

Central Nervous System Pharmacology

Welcome to this comprehensive guide on central nervous system medications. This presentation covers ten essential drug classes used in treating various neurological and psychiatric conditions. Each card provides detailed information on indications, mechanisms of action, nursing considerations, patient education, and key drug interactions.

Understanding these medications is crucial for healthcare providers to ensure safe and effective patient care. Let's explore the pharmacological agents that influence our most complex organ system.

G by **Miranda Ekenjock**



Benzodiazepines

Indications

Anxiety, seizures, muscle spasms, alcohol withdrawal

Mode of Action

Enhances the effect of GABA, a neurotransmitter that inhibits CNS activity

Nursing Care

Monitor for sedation, respiratory depression, and dependence

Patient Teaching

Avoid alcohol and other CNS depressants; do not stop abruptly to avoid withdrawal

Diazepam is a commonly prescribed benzodiazepine that effectively reduces anxiety and controls seizures. Remember the mnemonic "**Diazepam Decreases Anxiety and Seizures**" (DDAS) to recall its primary uses. When administering benzodiazepines, be vigilant for interactions with other medications that may increase sedation.





Selective Serotonin Reuptake Inhibitors (SSRIs)

1

Prescription

Depression, anxiety, panic disorders, OCD

2

Action

Inhibits serotonin reuptake, increasing its availability in the brain

3

Monitoring

Signs of serotonin syndrome and suicidal thoughts

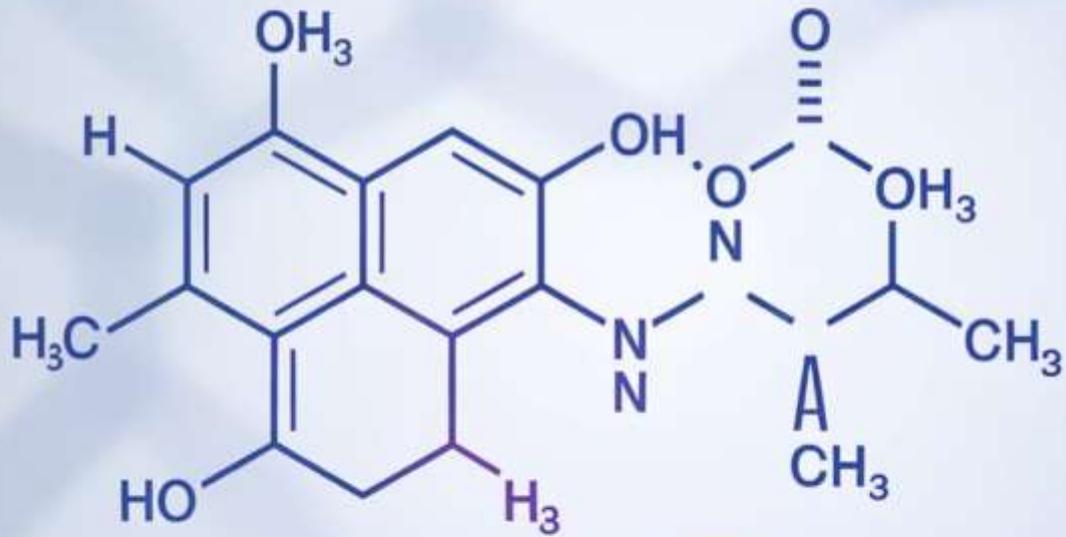
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Results

May take 4-6 weeks for full effect; avoid abrupt discontinuation

Sertraline is a widely used SSRI with the mnemonic "**Sertraline Stops Sadness**" (SSS). When administering SSRIs, be aware of potential interactions with MAOIs and St. John's Wort, which can increase the risk of serotonin syndrome. Patient education should emphasize the importance of consistent medication adherence.

Tricyclic Antidepressants (TCAs)



Depression

Primary indication for mood elevation



Neuropathic Pain

Effective for chronic nerve pain



Insomnia

Sedative effects help with sleep

Amitriptyline blocks the reuptake of norepinephrine and serotonin, increasing their levels in the brain. Remember "**Amitriptyline Alleviates Mood Troubles**" (AAMT) as a helpful mnemonic. Nursing care should include monitoring for cardiac toxicity, orthostatic hypotension, and sedation. Advise patients to take TCAs at bedtime due to their sedative effects.

Antipsychotics



Haloperidol is a potent antipsychotic that blocks dopamine receptors, effectively reducing psychotic symptoms. The mnemonic "**Haloperidol Halts Hallucinations**" (HHH) highlights its primary action. Nurses must monitor for extrapyramidal symptoms (EPS), tardive dyskinesia, and neuroleptic malignant syndrome (NMS).



Mood Stabilizers

0.6-1.2

Therapeutic Range

mEq/L serum lithium level

8-12

Fluid Intake

Cups of water daily

4-6

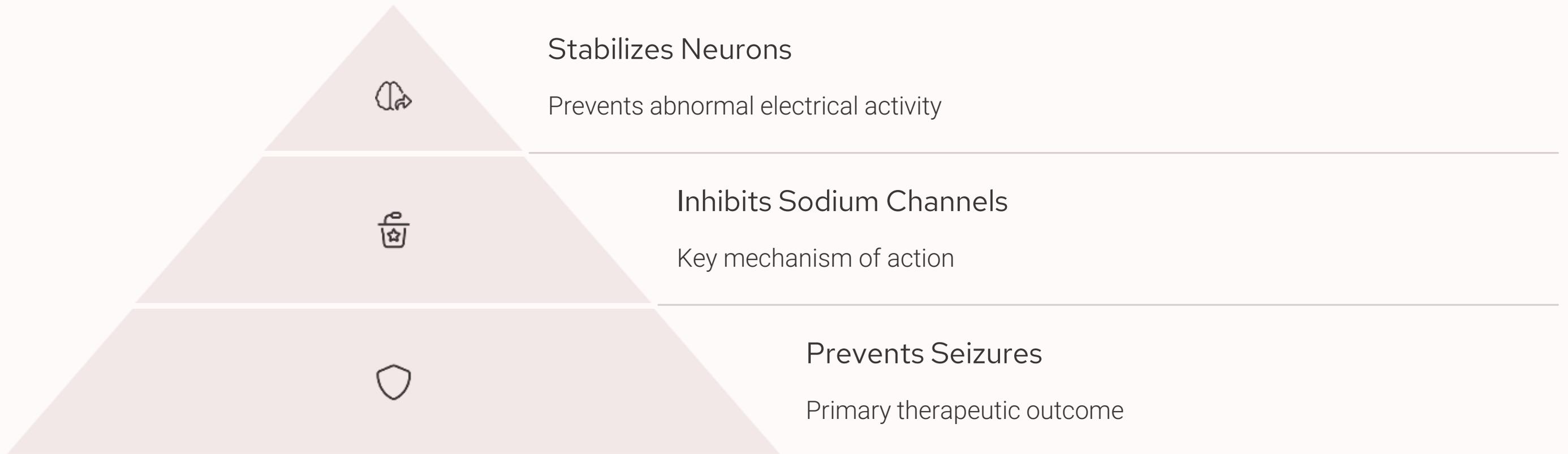
Monitoring

Weeks until stable levels

Lithium modulates neurotransmitter activity and stabilizes mood in bipolar disorder, particularly during manic episodes. The mnemonic "Lithium Levels Mood Swings" (LLMS) captures its therapeutic purpose. Nursing care must include monitoring serum lithium levels, renal function, and electrolytes to prevent toxicity.

Patient teaching should emphasize maintaining consistent salt and fluid intake, as fluctuations can affect lithium levels. Be alert for interactions with NSAIDs, ACE inhibitors, and diuretics that can increase toxicity.

Antiepileptics



Phenytoin stabilizes neuronal membranes by inhibiting sodium channels, preventing the abnormal electrical activity that causes seizures. Remember **"Phenytoin Prevents Seizures" (PPS)** as a helpful mnemonic. Nursing care should include monitoring therapeutic levels and assessing for gingival hyperplasia, nystagmus, and ataxia.

Patient education should emphasize the importance of regular dental care and consistent medication adherence. Be aware that phenytoin can decrease the efficacy of oral contraceptives.

Dopaminergic Agents

Absorption

Levodopa crosses the blood-brain barrier and converts to dopamine

Carbidopa Addition

Prevents peripheral conversion, increasing CNS availability

Dopamine Increase

Elevated brain dopamine levels improve motor function

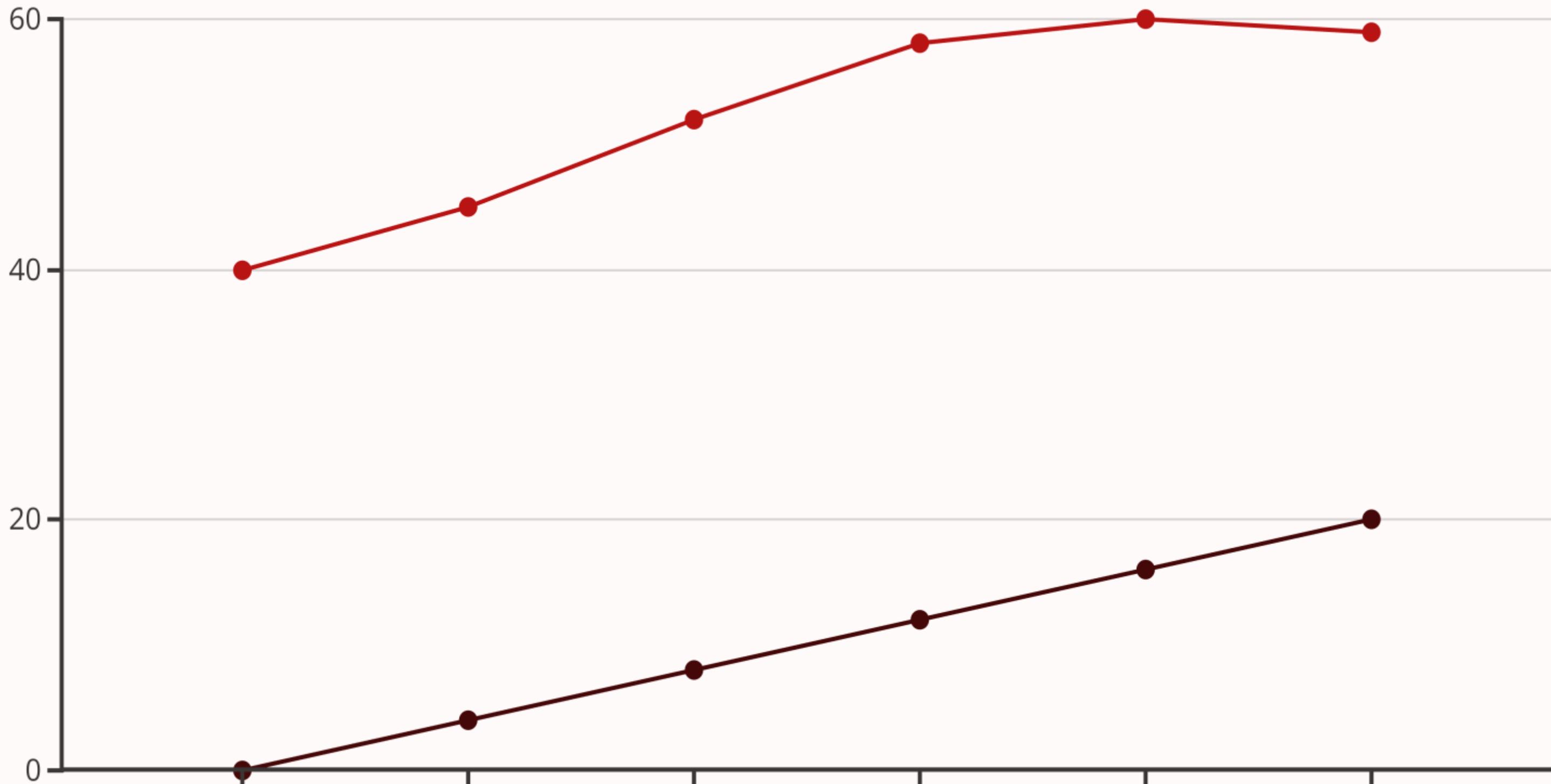
Symptom Relief

Reduction in tremor, rigidity, and bradykinesia

Levodopa/Carbidopa increases dopamine levels in the brain, improving motor function in Parkinson's disease. The mnemonic "**Levodopa Lifts Dopamine**" (LLD) highlights its mechanism. Nurses should monitor for dyskinesia, orthostatic hypotension, and nausea when administering this medication.



Cholinesterase Inhibitors



Opioid Analgesics



Receptor Binding

Binds to opioid receptors in CNS



Pain Perception

Alters pain signal processing



Pain Relief

Provides analgesia for severe pain

Morphine binds to opioid receptors in the CNS, altering the perception of and response to pain. Remember "**Morphine Minimizes Major Pain**" (MMMP) as a helpful mnemonic. Nursing care must include monitoring respiratory rate, sedation level, and signs of constipation.

Patient education should emphasize avoiding alcohol and reporting any signs of respiratory depression or severe constipation. Be vigilant for interactions with CNS depressants like benzodiazepines, which can increase sedation.

Antiparkinsonian Anticholinergics



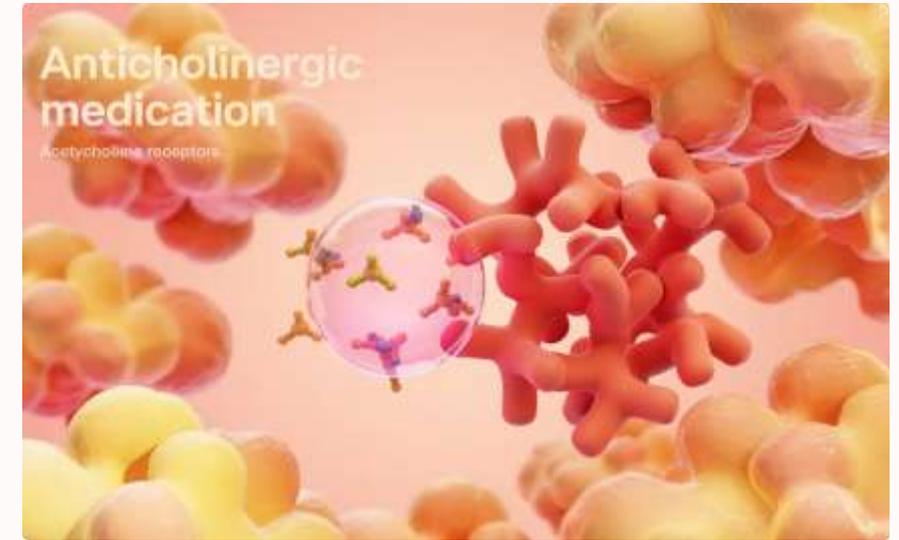
Parkinson's Disease

Reduces tremors and rigidity by balancing neurotransmitters



Drug-Induced EPS

Treats side effects of antipsychotic medications



Mechanism

Blocks acetylcholine receptors to balance dopamine and acetylcholine

Benztropine blocks acetylcholine receptors to help balance dopamine and acetylcholine, reducing muscle rigidity and tremors. The mnemonic "**Benztropine Balances Tremors**" (BBT) highlights its therapeutic effect. Nursing care should include monitoring for dry mouth, blurred vision, and urinary retention.