

Chapter 01: Fundamentals of Pharmacology
Moscou: Pharmacology for Pharmacy Technicians, 3rd Edition

MULTIPLE CHOICE

1. By which of the following routes are drugs administered directly into the bloodstream?
 - a. Enteral
 - b. Transdermal
 - c. Transmucosal
 - d. Intravenous

ANS: D

Parenteral drugs are injected or infused (slowly injected) directly into a blood vessel, muscle, skin, or joint; IV, IM, subcut, and intrathecal are common routes. Enteral (oral) route requires going through the GI system, transdermal (through the dermis) route requires lipid solubility, and transmucosal (through a membrane) route requires crossing a mucous membrane, which are not directly into the bloodstream.

DIF: Cognitive level 2: Comprehension REF: p. p0715 OBJ: 1 | 6

2. Fentanyl is used as a _____.
 - a. synthetic anesthetic
 - b. synthetic analgesic
 - c. natural analgesic
 - d. natural anesthetic

ANS: B

Fentanyl is a synthetically manufactured analgesic, made by chemical synthesis to mimic the natural drug opium for the *relief* of pain. Synthetic anesthetics are chemically synthesized for the lack of response to pain. Natural products are found in nature typically derived from plants, animals, or minerals; fentanyl is not a natural product and therefore would not be used as a natural analgesic.

DIF: Cognitive level 2: Comprehension REF: p. p0425 OBJ: 5 | 7

3. To help reduce nausea, the natural drug _____ can be used.
 - a. digitalis
 - b. peppermint
 - c. caffeine
 - d. quinine

ANS: B

Some common beverages and foods are natural drugs. Coffee and tea contain the drug caffeine. Ginger and peppermint contain ingredients that can reduce nausea. While the other options are natural drugs, they are not used as a drug to reduce nausea.

DIF: Cognitive level 3: Application REF: p. p0420 OBJ: 5

4. Which of the following options results in an *untrue* statement about pharmacy technicians? Pharmacy technicians who possess a good knowledge of pharmacology understand the importance of _____.
- drug interactions
 - therapeutic duplication
 - lab values
 - excessive dose alerts

ANS: C

Knowledge of pharmacology facilitates selection of warning labels for drugs dispensed. Pharmacy technicians who possess a good knowledge of pharmacology understand the importance of recognizing drug interactions, therapeutic duplication, and excessive dose alerts screened by the computer. Knowing and interpreting lab values is beyond the scope of a pharmacy technician and is left to the professional judgment of the pharmacist.

DIF: Cognitive level 2: Comprehension REF: p. p0140 OBJ: 1

5. Which of the following was passed to protect the public from ineffective and harmful drugs and later expanded to standardize new drugs getting to market?
- Durham-Humphrey Amendment
 - Controlled Substance Act
 - Pure Food and Drug Act
 - Combat Methamphetamine Epidemic Act

ANS: C

In 1906, the Pure Food and Drug Act was passed to protect the public from ineffective and harmful drugs. This Act was expanded in 1938, and standards for allowing new drugs onto the market were set. The Durham-Humphrey Amendment (1951) established the distinction between legend drugs and drugs that could safely be used by the public without supervision by a health care provider. The Controlled Substance Act helps regulate controlled substances by placing them in various schedules based on abuse potential. The Combat Methamphetamine Epidemic Act regulates, among other things, retail over-the-counter sales of ephedrine, pseudoephedrine, and phenylpropanolamine products used to manufacture crystal meth.

DIF: Cognitive level 2: Comprehension REF: p. p0440 OBJ: 3

6. Which of the following is the phase of the drug approval process that initially determines the safety and efficacy in those with the disease being studied?
- Phase 1
 - Phase 2
 - Phase 3
 - Phase 4

ANS: B

In phase 1 clinical trials, the drug is administered to a small number of healthy volunteers who are enrolled in the clinical study. Phase 2 studies are controlled trials with a limited number of patients with the condition to be treated. During this phase, data are collected to determine the drug's efficacy and the drug's side effects in patients with the disease. A phase 3 clinical study is when drug safety is evaluated, and the benefit of taking the drug is compared with the risks associated with taking the drug. Phase 4 trials are studies that are conducted after the drug is marketed to the public to determine safety and effectiveness when the drug is used in "real-world" conditions.

DIF: Cognitive level 2: Comprehension REF: p. p0450 OBJ: 4

7. Which of the following is the phase of the drug approval process that determines effectiveness of the drug in healthy volunteers?
- Phase 1
 - Phase 2
 - Phase 3
 - Phase 4

ANS: A

In phase 1 clinical trials, the drug is administered to a small number of healthy volunteers who are enrolled in the clinical study. Phase 2 studies are controlled trials with a limited number of patients with the condition to be treated. During this phase, data are collected to determine the drug's efficacy and the drug's side effects in patients with the disease. A phase 3 clinical study is when drug safety is evaluated, and the benefit of taking the drug is compared with the risks associated with taking the drug. Phase 4 trials are studies that are conducted after the drug is marketed to the public to determine safety and effectiveness when the drug is used in "real-world" conditions.

DIF: Cognitive level 2: Comprehension REF: p. p0450 OBJ: 4

8. One of the main purposes of drug therapy is to _____.
- analyze symptoms
 - maintain side effects produced by drug therapy
 - eradicate disease
 - help cure disease

ANS: D

The aim of drug therapy is to diagnose, treat, *cure*, or lessen the symptoms of disease. Analyzing symptoms is part of the process and drug therapy may be changed based on the results, but it's not the main purpose of drug therapy. Maintaining side effects implies that drug therapy is to only maintain or control side effects and not diagnose, treat, cure, or lessen the symptoms of disease. While some drug therapies can help eradicate disease, it is not the main purpose since most diseases can only be cured and eliminated.

DIF: Cognitive level 2: Comprehension REF: p. p0430 OBJ: 1

9. The streamlined generic drug approval process is a result of which of the following acts?
- Patent Restoration Act
 - Pure Food, Drug, and Cosmetic Act
 - Food and Drug Administration Reauthorization Act
 - Drug Price Competition Act

ANS: B

In 1906, the Pure Food and Drug Act was passed to protect the public from ineffective and harmful drugs. This Act was expanded in 1938 and standards for allowing new drugs onto the market were set. The Drug Price Competition Act and Patent Restoration Act (1984) encouraged the creation of generic drugs by streamlining the drug approval process for drugs that were no longer patented. Food and Drug Administration Reauthorization Act is a new law that includes the reauthorization of the Prescription Drug User Fee Act (PDUFA) that provides FDA with the necessary resources to maintain a predictable and efficient review process for human drug and biologic products.

DIF: Cognitive level 2: Comprehension REF: p. p0520 OBJ: 3

10. How does Combat Methamphetamine Epidemic Act (CMEA) of 2005 help deter the illegal manufacture of synthetic drugs?
 - a. It has taken all ingredients that could be used to make illegal drugs off the market.
 - b. It helps regulate controlled substances by placing them in various schedules based on abuse potential.
 - c. It provides a provision to have certain products placed behind the counters out of general public reach.
 - d. It has helped health care workers easily identify controlled substances by requiring identifying symbols on each of the drug labels.

ANS: C

The CMEA of 2005 was passed to curb the illegal manufacture and use of “crystal meth.” The CMEA was signed into law on March 6, 2006, to regulate, among other things, retail over-the-counter sales of ephedrine, pseudoephedrine, and phenylpropanolamine products used to manufacture crystal meth. Purchase limits, placement of product out of direct customer access, sales logbooks, customer ID verification, employee training, and self-certification of regulated sellers are required provisions of the CMEA. Not all ingredients that could be used to make illegal drugs have been taken off the market; they are still available. The CSA helps regulate controlled substances by placing them in various schedules based on abuse potential. Canadian legislation similar to the US CSA has helped health care workers easily identify controlled substances by requiring identifying symbols on each of the drug labels.

DIF: Cognitive level 4: Analysis REF: p. p0525 OBJ: 3

11. Which step is *not* part of the drug development process?
 - a. Clinical research
 - b. Clinical studies
 - c. New drug application process
 - d. Marketing

ANS: D

There are many steps in the drug development process. The steps from the test tube to production and distribution of a new drug involve preclinical research, clinical studies, a new drug application process, and review. Marketing takes place after the drug has been approved by the FDA, not when the drug is in development.

DIF: Cognitive level 2: Comprehension REF: p. p0445 OBJ: 4

12. The proprietary name of a drug is assigned by the _____.
a. manufacturer
b. CDER Labeling and Nomenclature Committee
c. New Drug Application reviewer
d. FDA

ANS: A

The proprietary name, or brand name, is assigned by the drug manufacturer according to nomenclature guidelines and must be approved (not assigned) by the CDER. The nonproprietary name must be approved (not assigned) by the FDA.

DIF: Cognitive level 1: Recall REF: p. p0490 OBJ: 7

13. Why must a customer go to the pharmacy to purchase pseudoephedrine?
a. Labeling confusion of the product has shown that counseling must be provided by the pharmacist.
b. Too much of the product was shown to cause serious adverse effects and therefore the drug needs to be regulated by pharmacy staff.
c. Placement in the pharmacy out of direct customer access helps to monitor the sale of the drug.
d. Where the product is stocked depends on directions for use found on package labeling.

ANS: C

The Combat Methamphetamine Epidemic Act of 2005 (CMEA) was signed into law on March 6, 2006, to regulate, among other things, retail over-the-counter sales of ephedrine, pseudoephedrine, and phenylpropanolamine products. Purchase limits, placement of product out of direct customer access, sales logbooks, customer ID verification, employee training, and self-certification of regulated sellers are required provisions of the CMEA. Because of this law, pharmacies keep the drug BTC to monitor the sales to implement the law.

DIF: Cognitive level 4: Analysis REF: p. p0520 OBJ: 3

14. Which of the following auxiliary labels should *always* be placed on a prescription for an oral suspension?
a. Take with food.
b. Store in the refrigerator.
c. Take with lots of water.
d. Shake well before each use.

ANS: D

When suspensions are dispensed, a SHAKE WELL auxiliary label should be placed on the prescription bottle. The drug itself (not dose form) will determine if the additional auxiliary labels would be placed on the prescription.

DIF: Cognitive level 3: Application REF: p. p0660 OBJ: 5

15. Which of the following routes would have the fastest onset of action?
a. Oral
b. Intravenous