Adrenergic Agents

Epinephrine (adrenergic agonist)
- **Indications:** Asthma and severe airway disease; management of allergic reactions, cardiac arrest; adjunct for local anesthesia.
- **Actions:** Beta 1, Beta 2, Alpha 1, Inhibits mast cells
- **Kinetics:** Absorption well via SC, IV
  - Distribution: crosses the placenta and enters milk.

EPI
- **Metabolism and excretion:** Uptake by nerves back into vesicles or broke down by COMT in the cleft and vessels and by Monoamine Oxidase in the presynaptic neuron.
- **Caution use:** HTN, Hyper thyroidism, diabetes, glaucoma, Preg, Lactation

Epi Side Effects
- Nervousness, tremor, HA, insomnia
- Paradoxical bronchospasm
- Angina, arrhythmias, HTN, Tachycardia
- Nausea/V
- Hyperglycemia

Epi Administration?

Adrenergic Agonists
- **Alpha/beta adrenergic agonists**
  - Dobutamine
  - Dopamine
  - Ephedrine
  - Epinephrine
  - Norepinephrine
- **Alpha specific adrenergic agonists**
  - Clindidine (alpha 1 specific)
  - Miadrine
  - Phenylephrine
Adrenergic Agonists

- Beta specific adrenergic agonists
  - Albuterol
  - Bitolterol
  - Levalbuterol
  - Terbutaline
  - Isoproterenol
  - Metaproterenol

Alpha Adrenergic blockers

- Regitine (phentolamine)

- Indications: prevention and treatment of dermal necrosis and sloughing following extravasation of NE, phenylephrine or dopamine
- Tx of HTN associated with adrenergic excess or with pheochromocytoma, or tyramine containing foods in pts on MAO inhibitors.

Beta Blockers have been discussed

- Used to block the effects of SNS.
- Alpha 1 selective adrenergic blocking agents used: Tx HTN, benign prostatic hyperplasia

Cholinergic Agents

- Direct acting cholinergic agonists
  - Bethanechol
  - Carbachol
  - Cevimeline
  - Pilocarpine
- Indirect acting cholinergic agonists
  - Ambenonium
  - Donepezil, edrophonium, galantamine
  - Neostigmine, pyridostigmine

Direct acting Cholinergic Agonists

- Bethanechol: Urecholine
  - Indications: nonobstructive postop and postpartum urinary retention or to treat neurogenic bladder atony: increases bladder tone and relaxes sphincters.
- Pilocarpine: used to induce miosis or pupil constriction to relieve IOP of glaucoma.

Bethanechol

- Indications: acute postop urinary retention
- Actions: increases tone of detrusor muscles and causes emptying of the bladder.
- Adverse Effects: Abdominal discomfort, salivation, nausea/v, sweating, flushing.
Indirect Acting Cholinergic Agonists

- Actions: react chemically with Acetylcholinesterase (the enzyme responsible for the breakdown of Ach).

Myasthenia Gravis

- Chronic muscular disease caused by a defect in neuromuscular transmission.
- Autoimmune disease in which patients make antibodies to their ACh receptors.
- Progressive weakness and lack of muscle control even up to paralysis of the diaphragm.

Myasthenia Gravis Tx

- Neostigmine
- Pyridostigmine
- Ambenonium
- Edrophonium (Tensilon, Enlon)
  - Dx of myasthenia gravis

Alzheimer's Disease Drugs

- Progressive loss of ACh producing neurons
  - Tacrine (Cognex)
  - Galantamine (Razadyne)
  - Rivastigmine (Exelon)
  - Donepezil (Aricept)

Anticholinergic Agents Indications

- Depress salivation and bronchial secretions
- Relax GI and GU tracts
- Mydriasis (pupil dilation).
- Cycloplegia (inhibition of the ability of the lens in the eye to accommodate to near vision).

- Atropine
- Dicyclomine
- Glycopyrrolate
- Scopolamine
- Ipratropium
Anticholinergic Agents Indications
- Decrease secretions before anesthesia
- Tx of parkinsonism
- Restore blood pressure after vagal stimulation during surgery
- To relieve bradycardia

Atropine uses in clinical settings
- Decrease secretions
- Treat parkinsonism
- Bradycardia
- Relieve hypertonic intestine
- Relax spasm of biliary and ureteral colic and bronchospasm
- Relax the urinary bladder
- Control crying and laughing in pts with brain lesions

Atropine uses in clinical settings
- Relax uterine hypertonicity
- Manage peptic ulcer
- Control rhinorrhea or acute hay fever
- Induce mydriasis
- Antidote for overdose of cholinergic drugs or cholinesterase inhibitors

Atropine Toxicity
- Mad as a hatter and dry as a bone.