

Bullet Point Nursing

Cholinergic pharmacology

Disclaimer: These notes are designed to provide the key points of each topic and may not contain all necessary information. Every effort is made to ensure this content is up to date and accurate at the time of writing. No liability is assumed for the content or its relation to current standards and practices. This should not replace comprehensive nursing educational resources.

Nervous system A & P review

- Adrenergic receptors activate the sympathetic nervous system
 - Primary sympathetic neurotransmitter is norepinephrine
- Cholinergic receptors activate the parasympathetic nervous system
 - Primary parasympathetic neurotransmitter is acetylcholine
 - Parasympathetic activation is rest and digest
- Excessive muscarinic stimulation causes SLUDGE/BBB
 - Salivation
 - Lacrimation
 - Urination
 - Defecation
 - Gastric Emesis
 - Bronchorrhea
 - Bronchoconstriction
 - Bradycardia
- Anticholinergic effects would be the opposite of these

Anticholinergic:

- Drug:
 - Atropine
- MOA: Blocks cholinergic (parasympathetic) effects. Acts on muscarinic receptors only.
- Indications: Bradycardia, organophosphate poisoning, cholinergic toxicity,
 - Also used preoperatively for inhibition of secretions
- SE/AE: Anticholinergic effects – Urinary retention, constipation, dry eyes, dry mouth, and more
- Atropine toxicity is reversed with physostigmine
- Parenterally only
- Not likely to be effective for bradycardia in higher heart blocks or in heart transplant patients
- **Common anticholinergics:**
 - **Scopolamine** – Motion sickness, nausea, postoperative vomiting
 - **Benztropine** – Parkinson's disease, drug-induced extrapyramidal symptoms
 - **Ipratropium** – COPD, asthma (inhaled bronchodilator)
 - **Tiotropium** – Long-term COPD maintenance therapy
 - **Tropicamide** – Mydriasis for eye exams (short-acting)
 - **Dicyclomine** – IBS, abdominal cramps
 - **Oxybutynin** – Overactive bladder, urinary incontinence

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Drug class: Direct acting cholinergic agonist

- Drug:
 - Bethanechol (Urecholine)
- MOA: Activates cholinergic receptors causing bladder muscle relaxation
- Indication: Neurogenic bladder causing urinary retention
- SE/AE: Tachycardia and hypotension, SLUDGE BBB
- Overdose treated with atropine
- Has an extensive list of contraindications including hyperthyroidism, PUD, epilepsy, bradycardia, hypotension, and more. Caution with asthma and COPD

Drug class: Acetylcholinesterase inhibitors

- Drugs:
 - Donepezil (Aricept)
 - Galantamine (Razadyne)
 - Rivastigmine (Exelon)
 - Neostigmine**
 - Pyridostigmine**
- MOA: Inhibit acetylcholinesterase from destroying acetylcholine, increasing ach levels
- Indications: Alzheimer's disease, myasthenia gravis**, neuromuscular blocker reversal**
- SE/AE: GI symptoms may present upon initial treatment, SLUDGE BBB
- Echothiophate is used only for glaucoma
- Physostigmine is used to treat anticholinergic toxicity, myasthenia gravis, and neuromuscular blocker reversal

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References

Adams, M., Holland, N. & Chang, S. (2023). *Pharmacology for nurses; A pathophysiologic approach*.
Pearson

Burchum, J., & Rosenthal, L. (2022). *Lehne's pharmacology for nursing care*. Elsevier

Mccuistion, L., Vuljoin-DiMaggio, K., Winton, M., & Yeager, J. (2023) *Pharmacology: A patient centered nursing process approach*. Elsevier