



benzodiazepine and may involve gamma aminobutyric (GABA) receptors. The anesthesia mechanism may involve GABA and possibly N-methyl-D-aspartate receptors as well.[6] In general, the effect of nitrous oxide ceases as soon as the inhalation stops, with no residual effect

**Indications** — Analgesia in the patient who is capable of self-administration of this medication

**Contraindications** — Significant respiratory compromise, suspected abnormal air-filled cavities (e.g., pneumothorax, bowel obstruction, air embolism)

**RELATIVE CONTRAINDICATIONS:** History of stroke, hypotension, pregnancy, known cardiac conditions, known vitamin B12 deficiency

### **Nitroglycerin**

**Name** — Nitrostat®, Nitrolingual Pumpspray®, NitroQuick®

**Class** — Nitrates, anti-anginal

**Pharmacologic Action** — Organic nitrate which causes systemic venodilation, decreasing preload.

Cellular mechanism: nitrate enters vascular smooth muscle and converted to nitric oxide (NO) leading to activation of cyclic guanosine monophosphate (cGMP) and vasodilation. Relaxes smooth muscle via dose-dependent dilation of arterial and venous beds to reduce both preload and afterload, and myocardial O<sub>2</sub> demand. Also improves coronary collateral circulation. Lower BP, increases heart rate, occasional paradoxical bradycardia

**Indications** — As an anti-anginal medication for the management of chest pain as well as a reducer of preload for patients suffering from acute pulmonary edema

**Contraindications** — Hypersensitivity, acute myocardial infarction, severe anemia, recent use of erectile dysfunction medications (sildenafil (Viagra® — within last 24 hours), tadalafil (Cialis® — within last 48 hours), vardenafil (Levitra® — within last 48 hours), or other phosphodiesterase-5 inhibitors). There is potential for dangerous hypotension, narrow angle glaucoma (controversial: may not be clinically significant). Nitrates are contraindicated in the presence of hypotension (SBP less than 90 mmHg or ≥30 mmHg below baseline), extreme bradycardia (less than 50 BPM), tachycardia in the absence of heart failure (greater than 100 BPM), and right ventricular infarction

### **Norepinephrine**

**Name** — Levophed®, Levarterenol®

**Class** — Alpha/beta adrenergic agonist

**Pharmacologic Action** — Strong beta-1 and alpha-adrenergic effects and moderate beta-2 effects, which increase cardiac output and heart rate, decrease renal perfusion and peripheral vascular resistance, and cause variable BP effects

**Indications** — As a pressor agent used in the management of shock

**Contraindications** — Hypersensitivity, hypotension due to blood volume deficit, peripheral vascular thrombosis (except for lifesaving procedures)

**RELATIVE CONTRAINDICATIONS:** concomitant use with some general anesthetics: chloroform, trichloroethylene, cyclopropane, halothane

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**WARNING:** Norepinephrine is a vesicant and can cause severe tissue damage if extravasation occurs. Do not use in the same IV line as alkaline solutions as these may deactivate it

### **Olanzapine**

**Name** — Zyprexa®

**Class** — Antipsychotic, second generation, antimanic agents

**Pharmacologic Action** — May act through combination of dopamine and serotonin type 2 receptor site antagonism