[NCLEX: Pharmacology Practice Test](http://nclexreviewers.com/nclex-sample-questions/pharmacology/nclex-pharmacology-practice-test.html" \o "Permanent Link to NCLEX: Pharmacology Practice Test)

Posted by admin on Dec 11, 2009

The nursery nurse is putting erythromycin ointment in the newborn’s eyes to prevent infection. She places it in the following area of the eye:

under the eyelid

on the cornea.

in the lower conjunctiva sac

by the optic disc.

The physician orders penicillin for a patient with streptococcal pharyngitis. The nurse administers the drug as ordered, and the patient has an allergic reaction. The nurse checks the medication order sheet and finds that the patient is allergic to penicillin. Legal responsibility for the error is:

only the nurse’s—she should have checked the allergies before administering the medication.

only the physician’s—she gave the order, the nurse is obligated to follow it.

only the pharmacist’s—he should alert the floor to possible allergic reactions.

the pharmacist, physician, and nurse are all liable for the mistake

James Perez, a nurse on a geriatric floor, is administering a dose of digoxin to one of his patients. The woman asks why she takes a different pill than her niece, who also has heart trouble. James replies that as people get older, liver and kidney function decline, and if the dose is as high as her niece’s, the drug will tend to:

have a shorter half-life.

accumulate.

have decreased distribution.

have increased absorption.

The nurse is administering Augmentin to her patient with a sinus infection. Which is the best way for her to insure that she is giving it to the right patient?

Call the patient by name

Read the name of the patient on the patient’s door

Check the patient’s wristband

Check the patient’s room number on the unit census list

The most important instructions a nurse can give a patient regarding the use of the antibiotic Ampicillin prescribed for her are to

call the physician if she has any breathing difficulties.

take it with meals so it doesn’t cause an upset stomach.

take all of the medication prescribed even if the symptoms stop sooner.

not share the pills with anyone else.

Mr. Jessie Ray, a newly admitted patient, has a seizure disorder which is being treated with medication. Which of the following drugs would the nurse question if ordered for him?

Phenobarbitol, 150 mg hs

Amitriptylene (Elavil), 10 mg QID.

Valproic acid (Depakote), 150 mg BID

Phenytoin (Dilantin), 100 mg TID

Mrs. Jane Gately has been dealing with uterine cancer for several months. Pain management is the primary focus of her current admission to your oncology unit. Her vital signs on admission are BP 110/64, pulse 78, respirations 18, and temperature 99.2 F. Morphine sulfate 6mg IV, q 4 hours, prn has been ordered. During your assessment after lunch, your findings are: BP 92/60, pulse 66, respirations 10, and temperature 98.8. Mrs. Gately is crying and tells you she is still experiencing severe pain. Your action should be to

give her the next ordered dose of MS.

give her a back rub, put on some light music, and dim the lights in the room.

report your findings to the RN, requesting an alternate medication order

be obtained from the physician.

call her daughter to come and sit with her.

When counseling a patient who is starting to take MAO (monoamine oxidase) inhibitors such as Nardil for depression, it is essential that they be warned not to eat foods containing tyramine, such as:

Roquefort, cheddar, or Camembert cheese.

grape juice, orange juice, or raisins.

onions, garlic, or scallions.

ground beef, turkey, or pork.

The physician orders an intramuscular injection of Demerol for the postoperativepatient’s pain. When preparing to draw up the medication, the nurse is careful to remove the correct vial from the narcotics cabinet. It is labeled

simethicone.

albuterol.

meperidine.

ibuprofen.

The nurse is administering an antibiotic to her pediatric patient. She checks the patient’s armband and verifies the correct medication by checking the physician’s order, medication kardex, and vial. Which of the following is not considered one of the five “rights” of drug administration?

Right dose

Right route

Right frequency

Right time

A nurse is preparing the client’s morning NPH insulin dose and notices a clumpy precipitate inside the insulin vial. The nurse should:

draw up and administer the dose

shake the vial in an attempt to disperse the clumps

draw the dose from a new vial

warm the bottle under running water to dissolve the clump

A client with histoplasmosis has an order for ketoconazole (Nizoral). The nurse teaches the client to do which of the following while taking this medication?

take the medication on an empty stomach

b. take the medication with an antacid

c. avoid exposure to sunlight

d. limit alcohol to 2 ounces per day

A nurse has taught a client taking a xanthine bronchodilator about beverages to avoid. The nurse determines that the client understands the information if the client chooses which of the following beverages from the dietary menu?

chocolate milk

cranberry juice

coffee

cola

A client is taking famotidine (Pepcid) asks the home care nurse what would be the best medication to take for a headache. The nurse tells the client that it would be best to take:

aspirin (acetylsalicylic acid, ASA)

b. ibuprofen (Motrin)

c. acetaminophen (Tylenol)

d. naproxen (Naprosyn)

A nurse is planning dietary counseling for the client taking triamterene (Dyrenium). The nurse plans to include which of the following in a list of foods that are acceptable?

baked potato

b. bananas

c. oranges

d. pears canned in water

A client with advanced cirrhosis of the liver is not tolerating protein well, as eveidenced by abnormal laboratory values. The nurse anticipates that which of the following medications will be prescribed for the client?

lactulose (Chronulac)

ethacrynic acid (Edecrin)

folic acid (Folvite)

thiamine (Vitamin B1)

A female client tells the clinic nurse that her skin is very dry and irritated. Which product would the nurse suggest that the client apply to the dry skin?

glycerin emollient

aspercreame

myoflex

acetic acid solution

A nurse is providing instructions to a client regarding quinapril hydrochloride (Accupril). The nurse tells the client:

to take the medication with food only

to rise slowly from a lying to a sitting position

to discontinue the medication if nausea occurs

that a therapeutic effect will be noted immediately

Auranofin (Ridaura) is prescribed for a client with rheumatoid arthritis, and the nurse monitors the client for signs of an adverse effect related to the medication. Which of the following indicates an adverse effect?

nausea

b. diarrhea

c. anorexia

d. proteinuria

A client has been taking benzonatate (Tessalon) as ordered. The nurse tells the client that this medication should do which of the following?

take away nausea and vomiting

calm the persistent cough

decrease anxiety level

increase comfort level

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Posted by admin on Dec 13, 2009

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1. C. The ointment is placed in the lower conjunctiva sac so it will not scratch the eye itself and will get well distributed.

2. D. The physician, nurse, and pharmacist all are licensed professionals and share responsibility for errors.

3. B. The decreased circulation to the kidney and reduced liver function tend to allow drugs to accumulate and have toxic effects.

4. C. The correct way to identify a patient before giving a medication is to check the name on the medication administration record with the patient’s identification band. The nurse should also ask the patient to state their name. The name on the door or the census list are not sufficient proof of identification. Calling the patient by name is not as effective as having the patient state their name; patients may not hear well or understand what the nurse is saying, and may respond to a name which is not their own.

5. C. Frequently patients do not complete an entire course of antibiotic therapy, and the bacteria are not destroyed.

6. B. Elavil is an antidepressant that lowers the seizure threshold, so would not be appropriate for this patient. The other medications are anti-seizure drugs.

7. C. Morphine sulfate depresses the respiratory center. When the rate is less than 10, the MD should be notified.

8. A. Monoamine oxidase inhibitors react with foods high in the amino acid tyramine to cause dangerously high blood pressure. Aged cheeses are all high in this amino acid; the other foods are not.

9. C. The generic name for Demerol is meperidine.

10. C. The five rights of medication administration are right drug, right dose, right route, right time, right patient. Frequency is not included.

11. C. The nurse should always inspect the vial of insulin before use for solution changes that may signify loss of potency. NPH insulin is normally uniformly cloudy. Clumping, frosting, and precipitates are signs of insulin damage. In this situation, because potency is questionable, it is safer to discard the vial and draw up the dose from a new vial.

12. C. The client should be taught that ketoconazole is an antifungal medication. It should be taken with food or milk. Antacids should be avoided for 2 hours after it is taken because gastric acid is needed to activate the medication. The client should avoid concurrent use of alcohol, because the medication is hepatotoxic. The client should also avoid exposure to sunlight, because the medication increases photosensitivity.

13. B. Cola, coffee, and chocolate contain xanthine and should be avoided by the client taking a xanthine bronchodilator. This could lead to an increased incidence of cardiovascular and central nervous system side effects that can occur with the use of these types of bronchodilators.

14. C. The client is taking famotidine, a histamine receptor antagonist. This implies that the client has a disorder characterized by gastrointestinal (GI) irritation. The only medication of the ones listed in the options that is not irritating to the GI tract is acetaminophen. The other medications could aggravate an already existing GI problem.

15. D. Triamterene is a potassium-sparing diuretic, and clients taking this medication should be cautioned against eating foods that are high in potassium, including many vegetables, fruits, and fresh meats. Because potassium is very water-soluble, foods that are prepared in water are often lower in potassium.

16. A. The client with cirrhosis has impaired ability to metabolize protein because of liver dysfunction. Administration of lactulose aids in the clearance of ammonia via the gastrointestinal (GI) tract. Ethacrynic acid is a diuretic. Folic acid and thiamine are vitamins, which may be used in clients with liver disease as supplemental therapy.

17. A. Glycerin is an emollient that is used for dry, cracked, and irritated skin. Aspercreame and Myoflex are used to treat muscular aches. Acetic acid solution is used for irrigating, cleansing, and packing wounds infected by Pseudomonas aeruginosa.

18. B. Accupril is an angiotensin-converting enzyme (ACE) inhibitor. It is used in the treatment of hypertension. The client should be instructed to rise slowly from a lying to sitting position and to permit the legs to dangle from the bed momentarily before standing to reduce the hypotensive effect. The medication does not need to be taken with meals. It may be given without regard to food. If nausea occurs, the client should be instructed to take a noncola carbonated beverage and salted crackers or dry toast. A full therapeutic effect may be noted in 1 to 2 weeks.

19. D. Auranofin (Ridaura) is a gold preparation that is used as an antirheumatic. Gold toxicity is an adverse effect and is evidenced by decreased hemoglobin, leukopenia, reduced granulocyte counts, proteinuria, hematuria, stomatitis, glomerulonephritis, nephrotic syndrome, or cholestatic jaundice. Anorexia, nausea, and diarrhea are frequent side effects of the medication.

20. B. Benzonatate is a locally acting antitussive. Its effectiveness is measured by the degree to which it decreases the intensity and frequency of cough, without eliminating the cough reflex.

[Pharmacology Questions Part 1](http://nclexreviewers.com/nclex-sample-questions/pharmacology/pharmacology-questions-part-1.html" \o "Permanent Link to Pharmacology Questions Part 1)

1.    Walter, teenage patient is admitted to the hospital because of acetaminophen (Tylenol) overdose. Overdoses of acetaminophen can precipitate life-threatening abnormalities in which of the following organs?  
a.    Lungs  
b.    Liver  
c.    Kidney  
d.    Adrenal Glands

2.    A contraindication for topical corticosteroid usage in a male patient with atopic dermatitis (eczema) is:  
a.    Parasite infection.  
b.    Viral infection.  
c.    Bacterial infection.  
d.    Spirochete infection.

3.    In infants and children, the side effects of first generation over-the-counter (OTC) antihistamines, such as diphenhydramine (Benadryl) and hydroxyzine (Atarax) include:  
a.    Reye’s syndrome.  
b.    Cholinergic effects.  
c.    Paradoxical CNS stimulation.  
d.    Nausea and diarrhea.

4.    Reye’s syndrome, a potentially fatal illness associated with liver failure and encephalopathy is associated with the administration of which over-the-counter (OTC) medication?  
a.    acetaminophen (Tylenol)  
b.    ibuprofen (Motrin)  
c.    aspirin  
d.    brompheniramine/psudoephedrine (Dimetapp)

5.    The nurse is aware that the patients who are allergic to intravenous contrast media are usually also allergic to which of the following products?  
a.    Eggs  
b.    Shellfish  
c.    Soy  
d.    acidic fruits

6.    A 13-month-old child recently arrived in the United States from a foreign country with his parents and needs childhood immunizations. His mother reports that he is allergic to eggs. Upon further questioning, you determine that the allergy to eggs is anaphylaxis. Which of the following vaccines should he not receive?  
a.    Hepatitis B  
b.    inactivated polio  
c.    diphtheria, acellular pertussis, tetanus (DTaP)  
d.    mumps, measles, rubella (MMR)

7.    The cell and Coombs classification system categorizes allergic reactions and is useful in describing and classifying patient reactions to drugs. Type I reactions are immediate hypersensitivity reactions and are mediated by:  
a.    immunoglobulin E (IgE).  
b.    immunoglobulin G (IgG).  
c.    immunoglobulin A (IgA).  
d.    immunoglobulin M (IgM).

8.    Drugs can cause adverse events in a patient. Bone marrow toxicity is one of the most frequent types of drug-induced toxicity. The most serious form of bone marrow toxicity is:  
a.    aplastic anemia.  
b.    thrombocytosis.  
c.    leukocytosis.  
d.    granulocytosis.

9.    Serious adverse effects of oral contraceptives include:  
a.    Increase in skin oil followed by acne.  
b.    Headache and dizziness.  
c.    Early or mid-cycle bleeding.  
d.    Thromboembolic complications.

10.    The most serious adverse effect of Alprostadil (Prostin VR pediatric injection) administration in neonates is:  
a.    Apnea.  
b.    Bleeding tendencies.  
c.    Hypotension.  
d.    Pyrexia.

11.    Mandy, a patient calls the clinic today because he is taking atrovastatin (Lipitor) to treat his high cholesterol and is having pain in both of his legs. You instruct him to:  
a.    Stop taking the drug and make an appointment to be seen next week.  
b.    Continue taking the drug and make an appointment to be seen next week.  
c.    Stop taking the drug and come to the clinic to be seen today.  
d.    Walk for at least 30 minutes and call if symptoms continue.

12.    Which of the following adverse effects is associated with levothyroxine (Synthroid) therapy?  
a.    Tachycardia  
b.    Bradycardia  
c.    Hypotension  
d.    Constipation

13.    Which of the following adverse effects is specific to the biguanide diabetic drug metformin (Glucophage) therapy?  
a.    Hypoglycemia  
b.    GI distress  
c.    Lactic acidosis  
d.    Somulence

14.    The most serious adverse effect of tricyclic antidepressant (TCA) overdose is:  
a.    Seizures.  
b.    Hyperpyrexia.  
c.    Metabolic acidosis.  
d.    Cardiac arrhythmias.

15.    The nurse is aware that the following solutions is routinely used to flush an IV device before and after the administration of blood to a patient is:  
a.    0.9 percent sodium chloride  
b.    5 percent dextrose in water solution  
c.    Sterile water  
d.    Heparin sodium

16.    Cris asks the nurse whether all donor blood products are cross-matched with the recipient to prevent a transfusion reaction. Which of the following always require cross-matching?  
a.    packed red blood cells  
b.    platelets  
c.    plasma  
d.    granulocytes

17.   A month after receiving a blood transfusion an immunocompromised male patient develops fever, liver abnormalities, a rash, and diarrhea. The nurse would suspect this patient has:  
a.    Nothing related to the blood transfusion.  
b.    Graft-versus-host disease (GVHD).  
c.    Myelosuppression.  
d.    An allergic response to a recent medication.

18.    Jonas comes into the local blood donation center. He says he is here to donate platelets only today. The nurse knows this process is called:  
a.    Directed donation.  
b.    Autologous donation.  
c.    Allogenic donation.  
d.    Apheresis.

19.    Nurse Bryan knows that the age group that uses the most units of blood and blood products is:  
a.    Premature infants.  
b.    Children ages 1-20 years.  
c.    Adults ages 21-64 years.  
d.    The elderly above age 65 years.

20.    A child is admitted with a serious infection. After two days of antibiotics, he is severely neutropenic. The physician orders granulocyte transfusions for the next four days. The mother asks the nurse why? The nurse responds:  
 a.    “This is the only treatment left to offer the child.”  
b.    “This therapy is fast and reliable in treating infections in children.”  
c.    “The physician will have to explain his rationale to you.”  
d.    “Granulocyte transfusions replenish the low white blood cells until the body can produce its own.”

21.    A neighbor tells nurse Maureen he has to have surgery and is reluctant to have any blood product transfusions because of a fear of contracting an infection. He asks the nurse what are his options. The nurse teaches the person that the safest blood product is:  
a.    An allogenic product.  
b.    A directed donation product.  
c.    An autologous product.  
d.    A cross-matched product.

22.    A severely immunocompromised female patient requires a blood transfusion. To prevent GVHD, the physician will order:  
a.    Diphenhydramine hydrochloride (Benadryl).  
b.    The transfusion to be administered slowly over several hours.  
c.    Irradiation of the donor blood.  
d.    Acetaminophen (Tylenol).

23.    Louie who is to receive a blood transfusion asks the nurse what is the most common type of infection he could receive from the transfusion. The nurse teaches him that approximately 1 in 250,000 patients contract:  
a.    Human immunodeficiency disease (HIV).  
b.    Hepatitis C infection.  
c.    Hepatitis B infection.  
d.    West Nile viral disease.

24.    A male patient with blood type AB, Rh factor positive needs a blood transfusion. The Transfusion Service (blood bank) sends type O, Rh factor negative blood to the unit for the nurse to infuse into this patient. The nurse knows that:  
a.    This donor blood is incompatible with the patient’s blood.  
b.    Premedicating the patient with diphenhydramine hydrochloride (Benadryl) and acetaminophen (Tylenol) will prevent any transfusion reactions or side effects.  
c.    This is a compatible match.  
d.    The patient is at minimal risk receiving this product since it is the first time he has been transfused with type O, Rh negative blood.

25.    Dr. Rodriguez orders 250 milliliters of packed red blood cells (RBC) for a patient. This therapy is administered for treatment of:  
a.    Thrombocytopenia.  
b.    Anemia.  
c.    Leukopenia.  
d.    Hypoalbuminemia.

26.    A female patient needs a whole blood transfusion. In order for transfusion services (the blood bank) to prepare the correct product a sample of the patient’s blood must be obtained for:  
a.    A complete blood count and differential.  
b.    A blood type and cross-match.  
c.    A blood culture and sensitivity.  
d.    A blood type and antibody screen.

27.    A male patient needs to receive a unit of whole blood. What type of intravenous (IV) device should the nurse consider starting?  
a.    A small catheter to decrease patient discomfort  
b.    The type of IV device the patient has had in the past, which worked well  
c.    A large bore catheter  
d.    The type of device the physician prefers

28.    Dr. Smith orders a gram of human salt poor albumin product for a patient. The product is available in a 50 milliliter vial with a concentration of 25 percent. What dosage will the nurse administer?  
a.    The nurse should use the entire 50 milliliter vial.  
b.    The nurse should determine the volume to administer from the physician.  
c.    This concentration of product should not be used.  
d.    The nurse will administer 4 milliliters.

29.    Central venous access devices (CVADs) are frequently utilized to administer chemotherapy. What is a distinct advantage of using the CVAD for chemotherapeutic agent administration?  
a.    CVADs are less expensive than a peripheral IV.  
b.    Once a week administration is possible.  
c.    Caustic agents in small veins can be avoided.  
d.    The patient or his family can administer the drug at home.

30.    A female patient’s central venous access device (CVAD) becomes infected. Why would the physician order antibiotics to be given through the line rather than through a peripheral IV line?  
a.    To prevent infiltration of the peripheral line  
b.    To reduce the pain and discomfort associated with antibiotic administration in a small vein  
c.    To lessen the chance of an allergic reaction to the antibiotic  
d.    To attempt to sterilize the catheter

[Pharmacology Questions Part 1 Answers and Rationale](http://nclexreviewers.com/nclex-sample-questions/pharmacology/pharmacology-questions-part-1-answers-and-rationale.html" \o "Permanent Link to Pharmacology Questions Part 1 Answers and Rationale)

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Answer B. Acetaminophen is extensively metabolized by pathways in the liver. Toxic doses of acetaminophen deplete hepatic glutathione, resulting in accumulation of the intermediate agent, quinine, which leads to hepatic necrosis. Prolonged use of acetaminophen may result in an increased risk of renal dysfunction, but a single overdose does not precipitate life-threatening problems in the respiratory system, renal system, or adrenal glands.

Answer B. Topical agents produce a localized, rather than systemic effect. When treating atopic dermatitis with a steroidal preparation, the site is vulnerable to invasion by organisms. Viruses, such as herpes simplex or varicella-zoster, present a risk of disseminated infection. Educate the patient using topical corticosteroids to avoid crowds or people known to have infections and to report even minor signs of an infection. Topical corticosteroid usage results in little danger of concurrent infection with these agents.

Answer C. Typically, first generation OTC antihistamines have a sedating effect because of passage into the CNS. However, in some individuals, especially infants and children, paradoxical CNS stimulation occurs and is manifested by excitement, euphoria, restlessness, and confusion. For this reason, use of first generation OTC antihistamines has declined, and second generation product usage has increased. Reye’s syndrome is a systemic response to a virus. First generation OTC antihistamines do not exhibit a cholinergic effect. Nausea and diarrhea are uncommon when first generation OTC antihistamines are taken.

Answer C. Virus-infected children who are given aspirin to manage pain, fever, and inflammation are at an increased risk of developing Reye’s syndrome. Use of acetaminophen has not been associated with Reye’s syndrome and can be safely given to patients with fever due to viral illnesses. Ibuprofen adverse effects include GI irritation and bleeding, and in toxic doses, both renal and hepatic failure are reported. However, ibuprofen has not been associated with the onset of Reye’s disease. Brompheniramine/psudoephedrine contains a first generation OTC antihistamine and a decongestant. Neither agent has been associated with the development of Reye’s syndrome.

Answer B. Some types of contrast media contain iodine as an ingredient. Shellfish also contain significant amounts of iodine. Therefore, a patient who is allergic to iodine will exhibit an allergic response to both iodine containing contrast media and shellfish. These products do not contain iodine.

Answer D. The measles portion of the MMR vaccine is grown in chick embryo cells. The current MMR vaccine does not contain a significant amount of egg proteins, and even children with dramatic egg allergies are extremely unlikely to have an anaphylactic reaction. However, patients that do respond to egg contact with anaphylaxis should be in a medically controlled setting where full resuscitation efforts can be administered if anaphylaxis results. The vaccines in options a,b and c do not contain egg protein.

Answer A. IgE, the least common serum immunoglobulin (Ig) binds very tightly to receptors on basophils and mast cells and is involved in allergic reactions. Binding of the allergen to the IgE on the cells results in the release of various pharmacological mediators that result in allergic symptoms. IgG is the major Ig (75 percent of serum Ig is IgG). Most versatile Ig because it is capable of carrying out all of the functions of Ig molecules. IgG is the only class of Ig that crosses the placenta. It is an opsonin, a substance that enhances phagocytosis. IgA, the second most common serum Ig is found in secretions (tears, saliva, colostrum, and mucus). It is important in local (mucosal) immunity. IgM, the third most common serum Ig, is the first Ig to be made by the fetus and the first Ig to be made by a virgin B cell when it is stimulated by antigen. IgM antibodies are very efficient in leading to the lysis of microorganisms.

Answer A. Aplastic anemia is the result of a hypersensitivity reaction and is often irreversible. It leads to pancytopenia, a severe decrease in all cell types: red blood cells, white blood cells, and platelets. A reduced number of red blood cells causes hemoglobin to drop. A reduced number of white blood cells make the patient susceptible to infection. And, a reduced number of platelets cause the blood not to clot as easily. Treatment for mild cases is supportive. Transfusions may be necessary. Severe cases require a bone marrow transplant. Option 2 is an elevated platelet count. Option 3 is an elevated white count. Option 4 is an elevated granulocyte count. A granulocyte is a type of white blood cell.

Answer D. Oral contraceptives have been associated with an increased risk of stroke, myocardial infarction, and deep vein thrombosis. These risks are increased in women who smoke. Increased skin oil and acne are effects of progestin excess. Headache and dizziness are effects of estrogen excess. Early or mid-cycle bleeding are effects of estrogen deficiency.

Answer A. All items are adverse reactions of the drug. However, apnea appearing during the first hour of drug infusion occurs in 10-12 percent of neonates with congenital heart defects. Clinicians deciding to utilize alprostadil must be prepared to intubate and mechanically ventilate the infant. Careful monitoring for apnea or respiratory depression is mandatory. In some institutions, elective intubation occurs prior to initiation of the medication.

Answer C. Muscle aches, soreness, and weakness may be early signs of myopathy such as rhabdomyolysis associated with the HMG-CoA reducatase class of antilipemic agents. This patient will need an immediate evaluation to rule out myopathy. Additional doses may exacerbate the problem. Exercise will not reverse myopathy and delays diagnosis.

Answer A. Levothyroxine, especially in higher doses, can induce hyperthyroid-like symptoms including tachycardia. An agent that increases the basal metabolic rate would not be expected to induce a slow heart rate. Hypotension would be a side effect of bradycardia. Constipation is a symptom of hypothyroid disease.

Answer C. Lactic acidosis is the most dangerous adverse effect of metformin administration with death resulting in approximately 50 percent of individuals who develop lactic acidosis while on this drug. Metformin does not induce insulin production; thus, administration does not result in hypoglycemic events. Some nausea, vomiting, and diarrhea may develop but is usually not severe. NVD is not specific for metformin. Metformin does not induce sleepiness.

Answer D. Excessive ingestion of TCAs result in life-threatening wide QRS complex tachycardia. TCA overdose can induce seizures, but they are typically not life-threatening. TCAs do not cause an elevation in body temperature. TCAs do not cause metabolic acidosis.

Answer A. 0.9 percent sodium chloride is normal saline. This solution has the same osmolarity as blood. Its use prevents red cell lysis. The solutions given in options 2 and 3 are hypotonic solutions and can cause red cell lysis. The solution in option 4 may anticoagulate the patient and result in bleeding.

Answer A. Red blood cells contain antigens and antibodies that must be matched between donor and recipient. The blood products in options 2-4 do not contain red cells. Thus, they require no cross-match.

Answer B. GVHD occurs when white blood cells in donor blood attack the tissues of an immunocompromised recipient. This process can occur within a month of the transfusion. Options 1 and 4 may be a thought, but the nurse must remember that immunocompromised transfusion recipients are at risk for GVHD.

Answer D. The process of apheresis involves removal of whole blood from a donor. Within an instrument that is essentially designed as a centrifuge, the components of whole blood are separated. One of the separated portions is then withdrawn, and the remaining components are retransfused into the donor. Directed donation is collected from a blood donor other than the recipient, but the donor is known to the recipient and is usually a family member or friend. Autologous donation is the collection and reinfusion of the patient’s own blood. Allogenic donation is collected from a blood donor other than the recipient.

Answer D. People older than 65 years use 43 percent of donated blood. This number is expected to increase as the population ages.

Answer D. Granulocyte (neutrophil) replacement therapy is given until the patient’s blood values are normal and he is able to fight the infection himself. Options 1 and 3 are not therapeutic responses. The treatment in option 2 takes days and is not always able to prevent morbidity and mortality.

Answer C. This process is the collection and reinfusion of the patient’s own blood. It is recommended by the American Medical Association’s Council on Scientific Affairs as the safest product since it eliminates recipient incompatibility and infection. The product in option 1 is collected from a blood donor other than the recipient. The process in option 2 is also collected from a blood donor other than the recipient, but the donor is known to the recipient and is usually a family member or friend. Cross-matching significantly enhances compatibility. It does not detect infection.

Answer C. This process eliminates white blood cell functioning, thus, preventing GVHD. Diphenhydramine HCl is an antihistamine. It’s use prior to a blood transfusion decreases the likelihood of a transfusion reaction. Option 2 will not prevent GVHD. Use of acetaminophen prevents and treats the common side effects of blood administration caused by the presence of white blood cells in the transfusion product: fever, headache, and chills.

Answer C. Hepatitis B is the most common infection spread via blood transfusion. Donors are screened by a questionnaire that includes symptoms. The donated blood is also tested for infection. The risk of infection with the agents in options 2 and 3 has decreased to approximately 1 in 2 million secondary to donor questioning and donor blood testing. The incidence of West Nile viral transmission is unknown, but donor infection is still relatively rare.

Answer C. Type O, Rh negative blood has none of the major antigens and is safely administered to patients of all blood types. It is also known as the universal donor. Premedicating with these agents will not prevent a major transfusion reaction if the blood type and Rh factors of the donor blood are incompatible with the recipient’s blood.

Answer B. A red blood cell transfusion is used to correct anemia in patients in which the low red blood cell count must be rapidly corrected. RBC transfusion will not correct a low platelet count. RBC transfusion will not correct a low white blood cell count. Packed RBCs contain very little plasma and, thus, only a small amount of albumin. This amount will not correct low albumin levels.

Answer B. This is needed to utilize the correct type of donor blood and to match the donor product with the patient. Incompatible matches would result in severe adverse events and possible death. The tests in options 1 and 3 are unnecessary. The test in option 4 is utilized to determine the patient’s blood type and presence of antibodies to blood antigens. It does not determine donor blood compatibility with the patient.

Answer C. Large bore catheters prevent damage to blood components and are less likely to develop clotting problems than a small bore catheter. The nurse should determine the correct device without asking the patient what type has been used before or asking the physician which type he prefers and start the IV.

Answer D. A 25 percent solution contains one quarter of a gram per milliliter. Thus, the nurse will administer 4 milliliters to provide a complete gram of albumin. The volume in option 1 would provide 12.5 grams of albumin. The nurse should determine the volume. It is unnecessary to seek the answer from the physician. A 25 percent solution is an acceptable product and can safely be used.

Answer C. Many chemotherapeutic drugs are vesicants (highly active corrosive materials that can produce tissue damage even in low concentrations). Extravasations of a vesicant can result in significant tissue necrosis. Administration into a large vein is optimal. CVADs are more expensive than a peripheral IV. Dosing depends on the drug. IV chemotherapeutic agents are not administered at home. They are given in an outpatient or clinic setting if not given during hospitalization.

Answer D. Microorganisms that infect CVADs are often coagulase-negative staphylococci, which can be eliminated by antibiotic administration through the catheter. If unsuccessful in eliminating the microorganism, the CVAD must be removed. CVAD use lessens the need for peripheral IV lines and, thus, the risk of infiltration. In this case however, the antibiotics are given to eradicate microorganisms from the CVAD. CVAD use has this effect, but in this case, the antibiotics are given through the CVAD to eliminate the infective agent. The third option would not occur. [Home](http://nclexreviewers.com/)

[Pharmacology Questions Part 2](http://nclexreviewers.com/nclex-sample-questions/pharmacology/pharmacology-questions-part-2.html" \o "Permanent Link to Pharmacology Questions Part 2)

1.    An infection in a central venous access device is not eliminated by giving antibiotics through the catheter. How would bacterial glycocalyx contribute to this?  
a.    It protects the bacteria from antibiotic and immunologic destruction.  
b.    Glycocalyx neutralizes the antibiotic rendering it ineffective.  
c.    It competes with the antibiotic for binding sites on the microbe.  
d.    Glycocalyx provides nutrients for microbial growth.

2.    Central venous access devices are beneficial in pediatric therapy because:  
a.    They don’t frighten children.  
b.    Use of the arms is not restricted.  
c.    They cannot be dislodged.  
d.    They are difficult to see.

3.    How can central venous access devices (CVADs) be of value in a patient receiving chemotherapy who has stomatitis and severe diarrhea?  
a.    The chemotherapy can be rapidly completed allowing the stomatitis and diarrhea to resolve.  
b.    Crystalloid can be administered to prevent dehydration.  
c.    Concentrated hyperalimentation fluid can be administered through the CVAD.  
d.    The chemotherapy dose can be reduced.

4.    Some central venous access devices (CVAD) have more than one lumen. These multi lumen catheters:  
a.    Have an increased risk of infiltration.  
b.    Only work a short while because the small bore clots off.  
c.    Are beneficial to patient care but are prohibitively expensive.  
d.    Allow different medications or solutions to be administered simultaneously.

5.    Some institutions will not infuse a fat emulsion, such as Intralipid, into central venous access devices (CVAD) because:  
a.    Lipid residue may accumulate in the CVAD and occlude the catheter.  
b.    If the catheter clogs, there is no treatment other than removal and replacement.  
c.    Lipids are necessary only in the most extreme cases to prevent essential fatty acid (EFA) deficiency.  
d.    Fat emulsions are very caustic.

6.    A male patient needs a percutaneously inserted central catheter (PICC) for prolonged IV therapy. He knows it can be inserted without going to the operating room. He mentions that, “at least the doctor won’t be wearing surgical garb, will he?” How will the nurse answer the patient?  
a.    “You are correct. It is a minor procedure performed on the unit and does not necessitate surgical attire.”  
b.    “To decrease the risk of infection, the doctor inserting the PICC will wear a cap, mask, and sterile gown and gloves.”  
c.    “It depends on the doctor’s preference.”  
d.    “Most doctors only wear sterile gloves, not a cap, mask, or sterile gown.”

7.    A male patient is to receive a percutaneously inserted central catheter (PICC). He asks the nurse whether the insertion will hurt. How will the nurse reply?  
a.    “You will have general anesthesia so you won’t feel anything.”  
b.    “It will be inserted rapidly, and any discomfort is fleeting.”  
c.    “The insertion site will be anesthetized. Threading the catheter through the vein is not painful.”  
d.    “You will receive sedation prior to the procedure.”

8.    What volume of air can safely be infused into a patient with a central venous access device (CVAD)?  
a.    It is dependent on the patient’s weight and height.  
b.    Air entering the patient through a CVAD will follow circulation to the lungs where it will be absorbed and cause no problems.  
c.    It is dependent on comorbidities such as asthma or chronic obstructive lung disease.  
d.    None.

9.    Kent a new staff nurse asks her preceptor nurse how to obtain a blood sample from a patient with a portacath device. The preceptor nurse teaches the new staff nurse:  
a.    The sample will be withdrawn into a syringe attached to the portacath needle and then placed into a vacutainer.  
b.    Portacath devices are not used to obtain blood samples because of the risk of clot formation.  
c.    The vacutainer will be attached to the portacath needle to obtain a direct sample.  
d.    Any needle and syringe may be utilized to obtain the sample.

10.    What is the purpose of “tunneling” (inserting the catheter 2-4 inches under the skin) when the surgeon inserts a Hickman central catheter device? Tunneling:  
a.    Increases the patient’s comfort level.  
b.    Decreases the risk of infection.  
c.    Prevents the patient’s clothes from having contact with the catheter  
d.    Makes the catheter less visible to other people.

11.    The primary complication of a central venous access device (CVAD) is:  
a.    Thrombus formation in the vein.  
b.    Pain and discomfort.  
c.    Infection.  
d.    Occlusion of the catheter as the result of an intra-lumen clot.

12.    Nurse Blessy is doing some patient education related to a patient’s central venous access device. Which of the following statements will the nurse make to the patient?  
a.    “These type of devices are essentially risk free.”  
b.    “These devices seldom work for more than a week or two necessitating replacement.”  
c.    “The dressing should only the changed by your doctor.”  
d.    “Heparin in instilled into the lumen of the catheter to decrease the risk of clotting.”

13.    The chemotherapeutic DNA alkylating agents such as nitrogen mustards are effective because they:  
a.    Cross-link DNA strands with covalent bonds between alkyl groups on the drug and guanine bases on DNA.  
b.    Have few, if any, side effects.  
c.    Are used to treat multiple types of cancer.  
d.    Are cell cycle-specific agents.

14.    Hormonal agents are used to treat some cancers. An example would be:  
a.    Thyroxine to treat thyroid cancer.  
b.    ACTH to treat adrenal carcinoma.  
c.    Estrogen antagonists to treat breast cancer.  
d.    Glucagon to treat pancreatic carcinoma.

15.    Chemotherapeutic agents often produce a certain degree of myelosuppression including leukopenia. Leukopenia does not present immediately but is delayed several days to weeks because:  
a.    The patient’s hemoglobin and hematocrit are normal.  
b.    Red blood cells are affected first.  
c.    Folic acid levels are normal.  
d.    The current white cell count is not affected by chemotherapy.

16.    Currently, there is no way to prevent myelosuppression. However, there are medications available to elicit a more rapid bone marrow recovery. An example is:  
a.    Epoetin alfa (Epogen, Procrit).  
b.    Glucagon.  
c.    Fenofibrate (Tricor).  
d.    Lamotrigine (Lamictal).

17.    Estrogen antagonists are used to treat estrogen hormone-dependent cancer, such as breast carcinoma. Androgen antagonists block testosterone stimulation of androgen-dependent cancers. An example of an androgen-dependent cancer would be:  
a.    Prostate cancer.  
b.    Thyroid cancer.  
c.    Renal carcinoma.  
d.    neuroblastoma.

18.    Serotonin release stimulates vomiting following chemotherapy. Therefore, serotonin antagonists are effective in preventing and treating nausea and vomiting related to chemotherapy. An example of an effective serotonin antagonist antiemetic is:  
a.    ondansetron (Zofran).  
b.    fluoxetine (Prozac).  
c.    paroxetine (Paxil).  
d.    sertraline (Zoloft).

19.    Methotrexate, the most widely used antimetabolite in cancer chemotherapy does not penetrate the central nervous system (CNS). To treat CNS disease this drug must be administered:  
a.    Intravenously.  
b.    Subcutaneously.  
c.    Intrathecally.  
d.    By inhalation.

20.    Methotrexate is a folate antagonist. It inhibits enzymes required for DNA base synthesis. To prevent harm to normal cells, a fully activated form of folic acid known as leucovorin (folinic acid; citrovorum factor) can be administered. Administration of leucovorin is known as:  
a.    Induction therapy.  
b.    Consolidation therapy.  
c.    Pulse therapy.  
d.    Rescue therapy.

21.    A male Patient is undergoing chemotherapy may also be given the drug allopurinol (Zyloprim, Aloprim). Allopurinol inhibits the synthesis of uric acid. Concomitant administration of allopurinol prevents:  
a.    Myelosuppression.  
b.    Gout and hyperuricemia.  
c.    Pancytopenia.  
d.    Cancer cell growth and replication

22.    Superficial bladder cancer can be treated by direct instillation of the antineoplastic antibiotic agent mitomycin (Mutamycin). This process is termed:  
a.    Intraventricular administration.  
b.    Intravesical administration.  
c.    Intravascular administration.  
d.    Intrathecal administration.

23.    The most common dose-limiting toxicity of chemotherapy is:  
a.    Nausea and vomiting.  
b.    Bloody stools.  
c.    Myelosuppression.  
d.    Inability to ingest food orally due to stomatitis and mucositis.

24.    Chemotherapy induces vomiting by:  
a.    Stimulating neuroreceptors in the medulla.  
b.    Inhibiting the release of catecholamines.  
c.    Autonomic instability.  
d.    Irritating the gastric mucosa.

25.    Myeloablation using chemotherapeutic agents is useful in cancer treatment because:  
a.    It destroys the myelocytes (muscle cells).  
b.    It reduces the size of the cancer tumor.  
c.    After surgery, it reduces the amount of chemotherapy needed.  
d.    It destroys the bone marrow prior to transplant.

26.    Anticipatory nausea and vomiting associated with chemotherapy occurs:  
a.    Within the first 24 hours after chemotherapy.  
b.    1-5 days after chemotherapy.  
c.    Before chemotherapy administration.  
d.    While chemotherapy is being administered.

27.    Medications bound to protein have the following effect:  
a.    Enhancement of drug availability.  
b.    Rapid distribution of the drug to receptor sites.  
c.    The more drug bound to protein, the less available for desired effect.  
d.    Increased metabolism of the drug by the liver.

28.    Some drugs are excreted into bile and delivered to the intestines. Prior to elimination from the body, the drug may be absorbed. This process is known as:  
a.    Hepatic clearance.  
b.    Total clearance.  
c.    Enterohepatic cycling.  
d.    First-pass effect.

29.    An adult patient has been taking a drug (Drug A) that is highly metabolized by the cytochrome p-450 system. He has been on this medication for 6 months. At this time, he is started on a second medication (Drug B) that is an inducer of the cytochrome p-450 system. You should monitor this patient for:  
a.    Increased therapeutic effects of Drug A.  
b.    Increased adverse effects of Drug B.  
c.    Decreased therapeutic effects of Drug A.  
d.    Decreased therapeutic effects of Drug B.

30.    Epinephrine is administered to a female patient. The nurse should expect this agent to rapidly affect:  
a.    Adrenergic receptors.  
b.    Muscarinic receptors.  
c.    Cholinergic receptors.  
d.    Nicotinic receptors.

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Answer C. Glycocalyx is a viscous polysaccharide or polypeptide slime that covers microbes. It enhances adherence to surfaces, resists phagocytic engulfment by the white blood cells, and prevents antibiotics from contacting the microbe. Glycocalyx does not have the effects in options B-D.

Answer B. The child can move his extremities and function in a normal fashion. This lessens stress associated with position restriction and promotes normal activity. Fear may not be eliminated. All lines can be dislodged. Even small catheters can be readily seen.

Answer C. In patients unable to take oral nutrition, parenteral hyperalimentation is an option for providing nutritional support. High concentrations of dextrose, protein, minerals, vitamins, and trace elements can be provided. Dosing is not affected with options a and d. Crystalloid can provide free water but has very little nutritional benefits. Hyperalimentation can provide free water and considerable nutritional benefits.

Answer D. A multilumen catheter contains separate ports and means to administer agents. An agent infusing in one port cannot mix with an agent infusing into another port. Thus, agents that would be incompatible if given together can be given in separate ports simultaneously.

Answer A. Occlusion occurs with slow infusion rates and concurrent administration of some medications. Lipid occlusions may be treated with 70 percent ethanol or with 0.1 mmol/mL NaOH. Lipids provide essential fatty acids. It is recommended that approximately 4 percent of daily calories be EFAs. A deficiency can quickly develop. Daily essential fatty acids are necessary for constant prostaglandin production. Lipids are almost isotonic with blood.

Answer C. Strict aseptic technique including the use of cap, mask, and sterile gown and gloves is require when placing a central venous line including a PICC. Options A, B, and D are incorrect statements. They increase the risk of infection.

Answer C. Pain related to PICC insertion occurs with puncture of the skin. When inserting PICC lines, the insertion site is anesthetized so no pain is felt. The patient will not receive general anesthesia or sedation. Statement 2 is false. Unnecessary pain should be prevented.

Answer B. Any air entering the right heart can lead to a pulmonary embolus. All air should be purged from central venous lines; none should enter the patient.

Answer A. A special portacath needle is used to access the portacath device. A syringe is attached and the sample is obtained. One of the primary reasons for insertion of a portacath device is the need for frequent or long-term blood sampling. A vacutainer will exert too much suction on the central line resulting in collapse of the line. Only special portacath needles should be used to access the portacath device.

Answer B. The actual access to the subclavian vein is still just under the clavicle, but by tunneling the distal portion of the catheter several inches under the skin the risk of migratory infection is reduces compared to a catheter that enters the subclavian vein directly and is not tunneled. The catheter is tunneled to prevent infection.

Answer C. A foreign body in a blood vessel increases the risk of infection. Catheters that come outside the body have an even higher risk of infection. Most infections are caused by skin bacteria. Other infective organisms include yeasts and fungi. Options 1 and 4 are complications of a CVAD but are not the primary problem. Once placed, these lines do not cause pain and discomfort.

Answer D. A solution containing heparin is used to reduce catheter clotting and maintain patency. The concentration of heparin used depends on the patient’s age, comorbidities, and the frequency of catheter access/flushing. Although patients have few complications, the device is not risk free. Patients may develop infection, catheter clots, vascular obstruction, pneumothorax, hemothorax, or mechanical problems (catheter breakage). Strict adherence to protocol enhances the longevity of central access devices. They routinely last weeks to months and sometimes years. The patient will be taught how to perform dressing changes at home.

Answer A. Alkylating agents are highly reactive chemicals that introduce alkyl radicals into biologically active molecules and thereby prevent their proper functioning, replication, and transcription. Alkylating agents have numerous side effects including alopecia, nausea, vomiting, and myelosuppression. Nitrogen mustards have a broad spectrum of activity against chronic lymphocytic leukemia, non-Hodgkin’s lymphoma, and breast and ovarian cancer, but they are effective chemotherapeutic agents because of DNA cross-linkage. Alkylating agents are noncell cycle-specific agents.

Answer C. Estrogen antagonists are used to treat estrogen hormone-dependent cancer, such as breast carcinoma. A well-known estrogen antagonist used in breast cancer therapy is tamoxifen (Nolvadex). This drug, in combination with surgery and other chemotherapeutic drugs reduces breast cancer recurrence by 30 percent. Estrogen antagonists can also be administered to prevent breast cancer in women who have a strong family history of the disease. Thyroxine is a natural thyroid hormone. It does not treat thyroid cancer. ACTH is an anterior pituitary hormone, which stimulates the adrenal glands to release glucocorticoids. It does not treat adrenal cancer. Glucagon is a pancreatic alpha cell hormone, which stimulates glycogenolysis and gluconeogenesis. It does not treat pancreatic cancer.

Answer D. The time required to clear circulating cells before the effect that chemotherapeutic drugs have on precursor cell maturation in the bone marrow becomes evident. Leukopenia is an abnormally low white blood cell count. Answers A-C pertain to red blood cells.

Answer A. Epoetin alfa (Epogen, Procrit) is a recombinant form of endogenous erythropoietin, a hematopoietic growth factor normally produced by the kidney that is used to induce red blood cell production in the bone marrow and reduce the need for blood transfusion. Glucagon is a pancreatic alpha cell hormone, which cause glycogenolysis and gluconeogenesis. Fenofibrate (Tricor) is an antihyperlipidemic agent that lowers plasma triglycerides. Lamotrigine (Lamictal) is an anticonvulsant.

Answer A. Prostate tissue is stimulated by androgens and suppressed by estrogens. Androgen antagonists will block testosterone stimulation of prostate carcinoma cells. The types of cancer in options 2-4 are not androgen dependent.

Answer A. Chemotherapy often induces vomiting centrally by stimulating the chemoreceptor trigger zone (CTZ) and peripherally by stimulating visceral afferent nerves in the GI tract. Ondansetron (Zofran) is a serotonin antagonist that bocks the effects of serotonin and prevents and treats nausea and vomiting. It is especially useful in single-day highly emetogenic cancer chemotherapy (for example, cisplatin). The agents in options 2-4 are selective serotonin reuptake inhibitors. They increase the available levels of serotonin.

Answer C. With intrathecal administration chemotherapy is injected through the theca of the spinal cord and into the subarachnoid space entering into the cerebrospinal fluid surrounding the brain and spinal cord. The methods in options A, B, and D are ineffective because the medication cannot enter the CNS.

Answer B. Leucovorin is used to save or "rescue" normal cells from the damaging effects of chemotherapy allowing them to survive while the cancer cells die. Therapy to rapidly reduce the number of cancerous cells is the induction phase. Consolidation therapy seeks to complete or extend the initial remission and often uses a different combination of drugs than that used for induction. Chemotherapy is often administered in intermittent courses called pulse therapy. Pulse therapy allows the bone marrow to recover function before another course of chemotherapy is given.

Answer B. Prevent uric acid nephropathy, uric acid lithiasis, and gout during cancer therapy since chemotherapy causes the rapid destruction of cancer cells leading to excessive purine catabolism and uric acid formation. Allopurinol can induce myelosuppression and pancytopenia. Allopurinol does not have this function.

Answer B. Medications administered intravesically are instilled into the bladder. Intraventricular administration involves the ventricles of the brain. Intravascular administration involves blood vessels. Intrathecal administration involves the fluid surrounding the brain and spinal cord.

Answer C. The overall goal of cancer chemotherapy is to give a dose large enough to be lethal to the cancer cells, but small enough to be tolerable for normal cells. Unfortunately, some normal cells are affected including the bone marrow. Myelosuppression limits the body’s ability to prevent and fight infection, produce platelets for clotting, and manufacture red blood cells for oxygen portage. Even though the effects in options a, b, and d are uncomfortable and distressing to the patient, they do not have the potential for lethal outcomes that myelosuppression has.

Answer A. Vomiting (emesis) is initiated by a nucleus of cells located in the medulla called the vomiting center. This center coordinates a complex series of events involving pharyngeal, gastrointestinal, and abdominal wall contractions that lead to expulsion of gastric contents. Catecholamine inhibition does not induce vomiting. Chemotherapy does not induce vomiting from autonomic instability. Chemotherapy, especially oral agents, may have an irritating effect on the gastric mucosa, which could result in afferent messages to the solitary tract nucleus, but these pathways do not project to the vomiting center.

Answer A. Myelo comes from the Greek word myelos, which means marrow. Ablation comes from the Latin word ablatio, which means removal. Thus, myeloablative chemotherapeurtic agents destroy the bone marrow. This procedure destroys normal bone marrow as well as the cancerous marrow. The patient’s bone marrow will be replaced with a bone marrow transplant. Myelocytes are not muscle cells Tumors are solid masses typically located in organs. Surgery may be performed to reduce tumor burden and require less chemotherapy afterward.

Answer C. Nausea and vomiting (N&V) are common side effects of chemotherapy. Some patients are able to trigger these events prior to actually receiving chemotherapy by anticipating, or expecting, to have these effects. N&V occurring post-chemotherapeutic administration is not an anticipatory event but rather an effect of the drug. N&V occurring during the administration of chemotherapy is an effect of the drug.

Answer C. Only an unbound drug can be distributed to active receptor sites. Therefore, the more of a drug that is bound to protein, the less it is available for the desired drug effect. Less drug is available if bound to protein. Distribution to receptor sites is irrelevant since the drug bound to protein cannot bind with a receptor site. Metabolism would not be increased. The liver will first have to remove the drug from the protein molecule before metabolism can occur. The protein is then free to return to circulation and be used again.

Answer C. Drugs and drug metabolites with molecular weights higher than 300 may be excreted via the bile, stored in the gallbladder, delivered to the intestines by the bile duct, and then reabsorbed into the circulation. This process reduces the elimination of drugs and prolongs their half-life and duration of action in the body. Hepatic clearance is the amount of drug eliminated by the liver. Total clearance is the sum of all types of clearance including renal, hepatic, and respiratory. First-pass effect is the amount of drug absorbed from the GI tract and then metabolized by the liver; thus, reducing the amount of drug making it into circulation.

Answer C. Drug B will induce the cytochrome p-450 enzyme system of the liver; thus, increasing the metabolism of Drug A. Therefore, Drug A will be broken down faster and exert decreased therapeutic effects. Drug A will be metabolized faster, thus reducing, not increasing its therapeutic effect. Inducing the cytochrome p-450 system will not increase the adverse effects of Drug B. Drug B induces the cytochrome p-450 system but is not metabolized faster. Thus, the therapeutic effects of Drug B will not be decreased.

Answer A. Epinephrine (adrenaline) rapidly affects both alpha and beta adrenergic receptors eliciting a sympathetic (fight or flight) response. Muscarinic receptors are cholinergic receptors and are primarily located at parasympathetic junctions. Cholinergic receptors respond to acetylcholine stimulation. Cholinergic receptors include muscarinic and nicotinic receptors. Nicotinic receptors are cholinergic receptors activated by nicotine and found in autonomic ganglia and somatic neuromuscular junctions.