Fast-Moving Drugs

Unit: Handling, Storing, and Packaging Drugs

Problem Area: Storage Protocols

Lesson: Fast-Moving Drugs

Student Learning Objectives.

Instruction in this lesson should result in students achieving the following objectives:

1. **Summarize the most frequently used drugs.**
2. **Review seasonal drugs.**

Resources.

The following resources may be useful in teaching this lesson:

E-unit(s) corresponding to this lesson plan. CAERT, Inc. http://www.mycaert.com.

Ballington, Don A., and Mary M. Laughlin. *Pharmacology for Technicians*, 6th ed. Paradigm 2017.

Mizner, James J. *Pharmacy Technician Certification Examination*, 3rd ed. Elsevier 2014.

"The Top 50 Prescription Drugs Filled in the United States," *Lowest Med*. Accessed April 24, 2017. http://www.lowestmed.com/top-50-prescription-drugs-filled/.

"Updated Prescriber-Level Medicare Data," *CMS.gov*. Accessed April 24, 2017. http://www.cms.gov/Newsroom/MediaReleaseDatabase/Fact-sheets/2016-Fact-sheets-items/2016-08-18.html.

Whipps, Heather. "Allergy Medications: Which Drugs Treat Which Symptoms," *Live Science.* Accessed April 24, 2017. http://www.livescience.com/45335-allergy-medications.html.



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Equipment, Tools, Supplies, and Facilities

- ✓ Overhead or PowerPoint projector
- ✓ Visual(s) from accompanying master(s)
- ✓ Copies of sample test, lab sheet(s), and/or other items designed for duplication
- ✓ Materials listed on duplicated items
- ✓ Computers with printers and Internet access
- ✓ Classroom resource and reference materials

Key Terms.

The following terms are presented in this lesson (shown in bold italics):

- analgesic
- dermatological
- drug
- edema
- fast-moving drugs
- gastrointestinal
- gastroesophageal reflux disease (GERD)
- heartburn
- homeopathic drugs
- hypertension
- hypothyroidism
- immune system
- laxative
- nicotine
- ophthalmic
- over-the-counter (OTC) drugs
- prescription drugs
- Seasonal Affective Disorder (SAD)
- therapeutic
- triglycerides

Interest Approach.

Use an interest approach that will prepare the students for the lesson. Teachers often develop approaches for their unique class and student situations. A possible approach is included here.

> *Tell students that nearly 60 percent of Americans (20 years and older) use at least one prescription drug. About 20 percent of Americans use at least five prescription drugs. Surprisingly, the 10 most-prescribed drugs in the United States are not the drugs on which we spend the most money. In groups, have students discuss some reasons as to why that would occur. Tell them to generate a list of conditions that they are familiar with that might require the*

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use of a medication. Also, they should identify those conditions that can be treated with over-the-counter products.

CONTENT SUMMARY AND TEACHING STRATEGIES

Objective 1: Summarize the most frequently used drugs.

Anticipated Problem: What are the most frequently used drugs?

I. The most frequently used drugs

A. A ***drug*** is any substance taken into or applied to the body for the purpose of altering the body's biochemical functions and its physiological processes. The active ingredient in a drug exerts a ***therapeutic*** (related to the healing of disease) effect. Typically, the term "drug" evokes images of medications prescribed by a physician. However, drugs include prescription, OTC, and homeopathic types.

1. ***Prescription drugs*** are an order of medication for a patient written by a licensed practitioner.
2. ***Over-the-counter (OTC) drugs*** are medications available without a prescription.
3. ***Homeopathic drugs*** are disease treatments that use natural substances, remedies, and diet supplements, including vitamins, minerals, and herbs.

B. ***Fast-moving drugs*** are medications filled or sold several times each day in the pharmacy, such as Synthroid (treats hypothyroidism), metformin (treats type 2 diabetes), and Atenolol (a beta-blocker). Many pharmacies organize their storage space to make fast-moving drugs easily accessible by pharmacy technicians. There are many drugs on the market for many indications. After making a diagnosis, a physician may decide to treat the patient with a specific medication. Yet physicians often rely on medications with which they are most familiar.

C. Fast-moving prescription drugs include the following most commonly prescribed in the United States:

1. Synthroid has been the top prescribed medication for several years and continues to be the most prescribed medication in the United States. Levothyroxine (Synthroid) treats ***hypothyroidism***, which is a thyroid deficiency of thyroxine. Low thyroid hormone levels can be caused by hormone imbalance, radiation treatment, surgery, or cancer.
2. Atorvastatin Calcium (Lipitor) is used to treat high cholesterol and to lower the risk of stroke and heart attack in people with type 2 diabetes and/or coronary heart disease.

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3. Lisinopril (Prinivil) treats hypertension and is used to improve survival rates following a heart attack. ***Hypertension*** is high blood pressure.
4. Omeprazole (Prilosec) decreases the amount of acid produced in the stomach. It is used to treat GERD and other conditions caused by excess stomach acid. ***Gastroesophageal reflux disease (GERD)***, or acid reflux disease, is a chronic digestive disorder that occurs when stomach acid or stomach contents flow back to the esophagus. This backflow causes an irritation of the esophagus lining.
5. Metformin (Glucophage) is a medication used to improve blood sugar control in people with type 2 diabetes.
6. Amlodipine (Norvasc) is a drug that treats hypertension, chest pain, and other conditions caused by coronary artery disease.
7. Simvastatin (Zocor) is a medication that lowers cholesterol and triglycerides in the blood. ***Triglycerides*** are a type of fat found in blood. Elevated triglyceride levels can lead to an increased risk of heart disease and stroke.
8. Hydrocodone/Acetaminophen (Lortab) is a combination drug used to relieve moderate to moderately severe pain.
9. Azithromycin (Z-Pak) is a drug that treats a wide variety of bacterial infections.
10. Furosemide (Lasix) is a medication used to reduce ***edema***—extra fluid in the body caused by heart failure, liver disease, and kidney disease.

D. Fast-moving over-the-counter drugs include the following list of some most commonly purchased in the United States. OTCs typically treat common conditions that affect a large segment of the population. They are used for non-emergency medical issues (e.g., headaches, muscle aches, cold, flu, and minor injuries). OTC medications are popular because of their convenience.
   1. Cough, cold, and allergy: The American College of Preventive Medicine reported that the most commonly sold OTC products in the United States are cough, cold, and allergy remedies. These medications include:
      a. Nasal decongestants, such as pseudoephedrine (Sudafed), relieve stuffed-up noses.
      b. Cough suppressants, such as dextromethorphan (Delsym or Robitussin), work to ease coughing.
      c. Expectorants, such as guaifenesin (Mucinex), work to loosen mucus so that it may be coughed up.
      d. Antihistamines, such as loratadine (Claritin), work to ease the symptoms of sneezing and runny noses that can occur in response to allergies.
   2. The second most common OTC products are analgesics. An ***analgesic*** is a pain medication. For example:
      a. Acetaminophen (Tylenol) works to relieve fever, headaches, and other aches and pains.
      b. Nonsteroidal anti-inflammatory drugs (NSAIDS) are a form of analgesics that relieve inflammation and include aspirin, ibuprofen (Advil or Motrin), and naproxen (Aleve). NSAIDS fight fever, pain, and swelling that may be caused by arthritis or strained muscles.

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3. Antacids and anti-gas products are the third most common OTC medications.
   a. Antacids treat ***heartburn*** (indigestion). They work by neutralizing the stomach acid that causes heartburn. Common antacids are calcium carbonate (Tums and Prilosec OTC) and aluminum/magnesium (Maalox).
   b. Anti-gas medications, like simethicone (Gas-X), work to relieve discomfort from excess gas in the ***gastrointestinal*** (related to the stomach and intestines) tract.
4. A ***laxative*** is a product that promotes emptying of the bowels. It is the next most common type of OTC medication. These products include the stool softener docusate (Colace), which allows more moisture to enter stools and softens them to create easier bowel movements.
5. The fifth most commonly used OTC products are diarrhea medications. These include loperamide (Imodium A-D) and bismuth subsalicylate (Pepto-Bismol). These medications slow down the process of moving materials through the bowels and reduce inflammation to keep certain bacteria and viruses that cause diarrhea from growing in the stomach and intestines.
6. Another commonly purchased group is ***dermatological*** (related to the skin, hair, and nails) products. Dermatological products are applied directly to the skin, hair, or nails. These include:
   a. Cleansing agents, such as Neutrogena soaps
   b. Acne products, such as Clearasil
   c. Anti-infective products, such as Neosporin
   d. Anti-inflammatory products, such as BENGAY
   e. Anti-fungal products, such as Lamisil
7. ***Ophthalmic*** (related to the eyes) products include:
   a. Eye drops and ointments that treat conditions for dry eyes (e.g., Clear Eyes) or redness (e.g., Visine)
   b. Contact lens solution (e.g., Bausch and Lomb Sensitive Eyes Plus Saline)
8. Women's health products include:
   a. Menstrual pain relievers, such as Midol
   b. Vaginal antifungal products (e.g., AZO Yeast) to relieve itching, pain, and abnormal discharges
   c. Medications to relieve the pain associated with urinary tract infections (e.g., AZO Standard)
   d. Ovulation tests (e.g., First Response) to determine conception dates
   e. Pregnancy tests (e.g., First Response) to determine if conception has occurred
9. More than half of all Americans take one or more dietary supplements daily or on occasion. Supplements are available without a prescription and come in pill, powder, and liquid form. Common supplements are:
   a. Vitamins (e.g., Centrum) are common.
   b. Minerals (e.g., Magnesium) Low magnesium levels have been linked to osteoporosis, anxiety, irritability, depression, and ADHD.

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c. Herbal products, such as Echinacea, are said to promote immune health.

10. More Americans are addicted to nicotine than any other drug. ***Nicotine*** is a drug present in tobacco that can cause increased heart rate, heart stroke volume, and oxygen consumption by the heart muscle. Nicotine is also highly addictive, and stopping smoking can be difficult and may require several attempts. Numerous products can help smokers quit. For example:
    a. Nicotine patches, such as Nicoderm CQ, deliver small doses of nicotine through the skin to reduce cravings.
    b. Nicotine gum, such as Nicorette, delivers small doses of nicotine to reduce cravings.
    c. Nicotine lozenges, such as GoodSense, are short acting to control nicotine cravings.

Teaching Strategy: *Many techniques can be used to help students master this objective. Use VM–A.*

Objective 2: Review seasonal drugs.

Anticipated Problem: What are seasonal drugs?

II. Seasonal drug

A. The ***immune system*** is a complex defense system that shields people from foreign pathogens and infections. Research has shown that immune systems vary with the seasons, and scientists report that incidents of various diseases vary with the seasons. Medications used to treat these conditions are more commonly purchased and used during the seasons for which these conditions (e.g., allergies) are more prevalent. The time of year also comes into play when ordering medications.
    1. The fall and winter seasons promise increased purchases of cold and flu medications: antivirals, cough suppressants, and nasal decongestants.
    2. The spring and summer are associated with fewer cold and flu medications and more allergy medications.

B. Spring and summer: Allergies caused by blooming flowers and grasses can cause severe symptoms for some individuals. For example:
    1. Antihistamines (Zyrtec or Allegra) calm the body's immune system reaction to an allergen and relieve the sneezing, runny nose, watery eyes, and itchy eyes and nose associated with those reactions.
    2. Decongestants (Sudafed) relieve nasal and sinus congestion.

C. Fall and winter: When the weather turns colder, the threat of catching certain widespread illnesses becomes greater. Some health problems are triggered or worsened by cold weather. For example:
    1. Asthma: Cold air is a major trigger of asthma symptoms, such as wheezing and shortness of breath. Patients with mild, infrequent asthma symptoms may only

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need a short-acting rescue medication, such as Albuterol. A controller medication, such as inhaled corticosteroids or Theophyline, is used to prevent or improve asthma conditions in patients who experience frequent symptoms.

2. Colds: The common cold is an upper respiratory infection caused by different viruses. Common colds can affect anyone at any time of the year, but peak cold activity hits during the winter and during rainy months. Symptoms of the common cold are runny nose, sneezing, cough, and sore throat.
   a. Nasal decongestants (Sudafed) can shrink the swollen tissue in the nose.
   b. Cough suppressants (Robitussin) contain dextromethorphan that blocks the nerve impulse that causes the cough reflex.
   c. Expectorants (Mucinex) thin and loosen mucus so it can be coughed up more easily.
3. Influenza (the flu) is a contagious respiratory illness caused by a virus that infects the nose, throat, and lungs. The peak of flu season occurs anywhere from late November through March. Antiviral drugs (Tamiflu) can reduce the severity and shorten the duration of the illness.
4. Allergies: Fall and winter allergies can include a stuffed up and runny nose as well as itchy, watery eyes.
   a. Antihistamines (Benadryl or Claritin) block histamines that the immune system releases when exposed to an allergen.
   b. Corticosteroids (Flonase) relieve seasonal nasal allergy symptoms by blocking six allergic substances, not just histamine.
5. ***Seasonal Affective Disorder (SAD)*** is a type of depression related to changes in the seasons. SAD tends to occur as the hours of daylight grow shorter during the fall and winter months, but it may occur during the summer months for some individuals. Antidepressant medications (e.g., Prozac, Zoloft, and Lexapro) have been found to be effective in treating SAD. Light therapy is an alternative.

Teaching Strategy: *Many techniques can be used to help students master this objective. Use VM–B to review. Assign LS–A.*

- **Review/Summary.** Use the student learning objectives to summarize the lesson. Have students explain the content associated with each objective. Student responses can be used in determining which objectives need to be reviewed or taught from a different angle. If a textbook is being used, questions at the ends of chapters may be included in the Review/Summary.

- **Application.** Use the included visual master(s) and lab sheet(s) to apply the information presented in the lesson.

- **Evaluation.** Evaluation should focus on student achievement of the objectives for the lesson. Various techniques can be used, such as student performance on the application activities. A sample written test is provided.

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Answers to Sample Test:

Part One: Matching

1. c
2. a
3. f
4. e
5. b
6. d

Part Two: Completion

1. hypothyroidism
2. nicotine
3. mucus
4. triglycerides
5. depression
6. decongestant

Part Three: True/False

1. T
2. F
3. T
4. F
5. T
6. F

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Sample Test

Name _____

Fast-Moving Drugs

Part One: Matching

Instructions: **Match the term with the correct definition.**

a. heartkkburn
b. therapeutic
c. homeopathic
d. analgesic
e. laxative
f. hypertension

_____1. The treatment of disease using natural substances, remedies, and diet supplements, including vitamins, minerals, and herbs

_____2. Indigestion

_____3. High blood pressure

_____4. A product that promotes emptying of the bowels

_____5. Related to the healing of disease

_____6. Pain medication

Part Two: Completion

Instructions: **Provide the word or words to complete the following statements.**

1. A hormone imbalance, radiation treatment, surgery, or cancer can cause _____.
2. More Americans are addicted to _____ than any other drug.
3. An expectorant, like Mucinex, works to loosen _____ so it can be coughed up.
4. The type of fat found in blood that can lead to an increased risk of heart disease and stroke is _____.



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5. As the hours of daylight grow shorter during the fall and winter months, seasonal affective disorder (SAD) is a kind of _____ that tends to occur.

6. A medication that can shrink the swollen tissue in the nose is a/an _____.

Part Three: True/False

Instructions: **Write *T* for true or *F* for false.**

_____1. Omeprazole decreases the amount of acid produced in the stomach.

_____2. The common cold is an upper respiratory infection caused by different bacteria.

_____3. Many U.S. citizens take one or more dietary supplements daily or on occasion.

_____4. Hydrocodone/acetaminophen is a combination drug used to relieve high blood pressure.

_____5. Antiviral drugs can reduce the severity and shorten the duration of influenza.

_____6. Warm air is a major trigger of asthma symptoms, such as wheezing and shortness of breath.

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MOST FREQUENTLY USED PRESCRIPTION MEDICATIONS

Brand Name	Generic Name	Conditions Treated
Synthroid	Levothyroxine	Hypothyroidism
Lipitor	Atorvastatin Calcium	• High cholesterol • Lower the risk of stroke and heart attacks in people with type 2 diabetes and coronary heart disease
Prinivil	Lisinopril	• Hypertension • Improve survival after heart attack
Prilosec	Omeprazole	GERD
Glucophage	Metformin	Type 2 diabetes
Norvasc	Amlodipine	• Hypertension • Coronary artery disease
Zocor	Simvastatin	• Lower cholesterol • Lower fat in the blood
Lortab	Hydrocodone/Acetaminophen	Moderate to moderately severe pain
Z-Pak	Azithromycin	Bacterial infections
Lasix	Furosemide	Edema due to heart, liver, and kidney disease



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SEASONAL DRUGS

Medication	Conditions Treated	Season
Antihistamines	• Inflammation of the nose and eyes • Sneezing • Runny nose • Itching of the eyes, nose, & throat	All year
Decongestants	• Nasal congestion • Common cold • Sinus congestion	• Spring • Summer, fall, & winter • Fall & winter
Corticosteroids	• Asthma • Allergies	All year but often more prevalent in winter because of the colder temperatures
Dextromethorphan	Cough	Winter
Expectorants	Eliminate mucus	Winter
Antiviral drugs	Influenza	Winter
Antidepressant	Seasonal affective disorder	Fall & winter



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LS–A

Name _____

Fast-Moving Drug Medication Guide

Purpose

The purpose of this activity is to create a medication guide for one fast-moving drug.

Objectives

1. Collect information for the safe and effective use of a fast-moving drug.
2. Highlight serious side effects associated with certain medications.
3. Construct the medication guide.
4. Share your medication guide with the class.

Materials

- lab sheet
- device with Internet access
- class notes
- printer
- paper
- writing utensil

Procedure

1. Review your class notes. Choose a fast-moving medication to research and receive your instructor's approval of your choice.
2. Research information about your medication.
3. Create a medication guide for a fast-moving drug that includes the following:
   a. What is the most important information to know about this medication?



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b. What is this medication used to treat?
c. Who should not take this medication?
d. Before taking this medication, what should people tell their doctor?
e. How should this medication be taken?
f. What are the possible side effects of this medication?
g. How should this medication be stored?

4. Construct the medication guide according to any instructor requirements. Proofread and edit as necessary.
5. Share your fast-moving drug medication guide with the entire class.
6. Turn in your fast-moving drug medication guide to your instructor.

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