

NALOXONE

CLASS: Antidote; Opioid Antagonist

INDICATIONS: Complete or partial reversal of opioid drug effects, including respiratory depression; management of known or suspected opioid overdose; diagnosis of suspected opioid dependence or acute opioid overdose

AVAILABLE DOSAGE FROM THE HOSPITAL:

NALOXONE 0.02MG AMP

NALOXONE 0.4MG AMP

TRADE NAMES:

DOSAGE:

- **Dosing: Adult**

Note: Available routes of administration include I.V. (preferred), I.M., and SubQ; other available routes (unlabeled) include inhalation via nebulization (adults only), intranasal (adults only), and intraosseous (I.O.). Endotracheal administration is the least desirable and is supported by only anecdotal evidence (case report) (Neumar, 2010); nebulized naloxone has been shown to be an effective alternative to parenteral administration when needleless administration is desired (Weber, 2012):

Opioid overdose (with standard ACLS protocols):

I.V., I.M., SubQ: Initial: 0.4-2 mg; may need to repeat doses every 2-3 minutes; after reversal, may need to readminister dose(s) at a later interval (ie, 20-60 minutes) depending on type/duration of opioid. If no response is observed after 10 mg total, consider other causes of respiratory depression. **Note:** May be given endotracheally (unlabeled route) as 2-2.5 times the initial I.V. dose (ie, 0.8-5 mg) (Neumar, 2010).

Continuous infusion (unlabeled dosing): I.V.: **Note:** For use with exposures to long-acting opioids (eg, methadone), sustained release product, and symptomatic body packers after initial naloxone response. Calculate dosage/hour based on effective intermittent dose used and duration of adequate response seen (Tenenbein, 1984) or use two-thirds (2/3) of the initial effective naloxone bolus on an hourly basis (typically 0.25-6.25 mg/hour); one-half (1/2) of the initial bolus dose should be readministered 15 minutes after initiation of the continuous infusion to prevent a drop in naloxone levels; adjust infusion rate as needed to assure adequate ventilation and prevent withdrawal symptoms (Goldfrank, 1986).

Inhalation via nebulization (unlabeled route): 2 mg; may repeat. Switch to I.V. or I.M. administration when possible (Weber, 2012).

Intranasal administration (unlabeled route): 2 mg (1 mg per nostril); may repeat in 5 minutes if respiratory depression persists. Note: Onset of action is slightly

delayed compared to I.M. or I.V. routes (Kelly, 2005; Robertson, 2009; Vanden Hoek, 2010).

Reversal of respiratory depression with therapeutic opioid doses: I.V., I.M., SubQ.: Initial: 0.04-0.4 mg; may repeat until desired response achieved. If desired response is not observed after 0.8 mg total, consider other causes of respiratory depression. **Note:** May be given endotracheally (unlabeled route) as 2-2.5 times the initial I.V. dose (ie, 0.08-1 mg) (Neumar, 2010).

Continuous infusion (unlabeled dosing): I.V.: **Note:** For use with exposures to long-acting opioids (eg, methadone) or sustained release products. Calculate dosage/hour based on effective intermittent dose used and duration of adequate response seen (Tenenbein, 1984) or use two-thirds (2/3) of the initial effective naloxone bolus on an hourly basis (typically 0.2-0.6 mg/hour); one-half (1/2) of the initial bolus dose should be readministered 15 minutes after initiation of the continuous infusion to prevent a drop in naloxone levels; adjust infusion rate as needed to assure adequate ventilation and prevent withdrawal symptoms (Goldfrank, 1986).

Opioid-dependent patients being treated for cancer pain (NCCN guidelines, v.2.2011): I.V.: 0.04-0.08 mg (40-80 mcg) slow I.V. push; administer every 30-60 seconds until improvement in symptoms; if no response is observed after total naloxone dose 1 mg, consider other causes of respiratory depression. **Note:** May dilute 0.4 mg/mL (1 mL) ampul into 9 mL of normal saline for a total volume of 10 mL to achieve a 0.04 mg/mL (40 mcg/mL) concentration.

Postoperative reversal: I.V.: 0.1-0.2 mg every 2-3 minutes until desired response (adequate ventilation and alertness without significant pain). **Note:** Repeat doses may be needed within 1-2 hour intervals depending on type, dose, and timing of the last dose of opioid administered.

Opioid-induced pruritus (unlabeled use): I.V. infusion: 0.25 mcg/kg/hour; **Note:** Monitor pain control; verify that the naloxone is not reversing analgesia (Gan, 1997)

- **Dosing: Geriatric**
Refer to adult dosing.
- **Dosing: Renal Impairment**
No dosage adjustment provided in manufacturer's labeling.
- **Dosing: Hepatic Impairment**
No dosage adjustment provided in manufacturer's labeling.

COMMON SIDE EFFECT:

Adverse reactions are related to reversing dependency and precipitating withdrawal. Withdrawal symptoms are the result of sympathetic excess. Adverse events occur secondarily to reversal (withdrawal) of opioid analgesia and sedation.

Cardiovascular: Cardiac arrest, fever, flushing, hypertension, hypotension, tachycardia, ventricular fibrillation ventricular tachycardia

Central nervous system: Agitation, coma, crying (excessive [neonates]), encephalopathy, hallucination, irritability, nervousness, restlessness, seizure (neonates), tremulousness

Gastrointestinal: Abdominal cramps, diarrhea, nausea, vomiting

Local: Injection site reaction

Neuromuscular & skeletal: Ache, hyperreflexia (neonates), paresthesia, piloerection, tremor, weakness

Respiratory: Dyspnea, hypoxia, pulmonary edema, respiratory depression, rhinorrhea, sneezing

Miscellaneous: Diaphoresis, hot flashes, shivering, yawning

PREGNANCY RISK FACTORS: C