

**Study Objectives**  
**Introduction to Pharmacology**  
**Spring, 2001**

The student should be able to .....

*Remember to continue to work with the Tables in Chapter 14, describing the actions of muscarinic drugs and adrenergic drugs*

**Chapter 23: Drugs for Epilepsy**

1. Define the following terms in how they relate to epilepsy: seizure, convulsion, “focus”, partial seizures, generalized seizures.
2. Describe how antiepileptic drugs (AEDs) work, **AND** how they are chosen to be used for different forms of epilepsy: suppression of sodium influx, suppression of calcium influx, potentiation of GABA.
3. Discuss the mechanisms of actions of the following drugs in their control of different type of epileptic seizures: Phenytoin, phenobarbital, carbamazepine, valproic acid.
  - A. Discuss the following unique characteristics of Phenytoin:
    - a. Metabolism
    - b. Effect of cimetidine
    - c. Phenobarbital and alcohol (when used chronically)
  - B. Discuss the following unique characteristics of Carbamazepine:
    - a. teratogenic properties
    - b.  $\frac{1}{2}$  life of drug during therapy
    - c. Effect of grapefruit juice
4. As a Nurse, describe how you would perform the following: pre-administration assessment of epileptic patients, baseline data needed, and on-going evaluation.

**Chapter 26: Local Anesthetics**

1. Describe how local anesthetics work, and discuss their selective capacity for blocking nerve action.
2. Describe the two groups, and their differences in action and clearance and allergic reactions, of local anesthetics.
3. Discuss why you might want to combine use of local anesthetics with epinephrine (vasoconstrictor).
4. Describe the properties of the following local anesthetics: Procaine. Lidocaine, Cocaine.
5. Briefly discuss the **use** of the following techniques used to produce local anesthesia: surface anesthesia, infiltration anesthesia, nerve block anesthesia, epidural vs spinal anesthesia.
6. Discuss why you would not want a local anesthetic to get into the systemic circulation.

## **Chapter 27: General Anesthetics**

1. Contrast local vs general anesthetics.
2. Discuss the two groups of general anesthetics.
3. Define and distinguish between analgesia and anesthesia.
4. List the “ideal characteristics” of an ideal inhalation anesthetic and define “balanced anesthesia”..
5. Describe the four stages of anesthesia.
6. Define “Minimum Alveolar Concentration” (MAC) and its relation to an effective inhalation anesthesia.
7. Describe how the Uptake, Distribution, Metabolism and Elimination affect anesthetic effects.
8. Describe the use of “Adjuncts” and discuss why you would want to give pre- and/or post-anesthetic medications to the patient. What are the effects of the following adjunct therapies: Benzodiazepines, Barbituates, Opioids, Clonidine, Anti-Cholinergic drugs.
9. Explain why you would give analgesics, antiemetics and muscarinic agonists post-anesthetically.
10. Describe the characteristics of the following: Halothane, Benzodiazepines, and Ketamine, and Nitrous oxide.

## **Chapter 28: Opioid (Narcotic) Analgesics, Opioid Antagonists, and Nonopioid Centrally Acting Analgesics**

1. Define the following terms: opioid, narcotic, endogenous opioid peptides (name the 3 types and tell what they do as a group), opioid receptors (name the 3 types and describe what happens due to activation of these receptors), abuse (addiction), physical dependence and tolerance.
2. Describe the following terms as they relate to opioids: agonist, partial agonist and antagonist, and “agonist-antagonist opioids”.
3. Discuss the mechanisms of action, therapeutic use, toxicity symptoms and pharmacokinetics of the following: morphine, methadone, codeine, pentazocine, naloxone.
4. As a nurse practitioner, how would you assess pain in patients?
5. Define: physical dependence, abuse, and addiction.
6. Describe “patient-controlled analgesia (PCA).
7. Describe the use of opioids in post-operative pain, obstetric analgesia, myocardial infarction, and sickle cell vaso-occlusive crisis.

## **Chapter 29: Pain Management in Patients with Cancer**

1. Define the term “pain”, and the 3 types of stimuli that activate pain.
2. Describe how the following affect pain sensation: prostaglandins, substance P, glutamate, enkephalins, beta-endorphins.
3. Describe the differences between nociceptive and neuropathic pain.
4. Describe the overall strategy for management **and** assessment of pain. Use the flow-chart, but do not memorize the chart itself: put the management strategy into your own words.
5. Discuss some of the patient’s fears concerning the reporting of pain and how their assessment will be taken by health professionals.
6. Generally describe the non-opioid analgesics (non-steroidal anti-inflammatory drugs {NSAIDS}, the opioid analgesics, and the adjuvant analgesics for control of pain.
7. Discuss the following in terms of use, pharmacokinetics and mechanisms of pain control: Acetaminophen, morphine, butophanol.
8. Understand why, when using the above drugs, there would be such side effects as: respiratory depression, constipation, itching, orthostatic hypotension, and urinary retention.
9. Tell what the special circumstances are concerning pain management in the Elderly and in Young Children.

## **Chapter 30: Antipsychotic agents and their use in Schizophrenia**

1. Define schizophrenia: the positive and negative features, the DSM-IV Diagnostic Criteria For Schizophrenia, and the possible causes of schizophrenia.
2. Describe what is meant by the term potency vs effect of drugs, and how this relates to the “high potency” and “low potency” drugs in the treatment of schizophrenia (Thorazine and Haldol).
3. Describe the mechanisms of action, pharmacokinetics, and therapeutic uses of thorazine and haldol.
4. Tell what “extrapyramidal symptoms” (EPS) are.
5. Discuss the 3 major objectives to therapy for schizophrenia, and how drug selection for each is determined.
6. As a nurse practitioner, what types of preadministration assessment should be made for schizophrenia, and how are high risk patients identified?

## **Chapter 31: Antidepressants**

1. Describe and give the major clinical features of depression.
2. Describe what the *monoamine hypothesis* of depression is.
3. Discuss the Tricyclic Antidepressants (TCAs), their mechanism of action, their pharmacokinetics, and therapeutic uses in depression.
4. Describe the action of the monoamine oxidase inhibitors (MAOI) and how these might interact with the TCAs.
5. Understand the different types of antidepressants: tricyclic antidepressants, monoamine oxidase inhibitors, selective serotonin reuptake inhibitors, and atypical antidepressants (Pamelor, Nardil, Celexa, Wellbutrin).
6. Discuss the pro's and con's of electroconvulsive therapy for depression.
7. As a nurse practitioner, discuss the types of assessments needed for a patient who is depressed. What are the types of baseline data you should collect, who are the high risk patients, and what type of follow ups and patient education should be done?

## **Chapter 32: Drugs for Bipolar Disorder**

1. Tell what the clinical manifestations and treatment strategies are for bipolar disorder (manic depressive illness). {DSM-IV Criteria for a Manic Episode}
2. Discuss the use of lithium and benzodiazepine (or haloperidol) for bipolar disorder.
3. Describe the pharmacokinetics, therapeutic uses and chemistry behind the effects of lithium.
4. As a nurse practitioner, what are the therapeutic goals, the types of baseline data, and the criteria used to identify high risk patients for manic depression?

## **Chapter 33: Benzodiazepines and Other Drugs for Anxiety and Insomnia**

1. Define the following: benzodiazepines, and anxiolytics (tranquilizers), and hypnotics.
2. Discuss the pharmacologic effects of benzodiazepines (diazepam= valium). What is the action of benzodiazepines on GABA?
3. Explain the pharmacokinetics, metabolism, time course of action and therapeutic uses (3) of the benzodiazepines.
4. Describe the actions and pharmacologic effect of barbiturates.
5. Define tolerance and physical dependence as related to barbiturates.

6. Discuss the management of anxiety. Describe “situational anxiety” and “generalized anxiety disorder (GAD)”.
7. Discuss the management of insomnia. In your description, define the two primary sleeping divisions: rapid eye movement (REM) and non rapid eye movement (NREM).
8. Give some of the “Rules for Sleep Fitness”.

### **Chapter34: Central Nervous System Stimulants and their Use in Attention-Deficit/Hyperactivity Disorder (ADHD)**

1. Contrast the differences between CNS stimulants and antidepressants.
2. Define amphetamines (dextroamphetamine and levamphetamine).
3. Give the pharmacologic effects of amphetamines.
4. Describe the use and pharmacologic effects of the following: methylphenidate (Ritalin), Methylxanthines (Caffeine).
5. Define ADHD (give the DSM-IV Diagnostic Criteria for ADHD).
6. Give the etiology, management, and treatment protocols for ADHD.

### **Chapter35: Other Psychologic Disorders: Panic Disorder, Obsessive-Compulsive Disorder, and Alzheimer’s Disease**

1. Describe “Panic Disorder”, and give the treatments for this disorder.
2. Describe “Obsessive-Compulsive Disorder” and give the treatments for this disorder.
3. Describe “Alzheimer’s Disease”, the pathophysiology (reduced cholinergic transmission, neuritic plaques and beta-amyloid, the neurofibrillary tangles and tau, and the function of apolipoprotein E4).
4. Give the symptoms of AD, the diagnostic criteria, and the drug therapy for AD.