**Name**: **Edrophonium (Tensilon)**
**Class**: Anticholinesterase Agent: Choline Analog
**Mech**.: Combines w/AChE. Competitively prevents interaction of ACh w/AChE.
**Absorption**:
**Dist**.: No CNS. Acts mostly at neuromusc sites. Some autonomic action.
**Metab**.:
**Excretion**, **t_**: Brief duration of action (several min.) because binding is rapidly reversible.
**Toxicity/S.E.s**: Toxic doses first stim. then depress autonomic ganglia, neuromusc. jxns, and central sites. IV—↑ skeletal muscle strength = myasthenic weakness; ↓ strength = cholinergic crisis. Avoid in cases of asthma, coronary insufficiency, peptic ulcers.
**Utility**: IV—test for myasthenia gravis. Antag. NM blockade of curare-like agents. Treat paroxysmal supraventricular tachycardia.
**Special Features**: IV → Non-selective. Stim. cholinergic receptors throughout CNS and PNS. Inhib. AChE and BuChE.

**Name**: **Physostigmine (Antilirium)**
**Class**: Anticholinesterase Agent: Carbamate (Tertiary Amine)
**Mech**.: Substrate for AChE. Competitive inhib. of interaction btwn ACh and AChE.
**Absorption**:
**Dist**.: Enters CNS. Acts mostly at autonomic sites. Some neuromusc. action.
**Metab**.: Slowly hydrolyzed by AChE
**Excretion**, **t_**: A few hours.
**Toxicity/S.E.s**: Toxic doses first stim. then depress autonomic ganglia, neuromusc. jxns, and central sites. Avoid in cases of asthma, coronary insufficiency, peptic ulcers.
**Utility**: DOC to antag. toxic effects of atropine-like (anticholinergic) drugs.
**Special Features**: Non-selective. Stim. cholinergic receptors throughout CNS and PNS. Inhib. AChE and BuChE.

**Name**: **Neostigmine (Prostigmine)**
**Class**: Anticholinesterase Agent: Carbamate (Quaternary Amine)
**Mech**.: Substrate for AChE. Competitive inhib. of interaction btwn ACh and AChE. Stim. postjxnl nicotinic (i.e., muscular) receptors.
**Absorption**: Oral adequate.
**Dist**.: No CNS. Acts mostly at neuromusc sites. Some autonomic action.
**Metab**.: Slowly hydrolyzed by AChE
**Excretion**, **t_**: Slowly hydrolyzed by AChE
**Toxicity/S.E.s**: Toxic doses first stim. then depress autonomic ganglia, neuromusc. jxns, and central sites. Dose too large → skeletal muscle weakness = cholinergic crisis. Dose too small → skeletal muscle weakness = myasthenic weakness. Avoid in cases of asthma, coronary insufficiency, peptic ulcers.
**Utility**: Treat myasthenia gravis. Treat post-op paralytic ileus and urinary bladder atony. Antag. NM blockade of curare-like agents.
**Special Features**: IV → Non-selective. Stim. cholinergic receptors throughout CNS and PNS. Inhib. AChE and BuChE. Musc. effects prevented by pretreatment w/atropine.

**Name**: **Pyridostigmine (Mestinon)**
**Class**: Anticholinesterase Agent: Carbamate (Quaternary Amine)
**Mech**.: Substrate for AChE. Competitive inhib. of interaction btwn ACh and AChE. Stim. postjxnl nicotinic (i.e., muscular) receptors.
**Absorption**: Oral adequate.
**Metab**.: Slowly hydrolyzed by AChE
**Dist.:** No CNS. Acts mostly at neuromusc sites. Some autonomic action.
**Excretion**, **t_**: Slowly hydrolyzed by AChE
**Toxicity/S.E.s**: Toxic doses first stim. then depress autonom. ganglia, NM jxns, and central sites. Dose too large → skel. muscle weakness = cholinergic crisis. Too small → muscle weakness = myasthenic weakness. Avoid in cases of asthma, coronary insufficiency, peptic ulcers.
**Utility**: Treat myasthenia gravis. Longer acting than neostigmine; used more freq.
**Special Features**: Non-selective. Stim. cholinergic receptors throughout CNS and PNS. Inhib. AChE and BuChE.

**Name**: **Isoflurophate (Floropryl, DFP)**
**Class**: Anticholinesterase Agent: Organophosphate
**Mech**.: Binds irreversibly to AChE
**Absorption**:
**Dist**.: Acts mostly at autonomic sites. Some neuromusc. action.
**Metab**.:
**Excretion**, **t_**: Long-lasting inhibition—days to weeks.
**Toxicity/S.E.s**: Toxic doses first stim. then depress autonomic ganglia, neuromusc. jxns, and central sites. Treat w/heroic doses of atropine for muscarinic effects, pralidoxime for neuromusc effects.
**Utility**:
**Special Features**: Bond btwn drug and AChE must age before becoming irreversible. While bond is aging, drugs such as pralidoxime can reactivate AChE.

**Name**: **Echothiophate (Phospholine)**
**Class**: Anticholinesterase Agent: Organophosphate
**Mech**.: Binds irreversibly to AChE
**Absorption**: Eye drops.
**Dist**.:
**Metab**.:
**Excretion**, **t_**: Long-lasting inhibition—days to weeks.
**Toxicity/S.E.s**: Toxic doses first stim. then depress autonomic ganglia, neuromusc. jxns, and central sites. Treat w/heroic doses of atropine for muscarinic effects, pralidoxine for neuromusc effects.
**Utility**: Topical eye applic. to treat glaucoma. For closed-angle glaucoma, stim. constriction of iris sphincter → iris removed from entrance to trabecular space. For open-angle glaucoma, stim. sphincter and ciliary body contraction → ↑ patency of trabecular network. Topical to treat crossed eyes.
**Special Features**: Bond btwn drug and AChE must age before becoming irreversible. While bond is aging, drugs such as pralidoxime can reactivate AChE.

**Name**: **Tacrine (Cognex)**
**Class**: Anticholinesterase Agent: Acridinamine
**Mech**.: Blocks AChE and BuChE. Inhib. M1 and M2 receptors. Weak nicotinic blocker. ↑ release of ACh from nerve endings.
**Absorption**:
**Dist**.: Good CNS.
**Metab**.:
**Excretion**, **t_**:
**Toxicity/S.E.s**: Reversible liver damage. Avoid in cases of asthma, coronary insufficiency, peptic ulcers.
**Utility**: Alzheimer's disease
**Special Features**:

**Name**: **Acetylcholine**
**Class**: Cholinomimetic Agent
**Mech**.: Stim. muscarinic and nicotinic receptors.
**Absorption**:
**Dist**.:
**Metab**.:
**Excretion**, **t_**: Short duration due to rapid metab. by AChE and BuChE.
**Toxicity/S.E.s**:
**Utility**: Topical for cataract surgery.
**Special Features**: Usu. of limited value due to short duration of action.

**Name**: **Bethanechol (Urecholine)**

**Class**: Cholinomimetic Agent

**Mech**.: Stim. muscarinic receptors. Completely resistant to hydrolysis by AChE or BuChE.

**Absorption**:

**Dist**.:

**Metab**.:

**Excretion**, **t_**: Longer duration than methacholine.

**Toxicity/S.E.s**: Avoid in cases of asthma, coronary insufficiency, peptic ulcers.

**Utility**: Stim. muscarinic receptors of GI tract and urinary bladder. Treat post-op paralytic ileus and urinary bladder atony.

**Special Features**:

**Name**: **Carbachol**

**Class**: Cholinomimetic Agent

**Mech**.: Stim. muscarinic and nicotinic receptors. Stim. release of ACh from nerve terminals.

**Absorption**: Eye drops

**Dist**.:

**Metab**.:

**Excretion**, **t_**:

**Toxicity/S.E.s**:

**Utility**: Topical eye applic. to treat glaucoma. For closed-angle glaucoma, stim. constriction of iris sphincter → iris removed from entrance to trabecular space. For open-angle glaucoma, stim. sphincter and ciliary body contraction → ↑ patency of trabecular network. Topical for cataract surgery.

**Special Features**: Use only when pilocarpine doesn't work, due to unpleasant side effect of ACh release.

**Name**: **Pilocarpine**

**Class**: Cholinomimetic Agent

**Mech**.: Stim muscarinic receptors.

**Absorption**: Eye drops

**Dist**.:

**Metab**.:

**Excretion**, **t_**:

**Toxicity/S.E.s**:

**Utility**: Topical eye applic. to treat glaucoma. For closed-angle glaucoma, stim. constriction of iris sphincter → iris removed from entrance to trabecular space. For open-angle glaucoma, stim. sphincter and ciliary body contraction → ↑ patency of trabecular network.

**Special Features**:

**Name**: **Pralidoxime (Protopam)**

**Class**: Cholinesterase Reactivator

**Mech**.: Hydrolyzes phosphorylated AChE, provided the complex has not "aged."

**Absorption**:

**Dist**.: No CNS.

**Metab**.:

**Excretion**, **t_**:

**Toxicity/S.E.s**:

**Utility**: Counteracts NM activation and paralysis due to organophosphorous poisoning. Must be given ASAP.

**Special Features**:

**Name**: **Atropine**
**Class**: Tertiary $M_2$-Muscarinic Antagonist
**Mech**.: Bind to muscarinic receptors and competitively inhib. ACh interaction.
**Absorption**: Syst. absorption from eye drops. Oral good.—use gastric lavage to limit systemic absorption. IV.
**Dist**.: Selective doses (0.2-0.5 mg) act at muscar. receptors, not at nicot. receptors
**Metab**.:
**Excretion**, **t_**:
**Toxicity/S.E.s**: Dry as a bone (sweat/saliva blocked), blind as a bat (pupil dilation, no ciliary muscle contraction), red as a beet (flushing and rash over face, neck, upper part of trunk), hot as a hare (no sweat → ↑ temp), mad as a hatter (delirium, toxic psychosis). Urinary retention, constipation. Treat intoxication w/physostigmine. Diazepam relieves CNS effects. Topical eye applic. can precipitate glaucoma.
**Utility**: Give parenterally in advance to counteract nasty anesthesia side effects (cardiac slowing, salivation, bronchial secretions). Treat anticholinesterase poisoning. Treat urinary problems. Can be applied to eye to produce mydriasis and cyclopegia (lasts 7-12 days).

**Name**: **Scopolamine (Transderm-Scop)**
**Class**: Tertiary $M_2$-Muscarinic Antagonist
**Mech**.: Bind to muscarinic receptors and competitively inhib. ACh interaction.
**Absorption**: Oral, transdermal, parenteral.
**Dist**.:
**Metab**.:
**Excretion**, **t_**:
**Toxicity/S.E.s**: Drowsiness, blurred vision, dry mouth, urinary retention, tachycardia, constipation, cyclopegia. Mostly avoided w/transdermal application.
**Utility**: Prevent motion sickness (transdermal patch). Give parenterally in advance to counteract nasty anesthesia side effects (cardiac slowing, salivation, bronchial secretions).
**Features**: In addition to atropine-like anti-musc properties, also produces central depressant and anti-motion sickness effects. Best if admin. prophylactically.

**Name**: **Tropicamide (Mydriacil)**
**Class**: Tertiary $M_2$-Muscarinic Antagonist
**Mech**.: Bind to muscarinic receptors and competitively inhib. ACh interaction.
**Absorption**: Eye drops
**Dist**.:
**Metab**.:
**Excretion**, **t_**:
**Toxicity/S.E.s**: Topical eye applic. can precipitate glaucoma.
**Utility**: Apply to conjunctival sac to produce mydriasis and cycloplegia (lasts ~6hr).
**Special Features**:

**Name**: **Ipratropium (Atrovent)**
**Class**: Quaternary $M_2$-Muscarinic Antagonist
**Mech**.: Bind to muscarinic receptors and competitively inhib. ACh interaction.
**Absorption**: Inhalation → local effect (minimal systemic absorption)
**Dist**.:
**Metab**.:
**Excretion**, **t_**:
**Toxicity/S.E.s**:
**Utility**: Produces bronchodilation. Treat bronchospasm assoc. w/asthma and COPD (including chronic bronchitis and emphysema).
**Special Features**: Effect prolonged when combined w/a $\beta_2$-adrenergic agonist.

**Name**: **Pirenzepine (not on market)**

**Class**: $M_1$-Muscarinic Antagonist

**Mech**.:

**Absorption**:

**Dist**.:

**Metab**.:

**Excretion**, **t_**:

**Toxicity/S.E.s**:

**Utility**:

**Special Features**: Relatively selective for GI tract. Can reduce gastric acid secretion w/minimum of untoward antimuscarinic effects.

**Name**: **Succinylcholine (Anectine)**

**Class**: Depolarizing Neuromuscular Blocking Agent

**Mech**.: ACh congener → continuous stim. of nicotin. neuromusc receptors, making them refractory to production of action potentials.

**Absorption**: IV

**Dist**.: Poor CNS.

**Metab**.: Plasma and liver pseudocholinesterases.

**Excretion**, **t_**: Effect begins 1-1.5 min., peaks in 2 min., over by 5 min.

**Toxicity/S.E.s**: Initial stim. causes asynchronous twitches (fasciculations) over chest and abd. → post-op. muscle soreness. Bradycardia, hyper/hypotension, tachycardia. Rare malignant hyperthermia when admin. w/halothane. Low pseudocholinesterase activity → prolonged apnea; requires artific. resp. until patient recovers.

**Utility**: Relaxes skeletal muscle, esp. abdominal wall. Used in surgery.

**Special Features**:

**Name**: **d-Tubocurarine**

**Class**: Competitive Neuromuscular Blocking Agent

**Mech**.: Competitive antagonism of ACh on nicotinic receptors at NMJ → skeletal muscle paralysis.

**Absorption**: IV

**Dist**.: Poor CNS.

**Metab**.: Kidney (up to 1/3 of dose in several hours). Variable liver action.

**Excretion**, **t_**: Effect begins in 2 min. 90% of muscle fxn returns in 40-60 min. Residual effect 2-4 hr. Effect terminated by redistribution into other tissues.

**Toxicity/S.E.s**: Repeated exposure → cumulative effects, even when spaced 24 hr. apart. Hypotension due to periph. vasodilation as a result of histamine release and symp. ganglia blockade.

**Utility**: Relaxes skeletal muscle, esp. abdominal wall. Used in surgery.

**Special Features**: Synergy w/general anesthetics → lower doses of each necessary. Antag. by IV neostigmine or edrophonium.

**Name**: **Atracurium (Tracrium)**

**Class**: Competitive Neuromuscular Blocking Agent

**Mech**.: Competitive antagonism of ACh on nicotinic receptors at NMJ → skeletal muscle paralysis.

**Absorption**: IV

**Dist**.: Poor CNS.

**Metab**.: Spontaneous decomposition in plasma. Some esterase metab.

**Excretion**, **t_**: Effect begins in 2-5 min. 90% of muscle fxn returns in 30-60 min. Duration dose-related.

**Toxicity/S.E.s**: Histamine release → hypotension.

**Utility**: Relaxes skeletal muscle, esp. abdominal wall. Used in surgery.

**Special Features**: Effect non-cumulative. Antag by IV neostigmine or edrophonium. Used more than d-Tubocurarine. Possesses many features of an ideal agent.

**Name**: **Vecuronium (Norcuron)**

**Class**: Competitive Neuromuscular Blocking Agent

**Mech**.: Competitive antagonism of ACh on nicotinic receptors at NMJ → skeletal muscle paralysis.

**Absorption**:

**Dist**.: Poor CNS.

**Metab**.: Hepatic uptake.

**Excretion**, **t_**: Biliary excretion. Minimal kidney excretion. Effect begins in 2-5 min. Duration 15-30 min.

**Toxicity/S.E.s**:

**Utility**: Relaxes skeletal muscle, esp. abdominal wall. Used in surgery.

**Special Features**: No histamine release. No ganglionic blockade. Non-cumulative effect. Widely used.

**Name**: **Rocuronium (Zemuron)**

**Class**: Competitive Neuromuscular Blocking Agent

**Mech**.: Competitive antagonism of ACh on nicotinic receptors at NMJ → skeletal muscle paralysis.

**Absorption**:

**Dist**.:

**Metab**.: Hepatic uptake.

**Excretion**, **t_**: Biliary excretion. Minimal kidney excretion. Effect begins in 1-2 min. Duration 15-30 min.

**Toxicity/S.E.s**:

**Utility**: Relaxes skeletal muscle, esp. abdominal wall. Used in surgery.

**Special Features**: No histamine release. No ganglionic blockade. Non-cumulative effect. Widely used. Negligible CV effect.

**Name**: **Nicotine**

**Class**: Ganglionic Stimulant/Blocking Agent

**Mech**.: Stim. ganglionic receptors. Non-selective.

**Absorption**:

**Dist**.:

**Metab**.:

**Excretion**, **t_**:

**Toxicity/S.E.s**:

**Utility**: Gum and transdermal patches used to suppress nicotine withdrawal in smokers trying to quit.

**Special Features**:

**Name**: **Mecamylamine (Inversine)**

**Class**: Ganglionic Blocking Agent

**Mech**.: Blocks nerve transmission at parasympathetic and sympathetic ganglia. Non-selective.

**Absorption**: Oral → complete absorption.

**Dist**.:

**Metab**.:

**Excretion**, **t_**:

**Toxicity/S.E.s**:

**Utility**: Treat severe hypertension.

**Special Features**:

**Name**: **Trimethaphan (Arfonad)**

**Class**: Ganglionic Blocking Agent

**Mech**.: Blocks nerve transmission at parasympathetic and sympathetic ganglia. Direct peripheral vasodilation. Non-selective.

**Absorption**: Only IV admin.

**Dist**.:

**Metab**.:

**Excretion**, **t_**: Short duration of action.

**Toxicity/S.E.s**: Hypotension—requires constant monitoring of blood pressure during administration.

**Utility**: Treat hypertensive emergencies. Produce controlled hypotension during surgery.

**Special Features**:

**Name**: **Diphenhydramine (Benadryl)**

**Class**: $H_1$-Histamine Antagonist (OTC)

**Mech**.: Competitive inhib. of histamine and histamine receptor interaction.

**Absorption**:

**Dist**.: Enters CNS

**Excretion**, **t_**:

**Toxicity/S.E.s**: Sedation (not in everyone). Taken w/alcohol → enhanced CNS depression. Local anesthetic activity. Acute poisoning in kids → complex CNS excitatory and depressant effects. Topical use = highest risk of sensitization, ∴ shouldn't be applied topically.

**Utility**: Treat allergic rxns (e.g., hay fever).

**Special Features**: Most effective if taken prophylactically. Can't reverse effects once histamine has bound to receptor. Therapeutically effective dose related to amount of antigen.

**Name**: **Terfenadine (Seldane)**

**Class**: $H_1$-Histamine Antagonist

**Mech**.: Competitive inhib. of histamine and histamine receptor interaction.

**Absorption**: Oral

**Dist**.: No CNS

**Metab**.:

**Excretion**, **t_**:

**Toxicity/S.E.s**:

**Utility**: Treat allergic rxns (e.g., hay fever).

**Special Features**: No anticholinergic activity. Few/no CNS effects. Probably not as effective as older antihistamines. Fails to produce even moderate relief of symptoms in many patients.

**Name**: **Astemizole (Hismanal)**

**Class**: $H_1$-Histamine Antagonist

**Mech**.: Competitive inhib. of histamine and histamine receptor interaction.

**Absorption**:

**Dist**.: No CNS

**Metab**.:

**Excretion**, **t_**: *10-20 days*

**Toxicity/S.E.s**: Increased appetite, weight gain. Overdose → cardiac arrhythmia.

**Utility**: Effective against allergic rhinitis and chronic urticaria.

**Special Features**: No anticholinergic activity.

**Name**: **Cimetidine (Tagamet)**

**Class**: $H_2$-Histamine Antagonist

**Mech**.: Competitive inhib. of histamine and histamine receptor interaction.

**Absorption**: Oral

**Dist**.:

**Metab**.:

**Excretion**, **t_**:

**Toxicity/S.E.s**: Reversible gynecomastia. Dose-dependent elevation in prolactin. Slows hepatic microsomal metab. of some drugs. Headache.

**Utility**: Reduces gastric acid secretion by over 90% after a single dose. Used to treat duodenal and gastric ulcers.

**Special Features**:

**Name**: **Epinephrine**
**Class**: Catecholamine
**Mech**.: Stim. $\alpha$ and $\beta$ receptors. EPI $\cong$ NE at $\alpha$, but EPI>>NE at $\beta$2. At normal doses, $\beta$ actions predominate. At high doses, $\alpha$ actions predominate. IV bolus $\rightarrow$ rapid rise in BP (mainly systolic),$\uparrow$ strength of ventricular contraction, $\uparrow$ HR, arteriolar constrict. in skin, mucosa, splanchnic areas. Slower app. or lower dose $\rightarrow$ $\downarrow$ diastolic pressure due to $\downarrow$ periph resistance; increased pulse pressure. Causes $\uparrow$ CO due to $\uparrow$ rate and strength of contraction. Dilates bronchi and iris. Increases blood sugar and liver glycogenolysis.
**Absorption**: Subcutaneous, inhalation, IV, ophthalmic. Oral ineffective.
**Metab**.: Catab. by COMT and MAO, esp. in liver and kidneys. Glucuron. & sulfconj.
**Excretion**, **t_**: Short duration of action.
**Toxicity/S.E.s**: Cerebral hemorrhage, cardiac arrhythmias. May induce angina pain in angina patients. Also fear, anxiety, tenseness, restlessness, headache, tremor, weakness, dizziness, pallor, resp. difficulty, heart palpitations. Use w/ caution w/old folk, CV disease, hypertension, diabetes, hyperthyroidism, psychoneuroses, bronchial asthma, emphysema w/degenerative heart disease, and tricyclic drugs.
**Utility**: Reduce resp. distress due to bronchospasm. DOC for anaphylaxis. Prolong actions of local anesthetics. Restore cardiac fxn after cardiac arrest. Treat local hemostasis, open-angle glaucoma. Also inhibits uterine contractions, reduces mucosal congestion of hay fever, rhinitis, and acute sinusitis. ONLY OTC sympathomimetic for asthma.

**Name**: **Norepinephrine**
**Class**: Catecholamine
**Mech**.: Stim. $\alpha$ and $\beta$1, but not $\beta$2. Approx equal affinity as EPI at $\beta$1, less at $\alpha$. Causes $\uparrow$ in systolic & diastolic pressure. CO unchanged or $\downarrow$ due to reflexive bradycardia. $\uparrow$ TPR. Marked vasoconstriction but $\uparrow$ coronary flow due to $\uparrow$ myocardial contractility.
**Absorption**: No oral. Usu slow IV. Poor subcut.
**Dist**.:
**Metab**.: Catab. by COMT and MAO, esp. in liver and kidneys. Glucuronidation and sulfconjugation.
**Excretion**, **t_**: Short duration (1-2 min)
**Toxicity/S.E.s**: Less severe than EPI. Anxiety, resp. difficulty, slow forceful heart beat, transient headache. Risk of cardiac arrhythmia $\rightarrow$ contraind. w/halogenated hydrocarbon anesthetics. $\downarrow$ blood to vital organs. Necrosis at infusion site if extravasated. Contraind. for pregnant women, halog. hydroc. anesthetics, tricyclics.
**Utility**: Limited value. 1° for shock, certain acute hypotensive states (e.g., hypotension persisting after correction of blood volume deficit). Adjunct in treatment of cardiac arrest w/profound hypertension.

**Name**: **Dopamine**
**Class**: Catecholamine
**Mech**.: $\downarrow$ dose $\rightarrow$ D1 stim. $\uparrow$ dose $\rightarrow$ $\beta$1 stim. Also releases NE from symp. neur. Causes vasodilation in renal, mesenteric, and coronary beds $\rightarrow$ $\uparrow$ renal blood flow, glomerular filtration, and $Na^+$ excretion. Also causes $\downarrow$ $Na^+$ and $H_20$ resorption. High doses $\rightarrow$ $\uparrow$ HR. Usu. increases systolic BP and pulse pressure. Low-mod. doses $\rightarrow$ static or decreased vasc. resistance. High conc. $\rightarrow$ $\alpha$1 activation $\rightarrow$ vasoconstriction $\rightarrow$ $\uparrow$ BP.
**Absorption**: No oral. IV. Onset w/in 5 min.
**Dist**.:
**Metab**.: Catab. by COMT and MAO, esp. in liver and kidneys. Glucuronidation and sulfconjugation
**Excretion**, **t_**: Duration of action 10 min. t_: 2 min.
**Toxicity/S.E.s**: Nausea, vomiting, tachycardia, anginal pain, arrhythmia, headache, hypertension, vasoconstriction. Usu. due to excessive symp activity. Treat by stopping admin. or w/$\alpha$ blockers. Local ischemic necrosis. Contraind. w/pheochromocytomas, uncorrected tachyarrhythm. or vent. fibrillation, MAO inhibitors, furazolidone. Adjust dose w/tricyclics.
**Utility**: Some shock (e.g., oliguria and low-normal periph. resist, cardiogenic/septic shock).

**Name**: **Dobutamine (Dobutrex)**

**Class**: Mixed ($\alpha$-$\beta$) Agonist (Cardioselective)

**Mech**.: Stim. $\alpha$ and $\beta$ receptors, but not DA. → ↑ CO w/o ↑ HR. ↑ stroke volume. No/little change in periph. resist.

**Absorption**: IV → rapid onset (1-2 min). Peak effect ~ 10 min.

**Dist**.:

**Metab**.: Methylation by COMT. Conjugation

**Excretion**, **t_**: 2 min.

**Toxicity/S.E.s**: ↑ BP, ↑ HR, tachycardia, ventricular ectopic activity. ↑ myocard. $O_2$ consump. may cause ↑ size MI. Tachyphylaxis to $\beta$ stim.

**Utility**: Short-term treatment of cardiac decompensation after cardiac surgery or w/CHF or acute MI. Often DOC after acute MI. Treatment of shock after correction of hypovolemia.

**Name**: **Ephedrine**

**Class**: Mixed ($\alpha$-$\beta$) Agonist (Direct-indirect) (CNS active) (OTC)

**Mech**.: Stim. $\alpha$ and $\beta$ receptors. Releases NE from symp. neurons. ↑ BP, ↑ HR, ↑CO, constricts arterioles, relaxes smooth muscle of bronchi and GI tract. CNS effects.

**Absorption**: Oral → high bioavail. Parenteral.

**Dist**.: CNS

**Metab**.: Slow hepatic metab.

**Excretion**, **t_**: Urine, mostly unchanged. ↑ rate w/urine acidification. 3-6 hrs.

**Toxicity/S.E.s**: hypertension, arrhythmias, insomnia (CNS)

**Utility**: Treat hypotension w/spinal anesthesia. Treat nasal congestion. Often included in OTC oral asthma preparations.

**Special Features**: Not metab. by COMT.

**Name**: **Phenylephrine**

**Class**: $\alpha$1 Agonist (OTC)

**Mech**.: Stim. $\alpha$1. Some $\beta$ at ↑ doses. Marked vasoconstriction → ↑ systolic and diastolic pressures and marked reflex bradycardia.

**Absorption**: IV, IM, nasal spray or jelly, ophthalmic soln.

**Dist**.:

**Metab**.:

**Excretion**, **t_**:

**Toxicity/S.E.s**: Overuse of nasal spray → rebound congestion (may be worse than previous congestion).

**Utility**: Induces vasoconstriction (IV). Prevents hypotension (IM). Nasal decongestant. Mydriatic (DOC for non-ophthalmologists). Eye drops to "get the red out."

**Special Features**: $\alpha$ agonists gen. used to treat hypotension/shock, arrhythmia, nasal decongestion. Also induce local vasoconstriction.

**Name**: **Metaraminol (Aramine)**

**Class**: Mixed ($\alpha$-$\beta$) Agonist

**Mech**.: Prominent direct effect on $\alpha$ receptors in vasc. Indirect release of NE → some $\beta$ effects. Causes ↑ systolic and diastolic BP (vasoconstriction) → marked reflex bradycardia. Positive inotropic effect on heart.

**Absorption**: IV

**Dist**.:

**Metab**.:

**Excretion**, **t_**:

**Toxicity/S.E.s**:

**Utility**: Hypotension due to spinal anesthesia or injury. Inject for reversal of hypotension. Slow infusion for BP maintenance.

**Special Features**:

**Name**: **Methoxamine (Vasoxyl)**

**Class**: α1 Agonist

**Mech**.: Specific α1 agony → dose-dependent ↑ in periph. resist. Prompt, prolonged ↑ BP. Little/no β or CNS activity.

**Absorption**: IV

**Dist**.:

**Metab**.:

**Excretion**, **t_**:

**Toxicity/S.E.s**:

**Utility**: Treat hypotension. Maintenance of BP during surgery under spinal anesth.

**Special Features**: α agonists gen. used to treat hypotension/shock, arrhythmia, nasal decongestion. Also induce local vasoconstriction.

**Name**: **Isoproteronol (Isuprel)**

**Class**: β (Non-Selective) Agonist

**Mech**.: Non-selective stim. of β1 & β2 → bronchodilation, ↓ periph. resist (→ ↓diastolic pressure), ↑ CO (pos. inotropy and chronotropy).

**Absorption**: Poor oral and subcut. IV (immediate onset). Aerosol.
**Dist**.:
**Metab**.:

**Excretion**, **t_**: Urine, 50% unchanged.

**Toxicity/S.E.s**: **Freq**.—Palpitations, sinus tachycard., headache, flushing. **Infreq**—angina pain, nausea, tremor, dizziness, weakness, sweating. Arrhythmia (usu. not serious w/moderate doses). Contraind. w/tachyarrhyth., tachycard., heart block caused by digitalis, vent. arrhythmias requiring inotropic therapy, angina pectoris, acute MI. ↑ blood glucose, ↓ $K^+$.

**Utility**: Stim. HR in patients w/bradycardia or heart block. Bronchodilation in asthma (largely supplanted by β2 agonists).

**Name**: **Metaproterenol (Alupent)**

**Class**: β2 Agonist

**Mech**.: β2 selective, but not as much as albuterol or terbutaline.

**Absorption**: Oral → 40%. Inhalation of aerosol (onset in minutes).

**Dist**.:

**Metab**.:

**Excretion**, **t_**: Effects last 3-4 hrs.

**Toxicity/S.E.s**: Less likely w/inhalation. Tachycardia, arrhythmia, MI. ↑ risk w/underlying CV disease or use of MAO inhib. or tricyclics. Skeletal muscle tremor, restlessness, anxiety, apprehension. ↓ arterial O2 tension. High doses may cause myocard. necrosis, ↓ plasma K+, ↑ plasma glucose. ↑ hyperglycemia in diabetics, ↓ K+ in cardiac patients (esp. those taking cardiac glycosides and diuretics).

**Utility**: Treat asthma.

**Name**: **Terbutaline (Brethine)**

**Class**: β2 Agonist

**Mech**.: Selectively stim. β2.

**Absorption**: Inhalation, oral, subcut.

**Toxicity/S.E.s**: Not recommended for kids < 12 y.o. Less likely w/inhalation. Tachycardia, arrhythmia, MI. ↑ risk w/underlying CV disease or use of MAO inhib. or tricyclics. Skeletal muscle tremor, restlessness, anxiety, apprehension. ↓ arterial O2 tension. High doses may cause myocard. necrosis, ↓ plasma K+, ↑ plasma glucose. ↑ hyperglycemia in diabetics, ↓ K+ in cardiac patients (esp. those taking cardiac glycosides and diuretics).

**Utility**: Treat asthma. Suppress premature labor.

**Special Features**: Only β2 bronchodilator for parenteral use in emergency treatment of status asthmaticus. β2s are DOCs for sympathomimetic treatment of asthma.

**Name**: **Albuterol (Proventil, Ventolin)**

**Class**: β2 Agonist

**Mech**.: More selective than terbutaline for β2 receptors.

**Absorption**: Aerosol inhalation → bronchodilation w/in 15 min. Effects last 3-4 hr. Nebulized inhalation, oral.

**Dist**.:

**Toxicity/S.E.s**: Less likely w/inhalation. Tachycardia, arrhythmia, MI. ↑ risk w/underlying CV disease or use of MAO inhib. or tricyclics. Skeletal muscle tremor, restlessness, anxiety, apprehension. ↓ arterial O2 tension. High doses may cause myocard. necrosis, ↓ plasma K+, ↑ plasma glucose. ↑ hyperglycemia in diabetics, ↓ K+ in cardiac patients (esp. those taking cardiac glycosides and diuretics).

**Utility**: Treat asthma.

**Special Features**: β2s are DOCs for sympathomimetic treatment of asthma.

**Name**: **Ritodrine (Yutopar)**

**Class**: β2 Agonist

**Mech**.: Selective β2 stim.

**Absorption**: IV

**Dist**.:

**Metab**.:

**Excretion**, **t_**:

**Toxicity/S.E.s**: Tachycardia, arrhythmia, MI. ↑ risk w/underlying CV disease or use of MAO inhib. or tricyclics. Skeletal muscle tremor, restlessness, anxiety, apprehension. ↓ arterial O2 tension. High doses may cause myocard. necrosis, ↓ plasma K+, ↑ plasma glucose. ↑ hyperglycemia in diabetics, ↓ K+ in cardiac patients (esp. those taking cardiac glycosides and diuretics).

**Utility**: Uterine relaxant. Suppresses premature labor.

**Special Features**: Only drug approved in US to delay or prevent premature labor.

**Name**: **Amphetamine**

**Class**: CNS-Active Sympathomimetic Agent (Indirect)

**Mech**.: Indirect agonist of symp. receptors. Potent CNS and peripheral effects. Displaces catecholamines from storage vesicles. Reverses Uptake I transporter → NE release. Causes ↑ systolic & diastolic BP. HR often reflexively slowed. Contraction of urinary sphincter. Typical symp. effects.

**Absorption**: Oral → good bioavail.

**Dist**.: Crosses BBB.

**Metab**.:

**Excretion**, **t_**:

**Toxicity/S.E.s**:

**Utility**: Treat narcolepsy, ADHD.

**Special Features**: Not metab. by COMT. Decreased metab. by MAO.

**Name**: **Methylphenidate (Ritalin)**

**Class**: CNS-Active Sympathomimetic Agent (Indirect)

**Mech**.: Indirect agonist of symp. receptors. Potent CNS and peripheral effects. Displaces catecholamines from storage vesicles. Reverses Uptake I transporter → NE release. Causes ↑ systolic & diastolic BP. HR often reflexively slowed. Contraction of urinary sphincter. Typical symp. effects.

**Absorption**: Oral → good bioavail.

**Dist**.: Crosses BBB.

**Metab**.:

**Excretion**, **t_**:

**Toxicity/S.E.s**:

**Utility**: Treat ADHD.

**Special Features**: Not metab. by COMT. Decreased metab. by MAO.

**Name**: **Cocaine**

**Class**: CNS Stimulant (Indirect Sympathomimetic Agent)

**Mech**.: Inhib. reuptake of catecholamines (DA, NE, 5HT) → prolonged action. Local anesthetic properties. Also elevation of mood, euphoria, ↑ self-esteem, ↑ energy, ↓ sense of fatigue. Moderate dose → ↑ HR, ↑ BP.

**Absorption**:

**Dist**.:

**Metab**.:

**Excretion**, **t_**:

**Toxicity/S.E.s**: Fever, nausea, vomiting, confusion, headache, seizures.

**Utility**: Used in ENT surgery to produce local anesthesia, hemostasis, vasoconstriction.

**Special Features**:

**Name**: **Tyramine**

**Class**: CNS-Active Sympathomimetic Agent (Indirect)

**Mech**.: Releases NE from storage vesicles.

**Absorption**:

**Dist**.:

**Metab**.: Metab. by MAO

**Excretion**, **t_**:

**Toxicity/S.E.s**: MAO inhibitors → hypertensive crisis

**Utility**:

**Special Features**: Normal byproduct of tyrosine metab. Found in fermented foods (e.g., cheese, wine).

**Name**: **Phenoxybenzamine (Dibenzyline)**

**Class**: $\alpha$-Blocking Agent

**Mech**.: Blocks $\alpha$-receptors. No effect on $\beta$-receptors. Forms **irreversible** (i.e., covalent) bond w/receptors. **Vasc**— ↓ BP. Reduces compensatory reflexes (orthostatic hypotens.). Blocks pressor response to symp. (EPI reversal). **Myocard**.—No direct effect. Reflex tachycard. due to ↓ BP. **Eye**—Miosis. **GI**—No effect. **CNS**—High doses → stimulation and depression.

**Absorption**: Oral, but poor bioavailability.

**Dist**.:

**Metab**.:

**Excretion**, **t_**: Effect lasts 3-4 days.

**Toxicity/S.E.s**: Orthostatic hypotension, tachycardia, inhib. of ejaculation.

**Utility**: Reduce effects of pheochromocytoma.

**Special Features**: Discovered at the U. of U.

**Name**: **Prazosin (Minipress)**

**Class**: $\alpha$-Blocking Agent

**Mech**.: Blocks $\alpha$1 receptors in vasculature → arteriolar & venous vasodilation.

**Absorption**: Oral. 50% bioavailability

**Dist**.:

**Metab**.:

**Excretion**, **t_**: 3 hr.

**Toxicity/S.E.s**: 1st dose syncope (1%), dizziness, headaches, weakness.

**Utility**: Treat periph. vasc. disease (Raynaud's Disease), hypertension (lowers BP w/o producing sig. tachycardia), pheochromocytoma (phenoxybenz. is best), benign prostatic hyperplasia (relieves obstruction symptoms).

**Special Features**: Prazosin-type $\alpha$ blockers are the only clinically useful anti-hypertensive $\alpha$-receptor antagonists. Produces less tachycardia than do direct vasodilators. Readily combined w/other drugs.

**Name**: **Terazosin (Hytrin)**

**Class**: α-Blocking Agent (Prazosin-type)

**Mech**.: Blocks α1 receptors in vasculature.

**Absorption**: Oral. High bioavailability.

**Dist**.:

**Metab**.:

**Excretion**, **t_**: 9-12 hr.

**Toxicity/S.E.s**: 1st dose syncope (1%).

**Utility**: Treat periph. vasc. disease (Raynaud's Disease), hypertension, pheochromocytoma (phenoxybenz. is best), benign prostatic hyperplasia (relieves obstruction symptoms).

**Special Features**: Prazosin-type α blockers are the only clinically useful anti-hypertensive α-receptor antagonists. Lower BP w/o producing sig. tachycardia. Readily combined w/other drugs.

**Name**: **Propranolol (Inderal)**

**Class**: Nonselective β-Blocking Agent

**Mech**.: Competitive blockade of β1 and β2 receptors. No α effect. Decreases conversion of $T_4$ to $T_3$ by inhibiting hepatic monodeiodinase.

**Absorp**.: Good oral (>90%). Low bioavail.: ~30%. Plasma levels vary 20x btwn. patients.

**Dist**.:93% bound to protein. Enters CNS. **Metab**.: Hepatic **Excret.**, **t_**: Short t_ (3.5-6 hr).

**Toxicity/S.E.s**: **CV**—hypotension, bradycardia, c/i for CHF or AV block. **Resp**—c/i in asthmatics, COPD, bronchitis, allergic rhinitis. **Metab**—caution w/diabetics (masks signs of hypoglycemia: tachycardia). **CNS**—weakness, fatigue, nightmares, depression. **GI**—n/v (uncommon). **Hypersens**—rash, hematologic disorders (rare).

**Utility**: Mild-mod HTN (↓ CO → ↓ BP; blocks renin release). Adjunct to direct vasodilators for severe HTN (prevents reflex tachycardia). Angina pectoris (prophylactic → ↑ exercise tolerance 2° ↓ $O_2$ demand). Cardiac arrhythmias (esp. supravent. tachyarrhyths). Acute MI (prophylaxis & reduction of infarct size and failure). Pheochromocytoma (in comb. w/α-blocker). Essential tremor. Migraine headache (prophylaxis). Performance anxiety. Thyrotoxicosis—Suppression of signs/symptoms. Most effective drug for Rx of thyrotoxic crisis or thyroid storm (usu. in comb w/thioamide and/or iodide. Can be used preoperatively. Controversial Rx of hyperthyroid symptoms while awaiting effects of thioamides or iodide.

**Special Features**: Abrupt w/drawal may trigger MI.

**Name**: **Timolol (Blocadren)**

**Class**: Nonselective β-Blocking Agent

**Mech**.: Competitive blockade of β1 and β2 receptors. No α effect.

**Absorption**: Good oral (>90%). High bioavailability ~75%. Plasma levels vary 7x btwn. patients. β-blocking plasma conc. 5-10 ng/mL (low). Eye drops.

**Dist**.: 10% bound to protein. **Excretion, t_**: Hepatic, renal. Short t_ (3-4 hr).

**Toxicity/S.E.s**: **CV**—hypotension, bradycardia, c/i for CHF or AV block. **Resp**—c/i in asthmatics, COPD, bronchitis, allergic rhinitis. **Metab**—caution w/diabetics (masks signs of hypoglycemia: tachycardia). **CNS**—weakness, fatigue, nightmares, depression. **GI**—n/v (uncommon). **Hypersens**—rash, hematologic disorders (rare).

**Utility**: Hypertension (↓ CO → ↓ BP; blocks renin release). Angina pectoris (prophylactic → ↑ exercise tolerance due to ↓ $O_2$ demand). Cardiac arrhythmias (esp. supravent. tachyarrhyths). Acute MI (prophylaxis and reduction of infarct size and failure). Pheochromocytoma (in comb. w/alpha blocker). Essential tremor. Migraine headache (prophylaxis). Performance anxiety. Eyedrops for open-angle glaucoma (↓ production of aqueous humor).

**Name**: **Nadolol (Corgard)**

**Class**: Nonselective β-Blocking Agent

**Mech**.: Competitive blockade of β1 and β2 receptors. No α effect.

**Absorp.**: Poor oral (>30%). Low bioavail: ~30%. Plasma levels vary 7x btwn. pts.

**Dist**.: 30% bound to protein.

**Metab**.: **Excretion**, **t_**: Renal. Long t_ (14-24 hr). Unchanged in urine.

**Toxicity/S.E.s**: **CV**—hypotension, bradycardia, c/i for CHF or AV block. **Resp**—c/i in asthmatics, COPD, bronchitis, allergic rhinitis. **Metab**—caution w/diabetics (masks signs of hypoglycemia: tachycardia). **CNS**—weakness, fatigue, nightmares, depression. **GI**—n/v (uncommon). **Hypersens**—rash, hematologic disorders (rare).

**Utility**: Hypertension (↓ CO → ↓ BP; blocks renin release). Angina pectoris (prophylactic → ↑ exercise tolerance due to ↓ $O_2$ demand). Cardiac arrhythmias (esp. supravent. tachyarrhyths). Acute MI (prophylaxis and reduction of infarct size and failure). Pheochromocytoma (in comb. w/alpha blocker). Essential tremor. Migraine headache (prophylaxis). Performance anxiety.

**Special Features**: Abrupt w/drawal may trigger MI. Better pt. compliance than

**Name**: **Metoprolol (Lopressor)**

**Class**: Cardioselective β1-Blocking Agent

**Mech**.: Selective blockade of β1 (heart, kidney) w/rel. sparing of β2. No α effect.

**Absorption**: Good oral (>95%). Bioavailability ~50%. Plasma levels vary 10x btwn. patients.

**Dist**.: 12% bound to protein. **Metab**.: Hepatic **Excretion**, **t_**: Short t_ (3-4 hr).

**Toxicity/S.E.s**: **CV**—hypotension, bradycardia, c/i for CHF or AV block. **Resp**—c/i in asthmatics, COPD, bronchitis, allergic rhinitis. **Metab**—caution w/diabetics (masks signs of hypoglycemia: tachycardia). **CNS**—weakness, fatigue, nightmares, depression. **GI**—n/v (uncommon). **Hypersens**—rash, hematologic disorders (rare).

**Utility**: Hypertension (↓ CO → ↓ BP; blocks renin release). Angina pectoris (prophylactic → ↑ exercise tolerance due to ↓ $O_2$ demand). Cardiac arrhythmias (esp. supravent. tachyarrhyths). Acute MI (prophylaxis and reduction of infarct size and failure). Pheochromocytoma (in comb. w/alpha blocker). Essential tremor. Migraine headache (prophylaxis). Performance anxiety.

**Special Features**: Abrupt w/drawal may trigger MI. Cardioselectivity not great.

**Name**: **Atenolol (Tenormin)**

**Class**: Cardioselective β1-Blocking Agent

**Mech**.: Selective blockade of β1 (heart, kidney) w/rel. sparing of β2. No α effect.

**Absorption**: Oral (>50%). Bioavailability ~40%. Plasma levels vary 4x btwn. patients.

**Dist**.: <5% bound to protein.

**Metab**.: **Excretion**, **t_**: Renal (mostly unchanged). Long t_ (6-9 hr.)

**Toxicity/S.E.s**: **CV**—hypotension, bradycardia, c/i for CHF or AV block. **Resp**—c/i in asthmatics, COPD, bronchitis, allergic rhinitis. **Metab**—caution w/diabetics (masks signs of hypoglycemia: tachycardia). **CNS**—weakness, fatigue, nightmares, depression. **GI**—n/v (uncommon). **Hypersens**—rash, hematologic disorders (rare).

**Utility**: Hypertension (↓ CO → ↓ BP; blocks renin release). Angina pectoris (prophylactic → ↑ exercise tolerance due to ↓ $O_2$ demand). Cardiac arrhythmias (esp. supravent. tachyarrhyths). Acute MI (prophylaxis and reduction of infarct size and failure). Pheochromocytoma (in comb. w/alpha blocker). Essential tremor. Migraine headache (prophylaxis). Performance anxiety.

**Special Features**: Abrupt w/drawal may trigger MI. Cardioselectivity not great.

**Name**: **Esmolol (Breviblock)**

**Class**: Cardioselective β1-Blocking Agent

**Mech**.: Selective blockade of β1 (heart, kidney) w/rel. sparing of β2. No α effect.

**Absorption**: IV

**Dist**.:

**Metab**.: RBC esterases **Excretion**, **t_**: Ultrashort (10 min.).

**Toxicity/S.E.s**: **CV**—hypotension, bradycardia, c/i for CHF or AV block. **Resp**—c/i in asthmatics, COPD, bronchitis, allergic rhinitis. **Metab**—caution w/diabetics (masks signs of hypoglycemia: tachycardia). **CNS**—weakness, fatigue, nightmares, depression. **GI**—n/v (uncommon). **Hypersens**—rash, hematologic disorders (rare).

**Utility**: Acute cardiac arrhythmias (esp. supravent. tachyarrhythmias)—general anesthetics, thyrotoxicosis, digitalis toxicity. Perioperative hypertension. Acute MI (reduction of infarct size and failure).

**Special Features**: Ultrashort t_. Cardioselectivity not great.

**Name**: **Labetalol (Trandate)**

**Class**: Nonselective β and α1 Blocking Agent

**Mech**.: Competitive blockade of β1, β2, and α receptors.

**Absorption**:

**Dist**.:

**Metab**.:

**Excretion**, **t_**:

**Toxicity/S.E.s**: **CV**—orthostatic hypotension, sexual dysfxn, bradycardia, c/i for CHF or AV block. **Resp**—c/i in asthmatics, COPD, bronchitis, allergic rhinitis. **Metab**—caution w/diabetics (masks sign of hypoglycemia: tachycardia). **CNS**—weakness, fatigue, nightmares, depression. **GI**—n/v (uncommon). **Hypersens**—rash, hematologic disorders (rare). Also α effects.

**Utility**: Hypertension (↓ CO → ↓ BP; blocks renin release). Angina pectoris (prophylactic → ↑ exercise tolerance due to ↓ $O_2$ demand). Cardiac arrhythmias (esp. supravent. tachyarrhyths). Acute MI (prophylaxis and reduction of infarct size and failure). Pheochromocytoma (in comb. w/alpha blocker). Essential tremor. Migraine headache (prophylaxis). Performance anxiety.

**Features**: Abrupt w/drawal may trigger MI. More ... side effects. Widely used

**Name**: **Reserpine**

**Class**: Adrenergic Neuron Blocking Agent

**Mech**.: Depletes NE, 5-HT, DA from nerve terminals in periph. and CNS. Also depletes some EPI from adrenal medulla. 1° = impairs storage of NE in terminals → ↓ NE available for release. Cause slow fall in BP, some bradycardia, slight inhib. of cardiovasc reflexes, inhib of catechol. release actions of indirect sympathomimetics.

**Absorption**: Oral

**Dist**.:

**Metab**.:

**Excretion**, **t_**:

**Toxicity/S.E.s**: Sedation, nightmares, psychic depression (suicide). In GI, parasymp tone predominates (cramps, diarrhea, exacerbate peptic ulcer). Nasal congestion, bradycardia. May potentiate effects of CNS depressants. Adverse interactions w/MAOIs.

**Utility**: Treat mild-mod. hypertension (concurrent diuretic therapy). Periph. vasc. disease (Raynaud's Synd.). Antipsychotic (seldom used; higher doses).

**Special Features**: No longer considered very useful.

**Name**: **Guanethidine (Ismelin)**

**Class**: Adrenergic Neuron Blocking Agent

**Mech**.: Taken up at NE nerve terminal by NE transport system. Blocks release of NE by action potential or indirect agents. Eventually depletes NE. Causes ↓ BP, some bradycardia. No adrenal effect.

**Absorption**: Poor oral.

**Dist**.: No CNS.

**Metab**.:

**Excretion**, **t_**: 5 days.

**Toxicity/S.E.s**: Marked postural & exercise hypotension, bradycardia, fluid retention, asthma aggravation, diarrhea, inhib. of ejaculation. But no CNS effects. C/I for pheochromocytoma (supersens), impending CHF or partial heart block, bronchial asthma. Not to be used in comb. w/MAO inhibitors or sympathomimetics. TCAs block uptake into nerve terminals.. No CNS effects.

**Utility**: Mod.-severe hypertension (very effective, but last resort due to severe side effects).

**Special Features**: Supersensitivity develops (↑ effect of direct acting, but ↓ effect of indirect). Onset 1-3 wks. No longer considered very useful.

**Name**: **Clonidine (Catapres)**

**Class**: Centrally Acting Antiadrenergic Agent/Opioid Withdrawal Suppressant

**Mech**.: Stim. inhib. $\alpha 2$ receptors in central cardiovasc pathways involving EPI or NE. $\alpha 2$ are G-protein coupled to inhibit adenylyl cyclase → ↓ cAMP → ↓ central symp. activity.

**Absorption**: Oral, transdermal.

**Dist**.: Acts at medullary and spinal sites.

**Metab**.:

**Excretion**, **t_**:

**Toxicity/S.E.s**: Prominent sedation, dry mouth, depression in those so inclined, constipation. S.E.s may be reduced by transdermal admin. May potentiate actions of other CNS depressants. Rebound hypertension, nervousness, insomnia if w/drawn too quickly.

**Utility**: Treat hypertension. DOC for treating opioid w/drawal. No abstinence synd. when withdrawn.

**Special Features**: Direct $\alpha 2$ activation. Very potent (<0.5 mg/day). CV reflexes remain intact; normal homeostatic responses to exercise are maintained.

**Name**: **Methyldopa (Aldomet)**

**Class**: Centrally Acting Antiadrenergic Agent

**Mech**.: Stim. inhib. $\alpha 2$ receptors in central cardiovasc pathways involving EPI or NE. $\alpha 2$ are G-protein coupled to inhibit adenylyl cyclase → ↓ cAMP → ↓ central symp. activity.

**Absorption**:

**Dist**.: Act at medullary and spinal sites.

**Metab**.:

**Excretion**, **t_**:

**Toxicity/S.E.s**: Prominent sedation, dry mouth, nightmares, depression, movement disorders, endocrine disturbances (lactation), anemia, rare hypersensitivity of skin and liver. Possible toxic psychosis if given w/levodopa.

**Utility**: Treat hypertension.

**Special Features**: Activates $\alpha 2$ via metabolite, methylnorepinephrine (false transmitter). Probably the most used hypotensive agent in mgt. of pregnant E.

**Name**: **Phenylpropanolamine**
**Class**: Sympathomimetic Amine (OTC)
**Mech**.: Indirect action
**Absorption**: Oral
**Dist**.:
**Metab**.:
**Excretion**, **t_**:
**Toxicity/S.E.s**:
**Utility**: Nasal decongestant. Appetite suppressant.
**Special Features**: Limited effect for both uses. Tolerance develops in appetite suppressing actions. Likely to be abused for CNS stim effects.

**Name**: **Chlorpheniramine (Chlor-Trimeton)**
**Class**: $H_1$-Histamine Antagonist (OTC)
**Mech**.: Inhib. of histamine and histamine receptor interaction.
**Absorption**: Oral
**Dist**.:
**Metab**.:
**Excretion**, **t_**:
**Toxicity/S.E.s**: Sedation
**Utility**: Treat allergic rhinitis.
**Special Features**: