Introduction to Pharmacology
Exam # 2
Study Objectives: Chapters 13– 25

The student should be able to .....

Chapter 13–

1. Describe the basic principles of nerve action: resting nerve potential, depolarization, repolarization, K^+ and Na^+ movements, myelin sheath.
2. Discuss the sites of action by which neuropharmacologic agents act: altering synaptic transmission (local anesthetics), receptor, synthesis, storage, release, binding, and termination of response by; reuptake, enzymatic degradation and diffusion and liver function.

Chapter14–

3. Describe the different receptor types for neurotransmitter binding.
4. Show an understanding of the parasympathetic and sympathetic nerve responses and the differences between the somatic motor and autonomic nervous system.
5. Describe the functions of the parasympathetic and sympathetic responses.
6. Describe the feedback loops: baroreceptor reflexes and autonomic tone.
7. Give the major functions of the following neurotransmitters: acetylcholine, norepinephrine, epinephrine and dopamine: how are these regulated?
8. **Show an understanding of the cholinergic and adrenergic receptor subtypes**, describing the major functions of the $alpha_1$, $alpha_2$, $beta_1$ and $beta_2$ receptors as well as the actions of the $nicotinic_N$, $nicotinic_M$ and muscarinic receptors.
9. Describe the life cycle of acetylcholine and norepinephrine using the following terms: ACh, AChE, MAO.

Chapter 15–

10. Discuss the action and therapeutic uses of the following Muscarinic agonists and antagonists: Bethanechol, Atropine. Identify high risk patients for each.

Chapter 16–

11. Define and discuss Myasthenia Gravis; the cause and the treatment through the use of cholinesterase inhibitors in the treatment of the disease: Neostigmine (action?).
12. Explain the differences between reversible and irreversible cholinesterase inhibitors.
13. Explain the differences between Myasthenic Crisis and Cholinergic Crisis.

Chapter 17–

14. Define how neuromuscular blockers are classified.
15. Give the actions and therapeutic uses of Tubocurarine and Succinylcholine.

Chapter 18–

16. Give the mechanisms of Adrenergic Receptor Activation: direct receptor binding, promotion of NE release, inhibition of NE uptake, inhibition of NE inactivation.

17. Define Catecholamine vs non-catecholamine action and give some of the important differences between the two.
18. Give ONE consequence (therapeutic action) of activation of each of the following: $alpha_1$, $alpha_2$, $beta_1$ and $beta_2$ receptors.
19. Give one significant therapeutic use and site of action of the following drugs: Isoproterenol, Dopamine, Norepinephrine and Terbutaline.

Chapter 19–

20. Give ONE primary therapeutic usage of the following Adrenergic Antagonists: $alpha_1$ and $alpha_2$ blockade (Phentolamine), and $beta_1$ and $beta_2$ blockade (Propranolol).

Chapter 20–

21. Describe the action and primary use in therapy of the following adrenergic neuron blocking agents: Reserpine, Clonidine.

Chapter 21–

22. Discuss the actions of the blood brain barrier and the types of drugs that are able to cross this barrier the best.
23. Describe how the CNS drugs produce therapeutic effects, and what adaptation is when the CNS is exposed to long-term drug exposure (tolerance and physical dependence).

Chapter 22–

24. Define Parkinson's Disease: the symptoms, the causes and the general considerations of treatment.
25. Explain the importance of the balance of dopamine, ACh and how these relate to GABA.
26. Describe the use and action of Levodopa, Carbidopa and the significance of Selegiline in the treatment of Parkinson's.
27. Explain why you should not use MAO inhibitors while treating Parkinson's Disease.

Chapter 24–

28. Define the following: analgesic anti-inflammatory agents and centrally acting muscle relaxants.
29. Describe the use of diazepam and tizanidine and show your understanding of their mechanisms of action.
30. Describe the primary difference in action of dantrolene on muscle relaxation.

Chapter 25–

31. Give the primary characteristics and causes of migraine headache (classic vs common or with or without aura).
32. Describe the action of calcitonin gene-related peptide (CGRP) and serotonin (5-hydroxytryptamine) {5-HT} in migraine control.
33. Discuss the actions of the following in controlling migraine: Excedrine Migraine, Sumatriptan, Verapamil and Propranolol (prophylaxis).