Contents

Reference for Medication Listings

Activated Charcoal (Liqui-Char)
Albuterol (Proventil, Ventolin)
Aspirin
Epinephrine (Adrenalin)
Levalbuterol (Xopenex)
Metaproterenol 5% (Alupent)
Nitroglycerin (Nitrostat, Tridil, and others)
Oral Glucose (Insta-Glucose)
Oxygen
MARK 1 or NAAK Kit
    • Atropine Sulfate
    • Pralidoxime Chloride (2-PAM Chloride, Protopam)
**Activated Charcoal (Liqui-Char)**

**Class** Adsorbent.

**Mechanism of action** Adsorbs toxic substances from the gastrointestinal tract; onset of action is immediate.

**Indications** Most oral poisonings and medication overdoses; can be used after evacuation of poisons.

**Contraindications** Oral administration to comatose patient; after ingestion of corrosives, caustics, or petroleum distillates (ineffective and may induce vomiting); simultaneous administration with other oral drugs.

**Adverse reactions** May induce nausea and vomiting; may cause constipation; may cause black stools.

**Drug interactions** Bonds with and generally inactivates whatever it is mixed with, eg, syrup of ipecac.

**How supplied** 25 g (black powder)/125-mL bottle (200 mg/mL); 50 g (black powder)/250-mL bottle (200 mg/mL).

**Dosage and administration** Note: if not in premixed slurry, dilute with 1 part charcoal/4 parts water. Adult: 1–2 g/kg PO or via NGT. Pediatric: 1–2 g/kg PO or via NGT.

**Duration of action** Depends on gastrointestinal function; will act until excreted.

**Special considerations** Often used in conjunction with magnesium citrate. Must be stored in a closed container. Does not adsorb cyanide, lithium, iron, lead, or arsenic.

**Albuterol (Proventil, Ventolin)**

**Class** Sympathomimetic, bronchodilator.

**Mechanism of action** Elective beta-2 agonist that stimulates adrenergic receptors of the sympathomimetic nervous system resulting in smooth muscle relaxation in the bronchial tree and peripheral vasculature.

**Indications** Treatment of bronchospasm in patients with reversible obstructive airway disease (COPD/asthma). Prevention of exercise-induced bronchospasm.

**Contraindications** Known prior hypersensitivity reactions to albuterol. Tachycardia arrhythmias, especially those caused by digitalis. Synergistic with other sympathomimetics.

**Adverse reactions** Often dose-related and include restlessness, tremors, dizziness, palpitations, tachycardia, nervousness, peripheral vasodilatation, nausea, vomiting, hyperglycemia, increased blood pressure, and paradoxical bronchospasm.

**Drug interactions** Tricyclic antidepressants may potentiate vasculature effects. Beta-blockers are antagonistic. May potentiate hypokalemia caused by diuretics.

**How supplied** Solution for aerosolization: 0.5% (5 mg/mL). Metered dose inhaler: 90 µg/metered spray (17-g canister with 200 inhalations). Syrup: 2 mg/5 mL.

**Dosage and administration** Adult: Administer 2.5 mg (0.5 mL of 0.5% solution) added to 2 mL normal saline for inhalation by nebulizer treatment and administer over 10–15 minutes. Pediatric: (between the ages of 2 and 12) Administer 2.5 mg (0.5 mL of 0.083% solution) added to 2 mL normal saline for inhalation by nebulizer treatment and administer over 10–15 minutes. May repeat every 20 minutes, up to three times.

**Duration of action** Onset in 5–15 minutes with peak effect in 30 minutes to 2 hours and duration of 3–4 hours.

**Special considerations** Pregnancy safety: Category C. Antagonized by beta-blockers (eg, Inderal, Lopressor). May precipitate angina pectoris and arrhythmias. Should only be administered by inhalation methodology in prehospital management.
Aspirin

Class Platelet inhibitor, anti-inflammatory agent.
Mechanism of action Prostaglandin inhibition.
Indications New onset chest pain suggestive of acute myocardial infarction. Signs and symptoms suggestive of recent cerebrovascular accident.
Contraindications Hypersensitivity. Relatively contraindicated in patients with active ulcer disease or asthma.
Adverse reactions Heartburn, GI bleeding, prolonged bleeding, nausea, and vomiting. Wheezing in allergic patients.

Epinephrine (Adrenalin)

Class Sympathomimetic.
Indications Cardiac arrest (V-fib/pulseless V-tach, asystole, PEA), symptomatic bradycardia as an alternative infusion to dopamine, severe hypotension secondary to bradycardia when atropine and transcutaneous pacing are unsuccessful, allergic reactions, anaphylaxis, asthma.
Contraindications Hypertension, hypothermia, pulmonary edema, myocardial ischemia, hypovolemic shock.
Adverse reactions Hypertension, tachycardia, arrhythmias, pulmonary edema, anxiety, restlessness, psychomotor agitation, nausea, headache, angina.
Drug interactions Potentiates other sympathomimetics, deactivated by alkaline solutions (ie, sodium bicarbonate), monamine oxidase inhibitors (MAOIs) may potentiate effects, beta-blockers may blunt effects.
How supplied 1:1,000 solution: ampules and vials containing 1 mg/mL. 1:10,000 solution: prefilled syringes containing 1 mg in 10 mL (0.1 mg/mL). Auto-injector (EpiPen): 0.5 mg/mL (1:2,000).
Dosage and administration Adult: Mild allergic reactions and asthma: 0.3–0.5 mg (0.3–0.5 mL of 1:1,000) SC. Anaphylaxis: 0.1 mg (1 mL of 1:10,000) IV/IO over 5 minutes. Cardiac arrest: IV/IO dose: 1 mg (10 mL of 1:10,000 solution) every 3–5 minutes during resuscitation. Follow each dose with 20 mL flush and elevate arm for 10 to 20 seconds after dose. Higher dose: Higher doses (up to 0.2 mg/kg) may be used for specific indications (beta-blocker or calcium channel blocker overdose). Continuous infusion: Add 1 mg (1 mL of 1:1,000 solution) to 500 mL normal saline or D5W. Initial infusion rate of 1 µg/min titrated to effect (typical dose: 2–10 µg/min). Endotracheal (ET) dose: 2–2.5 mg diluted in 10 mL normal saline. Profound bradycardia or hypotension: 2–10 µg/min; titrate to patient response. Pediatric: Mild allergic reactions and asthma: 0.01 mg/kg (0.01 mL/kg) of 1:1,000 solution SC (maximum of 0.3 mL). Cardiac arrest: IV/IO dose: 0.01 mg/kg (0.1 mL/kg) of 1:10,000 solution every 3–5 minutes during arrest. All endotracheal (ET) doses: 0.1 mg/kg (0.1 mL/kg) of 1:1,000 solution. Symptomatic bradycardia: IV/IO dose: 0.01 mg/kg (0.1 mL/kg) of 1:10,000 solution. Continuous IV/IO infusion: Begin with rapid infusion, then titrate to response. Typical initial infusion: 0.1–1 µg/min. Higher doses may be effective.
Duration of action Onset: immediate. Peak effect: minutes. Duration: several minutes.
Special considerations Pregnancy safety: Category C. May cause syncope in asthmatic children. May increase myocardial oxygen demand.

Levalbuterol (Xopenex)

Class Bronchodilator, adrenergic beta-2 agonist.
Mechanism of Action Causes bronchodilation by action on the beta-2 pulmonary receptors to relax smooth muscle as well as produce CNS and cardiac stimulation.
Indications Used to treat or prevent bronchospasm in patients 6 years or older. Relaxes the smooth muscles of the lower airways.
Contraindications Known sensitivity to the drug. Hypersensitivity to sympathomimetics, tachyarrhythmias, and severe cardiac disease.
Adverse reactions Tremors, anxiety, insomnia, headache, dizziness, restlessness, hallucinations, flushing, irritability, vomiting, nausea, palpitations, tachycardia, hypertension, angina, hypotension, and arrhythmias.

Metaproterenol 5% (Alupent)

Class Sympathomimetic bronchodilator.
Mechanism of action Beta-2 agonist acts directly on bronchial smooth muscle causing relaxation of the bronchial tree and peripheral vasculature.
Drug interactions Increased actions of aerosol bronchodilators, tricyclic antidepressants, MAOIs, and other adrenergics.
How supplied Solution for inhalation 0.63 mg, 1.25 mg/3 mL.
Dosage and administration For adults and pediatrics over 6 years old: 1.25 mg in 3 mL administered by the nebulizer route. For adults only: 2 puffs by MDI.
Duration of action Onset: 5–15 minutes, peak effect: 60–90 minutes, duration: 6–8 hours. Metabolized in the liver.
Special considerations Crosses the placenta, breast milk, blood-brain barrier. Precautions should be taken with lactation, pregnancy (Class C), cardiac disorders, hyperthyroidism, diabetes mellitus, hypertension, prostatic hypertrophy, narrow-angle glaucoma, and seizures.

Indications Bronchial asthma, reversible bronchospasm secondary to bronchitis, COPD.
Contraindications Tachyarrhythmias, hypersensitivity, tachycardias due to digitalis toxicity.
Nitroglycerin (Nitrostat, Tridil, and others)

**Class** Vasodilator.

**Mechanism of action** Smooth muscle relaxant acting on vascular, bronchial, uterine, and intestinal smooth muscle, dilation of arterioles and veins in the periphery; reduces preload and afterload, decreases the work load of the heart and, thereby, myocardial oxygen demand.

**Indications** Acute angina pectoris, ischemic chest pain, hypertension, CHF, pulmonary edema.

**Contraindications** Hypotension, hypovolemia; intracranial bleeding or head injury; previous administration of Viagra, Revatio, Levitra, Cialis, or similar agents within past 24 hours.

**Adverse reactions** Headache, hypotension, syncope, reflex tachycardia, flushing, nausea, vomiting, diaphoresis, muscle twitching.

**Drug interactions** Additive effects with other vasodilators; incompatible with other drugs IV.

**How supplied** Tablets: 0.15 mg (1/400 grain); 0.3 mg (1/200 grain); 0.4 mg (1/150 grain); 0.6 mg (1/100 grain). NTG spray: 0.4 mg–0.8 mg under the tongue. NTG IV (Tridil).

**Dosage and administration** Adult: Tablets: 0.3–0.4 mg SL; may repeat in 3–5 minutes to maximum of 3 doses. NTG spray: 0.4 mg under the tongue, 1–2 sprays. NTG IV infusion: begin at 10 to 20 µg/min; increase by 5–10 µg/min every 5 minutes until desired effect. Pediatric: Not recommended.

**Duration of action** Onset: 1–3 minutes. Peak effect: 5–10 minutes. Duration: 20–30 minutes or if IV, 1–10 minutes after discontinuation of infusion.

**Special considerations** Pregnancy safety: Category C. Hypotension more common in geriatric population. NTG decomposes if exposed to light or heat. Must be kept in airtight containers. Active ingredient may have a stinging effect when administered.

Oral Glucose (Insta-Glucose)

**Class** Hyperglycemic.

**Mechanism of action** Provides quickly absorbed glucose to increase blood glucose levels.

**Indications** Conscious patients with suspected hypoglycemia.

**Contraindications** Decreased level of consciousness, nausea, vomiting.

**Adverse reactions** Nausea, vomiting.

**Drug interactions** None.

**How supplied** Glucoma: 300-mL bottles. Glucose pastes and gels in various forms.

**Dosage and administration** Adult: Should be sipped slowly by patient until clinical improvement noted. Pediatric: Same as adult.


**Special considerations** As noted in indications section.

Oxygen

**Class** Naturally occurring atmospheric gas.

**Mechanism of action** Reverses hypoxemia.

**Indications** Confirmed or expected hypoxemia, ischemic chest pain, respiratory insufficiency, prophylactically during air transport, confirmed or suspected carbon monoxide poisoning, all other causes of decreased tissue oxygenation, decreased level of consciousness.

**Contraindications** Certain patients with COPD or emphysema who will not tolerate oxygen concentrations over 35%, hyperventilation. Oxygen should never be withheld from a patient who needs it however. Be prepared to assist with ventilations in a patient with COPD who requires high concentration, as apnea may result.

**Adverse reactions** Decreased level of consciousness and respiratory depression in patients with chronic carbon dioxide retention. Retrolental fibroplasia if giving high concentrations to premature infants (maintain 30%-40% oxygen).

**Drug interactions** None.

**How supplied** Oxygen cylinders (usually green and white) of 100% compressed oxygen gas.

**Dosage and administration** Adult: Cardiac arrest and carbon monoxide poisoning: 100%. Hypoxemia: 10–15 L/min via nonrebreathing mask. COPD: 1–6 L/min via nasal cannula or 28%–35% Venturi mask. Be prepared to provide ventilatory support if higher concentrations of oxygen needed. Pediatric: Same as for adult with exception of premature infant.

**Duration of action** Onset: immediate. Peak effect: not applicable. Duration: Less than 2 minutes.

**Special considerations** Be familiar with liter flow and each type of delivery device used. Supports possibility of combustion.
**MARK 1 or NAAK Kit**

A Mark 1 or NAAK, Nerve Agent Antidote Kit, may be provided by the service you work or volunteer with. This kit is to be utilized only in the event of a chemical exposure to nerve agent event. Prior to the utilization of the Kit the EMT must be knowledgeable concerning local protocol. The kit contains two medications, Atropine and 2-PAM Chloride. Atropine should be administered first. The EMT should first recognize the primary signs and symptoms of nerve agent exposure. A common mnemonic to assist you in remembering these is SLUD-GEM: Salivation, Lacrimation, Urination, Defecation, GI disturbances, Emesis, Miosis, and muscle twitching. Nerve agent exposure results in a buildup of excess acetylcholine at nerve receptor sites.

**Atropine Sulfate**

**Class** Anticholinergic agent.

**Mechanism of action** Parasympatholytic: inhibits action of acetylcholine at postganglionic parasympathetic neuroeffector sites.

**Indications** Although there are cardiac indications for atropine the indication for the MARK I/ NAAK kit is nerve agent exposure.

**Contraindications** None in the event of a nerve agent exposure event.

**Adverse reactions** Headache, dizziness, palpitations, nausea and vomiting, tachycardia, arrhythmias, anticholinergic effects (blurred vision, dry mouth, urinary retention), paradoxical bradycardia when pushed slowly or at low doses; flushed, hot, dry skin.

**Drug interactions** Potential adverse effects when administered with digoxin, cholinergics, physostigmine. Effects enhanced by antihistamines, procainamide, quinidine, antipsychotics, benzodiazepines, and antidepressants.

**How supplied** Emergency Single Dose Kit containing: 2 mg in 0.7 mL autoinjector.

**Dosage and administration** Adult: Nerve agent poisoning: Extremely large doses (2–4 mg or higher) may be needed. The dose of 2 mg should be repeated if symptoms remain after 10 minutes.

**Duration of action** Onset: immediate. Peak effect: 1–2 minutes. Duration: 2–6 hours.

**Special considerations** Pregnancy safety: Category C. Moderate doses may cause pupillary dilation.

**Pralidoxime Chloride (2-PAM Chloride, Protopam)**

**Class** Oxime Cholinesterase reactivator.

**Mechanism of action** Reactivation of cholinesterase to effectively act as an antidote to nerve or organophosphate poisoning. This action breaks the bond between the nerve agent and the acetylcholinesterase and allows for destruction of accumulated acetylcholine at the neuromuscular junction.

**Indications** As an antidote in the treatment of poisoning by nerve agents.

**Contraindications** None in the event of a nerve agent exposure event.

**Adverse reactions** Dizziness, blurred vision, diplopia, headache, drowsiness, nausea, tachycardia, hyperventilation, muscular weakness, excitement, and manic behavior.

**Drug interactions** No direct drug interactions; however, patients with organophosphate poisoning should not be given barbiturates, morphine, theophylline, aminophylline, succinylcholine, reserpine, and phenothiazines.

**How supplied** Emergency Single Dose Kit containing: One 600 mg in 2 mL autoinjector.

**Dosage and administration** Should be administered immediately after atropine.

**Duration of action** Onset: minutes. Peak effects: variable. Duration: variable.

**Special considerations** Pregnancy safety: unknown. Treatment will be most effective if given within a few hours after poisoning.