

□ Dosing of Naloxone:

- ❖ Positive response, short-acting opioid suspected: observe for re-sedation for 6 h Positive response.
- ❖ Re-sedation: redoes as needed or continuous infusion starting at two-thirds of the initial reversal dose hourly, titrated to effect IV, intravenously.

Treatment

- ❑ Naloxone is not only beneficial in treating tramadol-induced respiratory depression and somnolence but also preventing tramadol-induced seizures in both animal models and humans.
- ❑ Standard naloxone dosing will often not result in clinical improvement in patients with buprenorphine toxicity

Treatment

- If opioid withdrawal occurs, do not attempt to reverse the withdrawal symptoms with another opioid. Allow naloxone's effect to wane spontaneously (typically 20–60 min).
- Patients who respond to naloxone administration may develop recurrent central nervous system and/ or respiratory depression and require longer periods of observation before safe discharge.

Treatment

➤ routes of naloxone administration:

- Intramuscular
- Intravenous
- Intranasal
- Intra-tracheal
- Subcutaneous

...

Treatment

- **The goal** of naloxone therapy is not necessarily complete arousal; rather, **the goal is** reinstatement of adequate spontaneous ventilation.

- Because precipitation of withdrawal is potentially detrimental and often unpredictable, the lowest practical naloxone dose should be administered initially, with rapid escalation as warranted by the clinical situation.

Treatment

➤ In the absence of a confirmatory history or diagnostic clinical findings, the cautious empiric administration of naloxone may be both diagnostic and therapeutic.

➤ Partial response to Naloxone:

Asphyxia?

Some opioids?

Clonidine?

Other drugs?

Special consideration in Neonates / children

- **Neonatal** opioid withdrawal syndrome occurs in newborns of opioid-using mothers.
- Sign: hyperirritability; GI dysfunction; respiratory distress; and vague autonomic symptoms, including yawning, sneezing, mottling, and fever. Myoclonic jerks or seizures may also signify neurologic irritability.
- Withdrawing infants are recognizable by their extreme jitteriness despite efforts at consolation; ecchymosis and contusions may be found on the tips of their fingers or toes as a result of trauma from striking the sides of the bassinet.

Special consideration in Neonates / children

- Although it is similar to the adult opioid withdrawal syndrome in many respects, fever, myoclonic jerks, and life threatening seizures are unique to the neonatal syndrome.
- Approximately 50% to 90% of methadone, heroin, buprenorphine, and probably other chronic opioid-exposed newborns show some signs of withdrawal.
- The withdrawal syndrome typically presents within minutes to 2 weeks after birth. The half-life of the particular opioid used by the mother directly correlates with the time at which opioid withdrawal symptoms manifest in the neonate

Special consideration in Neonates / children

- Ethic / Legal
- Prevention



Thank You