

REFERENCE GUIDE FOR PHARMACY TECHNICIAN EXAM

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PREFACE

Today, the pharmacy is considered a very fast growing field. The jobs done by pharmacists yesterday have completely changed today. Today's pharmacist is not merely a machine to dispense drugs, he or she can counsel the patients, keep an eye on important interactions, and practice more towards the clinical side of the field of pharmacy.

However, this requires a great amount of time and patience. By considering all of these factors, in 1995 PTCB® was introduced. By certifying pharmacy technicians, pharmacists can spend more time on patient counseling and other patient oriented jobs.

To prepare a pharmacy technician to take over some of the responsibilities of pharmacists, such as discovering duplicated therapy, wrong doses and directions, and the knowledge of drug indications and interactions, the Pharmacy Technician Certification Exam® was introduced in 1995.

This exam will test pharmacy technicians on three major areas:

1. Assisting the pharmacist in serving patients.
2. Maintaining medications and inventory control systems.
3. Participating in administration and management of the pharmacy practice.

This reference guide has more than 500 questions that allow you to practice tackling the actual exam.

We have also included more than 40 chapters that will give you knowledge of drug trade names, generic names, indications and major adverse reactions.

The PTCB® exam puts more emphasis on calculations; therefore, all efforts were made to include calculations in the tutorial.

The practice test at the end of the reference guide will ensure that you understand the material provided for you in this reference guide. All suggestions from you are always welcome.

Best of luck.

MANAN SHROFF

TABLE OF CONTENTS

SECTION -I

| | | |
|----|--|----|
| 1 | INOTROPIC AGENTS | 7 |
| 2 | ANTIARRHYTHMIC AGENTS | 7 |
| 3 | BETA-BLOCKERS | 8 |
| 4 | CENTRALLY ACTING ANTIHYPERTENSIVE | 9 |
| 5 | CA-CHANNEL BLOCKERS | 10 |
| 6 | ACE INHIBITORS | 11 |
| 7 | VASODILATORS | 12 |
| 8 | ANTIPLATELET AGENTS | 12 |
| 9 | CORONARY VASODILATORS | 13 |
| 10 | THROMBOLYTIC AGENTS | 14 |
| 11 | DIURETICS | 14 |
| 12 | SPECIFIC ALPHA-1 BLOCKERS | 16 |
| 13 | ANTIHYPERLIPIDEMIC AGENTS | 17 |
| 14 | TRANQUILIZERS | 18 |
| 15 | ANTIEPILEPTICS | 20 |
| 16 | ANTIDEPRESSANTS | 21 |
| 17 | ANTI PARKINSON'S | 25 |
| 18 | ATTENTION DEFICIT DISORDER | 28 |
| 19 | ANTI NEUROLEPTICS | 30 |
| 20 | ANTIBIOTICS | 32 |
| 21 | ANTI-AIDS | 44 |
| 22 | ACNE PRODUCTS | 46 |
| 23 | PEPTIC ULCER | 47 |
| 24 | ANTIHISTAMINES | 49 |
| 25 | ARTHRITIS | 50 |
| 26 | ASTHMA | 51 |
| 27 | BPH | 53 |
| 28 | COLONY and ERYTHROCYTE STIMULATING FACTORS | 54 |
| 29 | HEMATINIC AGENTS | 54 |
| 30 | HYPURICEMIA and GOUT | 55 |
| 31 | IMMUNOSUPPRESSANTS | 56 |
| 32 | MIGRAINE | 57 |
| 33 | NAUSEA MEDICATIONS | 59 |
| 34 | NSAIDS | 61 |

| | | |
|----|------------------------------------|----|
| 35 | OPIOIDS ANALGESIC | 62 |
| 36 | OSTEOPOROSIS and HYPOCALCEMIA | 65 |
| 37 | ANTI PLATELETS and ANTI COAGULANTS | 67 |
| 38 | SMOKING CESSATION AIDS AGENTS | 69 |
| 39 | THYROID | 69 |
| 40 | ULCERATIVE COLITIS | 70 |
| 41 | DIABETES-RELATED DRUGS | 71 |
| 42 | PHARMACY LAW | 75 |
| 43 | PHARMACEUTICAL CALCULATIONS | 86 |

SECTION-II

| | | |
|----|---------------|-----|
| 44 | QUESTIONS | 92 |
| 45 | ANSWERS | 136 |
| 46 | PRACTICE TEST | 177 |
| 47 | ANSWERS | 189 |

SECTION -I

1-INOTROPIC AGENTS

| <u>Brand</u> | <u>Generic</u> | <u>Adverse Effects</u> |
|---------------------|-----------------------|-------------------------------|
| Lanoxin | Digoxin | anorexia, nausea |
| Primacor | Milrinone | thrombocytopenia |
| Inocor | Amrinone | ventricular arrhythmia |

Therapeutic uses of inotropic agents:

- * Congestive heart failure (CHF)

Terminology:

Anorexia: Appetite loss.

Thrombocytopenia: A low platelets count in blood.

Ventricular arrhythmia: Irregular movements of left ventricles of the heart.

2-ANTIARRHYTHMIC AGENTS

M/A: This class of agents is indicated for the treatment of an irregular heart rhythm.

| <u>Brand</u> | <u>Generic</u> | <u>Adverse Effects</u> |
|---------------------|-----------------------|---|
| Cordarone | Amiodarone | pulmonary toxicity |
| Norpace | Disopyramide | dry eyes, blurred vision, negative inotropic effect |
| Tambocor | Flecainide | A.V. node suppression |
| Ethmozine | Moricizine | A.V. node suppression |
| Xylocaine | Lidocaine | CNS stimulation, seizure |
| Tonocard | Tocainide | pulmonary toxicity |
| Dilantin Cerebyx | Phenytoin | gingival hyperplasia, ataxia |
| Procanbid | Procainamide | S.L.E, blood dyscrasias |
| Quinidine | Quinidine | diarrhea |

Therapeutic uses of antiarrhythmic agents:

- * Arrhythmia

Terminology:

Pulmonary toxicity: Lung toxicity.

Gingival hyperplasia: Gum inflammation and bleeding.

Ataxia: Lack of coordination of muscle movements.

Nystagmus: Rapid involuntary movement of eyes that may be from side to side, up and down, or rotatory.

S.L.E.: Systemic lupus erythematosus (chronic inflammatory disease of connective tissues).

Blood dyscrasias: Abnormality in blood.

A.V. node suppression: Slowing down in conduction velocity of heart.

Negative inotropic effects: Reducing the force of muscle contraction of heart.

3-BETA-BLOCKERS

M/A: They block Beta-1 receptors in cardiac tissues. They reduce the oxygen requirement of the heart by decreasing the heart rate and force of contraction of the heart associated with an exercise.

| <u>Brand</u> | <u>Generic</u> | <u>Adverse Effects</u> |
|------------------------|-----------------------|-------------------------------|
| Tenormin | Atenolol | bradycardia |
| Lopressor Toprol XL | Metoprolol | bradycardia |
| Inderal | Propranolol | bradycardia |
| Corgard | Nadolol | bradycardia |
| Zebeta | Bisoprolol | bradycardia |
| Normodyne Trandate | Labetalol | bradycardia |
| Sectral | Acebutolol | bradycardia |
| Coreg | Carvedilol | bradycardia |
| Brevibloc | Esmolol | bradycardia |
| Levatol | Penbutolol | bradycardia |

Therapeutic uses of beta-blockers:

- * Hypertension and angina

Do not use beta-blockers for:

1. CHF patients: May cause fatal heart failure.
2. Diabetic patients: May mask the symptoms of hypoglycemia.
3. Asthma patients: May constrict the bronchial smooth muscles by blocking beta-2 receptors.

Terminology:

Bradycardia: Slowing down of heart rate.

Hypoglycemia: Low blood glucose level.

Bronchial muscles: Smooth muscles of lungs.

Angina: Heart disorder with sharp pain in heart.

4-CENTRALLY ACTING ANTIHYPERTENSIVE AGENTS

M/A: Agents of this class generally inhibit the secretion of nor-adrenaline from the brain, which is responsible for causing hypertension.

| <u>Brand</u> | <u>Generic</u> | <u>Adverse Effects</u> |
|---------------------|-----------------------|-------------------------------|
| Aldomet | Methyldopa | hemolytic anemia |
| Catapres | Clonidine | hypotension |
| Tenex | Guanfacine | hypotension |
| Wytensin | Guanabenz | hypotension |

Therapeutic uses:

- * Hypertension

Terminology:

Hemolytic anemia: In hemolytic anemia, due to a premature destruction of RBCs, there are not enough red blood cells in blood.

Hypertension: Elevation of arterial blood pressure above the normal range.

Hypotension: Condition in which arterial blood pressure is abnormally low.

5-CA-CHANNEL BLOCKERS

M/A: They produce the dilation of coronary arteries, and thereby increase the blood flow to the heart.

| <u>Brand</u> | <u>Generic</u> | <u>Adverse Effects</u> |
|-----------------------------|-----------------------|-------------------------------|
| Adalat Procardia | Nifedipine | hypotension |
| Calan Isoptin Verelan | Verapamil | hypotension, constipation |
| Cardizem | Diltiazem | hypotension |
| Norvasc | Amlodipine | hypotension |
| Plendil | Felodipine | hypotension |
| Cardene | Nicardipine | hypotension |
| DynaCirc | Isradipine | hypotension |
| Vascor | Bepridil | hypotension |
| Nimotop | Nimodipine | hypotension |
| Sular | Nisoldipine | hypotension |

Therapeutic uses:

- * Hypertension

Terminology:

Hypertension: Elevation of arterial blood pressure above the normal range.

Hypotension: Condition in which arterial blood pressure is abnormally low.

6-ACE INHIBITORS

M/A: They inhibit the enzymatic conversion of angiotensin I to angiotensin II. They are known as angiotensin converting enzyme inhibitors (ACE inhibitors).

| <u>Brand</u> | <u>Generic</u> | <u>Adverse Effects</u> |
|---------------------|-----------------------|--|
| Vasotec | Enalapril | hypertension, dry cough, dysgeusia, hyperkalemia |
| Zestril Prinivil | Lisinopril | hypertension, dry cough, dysgeusia, hyperkalemia |
| Capoten | Captopril | hypertension, dry cough, dysgeusia, hyperkalemia |
| Altace | Ramipril | hypertension, dry cough, dysgeusia, hyperkalemia |
| Lotensin | Benazepril | hypertension, dry cough, dysgeusia, hyperkalemia |
| Accupril | Quinapril | hypertension, dry cough, dysgeusia, hyperkalemia |
| Monopril | Fosinopril | hypertension, dry cough, dysgeusia, hyperkalemia |
| Mavik | Trandolapril | hypertension, dry cough, dysgeusia, hyperkalemia |

ANGIOTENSIN II RECEPTOR ANTAGONISTS

M/A: Angiotensin II receptor antagonists, also known as angiotensin receptor blockers (ARBs), are medications that block the action of angiotensin II by preventing angiotensin II from binding to angiotensin II receptors on blood vessels.

| <u>Brand</u> | <u>Generic</u> | <u>Adverse Effects</u> |
|---------------------|-----------------------|-------------------------------|
| Cozaar | Losartan | hyperkalemia |
| Diovan | Valsartan | hyperkalemia |
| Avapro | Irbesartan | hyperkalemia |
| Atacand | Candesartan | hyperkalemia |
| Micardis | Telmisartan | hyperkalemia |

The advantage of ACE II receptor antagonists over ACE inhibitors is that they do not produce dry cough.

Therapeutic uses:

- * Hypertension

Terminology:

Dysgeusia: Loss of taste.

Hyperkalemia: An elevated concentration of potassium in blood.

7-VASODILATORS

M/A: As the name suggests, this class of agents generally causes dilation of blood vessels.

| <u>Brand</u> | <u>Generic</u> | <u>Adverse Effects</u> |
|---------------------|-----------------------|--|
| Apresoline | Hydralazine | S.L.E., tachycardia, peripheral neuritis |
| Loniten Rogaine | Minoxidil | hypertrichosis, tachycardia |
| Hyperstat | Diazoxide | edema, tachycardia |

Therapeutic uses:

- * Hypertension

Terminology:

Tachycardia: It typically refers to a heart rate that exceeds the normal range for a resting heartrate (heartrate in an inactive or sleeping individual).

Edema: An excessive accumulation of fluid in body tissues.

Hypertrichosis: An excessive hair growth on the body.

Systemic lupus erythematosus (SLE): It is a chronic, inflammatory autoimmune disorder. It may affect the skin, joints, kidneys and other organs.

Peripheral neuritis: It is a problem with the nerves that carry information to and from the brain and spinal cord. This can produce pain, loss of sensation and an inability to control muscles.

8-ANTIPLATELET AGENTS

M/A: They generally inhibit the aggregation of platelets and make blood thinner in order to reduce heart strokes.

| <u>Brand</u> | <u>Generic</u> | <u>Adverse Effects</u> |
|---------------------|-----------------------|-------------------------------|
| Ecotrin | Aspirin | GI ulcer, bleeding |
| Ticlid | Ticlopidine | bleeding, agranulocytosis |
| Persantine | Dipyridamole | bleeding |
| Plavix | Clopidogrel | bleeding |

| <u>Brand</u> | <u>Generic</u> | <u>Adverse Effects</u> |
|--------------|------------------------|------------------------|
| Aggrenox | Aspirin + Dipyridamole | bleeding |
| Effient | Prasugrel | bleeding |

Therapeutic uses:

- * Heart strokes prevention.

Terminology:

Agranulocytosis: A disorder in which there is an acute deficiency of granulocytes in blood.

9-CORONARY VASODILATORS

M/A: Agents of this class generally dilate the blood vessels of the heart, thereby help controlling hypertension and preventing an angina.

| <u>Brand</u> | <u>Generic</u> | <u>Adverse Effects</u> |
|--|------------------------|--|
| Isordil | Isosorbide-dinitrate | lightheadedness, hypotension, severe headaches |
| Sorbitrate Iso-bid Dilatrate | | |
| Nitrostat Nitro dur Nitro-bid Deponit Nitrolingual | Nitroglycerine | lightheadedness, hypotension, severe headaches |
| Imdur ISMO Monoket | Isosorbide-mononitrate | lightheadedness, hypotension, severe headaches |

Therapeutic uses:

- * Angina

Terminology:

Lightheadedness: Dizziness (lightheadedness) is often caused by a decrease in blood supply to the brain.

Hypotension: Condition in which an arterial blood pressure is abnormally low.

10-THROMBOLYTIC AGENTS

M/A: Agents of this class help removing a blood clot that usually occurs after a heart stroke.

| <u>Brand</u> | <u>Generic</u> | <u>Adverse Effects</u> |
|------------------------|-----------------------|--|
| Streptase | Streptokinase | severe bleeding, intracranial hemorrhage |
| Abbokinase Kinlytic | Urokinase | severe bleeding, intracranial hemorrhage |
| Activase | Alteplase | severe bleeding, intracranial hemorrhage |
| Tnkase | Tenecteplase | severe bleeding, intracranial hemorrhage |
| Retavase | Reteplase | severe bleeding, intracranial hemorrhage |

Therapeutic uses:

- * Removal of a blood clot that usually occurs after a heart stroke.

Terminology:

Intracranial hemorrhage: An intracranial hemorrhage is a hemorrhage, or bleeding, within the skull.

11-DIURETICS

M/A: They generally increase the excretion of water from the body to reduce high blood pressure, swelling and edema.

Thiazide Diuretics:

| <u>Brand</u> | <u>Generic</u> | <u>Adverse Effects</u> |
|----------------------------------|-----------------------|-------------------------------|
| HydroDiuril Oretic Esidrix | HCTZ | hypokalemia |
| Diuril | Chlorothiazide | hypokalemia |
| Zaroxolyn | Metolazone | hypokalemia |
| Lozol | Indapamide | hypokalemia |
| Hygroton | Chlorthalidone | hypokalemia |

Loop Diuretics:

| <u>Brand</u> | <u>Generic</u> | <u>Adverse Effects</u> |
|---------------------|-----------------------|-------------------------------|
| Lasix | Furosemide | hypokalemia |
| Bumex | Bumetanide | hypokalemia |
| Demadex | Torsemide | hypokalemia |
| Edecrin | Ethacrynic acid | hypokalemia |

- * Loop and thiazide diuretics generally cause hypokalemia; therefore, a potassium supplement is required when a patient is treated with the above diuretics.

Terminology:

Hypokalemia: Low concentration of potassium in blood.

Hypertension: It is the term used to describe high blood pressure. Blood pressure readings are measured in millimeters of mercury (mmHg), and usually given as two numbers. For example, 120 over 80 (written as 120/80 mmHg).

- * The top number is called systolic pressure, the pressure created when a heart beats. It is considered high if it is consistently over 140.
- * The bottom number is known as diastolic pressure, the pressure inside blood vessels when the heart is at rest. It is considered high if it is consistently over 90. In hypertension, either or both of these numbers may be high or elevated.
- * Pre-hypertension is when the systolic blood pressure is between 120 and 139 and/or diastolic blood pressure is between 80 and 89 on multiple readings. If one has pre-hypertension, he/she is more likely to develop a high blood pressure in the future.

Edema: It is swelling that is caused by fluid trapped in the body's tissues. An edema happens most often in the feet, ankles and legs.

Potassium-Sparing Diuretics:

- * Unlike thiazide and loop diuretics, this class of diuretics does NOT affect the potassium concentration in blood, and therefore they are known as potassium-sparing diuretics.

| <u>Brand</u> | <u>Generic</u> | <u>Adverse Effects</u> |
|---------------------|-----------------------|-------------------------------|
| Aldactone | Spironolactone | hyperkalemia |
| Dyrenium | Triamterene | hyperkalemia |

| <u>Brand</u> | <u>Generic</u> | <u>Adverse Effects</u> |
|--------------|----------------|------------------------|
| Midamor | Amiloride | hyperkalemia |
| Inspra | Eplerenone | hyperkalemia |

Therapeutic uses:

- * Hypertension (high blood pressure) and edema.

Terminology:

Hyperkalemia: An elevated concentration of potassium in blood.

12-SPECIFIC ALPHA-1 BLOCKERS

M/A: Agents of this class generally dilate both veins and arteries by blocking alfa-1 adreno-receptors. They are indicated for the treatment of hypertension and BPH.

| <u>Brand</u> | <u>Generic</u> | <u>Use</u> |
|--------------|--------------------------|-------------------|
| Minipress | Prazosin | hypertension, BPH |
| Cardura | Doxazosin | hypertension, BPH |
| Hytrin | Terazosin | hypertension, BPH |
| Flomax | Tamsulosin | only BPH |
| Jalyn | Tamsulosin + Dutasteride | only BPH |
| Uroxatral | Alfuzosin | only BPH |
| Rapaflo | Silodosin | only BPH |

Adverse Effects:

- * Syncope

Terminology:

ER: Extended release.

Syncope: Sudden loss of consciousness.

BPH (Benign Prostatic Hyperplasia): Benign prostatic hyperplasia (BPH) refers to an increase in a size of the prostate gland in the middle-aged and elderly men.

13-ANTIHYPERLIPIDEMIC AGENTS

M/A: Hyperlipidemia is defined as a condition in which increases in serum concentrations of cholesterol and triglyceride have been notified. It increases the risk of atherosclerosis. Agents of this class generally reduce the serum concentration of cholesterol and thus reduce the risk of heart stroke associated with atherosclerosis.

HMG COA Inhibitors:

| <u>Brand</u> | <u>Generic</u> | <u>Adverse Effects</u> |
|---------------------|-----------------------|-------------------------------|
| Mevacor | Lovastatin | myopathy, liver toxicity |
| Altoprev | | |
| Altocor | | |
| Zocor | Simvastatin | myopathy, liver toxicity |
| Pravachol | Pravastatin | myopathy, liver toxicity |
| Lescol | Fluvastatin | myopathy, liver toxicity |
| Lescol XL | | |
| Lipitor | Atorvastatin | myopathy, liver toxicity |
| Baycol | Cerivastatin | myopathy, liver toxicity |
| Livalo | Pitavastatin | myopathy, liver toxicity |

FIBRIC ACID DERIVATIVES:

| <u>Brand</u> | <u>Generic</u> | <u>Adverse Effects</u> |
|---------------------|-----------------------|----------------------------------|
| Lopid | Gemfibrozil | gall bladder disease |
| Atromid | Clofibrate | cholelithiasis |
| Tricor | Fenofibrate | nausea, vomiting |
| Lipofen | | |
| Lofibra | | |
| Fenoglide | | |
| Antara | | |
| Triglide | | |
| Trilipix | Fibric acid | abdominal pain, nausea, vomiting |

BILE ACID BINDING RESINS:

| <u>Brand</u> | <u>Generic</u> | <u>Adverse Effects</u> |
|--------------|----------------|------------------------|
| Questran | Cholestyramine | constipation |
| Colestid | Colestipol | constipation |
| Welchol | Colesevelam | constipation |

MISCELLANEOUS:

| <u>Brand</u> | <u>Generic</u> | <u>Adverse Effects</u> |
|--------------|----------------------------|----------------------------------|
| Nicobid | Nicotinic acid | flushing of skin, liver toxicity |
| Slo-niacin | | |
| Niacin SR | | |
| Zetia | Ezetimibe | N/A |
| Lovaza | Omega-3 acid - ethyl ester | upset stomach, burping |

Therapeutic uses:

- * To reduce an elevated blood cholesterol level.

Terminology:

Atherosclerosis: Deposition of cholesterol into the coronary artery.

Myopathy: Disease of the muscles.

Cholelithiasis: The presence of gallstones in the gallbladder.

14-TRANQUILIZERS

M/A: Agents of this class are generally indicated for the treatment of anxiety, insomnia and seizure by producing sedation.

| <u>Brand</u> | <u>Generic</u> | <u>Brand</u> | <u>Generic</u> |
|--------------|------------------|--------------|------------------|
| Xanax | Alprazolam | Ambien | Zolpidem, Tovalt |
| Niravam | | | |
| Xanax (XR) | | | |
| Valium | Diazepam | Sonata | Zaleplon |
| Librium | Chlordiazepoxide | Dalmane | Flurazepam |

| <u>Brand</u> | <u>Generic</u> | <u>Brand</u> | <u>Generic</u> |
|--------------|----------------|--------------|----------------|
| Ativan | Lorazepam | Centrax | Prazepam |
| Restoril | Temazepam | Doral | Quazepam |
| ProSom | Estazolam | Halcion | Triazolam |
| Serax | Oxazepam | Klonopin | Clonazepam |
| Tranxene | Clorazepate | Lunesta | Eszopiclone |

Melatonin receptor antagonist:

Ramelteon Rozerem

Therapeutic uses:

- * Insomnia
 - * Anxiety
 - * Panic disorder (secondary therapy)
 - * Seizure (only Diazepam and Clonazepam)

Adverse Effects:

- * Drowsiness
 - * Depression
 - * Constipation
 - * Restlessness

Terminology:

Antagonist: A receptor antagonist is a type of receptor ligand or drug that does not provoke a biological response itself upon binding to a receptor, but blocks or dampens agonist-mediated responses.

Insomnia: It is difficulty getting to sleep or staying asleep, or having non-refreshing sleep for at least 1 month.

Drowsiness: It refers to feeling abnormally sleepy during the day.

Remember the following notes for benzodiazepines:

1. All benzodiazepines are controlled drugs and classified as schedule IV controlled agents.
 2. The maximum numbers of allowable refills for benzodiazepines are five.
 3. A prescription for benzodiazepines should not be filled or refilled after six months from the date it is issued.

15-ANTIEPILEPTICS

M/A: Epilepsy is defined as a chronic CNS disorder characterized by brief episodes of seizures.

| <u>Brand</u> | <u>Generic</u> | <u>Adverse Effects</u> |
|---------------------|-----------------------|---|
| Dilantin Cerebyx | Phenytoin | gum inflammation, ataxia, nystagmus |
| Depakene | Valproic acid | hepatic toxicity, bleeding |
| Depakote | Sodium valproate | hepatic toxicity, bleeding |
| Neurontin | Gabapentin | ataxia, nystagmus |
| Lamictal | Lamotrigine | severe rash |
| Barbital | Phenobarbital | hang-over effect, dizziness, drowsiness |
| Tegretol | Carbamazepine | aplastic anemia, agranulocytosis |
| Milontin | Phensuximide | blood dyscrasia |
| Celontin | Methsuximide | blood dyscrasia |
| Zarontin | Ethosuximide | blood dyscrasia |
| Mysoline | Primidone | hang-over effect, dizziness, drowsiness |
| Zonegran | Zonisamide | drowsiness, somnolence |
| Topamax | Topiramate | decreased visual activity |
| Gabitril | Tiagabine | somnolence, dizziness |
| Keppra | Levetiracetam | somnolence, fatigue |
| Trileptal | Oxcarbamazepine | somnolence, ataxia |
| Felbatol | Felbamate | aplastic anemia, liver failure |

Therapeutic uses:

- * Seizure (epilepsy)

SECTION II

1 Which of the following cannot be refilled under any circumstances?

- a. Metoprolol
- b. Methylphenidate
- c. Mitomycin
- d. Hydroxyurea

2 Valproic acid syrup is available as 250 mg/5cc. If a patient were taking 1000 mg in the morning and 750 mg in the evening, how many cc of syrup would you dispense for a 30-day supply?

- a. 1500 cc
- b. 1050 cc
- c. 500 cc
- d. 480 cc

3 If a patient were taking Glyburide for the treatment of Type II diabetes and a physician prescribed him Chlorpropamide, what should a pharmacy technician do?

- a. Fill the prescription.
- b. Notify a pharmacist about duplication of therapy.
- c. Notify a pharmacist about a drug interaction.
- d. All of the above.

4 All of the following drugs should be carefully prescribed with aspirin EXCEPT:

- a. Enoxaparin
- b. Coumadin
- c. Heparin
- d. Metoclopramide

5 An overdose of Coumadin can be treated with:

- a. Vitamin K
- b. Acetylcysteine
- c. Mesna
- d. Protamine sulfate

6 Prochlorperazine can be classified as an:

- a. Anti-emetic
- b. Anti-depressant
- c. Anti-anxiety
- d. Anti-hypertensive

7 A patient is taking Amoxicillin 500 mg by mouth, three times a day for 7 days. How many capsules of 500 mg of Amoxicillin will you dispense?

- a. 42
- b. 21
- c. 7
- d. 30

8 The cost for 100 tablets of Olanzapine is **\$420.00**. The percentage markup on the prescription is a 15. What would be the retail cost for 30 tablets of Olanzapine?

- a. \$200
- b. \$145
- c. \$300
- d. \$450

9 How much 3% salicylic acid powder is required to mix with talc powder to prepare 0.20%, 500 grams of Salicylic acid?

- a. 50 gm
- b. 33 gm
- c. 480 gm
- d. 57 gm

10 Clopidogrel is classified as a(n):

- a. Anti-hypertensive
- b. Platelet aggregation inhibitor
- c. Anti-diabetic
- d. Anti-Parkinson's

11 All of the following drugs can be indicated for the treatment of asthma EXCEPT:

- a. Ipratropium
- b. Metoprolol
- c. Albuterol
- d. Zafirlukast

12 A prescription for MS Contin 30 mg was written as follows:

| |
|----------------------------|
| Manan Care Rx |
| Mr. Shroff 1/1/01 |
| Ms Contin 30 mg |
| sig-1 po tid x 30 day # 60 |
| Dr. Bhatia 1/1/02 |
| Refill-0 MHS |
| DEA # AB2354760 |

What would be the dispensed quantity for the above prescription?

- a. 90
- b. 60
- c. 30
- d. 10

13 A patient brings a prescription for Diazepam 10 mg to a pharmacy. Upon reviewing a profile, the prescription has already been refilled 5 times. The pharmacy technician will do which of the following?

- a. Refill the prescription as it was written prn times.
- b. Cannot refill. Notify the pharmacist.
- c. Refuse to fill since the prescription needs the DEA Form 222.
- d. Refuse to fill since the drug is NOT in a stock.

14 Which of the following auxiliary labels is required when dispensing Oticort otic solution?

- a. Take with food.
- b. Do not consume alcoholic beverages.
- c. For ear only.
- d. Shake well before dispensing.

15 All of the following drugs are classified as colony and erythrocytes stimulators EXCEPT:

- a. Filgrastim
- b. Epoetin
- c. Tamsulosin
- d. Sargramostim

16 Lanoxin pediatric solution is available in 0.05 mg/ml. If a patient takes 0.25 mg of Lanoxin per day, what will be the dispensed quantity in mL for 30 days?

- a. 25 cc
- b. 50 cc
- c. 100 cc
- d. 150 cc

17 All of the following drugs need to be stored in a refrigerator EXCEPT:

- a. Ativan injection
- b. Compazine suppository
- c. Diflucan suspension
- d. Xalatan eye drops

18 What is the brand name for Terazosin?

- a. Glucophage
- b. Hytrin
- c. Inderal
- d. Haldol

19 Haloperidol should be classified as which of the following?

- a. Anti-psychotic
- b. Anti-anxiety
- c. Anti-depressant
- d. Tranquilizer

20 All of the following drugs can be used for the treatment of epilepsy EXCEPT:

- a. Diazepam
- b. Valproic acid
- c. Lovastatin
- d. Gabapentin

ANSWERS

1 (b) Methylphenidate is a Schedule II controlled drug. It is indicated for the treatment of attention deficit hyperactivity disorder (ADHD). It cannot be refilled under any circumstances. A list of other Schedule II controlled drugs is as follows:

| <u>For ADHD</u> | <u>For Pain</u> |
|-----------------|-----------------|
| Adderall | MS Contin |
| Ritalin | RMS |
| Dexedrine | Roxicodone |
| Desoxyn | Methadone |
| Concerta | Demerol |
| Focalin | Dilaudid |
| | Codeine |

2 (b) 1050cc. In this type of calculation we first calculate a number of cc required for a 1-day.

1050cc. In this type of calculation we first need to find out the number of cc required for 1 day.

Morning dose:

| <u>Drug</u> | <u>ml of solution</u> |
|-------------------|-----------------------|
| 250 mg present in | 5 cc of solution |
| 1000 mg | ? |

$$1000 \times 5 \text{ cc} / 250 = 20 \text{ cc of solution.}$$

Evening dose:

| <u>Drug</u> | <u>ml of solution</u> |
|-------------------|-----------------------|
| 250 mg present in | 5 cc of solution |
| 750 mg | ? |

$$750 \times 5 \text{ cc} / 250 = 15 \text{ cc of solution.}$$

For a 30-day supply:

$$[20 \text{ cc (am)} + 15 \text{ cc (pm)}] \times 30 = 1050 \text{ cc.}$$

3 (b) Glyburide and Chlorpropamide are sulfonylurea agents indicated for the treatment of Type II diabetes mellitus. A pharmacy technician

should notify a pharmacist about therapeutic duplication.

4 (d) Aspirin is a blood thinning agent indicated for the prevention of heart strokes. It should be carefully prescribed with other blood thinning agents because of a risk of a severe bleeding.

Lovenox (Enoxaparin), Coumadin (Warfarin), Heparin, Plavix (Clopidogrel), Ticlid (Ticlopidine), Depakene (Valproic acid), Persantine (Dipyridamole), Mandol (Cefamandole), Cefotan (Cefotetan), Cefobid (Cefoperazone) and Moxam (Moxalactam) may increase the bleeding tendency in patients and should be carefully prescribed with other blood thinning agents.

5 (a) An overdose of Coumadin can be treated by administering vitamin K1 (Mephyton).

6 (a) Compazine (Prochlorperazine) is indicated for the treatment of nausea and vomiting. It is classified as an anti-emetic (an agent that prevents nausea and vomiting).

7 (b) 21 capsules.

8 (b) The cost for 100 tablets of Olanzapine is \$420; therefore, the cost for a single tablet of Olanzapine should be $\$420/100 = \4.20 .

The % mark-up on a prescription is 15.

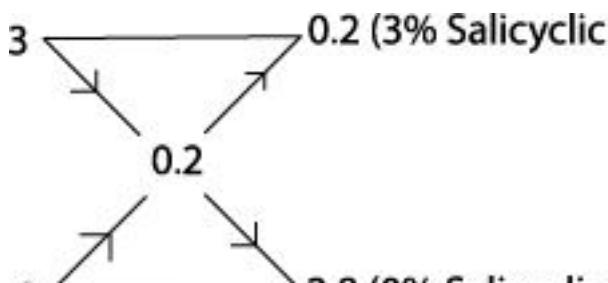
| <u>Cost for Olanzapine</u> | <u>mark-up on rx</u> |
|----------------------------|----------------------|
| \$100 | \$15 |
| \$4.20 | ? |

$15 \times 4.20 / 100 = \$0.63$, therefore a dispensing cost of each tablet of Olanzapine should be $\$4.20 + \$0.63 = \$4.83$.

The cost for dispensing 30 tablets should be $\$4.83 \times 30 = \145 .

9 (b) 33 grams. For calculations of this type, an allegation method is very useful. We should mix 3% Salicylic acid powder with a talc powder

(0 % Salicylic acid) in such a way that the final mixture would give us 500 grams of 0.2% Salicylic acid powder.



| <u>Total parts of 0.2% acid</u> | <u>Parts of 3 % acid</u> |
|---------------------------------|--------------------------|
| 3 parts | 0.2 parts |
| 500 | ? |

$$500 \times 0.2/3 = 33 \text{ grams of 3\% salicylic acid.}$$

Therefore, if we mix 33 grams (3% Salicylic acid) with 467 grams talc powder (500 grams - 33 grams = 467 grams), we will get 500 grams of 0.2% Salicylic acid.

10 (b) Plavix (Clopidogrel) is a blood thinning agent. Agents of this class generally act by inhibiting aggregation of platelets, which is thought to be the primary mechanism of blood clotting. It is indicated for prevention of heart strokes in patients with congestive heart failure (CHF).

11 (b) Asthma is characterized by increased responsiveness of the trachea and bronchi to various stimuli and narrowing of airways. It is associated with shortness of breath, chest tightness, wheezing and coughing. The stimulation of beta-2 receptors dilates the bronchial smooth muscles and helps controlling symptoms associated with asthma.

Beta-2 receptors blockers may constrict the smooth muscles of bronchi and even aggravate asthma.

Metoprolol is a beta receptor blocker indicated for the treatment of hypertension. It should be carefully prescribed to patients suffering from asthma. The other choices, such as Accolate and Atrovent, are indicated for the treatment of asthma.

12 (b) A prescription for Schedule II controlled drugs should be dispensed with an exact dispensing quantity mentioned on the prescription by a prescribing physician. MS-Contin is a Schedule II controlled drug. The correct dispensing quantity should be 60.

13 (b) A prescription for Schedule III and IV controlled drugs cannot be refilled more than 5 times within a period of six months from the date the prescription was issued. A patient must bring a new prescription since all the allowable refills were executed.

14 (c) Otocort otic solution is intended for ear use only. It should not be applied to eyes. An auxiliary label, "for ear use only", should be placed on the dispensing container.

15 (c) Tamsulosin is a generic name for Flomax. It is indicated for the treatment of Benign prostatic hyperplasia (BPH). All other choices are colony stimulating agents. They generally help stimulating the production of erythrocytes and granulocytes in patients receiving chemotherapeutic agents.

16 (d) 150 cc. Lanoxin is available as 0.05mg/ml. A patient is taking 0.25 mg per day. Therefore:

| <u>Lanoxin</u> | <u>ml of solution</u> |
|--------------------|-----------------------|
| 0.05 mg present in | 1 ml |
| 0.25 mg | ? |

$$0.25 \times 1 / 0.05 = 5 \text{ ml,}$$

For 30 days supply = $30 \times 5 \text{ ml} = 150 \text{ ml}$

17 (c) Diflucan and Biaxin suspensions should be stored at room temperature once they are reconstituted with water. All other suspensions (except Biaxin and Diflucan) are required to be stored in a refrigerator once they are reconstituted with water.

18 (b) Hytrin.

19 (a) An anti-psychotic.

20 (c) Mevacor (Lovastatin) is indicated for the treatment of elevated lipid levels. It is not indicated for the treatment of epilepsy.

21 (b) All drugs mentioned in a question are indicated for the treatment of hypertension; therefore, the patient is most likely suffering from hypertension.

22 (b) Aspirin is classified as an NSAID (Non Steroidal Anti-Inflammatory Drug). If a patient were allergic to aspirin, he might have an allergic reaction to drugs that fall into the same class. Naproxen is also classified as an NSAID and therefore the correct choice should be "b."

23 (d) A patient with a "sulfa" allergy should avoid thiazide diuretics (HCTZ), oral sulfonylurea agents (Glyburide) and sulfa drugs (Sulfadiazine) since these classes of drugs have a sulfa group in their chemical structures.

Cylert (Pemoline) is a Schedule III controlled drug indicated for the treatment of ADHD. It is not structurally related to sulfa drugs.

24 (b) An inventory of Schedule II controlled drugs should be strictly followed. Amphetamine is a Schedule II controlled drug and therefore the correct choice should be "b."

25 (b) Fosamax is indicated for the treatment of osteoporosis and Paget's disease of the bone. It should be taken with a full glass of plain water only.

A patient should not take Fosamax with mineral water, coffee, tea or orange juice. After taking Fosamax, the patient should not lie down for 30 minutes in order to avoid irritation of the esophagus; the patient should wait at least 30 minutes before eating his/her first food, beverages or other medications of the day.

26 (b) The partial supply of Schedule II controlled drugs should be filled within 72 hours from their initial filling.

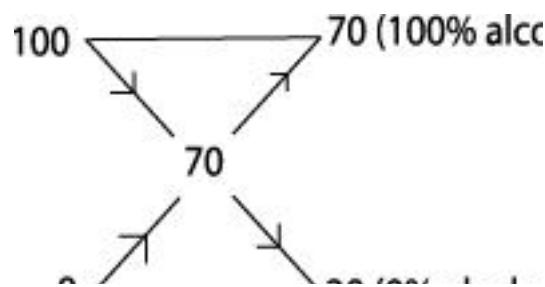
27 (a) A one grain is equal to 65 milligrams; therefore, a half grain of Phenobarbital is equal to 32.5 milligrams.

28 (b) Miacalcin (Calcitonin Salmon) is indicated for the treatment of osteoporosis. It is generally administered via nasal route. It should be stored in a refrigerator. A list of drugs that are administered via a nasal route includes:

| | | |
|-----------|---|------------------|
| Astelin | = | Azelastine |
| Beconase | = | Beclomethasone |
| Vancenase | = | Beclomethasone |
| Rhinocort | = | Budesonide |
| Nasalide | = | Flunisolide |
| Flonase | = | Fluticasone |
| Naphcon | = | Naphazoline |
| Afrin | = | Oxymetazoline |
| Tyzine | = | Tetrahydrazoline |
| Otrivin | = | Xylometazoline |
| Nasacort | = | Triamcinolone |

29 (b) A regular Insulin, Novolin R has the fastest onset of action among the given choices. A new Insulin Lispro has an even faster onset of action compared to Novolin R.

30 (b) The application of an alligation method is required to solve this kind of a problem.



First, we need to subtract 70 from 100, which will give us 30 parts (0% alcohol or water), and 0 from 70, which will give us 70 parts (100% alcohol).

Thus, 100 parts (70% alcohol) consist of 70 parts (100% alcohol) and 30 parts (0% alcohol or water). If we mix in this proportion then we will get 70% alcohol. Since we want to prepare 1000 cc, 70% alcohol: