

## Acetylsalicylic Acid

<b>Generic Name: Acetylsalicylic Acid</b>
<i>Trade Name: Novasen (Canada), Aspirin, ASA, Bufferin</i>
<i>Classification: salicylate, antiplatelet, antipyretic, anti-inflammatory, non-opioid analgesic</i>
<i>Supplied: 80 or 81 mg, 325 mg, 500 mg, 650 mg tabs</i>
<p><b>Actions (Pharmacodynamics):</b></p> <ul style="list-style-type: none"> <li>• Anticoagulant: at low doses, appears to impede clotting by blocking prostaglandin synthesis, which prevents formation of platelet-aggregating substance thromboxane A<sub>2</sub> (this is irreversible and can prolong bleeding time)</li> <li>• Analgesia/anti-inflammatory: inhibits the synthesis of prostaglandin, preventing or reducing pain</li> <li>• Antipyretic: acts on the hypothalamus to produce peripheral vasodilation causing sweating which leads to heat loss and cooling by evaporation</li> </ul>
<b>Indications: Acute coronary syndromes suggestive of an acute myocardial infarction</b>
<p><b>Dosage:</b>          Adult: 160-325 mg chewed as soon as possible          *Note: Give even if patient has taken ASA (doses higher than 1000 mg may limit beneficial effect)</p>
<p><b>Contraindications:</b></p> <ul style="list-style-type: none"> <li>• Hypersensitivity: SEVERE allergy (known)</li> <li>• Bleeding disorders (hemophilia, von Willebrand's disease)</li> <li>• Unconsciousness</li> <li>• Active GI bleed</li> <li>• Asthmatic with past hx of sensitivity</li> </ul>
<p><b>Precautions:</b></p> <ul style="list-style-type: none"> <li>• Active ulcer disease, asthma</li> <li>• Impaired renal and hepatic function</li> <li>• May produce bronchoconstriction in asthmatics</li> <li>• Children and adolescents with influenza or chickenpox infections (May increase the risk of Reye's syndrome)</li> <li>• Reye's syndrome is a rare but serious illness in childhood that has a mortality rate of 20-30%. Symptoms are encephalopathy and fatty liver degeneration</li> </ul>
<b>Note:</b> The effects of a single dose of aspirin persist for the life of the platelet (about 8 days)

**ipratropium bromide**

<b>Generic Name: <i>ipratropium bromide</i></b>
Trade Name: <b>Atrovent</b>
Classification: <b>anti-cholinergic, bronchodilator</b>
Supplied: <b>MDI 20 mcg/spray</b>
<p>Actions (Pharmacodynamics):          Inhibits cholinergic receptors in the bronchial smooth muscle, resulting in decreased concentrations of cyclic guanosine monophosphate (cyclic GMP). Decreased levels of cyclic GMP produce local, not systemic, bronchodilation</p>
Indications: <b>bronchospasm in asthma, chronic bronchitis and emphysema</b>
<p><b>Adult Dosage: 1 puff (20 mcg/puff) MDI with spacer</b></p> <p><b>30-60 seconds prn to a total maximum of 15 puffs MDI</b></p> <p>*Note: safety and efficacy in children under 12 years of age haven't been established.</p>
<b>Route:</b> metered dose inhaler
<p>Contraindications:</p> <ul style="list-style-type: none"> <li>• Hypersensitivity to drug or atropine or its derivatives</li> </ul>
<p>Precautions:</p> <ul style="list-style-type: none"> <li>• Hypersensitivity to soy lecithin or related food products (soybeans, peanuts)</li> <li>• Patients with narrow angle glaucoma</li> <li>• Be careful to avoid accidental release into the eyes (use mouth piece neb if possible)</li> </ul>

**Dextrose (D<sub>50</sub>W)**

<b>Generic Name: Dextrose (D<sub>50</sub>W)</b>
<b>Trade Name:</b>
<b>Classification: carbohydrate, antihypoglycemic</b>
<b>Supplied: preload 25g/50 ml (D<sub>50</sub>W)</b>
<b>Actions (Pharmacodynamics):</b> <ul style="list-style-type: none"> <li>• Rapidly metabolized calories given parenterally, which promotes glycogen stores and prevents ketosis in patients with inadequate oral intake</li> </ul>
<b>Indications:</b> <ul style="list-style-type: none"> <li>• Hypoglycemia</li> <li>• Coma of unknown origin (if unable to obtain blood glucose reading)</li> </ul>
<b>Contraindications:</b> <ul style="list-style-type: none"> <li>• Hyperglycemia</li> </ul>
<b>Dosage:</b> <b>Adult: 0.5 – 1.0 g/kg of D<sub>50</sub>W slow IVP</b> Second dose may be given if first dose ineffective *Note: Suspected head injury <b>12.5 g D<sub>50</sub>W slow IVP</b> *Note: Re-check chemstrip in opposite limb and assess patient  <b>Pediatric: 0.5-1.0 g/kg of D<sub>25</sub>W (2-4 mls/kg) slow IVP</b>
<b>Route: Intravenous</b>
<b>Precautions:</b> <ul style="list-style-type: none"> <li>• Dextrose greater (&gt;) than 5% is considered a hypertonic solution. It can be very irritating to the vein and could cause cerebral bleeding if not given slowly</li> <li>• Patients with increased intracranial pressure (give a half dose and reassess – Never withhold, if the patient’s metabolic needs are deficient)</li> <li>• Ensure patency of IV – can cause tissue sloughing if interstitial</li> <li>• IV cathalon should be 18g minimum as solution is very viscous</li> </ul> <b>*Note: Dextrose: 50% = 0.50 g/ml</b> <b>25% = 0.25 g/ml</b>

## Epinephrine

<b>Generic Name: Epinephrine</b>
<b>Trade Name: Adrenalin</b>
<b>Classification: adrenergic agonist (sympathomimetic)</b>
<b>Supplied: Epi Pen™ 0.3 mg, 1mg/mL Epi Pen Jr. 0.15 mg</b>
<b>Actions (Pharmacodynamics):</b> <ul style="list-style-type: none"> <li>• Directly stimulates the alpha and beta-adrenergic receptors in the sympathetic nervous system</li> <li>• Bronchodilation: relaxes bronchial smooth muscle (beta<sub>2</sub> receptors) and inhibits histamine release</li> <li>• CV and vasopressor: produces positive chronotropic and inotropic effects (beta<sub>1</sub> receptors); increasing cardiac output, myocardial oxygen consumption and force of contraction. Vasodilation (beta<sub>2</sub> receptors) and vasoconstriction (alpha receptors)</li> </ul>
<b>Indications: Anaphylaxis</b>
<b>Dosage:</b> <b>Adult: 0.3mg (1 mg/mL) IM</b> <b>Repeat q 5-10 minutes prn</b> <b>Pediatric: 0.01 mg/kg IM/SQ (do not exceed 0.3 mg)</b> *Note: Epinephrine dose is based on body weight. The EpiPen™ auto-injector (0.3mg) is for patients weighing more than 66 lbs/30 kg while the EpiPen™ Jr (0.15 mg) is for patients weighing between 33 lbs/15 kg and 66 lbs/30 kg.
<b>Route: intramuscular (IM lateral thigh preferred)</b>
<b>Contraindications:</b> <ul style="list-style-type: none"> <li>• None in the emergent setting</li> </ul>
<b>Precautions:</b> <ul style="list-style-type: none"> <li>• Do not mix with alkaline solutions</li> </ul> Ischemic heart disease
<b>Note: Massaging the site after an IM injection may hasten absorption</b>

**Glucose (oral)**

<b>Generic Name: Glucose (oral)</b>
<b>Trade Name: Insta-glucose, Monogel, Glutose</b>
<b>Classification: glucose</b>
<b>Supplied: 25 g/tube</b>
<b>Actions (Pharmacodynamics):</b> <ul style="list-style-type: none"> <li>• A monosaccharide that is given orally and is readily absorbed in the intestine</li> </ul>
<b>Indications:</b> <ul style="list-style-type: none"> <li>• Hypoglycemia in patients who are alert, are able to follow commands &amp; can swallow</li> </ul>
<b>Dosage:</b> <b>Adult: 25 g orally (may repeat in 10 minutes if necessary)</b> (Administer the entire contents of tube (25 g) slowly and intermittently while patient swallows)
<b>Route: Oral</b>
<b>Contraindications:</b> <ul style="list-style-type: none"> <li>• Any patient who is not alert</li> <li>• Any patient unable to follow commands</li> <li>• Any patient who lacks a gag reflex</li> <li>• Hyperglycemia</li> </ul>
<b>Precautions:</b> <ul style="list-style-type: none"> <li>• May cause nausea or the patient may gag when administered</li> </ul>
<b>Note:</b> <ul style="list-style-type: none"> <li>• Oral glucose is not absorbed sublingually or buccally</li> </ul>

## Glucagon

<b>Generic Name: Glucagon</b>
<b>Trade Name:</b>
<b>Classification: hormone, antihypoglycemic</b>
<b>Supplied: 1 mg (unit) vial, 10 mg (units) vial; *Note: must be reconstituted</b>
<b>Actions (Pharmacodynamics):</b> <ul style="list-style-type: none"> <li>• Stimulates hepatic production of glucose from glycogen stores (glycogenolysis)</li> <li>• Relaxes the musculature of the GI tract</li> <li>• Has positive inotropic and chronotropic effects</li> </ul>
<b>Indications:</b> <ul style="list-style-type: none"> <li>• Hypoglycemia (when IV access cannot be established)</li> </ul>
<b>Dosage:</b> <b>Adult: Hypoglycemia: 1 mg IM, q 15-20 minutes (prn)</b> <b>Pediatric: Hypoglycemia: (&lt;5 years) 0.5 mg IM</b> <b>(&gt;5 years) 1.0 mg IM</b>
<b>Route: subcutaneous or intramuscular (IM preferred)</b>
<b>Contraindications:</b> <ul style="list-style-type: none"> <li>• Hypersensitivity (beef or pork proteins as glucagon derived from beef or pork pancreas)</li> <li>• Pheochromocytoma</li> <li>• Hyperglycemia</li> </ul>
<b>Precautions:</b> <ul style="list-style-type: none"> <li>• After patient regains LOC – supplemental carbohydrates should be provided as soon as possible</li> <li>• Lowers serum potassium levels</li> <li>• Can cause tachycardia, nausea, vomiting or hypertension</li> </ul>
<b>Notes: Will not be effective if there are not sufficient stores of glycogen in the liver</b>

## Medical Oxygen

<b>Generic Name: Medical Oxygen</b>
<b>Trade Name:</b>
<b>Classification:</b> medicinal gas
<b>Supplied:</b> compressed gas cylinder
<b>Actions (Pharmacodynamics):</b> <ul style="list-style-type: none"> <li>• Colorless, odorless, tasteless gas essential to respiration</li> <li>• At sea level, oxygen makes up approximately 10% - 16% of venous blood and 17% - 21% of arterial blood</li> <li>• Transported from the lungs to the body's tissues attached to hemoglobin in the red blood cells</li> <li>• Inhalation/administration will increase arterial oxygen tension (PaO<sub>2</sub>) and hemoglobin saturation</li> </ul>
<b>Indications:</b> <ul style="list-style-type: none"> <li>• Hypoxia from any cause</li> <li>• Chest pain due to cardiac ischemia to an SpO<sub>2</sub> saturation of &lt; 94%</li> <li>• Altered level of consciousness</li> </ul>
<b>Dosage:</b> <b>Nasal Cannula:</b> @ 2-6 L/min (Provides 24% - 40% O <sub>2</sub> concentration) <b>Simple &amp; Pocket Mask:</b> @ 6 – 10 L/min (Provides 40% - 60% O <sub>2</sub> concentration) <b>Partial/ Non-Rebreather (NRB):</b> @ 10 – 15 L/min (Provides up to 98% O <sub>2</sub> concentration) <b>Bag-Valve Mask (BVM):</b> @ 10 – 15 L/min (Provides up to 100% O <sub>2</sub> concentration) <b>Route:</b> Inhalation
<b>Contraindications:</b> <ul style="list-style-type: none"> <li>• None for emergency use.</li> </ul>
<b>Precautions:</b> <ul style="list-style-type: none"> <li>• <i>Respiratory:</i> In some cases of COPD, oxygen administration may reduce the patient's respiratory drive</li> </ul> <b>Note:</b> This is not a reason to withhold oxygen, but be prepared to assist ventilations. <ul style="list-style-type: none"> <li>• Oxygen that is not humidified may dry out or irritate mucous membranes</li> </ul>

**naloxone**

<b>Generic Name: naloxone</b>	
<b>Trade Name: narcan</b>	
<b>Classification: opioid antagonist</b>	
<b>Supplied: Varies</b>	
<b>Class</b> Narcotic antagonist	<b>EMS Indications</b> Reversal of respiratory depression due to opiate overdose
<b>Adult and Pediatric Dose</b>	4.0 mg Nasal Spray Or 0.4 mg IM Or 0.4 mg IV/IO
<b>Repeat Dose</b>	Nasal Spray prn 2 to 3 minutes (alternate nostril between each dose) Or IM q 3 minutes prn to a total maximum of 1.6 mg Or IV/IO q 2 minutes prn to a total maximum of 1.6 mg
<b>EMS Contraindications</b>	<ul style="list-style-type: none"> <li>Hypersensitivity</li> </ul>
<b>Notes</b>	<ul style="list-style-type: none"> <li>The efficacy of IM naloxone is such that it is the preferred route of administration</li> <li>Caution in opiate-dependent patients; may become very agitated or violent</li> <li>Duration of action may be shorter than that of the opiate; watch for return signs of respiratory depression</li> <li>Administer only to reverse respiratory depression, not as a “diagnostic tool”</li> </ul>



## Nitroglycerin

<b>Generic Name: Nitroglycerin</b>
<b>Trade Name: Nitrostat, Nitro-Bid, Tridil</b>
<b>Classification: nitrate, anti-anginal, vasodilator</b>
<b>Supplied: 0.3 mg tabs SL, 0.4 mg/spray SL</b>
<p><b>Actions (Pharmacodynamics):</b></p> <ul style="list-style-type: none"> <li>• Antianginal: relaxes vascular smooth muscle of both venous and arterial beds, resulting in a net decrease in the myocardial oxygen consumption. It also dilates coronary vessels, leading to redistribution of blood flow to ischemic tissue and improves collateral circulation</li> <li>• Vasodilating: dilates peripheral vessels, decreasing venous return to the heart (preload) useful in treating pulmonary edema and heart failure. Arterial vasodilation decreases afterload, thereby decreasing left ventricular work and aiding the failing heart</li> </ul>
<p><b>Indications:</b></p> <ul style="list-style-type: none"> <li>• Acute coronary syndromes (pain &amp; ischemia with AMI without hypotension)</li> <li>• Suspected ischemic cardiac pain</li> </ul>
<p><b>Dosage:</b>  <b>Adult: SL 0.3 mg tab or 0.4 mg spray q 5 minute intervals (prn)</b>          *Note: as long as BP remains &gt; 100 mmHg</p>
<b>Route: sublingual spray or tablet</b>
<p><b>Contraindications:</b></p> <ul style="list-style-type: none"> <li>• Hypersensitivity to nitrates</li> <li>• Unable to initiate IV</li> <li>• Increased intracranial pressure</li> <li>• Hypotension</li> <li>• Uncorrected hypovolemia</li> <li>• Suspected cardiac tamponade or pericarditis</li> <li>• Sildenafil (Viagra, Cialis) or similar generic drug use within 72 hours</li> <li>• Avoid use in extreme bradycardia (&lt;50 bpm) or severe tachycardia (&gt; 180 bpm)</li> <li>• Important! Right ventricular infarction: use with Extreme Caution- if at all!</li> </ul>
<p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• *PCP Nitro Administration</li> </ul> <p>PCPs will withhold all forms of nitro if not equipped to obtain a 12-lead ECG or the computer generated 12-lead interpretation has any message in capital letters indicating a STEMI (e.g. STEMI, ACUTE MI, SUSPECTED, ST ELEVATION CRITERIA MET)</p> <p>Although not common to prehospital care, nitroglycerine can also be found in the form of a paste and a patch</p> <ul style="list-style-type: none"> <li>• In the event a patient presents with a Nitro patch already in place, remove the patch and administer Nitroglycerine spray or tabs as per local protocol</li> <li>• Also remove any nitro patches before application or use of an AED</li> </ul>

## Nitrous Oxide

<b>Generic Name: Nitrous Oxide</b>
<b>Trade Name: Entonox</b>
<b>Classification: gaseous analgesic/anesthetic</b>
<b>Supplied: compressed gas cylinder (50% nitrous oxide with 50% oxygen)</b>
<b>Actions (Pharmacodynamics):</b> <ul style="list-style-type: none"> <li>• Potent analgesic, weak anesthetic at these percentages</li> <li>• CNS depressant with analgesic properties</li> </ul>
<b>Indications:</b> <ul style="list-style-type: none"> <li>• Pain of musculoskeletal origin, particularly fractures</li> <li>• Burns</li> <li>• Pregnancy (only in active labour)</li> </ul>
<b>Dosage:</b> <b>Adult: Self administered until relief or patient drops mask</b> <b>Pediatric: Self administered until relief or patient drops mask</b>
<b>Route: Inhalation by demand valve and mask</b>
<b>Contraindications:</b> <ul style="list-style-type: none"> <li>• Unable to follow commands – due to interpretive problem, drugs, alcohol</li> <li>• Altered LOC</li> <li>• Significant COPD</li> <li>• Any traumatic chest injury</li> <li>• Any suspicion of pneumothorax, obstructed bowel (abdominal pain with distension)</li> <li>• Decompression sickness (diving in last 48 hours)</li> <li>• Pregnancy – except in active labor</li> </ul>
<b>Notes:</b> <ul style="list-style-type: none"> <li>• Use in well ventilated area</li> <li>• Ensure to invert tank three times prior to use</li> <li>• Do not use outside if ambient temperature is below minus six degrees Celsius (-6°C).</li> <li>• Do not use if frost on the tank</li> <li>• Prolonged use can cause hypoxemia- provide supplemental Oxygen</li> </ul>

**salbutamol**

<b>Generic Name: Salbutamol (Canada), albuterol sulfate</b>
<b>Trade Name: Ventolin</b>
<b>Classification: bronchodilator, beta<sub>2</sub>-selective adrenergic agonist (sympathomimetic)</b>
<b>Supplied: MDI 100 mcg/spray</b>
<p><b>Actions (Pharmacodynamics):</b></p> <ul style="list-style-type: none"> <li>• Selectively stimulates beta-adrenergic receptors of the lungs, uterus, and vascular smooth muscle</li> <li>• Bronchodilation results from relaxation of the vascular smooth muscles, which relieves bronchospasm and reduces airway resistance</li> <li>• Higher doses will drive serum potassium (K<sup>+</sup>) into the cells.</li> </ul>
<p><b>Indications:</b></p> <ul style="list-style-type: none"> <li>• Bronchospasm due to bronchial asthma, chronic bronchitis and other chronic bronchopulmonary disorders</li> <li>• Respiratory distress with bronchospasm</li> </ul>
<p><b>Dosage:</b></p> <p><b>Adult: 1 puff MDI (100 mcg/puff) with spacer</b></p> <p><b>Pediatric (if less than 20 kg): 1 puff (100 mcg/puff) MDI with spacer 30-60 seconds prn to a maximum of 15 puffs</b></p> <p><b>Or</b></p> <p><b>If 20 kg or greater: 30-60 seconds prn to a maximum of 30 puffs</b></p>
<b>Route: Nebulizer or metered dose inhaler</b>
<p><b>Contraindications:</b></p> <ul style="list-style-type: none"> <li>• Hypersensitivity</li> </ul>
<p><b>Precautions:</b></p> <ul style="list-style-type: none"> <li>• Should not be used with patients presenting with acute heart failure</li> <li>• Cardiovascular disease – cardiac dysrhythmias, hypertension</li> <li>• Diabetes mellitus – risk of drug induced hyperglycemia</li> <li>• Hypokalemia – risk further reducing serum potassium levels and possible adverse cardiovascular events</li> </ul>