naloxone (nal-ox-one)

**Indications**

Reversal of CNS depression and respiratory depression because of suspected opioid overdose. Unlabeled Use: Opioid-induced pruritus (low dose; Intravenous). Management of refractory circulatory shock.

**Action**

Competitively blocks the effects of opioids, including CNS and respiratory depression, without producing any agonist (opioid-like) effects. Therapeutic Effects: Reversal of signs of opioid excess.

**Pharmacokinetics**

**Absorption:** Well absorbed after IM or subcut administration.

**Distribution:** Rapidly distributed to tissues. Crosses the placenta.

**Metabolism and Excretion:** Metabolized by the liver.

**Half-life:** 60–90 min (up to 3 hr in neonates).

**Time/Action Profile (reversal of opioid effects)**

<table>
<thead>
<tr>
<th>Route</th>
<th>Onset</th>
<th>Peak</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>IM, Subcut</td>
<td>2–3 min</td>
<td>unknown</td>
<td>45 min</td>
</tr>
<tr>
<td>IV</td>
<td>1–2 min</td>
<td>unknown</td>
<td>45 min</td>
</tr>
</tbody>
</table>

**Contraindications/Precautions**

**Contraindicated in:**

Use cautiously in: Cardiovascular disease; Patients physically dependent on opioids (may precipitate severe withdrawal); OB: May cause acute withdrawal syndrome in mother and fetus if mother is opioid dependent; Lactation: Safety not established; Pedi: May cause acute withdrawal syndrome in neonates of opioid-dependent mothers.

**Adverse Reactions/Side Effects**

**CV:** Cardiac arrest, ventricular arrhythmias, hypertension, hypotension, GI: nausea, vomiting

**Interactions**

Drug-Drug: Can precipitate withdrawal in patients physically dependent on opioid analgesics. May be required to reverse the effects of buprenorphine, butorphanol, nalbuphine, or pentazocine. Antagonizes postoperative opioid analgesics.

**Route/Dosage**

**Postoperative Opioid-Induced Respiratory Depression**

*IV (Adults):* 0.02–0.2 mg q 2–3 min until response obtained; repeat q 1–2 hr if needed.

*IV (Children):* 0.01 mg/kg; may repeat q 2–3 min until response obtained. Additional doses may be given q 2–3 hr (up to 3 doses).

**Opioid-Induced Respiratory Depression During Chronic (>1 wk) Opioid Use**

*IV, IM, Subcut (Adults >40 kg):* 20–40 mcg (0.02–0.04 mg) given as small, frequent (q mm) boluses or as an infusion titrated to improve respiratory function without reversing analgesia.

*IV, IM, Subcut (Adults and Children ≤40 kg):* 0.005–0.02 mg given as small, frequent (q mm) boluses or as an infusion titrated to improve respiratory function without reversing analgesia.

**Overdose of Opioids**

*IV, IM, Subcut (Adults):* Patients not suspected of being opioid dependent—0.4 mg (10 mcg/kg); may repeat q 2–3 min (IV route is preferred). Some patients may require up to 2 mg. Patients suspected to be opioid dependent—limited dose should be given q 1–1.5 min q 2–3 min. May also be given by IV infusion at rate adjusted to patient’s response.

*IV, IM, Subcut (Children <5 yr or >20 kg):* 2 mg/kg; may repeat q 2–3 min.

*IV, IM, Subcut (Infants up to 5 yr or 20 kg):* 0.1 mg/kg; may repeat q 2–3 min.

**Opioid-Induced Pruritus**

*IV (Children):* 2 mcg/kg/hr continuous infusion, may titrate by 0.5 mcg/kg/hr every 2 hours if pruritus continues.

**Adverse Reactions/Side Effects**

**CV:** Nausea, vomiting, hypertension, hypotension, GI: nausea, vomiting

**Interactions**

Drug-Drug: Can precipitate withdrawal in patients physically dependent on opioid analgesics. May be required to reverse the effects of buprenorphine, butorphanol, nalbuphine, or pentazocine. Antagonizes postoperative opioid analgesics.
NURSING IMPLICATIONS

Assessment
- Monitor respiratory rate, rhythm, and depth; pulse, ECG, BP; and level of consciousness frequently for 3–10 hr after the expected peak of blood concentrations. After a moderate overdose of a short-acting opioid, physical stimulation may be enough to prevent significant respiratory depression. The effects of some opioids may last longer than the effects of naloxone, and repeat doses may be necessary.
- Patients who have been receiving opioids for <7 days are extremely sensitive to the effects of naloxone. Administer carefully.
- Assess patient for level of pain after administration when used to treat postsurgical respiratory depression. Naloxone decreases respiratory depression but does not reverse analgesia.
- Assess patient for signs and symptoms of opioid withdrawal (running, restlessness, abdominal cramps, increased BP, and temperature). Symptoms may occur within 45–75 min. Severity depends on dose of naloxone, the opioid involved, and degree of physical dependence.
- Lack of significant improvement indicates that symptoms are caused by a disease process or other non-opioid withdrawn unaffiliated by naloxone.

Potential Nursing Diagnoses
- Ineffective coping (Indications)
- Ineffective breathing pattern (Indications)
- Pain (Indications)
- Potential Nursing Diagnoses

Implementation

Indications (Contraindications)
- Acute pain
- Hypotension, hypertensive crisis, pulmonary edema, ventricular tachycardia and fibrillation, and severe pain. Excessive dose in postoperative patients may cause excitement, pain, hypotension, hypertension, pulmonary edema, ventricular tachycardia and fibrillation, and seizures. For children and adults weighing >40 kg, administer 10 mcg/mL solution at a rate of 0.5–2 mcg/mL (0.02 mg/mL) every 2 min. Titrate to avoid withdrawal and severe pain. Excessive dose in postoperative patients may cause excitement, pain, hypotension, hypertension, pulmonary edema, ventricular tachycardia and fibrillation, and seizures. For children and adults weighing >40 kg, administer 10 mcg/mL solution at a rate of 0.5–2 mcg/mL every 2–3 min.

Continuous Infusion: Dilute: Naloxone 2 mg/mL of naloxone in 500 mL of 0.9% NaCl or D5W. Infuse at a rate of 4 mcg/kg/min. Rate: Titrate dose according to patient response.

Y-Site Compatibility: acyclovir, alfentanil, amikacin, ampicillin-sulbactam, amphotericin B liposome, aminophylline, aminophylline, anidulafungin, argatroban, ascorbic acid, atropine, aztreonam, butorphanol, buvimicin, buprenorphine, buprenorphine, calcium chloride, calcium gluconate, carboplatin, carmustine, caspofungin, cefazolin, cefoperazone, cefotaxime, cefoxitin, ceftazidime, ceftriaxone, cefuroxime, chloramphenicol, chlorpromazine, cisplatin, clindamycin, cyclophosphamide, cyclosporine, cytarabine, dexamethasone, digoxin, diltiazem, dopaminergic drugs, doxorubicin, doxycycline, enalaprilat, ephedrine, epinephrine, epirubicin, eptifibatide, eptifibatide, esmolol, etoposide, etoposide phosphate, famotidine, fenoldopam, fentanyl, fluconazole, fludarabine, fluorouracil, folic acid, furosemide, gemcitabine, gentamicin, glycopyrrolate, granisetron, heparin, hetastarch, hydrocortisone sodium succinate, idarubicin, ifosfamide, imipenem/cilastatin, indomethacin, insulin, irinotecan, isoproterenol, ketamine, ketorolac, labetalol, levofloxacin, lidocaine, linezolid, lorazepam, methotrexate, methoxamine, methyldopate, methylprednisolone sodium succinate, metoclopramide, metoprolol, metronidazole, mexiteline, minocycline, morphine, multimammalian, mycophenolate mofetil, nafcillin, nalbuphine, naropin, nitroglycerin, nitroprusside, norepinephrine, octreotide, ondansetron, oxaliplatin, oxapetine, oxazepam, paclitaxel, pamidronate, pancuronium, pentazocine, phenobarbital, phenylephrine, piperacillin, piperoxane, piritrexim, potassium chloride, prednisone, prilocaine, propranolol, quinupristin/dalfopristin, ranitidine, remifentanil, rizatriptan, rufinamide, sodium bicarbonate, somatostatin, spironolactone, streptokinase, streptodornase, sulfadiazine, suxamethonium, tamoxifen, taxol, tacrolimus, temazepam, teniprosil, terbinafine, thiotepa, thiopental, ticarcillin, timolol, tocainide, tocyclonidine, tobramycin, topotecan, toksplatin, tolcapone, troglitazone, triamcinolone, trimethadione, trimetazidine, tsacemidine, turoctonol, vancomycin, vasoconstrictor drugs, vecuronium, verapamil, vinblastine, vincristine, vinorelbine, voriconazole, warfarin, xeloda, xenazine, xenon, xylazine, zafirlukast, zidovudine.
naloxone

palonosetron, pamidronate, pancreatin, papaverine, penicillin, pentobarbital, phenobarbital, phenol-
amin, phenylephrine, phytonadione, piperacillin/tazobactam, potassium acetate,
potassium chloride, procainamide, promethazine, propranolol, promethazine, quinidine,
quinidine succinate, succinylcholine, su-
fonamide, thiotepa, trimethoprim/sulfamethoxazole, vin-
cristine, vincristine, vinorelbine, voriconazole, zoledric acid.

● Y-Site Incompatibility: amphotericin B cholesteryl, amphotericin B lipid com-
plex, amphotericin B liposome, dantrolene, diazepam, diazoxide, pantoprazole,
phenytoin, thiotepa, trimethoprim/sulfamethoxazole.

● Additive Incompatibility: incompatible with preparations containing bisulfite,
sulfite, and solutions with an alkaline pH.

Patient/Family Teaching

● As medication becomes effective, explain purpose and effects of naloxone to pa-
tient.

Evaluation/Desired Outcomes

● Adequate ventilation.

● Alertness without significant pain or withdrawal symptoms.

Why was this drug prescribed for your patient?