Chapter 01 - Introduction to Drugs

A nurse working in radiology administers iodine to a patient who is having a computed tomography(CT) scan. The nurse working on the oncology unit administers chemotherapy to patients who have cancer. At the Public Health Department, a nurse administers a measles-mumps-rubella (MMR) vaccine to a 14-month-old child as a routine immunization. Which branch of pharmacology best describes the actions of all three nurses?

Pharmacoeconomics

Pharmacotherapeutics

Pharmacodynamics

Pharmacokinetics

Ans: B

Feedback:

Pharmacology is the study of the biologic effects of chemicals. Nurses are involved with clinical pharmacology or pharmacotherapeutics, which is a branch of pharmacology that deals with the uses of drugs to treat, prevent, and diagnose disease. The radiology nurse is administering a drug to help diagnose a disease. The oncology nurse is administering a drug to help treat a disease. Pharmacoeconomics includes any costs involved in drug therapy. Pharmacodynamics involves how a drug affects the body and pharmacokinetics is how the body acts on the body.

A physician has ordered intramuscular (IM) injections of morphine, a narcotic, every 4 hours as neededfor pain in a motor vehicle accident victim. The nurse is aware this drug has a high abuse potential. Under what category would morphine be classified?

Schedule I

Schedule II

Schedule III

Schedule IV

Ans: B

Feedback:

Narcotics with a high abuse potential are classified as Schedule II drugs because of severe dependence

liability. Schedule I drugs have high abuse potential and no accepted medical use. Schedule III drugs have a lesser abuse potential than II and an accepted medical use. Schedule IV drugs have low abuse potential and limited dependence liability.

When involved in phase III drug evaluation studies, what responsibilities would the nurse have?

Working with animals who are given experimental drugs

Choosing appropriate patients to be involved in the drug study

Monitoring and observing patients closely for adverse effects

Conducting research to determine effectiveness of the drugAns: C

Feedback:

Phase III studies involve use of a drug in a vast clinical population in which patients are asked to record any symptoms they experience while taking the drugs. Nurses may be responsible for helping collect and analyze the information to be shared with the Food and Drug Administration (FDA) but would not conduct research independently because nurses do not prescribe medications. Use of animals in drug testing is done in the preclinical trials. Select patients who are involved in phase II studies to participate in studies where the participants have the disease the drug is intended to treat. These patients are monitored closely for drug action and adverse effects. Phase I studies involve healthy human volunteers who are usually paid for their participation. Nurses may observe for adverse effects and toxicity.

What concept is considered when generic drugs are substituted for brand name drugs?

Bioavailability

Critical concentration

Distribution

Half-life

Ans: A

Feedback:

Bioavailability is the portion of a dose of a drug that reaches the systemic circulation and is available to act on body cells. Binders used in a generic drug may not be the same as those used in the brand name drug. Therefore, the way the body breaks down and uses the drug may differ, which may eliminate a generic drug substitution. Critical concentration is the amount of a drug that is needed to cause a therapeutic effect and should not differ between generic and brand name medications. Distribution is the phase of pharmacokinetics, which involves the movement of a drug to the body's tissues and is the

same in generic and brand name drugs. A drug's half-life is the time it takes for the amount of drug to decrease to half the peak level, which should not change when substituting a generic medication.

A nurse is assessing the patient's home medication use. After listening to the patient list current medications, the nurse asks what priority question?

Do you take any generic medications?

Are any of these medications orphan drugs?

Are these medications safe to take during pregnancy?

Do you take any over-the-counter medications?

Ans: D

Feedback:

It is important for the nurse to specifically question use of over-the-counter medications because patients may not consider them important. The patient is unlikely to know the meaning of orphan drugs unless they too are health care providers. Safety during pregnancy, use of a generic medication, or classification of orphan drugs are things the patient would be unable to answer but could be found in reference books if the nurse wishes to research them.

After completing a course on pharmacology for nurses, what will the nurse know?

Everything necessary for safe and effective medication administration

Current pharmacologic therapy; the nurse will not require ongoing education for 5 years.

General drug information; the nurse can consult a drug guide for specific drug information.

The drug actions that are associated with each classification of medicationAns: C

Feedback:

After completing a pharmacology course nurses will have general drug information needed for safe and effective medication administration but will need to consult a drug guide for specific drug information before administering any medication. Pharmacology is constantly changing, with new drugs entering the market and new uses for existing drugs identified. Continuing education in pharmacology is essential to safe practice. Nurses tend to become familiar with the medications they administer most often, but there will always be a need to research new drugs and also those the nurse is not familiar with because no nurse knows all medications.

A nurse is instructing a pregnant patient concerning the potential risk to her fetus from a Pregnancy Category B drug. What would the nurse inform the patient?

Adequate studies in pregnant women have demonstrated there is no risk to the fetus.

Animal studies have not demonstrated a risk to the fetus, but there have been no adequate studiesin pregnant women.

Animal studies have shown an adverse effect on the fetus, but there are no adequate studies inpregnant women.

There is evidence of human fetal risk, but the potential benefits from use of the drug may beacceptable despite potential risks.

Ans: B

Feedback:

Category B indicates that animal studies have not demonstrated a risk to the fetus. However, there have not been adequate studies in pregnant women to demonstrate risk to a fetus during the first trimester of pregnancy and no evidence of risk in later trimesters. Category A indicates that adequate studies in pregnant women have not demonstrated a risk to the fetus in the first trimester or in later trimesters. Category C indicates that animal studies have shown an adverse effect on the fetus, but no adequate studies in humans. Category D reveals evidence of human fetal risk, but the potential benefits from the use of the drugs in pregnant women may outweigh potential risks.

Discharge planning for patients leaving the hospital should include instructions on the use of over-the-counter (OTC) drugs. Which comment by the patient would demonstrate a good understanding of OTC drugs?

OTC drugs are safe and do not cause adverse effects if taken properly.

OTC drugs have been around for years and have not been tested by the Food and Drug Administration (FDA).

OTC drugs are different from any drugs available by prescription and cost less.

OTC drugs could cause serious harm if not taken according to directions.

Ans: D

Feedback:

It is important to follow package directions because OTCs are medications that can cause serious harm if not taken properly. OTCs are drugs that have been determined to be safe when taken as directed; however, all drugs can produce adverse effects even when taken properly. They may have originally been prescription drugs that were tested by the FDA or they may have been grandfathered in when the

FDA laws changed. OTC education should always be included as a part of the hospital discharge instructions.

What would be the best source of drug information for a nurse?

Drug Facts and Comparisons

A nurse's drug guide

A drug package insert

The Physicians' Drug Reference (PDR)Ans: B

Feedback:

A nurse's drug guide provides nursing implications and patient teaching points that are most useful to nurses in addition to need-to-know drug information in a very user friendly organizational style.*Lippincott's Nursing Drug Guide* (*LNDG*) has drug monographs organized alphabetically and includes nursing implications and patient teaching points. Numerous other drug handbooks are also on the market and readily available for nurses to use. Although other drug reference books such as *Drug Facts and Comparisons,* PDR, and drug package inserts can all provide essential drug information, they will not contain nursing implications and teaching points and can be more difficult to use than nurse's drug guides.

The nurse is preparing to administer a medication from a multidose bottle. The label is torn and soiledbut the name of the medication is still readable. What is the nurse's priority action?

Discard the entire bottle and contents and obtain a new bottle.

Find the drug information and create a new label for the bottle.

Ask another nurse to verify the contents of the bottle.

Administer the medication if the name of the drug can be clearly read.

Ans: A

Feedback:

When the drug label is soiled obscuring some information the safest action by the nurse is to discard the bottle and contents because drug labels contain a great deal of important information, far more than just the name of the drug. Concentration of the drug, expiration date, administration directions, and precautions may be missing from the label and so put the patient at risk. Looking up drug information in a drug handbook or consulting with another nurse will not supply the expiration date or concentration of medication. Be safe and discard the bottle and its contents.

What aspect of pharmacology does a nurse study? (Select all that apply.)

Chemical pharmacology

Molecular pharmacology

Impact of drugs on the body

The body's response to a drug

Adverse and anticipated drug effectsAns:

C, D, E

Feedback:

Nurses study pharmacology from a pharmacotherapeutic level, which includes the effect of drugs on the body, the body's response to drugs, and both expected and unexpected drug effects. Chemical and molecular pharmacology (Options A and B) are not included in nursing pharmacology courses.

The nurse, providing patient teaching about home medication use to an older adult, explains that evenwhen drugs are taken properly they can produce negative or unexpected effects. What are these negative or unexpected effects called?

Teratogenic effects

Toxic effects

Adverse effects

Therapeutic effects

Ans: C

Feedback:

Negative or unexpected effects are known as adverse or side effects. Teratogenic effects are adverse effects on the fetus and not a likely concern for an older adult. Toxic effects occur when medication is taken in larger than recommended dosages caused by an increase in serum drug levels. Therapeutic effects are the desired actions for which the medication is prescribed.

After administering a medication, for what would the nurse assess the patient?

Drug effects

Allergies

Pregnancy

Preexisting conditions

Ans: A

Feedback:

After the medication is administered, the nurse assesses the patient for drug affects, both therapeutic and adverse. The nurse would assess the patient for allergies, preexisting conditions, and pregnancy before administering a medication.

The nurse receives an order to administer an unfamiliar medication and obtains a nurse's drug guide published four years earlier. What is the nurse's most prudent action?

Find a more recent reference source.

Use the guide if the drug is listed.

Ask another nurse for drug information.

Verify the information in the guide with the pharmacist.

Ans: A

Feedback:

The nurse is responsible for all medications administered and must find a recent reference source to ensure the information learned about the medication is correct and current. Using an older drug guide could be dangerous because it would not contain the most up-to-date information. Asking another nurse or the pharmacist does not guarantee accurate information will be obtained and could harm the patient if the information is wrong.

What would the nurse provide when preparing a patient for discharge and home medication self-administration?

Personal contact information to use if the patient has questions

Thorough medication teaching about drugs and the drug regimen

Over-the-counter medications to use to treat potential adverse effects

A sample size package of medication to take home until prescription is filledAns: B

Feedback:

The nurse is responsible for providing thorough medication teaching about drugs and the drug regimen to ensure the patient knows how to take the medication and when to notify the provider. The nurse never provides personal contact information to a patient. If adverse effects arise, the patient is taught to call the health care provider and should not self-medicate with over-the-counter drugs, which could mask serious symptoms. The nurse never dispenses medication because it must be properly labeled for home use; this is done by the pharmacy.

In response to the patient's question about how to know whether drugs are safe, the nurse explains thatall medications undergo rigorous scientific testing controlled by what organization?

Food and Drug Administration (FDA)

Drug Enforcement Agency (DEA)

Centers for Disease Control and Prevention (CDC)

Joint Commission on Accreditation of Healthcare Organizations (JCAHO)Ans: A

Feedback:

The FDA is responsible for controlling and regulating the development and sale of drugs in the United States, allowing new drugs to enter the market only after being subjected to rigorous scientific testing. The DEA regulates and controls the use of controlled substances. The CDC monitors and responds to infectious diseases. The JCAHO is an accrediting body that inspects acute care facilities to ensure minimum standards are met.

The nurse, assisting with Phase I drug studies, is talking with a woman who asks, Why can't I participate in this study? What would be the nurse's best response?

Drugs pose a greater risk to women of reproductive age.

Drugs are only tested on men because they are stronger.

Women are more prone to adverse effects from medications.

Drugs affect women differently than they affect women.

Ans: A

Feedback:

Phase I drug trials usually involve healthy male volunteers because chemicals may exert an unknown and harmful effect on ova in women which could result in fetal damage when the woman becomes pregnant. Drugs are tested on both men and women, but women must be fully informed of risks and sign a consent stating they understand the potential for birth defects. Women are not more prone to adverse effects of medications. Although some drugs may affect women differently than men, this is a rationale for why drugs need to be tested on women, not an explanation of why women are not included in a phase I study.

The patient tells the nurse about a new drug being tested to treat the disease she was diagnosed with andasks the nurse whether the doctor can prescribe a medication still in the preclinical phase of testing. What is the nurse's best response?

The doctor would have to complete a great deal of paperwork to get approval to prescribe thatdrug.

Sometimes pharmaceutical companies are looking for volunteers to test a new drug and the doctorcould give them your name.

Drugs in the preclinical phase of testing are only tested on animals and so would not be available toyou.

Drugs in the preclinical phase of testing are given only to healthy young men and so would not beavailable to you.

Ans: C

Feedback:

During the preclinical phase of testing drugs are tested on animals and are not available to patients. In phase I, the drug is tested on volunteers who are usually healthy young men. It is only in phase III studies that the drug is made available to prescribers who agree to closely monitor patients getting the medication.

The nurse is caring for a patient who had a severe, acute, previously unseen adverse effect of a drug in Phase III testing. The patient asks, After all the testing done on this drug, didn't they know this adverseeffect could occur? What is the nurse's best response? (Select all that apply.)

Pharmaceutical companies sometimes underreport problems to make more money.

Your response to this medication will be reported to the drug company and the Food and Drug Administration (FDA).

When a drug begins to be used by a large clinical market, new adverse effects may be found.

The pharmaceutical company weighs the benefits of the drug with the severity of adverse effects.

After a drug reaches phase III testing it is considered an accepted drug and will not be recalled.

Ans: B, C

Feedback:

When a new and unexpected adverse effect occurs, especially one of a serious nature, it is reported to the drug company who reports it to the FDA immediately. When a large number of people begin using the drug in phase III studies, it is not unusual to identify adverse effects not previously noted. It would be both unprofessional and inaccurate to imply that pharmaceutical companies put profit ahead of patient concern because lawsuits would remove any potential profit if a drug proves harmful. The FDA is responsible for weighing risk versus benefit in deciding whether to allow the drug to move to the next phase of testing. Drugs found to have serious adverse effects can be removed from the market at any time.

The telephone triage nurse receives a call from a patient asking for a prescription for a narcotic to manage his surgical pain. The nurse explains that narcotic prescriptions must be written and cannot becalled in to the pharmacy. The patient says, Why are narcotics so difficult to get a prescription for? What is the nurse's best response?

The Drug Enforcement Agency (DEA) determines the risk for addiction and the Food and Drug Administration (FDA) enforces their control.

The increase in the number of drug addicts has made the rules stronger.

The Centers for Disease Control and Prevention (CDC) regulates use of controlled substances toreduce the risk of injury.

Controlled substances like narcotics are controlled by the FDA and the DEA.Ans:

D

Feedback:

Controlled substances are controlled by the FDA and the DEA: the DEA enforces control while the FDA determines abuse potential. Regulations related to controlled substances have remained strict and specific and have not been significantly impacted by substance abusers. The CDC is not involved in control of narcotics and other controlled substances.

The nurse explains the Drug Enforcement Agency's (DEA's) schedule of controlled substances to the nursing assistant who asks, Do you ever get a prescription for Schedule I medications? What is the nurse's best response?

Schedule I medications have no medical use so they are not prescribed.