Autonomic NS- review

- “subconscious” control system along with somatic motor (conscious or voluntary control system
- SNS - responses tend to prepare body for emergency situations
- PSNS - responses tend to be “housekeeping” kinds of responses

SNS vs PSNS

- Thoracolumbar vs craniosacral outflow
- Location of ganglia
- Divergence vs localized
- Cholinergic (Ach) & adrenergic (NE) vs only cholinergic

Effect of NT determined by cell membrane receptor

Cholinergic neurons (Ach)

- Nicotinic receptors (always excitatory)
  - Agonist = nicotine
  - Antagonist = curare
  - Found in skeletal muscle and autonomic ganglia
- Muscarinic Receptors (excitatory or inhibitory)
  - Agonist = muscarine
  - Antagonist = atropine, scopolamine
  - Found in PSNS postganglionic fibers, few SNS fibers (e.g. sweat glands)

Muscarinic receptors

- Excitatory: (circular muscles in iris contract -> pupil constrict
- Inhibitory: cardiac muscle inherent heart beat rate is slowed
Adrenergic (or noradrenergic) receptors

- WHERE: postganglionic fiber-effector interactions
- Two major types
  - Alpha adrenergic receptors
  - Beta adrenergic receptors

Alpha adrenergic

$\alpha_1$ and $\alpha_2$ adrenergic
Often excitatory (contraction)
Vasoconstriction decreases blood flow
Iris dilation, piloerection
Agonists: neosynephrine, ephedrine, amphetamines (nasal decongestants and CNS stimulants)

Beta adrenergic, $\beta_1$, $\beta_2$, $\beta_3$

- Often inhibitory (especially $\beta_2$)
  - Bronchiole dilation
  - Coronary artery dilation
  - GI tract relaxation
- EXCEPT $\beta_1$ responsible for cardiac excitation
- Agonist: isoproterenol, asthma drugs
- Antagonist: beta-blockers for hypertension, propanolol

Pharmacology

- Knowledge of receptors and pathways
- Drugs designed to have specific effects to modify or mimic specific ANS pathways
- Vagotomy - old treatment for ulcers