

Study Guide for Antiparkinson Drugs
Pharm 210, 2009
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Drug List

Dopaminergic drugs

Pramipexole
Levodopa (L-DOPA)
Carbidopa
Entacapone
Selegiline

Centrally-acting antimuscarinics

Diphenhydramine (be sure to see lectures on histamine/antihistamines)

Other

Vitamin B6 (pyridoxine; in terms of how it may affect PD therapy with levodopa)
Antipsychotic drugs (phenothiazines/chlorpromazine and haloperidol in terms of how they cause drug-induced parkinsonism), be sure to see your notes and book chapter on antipsychotic drugs

After studying the posted slides and reading the corresponding chapter in the text book, you should be able to do the following (based on your ability to identify the correct answer on the multiple-choice exam).

General Pathophysiology of Parkinson's Disease

1. State the general part or region of the brain that functions abnormally in parkinson's disease (PD) or drug-induced parkinsonism.
2. State what that brain region normally does (physiologically).
3. State the **two main neurotransmitters** that normally function, in opposition to one another, in that brain region; and state which neurotransmitter seems to be deficient (or, conversely, which one seems to be acting in excess) when signs and symptoms of PD occur.
4. State the **primary signs and symptoms of PD**, and be sure you understand what such terms as dyskinesia and bradykinesia mean (i.e., how you as a nurse could recognize them).
5. State the main group of drugs that can cause signs and symptoms of PD; and the biochemical imbalance they cause, in the brain, to cause those symptoms.

General Aspects of Drug Therapy of Parkinson's Disease

1. Given the neurotransmitter imbalance (#3), state the two basic mechanisms by which antiparkinson drugs, in general, work.

Dopaminergic Drugs for Parkinson's Disease

1. Recognize the **4 main dopaminergic drugs** or classes (listed in the slides); be able to state in simple terms how each works in terms of increasing the central levels or effects of dopamine.
2. Recognize **pramipexole** as the dopaminergic drug usually preferred for initial drug therapy of mild PD, and be able to state in simple terms what it does to the “dopamine side” of the central neurotransmitter imbalance that is characteristic of PD.
3. State why giving **dopamine** is largely ineffective in terms of treating PD; the reason why we use levodopa instead, and what property makes **levodopa** more effective than dopamine; and the reason why quite large doses of levodopa must be administered in order to increase brain dopamine levels even a little bit.
4. State the main pharmacologic effect of carbidopa, and the main reason we only give **carbidopa** in combination with levodopa (e.g., in SINEMET, PARACOPA).
5. Recognize the three main “problems” that often develop after several years of therapy with levodopa; given a diagram showing control of PD symptoms over time (e.g., the 3 graphs in the slide set), be able to associate them as typical of long-term levodopa therapy.
6. Recognize that levodopa (and most other dopaminergic drugs) participate in significant interactions with cardiac stimulants, MAO inhibitors, and anticonvulsants (antiepileptic drugs).
7. Understand what the term “seizure threshold” means.
8. Recognize that “typical” antipsychotic drugs (**chlorpromazine** as the prototype phenothiazine; **haloperidol**) antagonize the desired actions of levodopa (and other dopaminergic drugs for PD), and be able to give a simple explanation of how that antagonism comes about; recognize **Vitamin B6** as a drug that counteracts levodopa's actions, and be able to give a simple explanation of how it interferes with levodopa's actions.
9. State the three main signs or symptoms of levodopa overdose, and be sure you understand what the term blepharospasm means (i.e., how you can recognize it).

10. State why levodopa overdoses can cause psychosis (or a state resembling schizophrenia). That is, levodopa-induced psychosis involves an imbalance between dopamine and what other neurotransmitter in the brain.
11. Recognize **entacapone** as an adjunct to levodopa therapy for PD, state why it is ineffective if given alone, and in simple terms explain how entacapone works. Be sure you understand what, physiologically and in simple terms, COMT (catechol-o-methyltransferase) does. Be sure you recognize that drugs that inhibit COMT are used for parkinson's disease
12. Recognize **selegiline** as a dopaminergic antiparkinson drug. Recognize that it is an MAO inhibitor, be sure you understand that a few drugs we've addressed should not be administered to patients taking an MAO inhibitor (and know the name or general drug class) of those interactants.

Centrally-Acting Antimuscarinic Drugs

1. Consider **diphenhydramine**, in the context of PD therapy, as a **centrally-acting antimuscarinic**. Be sure you understand the "basics" of diphenhydramine actions, side effects, contraindications, etc., as we discussed in the histamine/antihistamine lecture. What property of diphenhydramine makes it useful for managing extrapyramidal side effects caused by the "typical" antipsychotics. What does it do to the neurotransmitter imbalance caused by antipsychotics?