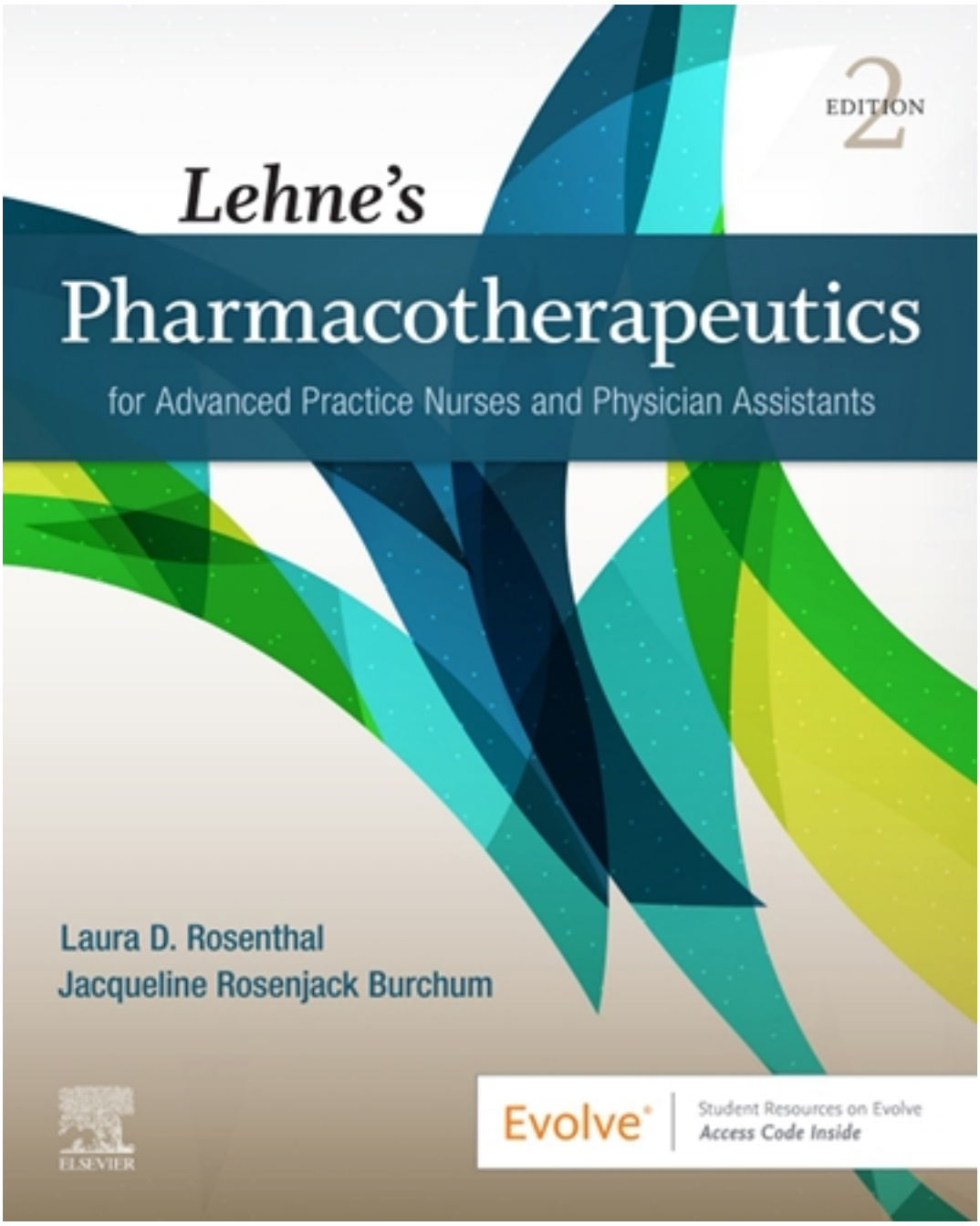
Test Bank for LehneGÇÖs Pharmacotherapeutics for Advanced Practice Nurses and Physician Assistants 2nd Edition by Rosenthal



Test Bank

Unit 02: Basic Principles of Pharmacology
Rosenthal: Lehne's Pharmacotherapeutics for Advanced Practice Nurses and Physician Assistants, 2nd Edition

MULTIPLE CHOICE

1. When prescribing lovastatin, what will a provider advise to decrease the risk of developing muscle toxicity?
   a. Avoid exercise for 2 hours after administration.
   b. Substitute grapefruit juice with orange juice.
   c. Monitor aspartate aminotransferase (AST) and alanine aminotransferase (ALT).
   d. Take the medication with an NSAID or other anti-inflammatory drug.

   ANS: B
   Grapefruit juice can inhibit the metabolism of certain drugs including statins like lovastatin. The juice raises drug levels decreasing the intestinal metabolism of the drug resulting in increased drug levels which increases the risk for adverse effects such as muscle toxicity. Taking the drug with an anti-inflammatory drug and avoiding exercise after administration are not supported by science. Monitoring AST and ALT detects liver toxicity, not muscle toxicity.

2. When prescribing drugs with a narrow therapeutic index, what intervention does the provider take to decrease risk to the patient?
   a. Schedule drug administration intervals that exceed the drug's half-life.
   b. Order the medication to be administered by the intravenous route.
   c. Monitor the patient's plasma drug levels at regular intervals.
   d. Teach the patient that optimal outcomes will require adherence to the medication regimen.

   ANS: C
   A drug with a narrow therapeutic range or index is more difficult to administer safely, because the difference between the minimum effective concentration and the toxic concentration is small. Patients taking these medications must have their plasma drug levels monitored closely to ensure that they are getting an effective dose that is not toxic. Administering medications at longer intervals risks increased periods of subtherapeutic levels. Drugs that have a narrow therapeutic range may be given by any route; intravenous administration is not preferable and in most cases will not be feasible. Medication regimen adherence is necessary; however, due to individual variation, for drugs with a narrow therapeutic range, what is an effective dose for one patient may be a lethal dose for another. For this reason, monitoring drug levels remains the primary method for decreasing risk.

3. A patient reports that a medication no longer effectively alleviates symptoms. What process informs the provider's response to the patient's concerns?
   a. Endogenous antagonists compete with the drug for receptor sites.
   b. Decreased selectivity for receptors results in a variety of effects.
   c. Desensitization of receptor sites results from continual exposure to the drug.
   d. Additional receptor sites are synthesized in response to the medication.

   ANS: C

Continual exposure to an agonist would cause the cell to become less responsive or desensitized. The body does not produce antagonists as a response to a medication. Medication tolerance is not related to receptor selectivity. Medications do not cause more receptors to be produced.

4. A patient reports that Brand X tablets work faster than Brand Y tablets of the same amount of the same drug. Which statement informs the prescriber's response when explaining this phenomenon to the patient?
   a. Advertising by pharmaceutical companies can enhance patient expectations of one brand over another, leading to a placebo effect.
   b. Because the drug preparations are chemically equivalent, the actions of the two brands must be identical.
   c. Inactive ingredients used in composition can result in differing rates of dissolution, which can alter the drug's onset of action.
   d. The bioavailability of a drug is determined by the amount of the drug in each dose.

   ANS: C
   Even if two brands of a drug are chemically equivalent (i.e., they have identical amounts of the same chemical compound), they can have different effects in the body if they differ in bioavailability. Tablets made by different manufacturers contain different binders and fillers, which disintegrate and dissolve at different rates and affect the bioavailability of the drug.

5. A patient receiving intravenous gentamicin has a toxic serum drug level. The prescriber confirms that the dosing is correct. Which possible cause of this situation will the provider explore?
   a. Whether a loading dose was administered
   b. If the drug was completely dissolved in the IV solution
   c. Whether patient is taking a medication that binds to serum albumin
   d. If the ordered dose frequency is longer than the gentamicin half-life

   ANS: C
   Gentamicin binds to albumin, but only weakly, and in the presence of another drug that binds to albumin, it can rise to toxic levels in blood serum. A loading dose increases the initial amount of a drug and is used to bring drug levels to the desired plateau more quickly. A drug that is not completely dissolved carries a risk of causing embolism but this addresses a different concern. A drug given at a frequency longer than the drug half-life will likely be at subtherapeutic levels and not at toxic levels.

6. A patient takes a drug that is metabolized by CYP3A4 isoenzymes. If a CYP3A4 inducing drug is prescribed, what drug adjustment may be necessary to maintain a therapeutic level of CYP3A4 substrate?
   a. Increase dosage of the CYP3A4 inducer.
   b. Decrease dosage of the CYP3A4 inducer.
   c. Increase dosage of the CYP3A4 substrate.
   d. Decrease dosage of the CYP3A4 substrate.

   ANS: C

A drug that acts as an inducing agent for an enzyme system increases the metabolism of drugs metabolized by that enzyme system, thereby lowering the level of those drugs in the body and requiring higher doses to maintain drug effectiveness. Although decreasing the dosage of the drug that induces metabolism may seem reasonable at first glance, this may decrease the therapeutic level of the drug making it ineffective in treating the condition for which it was prescribed.

7. The provider prescribes hydrocodone with acetaminophen for a patient's postsurgical pain. What instruction will the prescriber include regarding alcohol intake?
   a. "If you plan to drink alcohol, I will write an order for acetaminophen without hydrocodone for your pain."
   b. "I'd suggest that you substitute ibuprofen for pain on days when you plan to drink alcohol."
   c. "You should avoid drinking alcohol while you are taking the pain medication I've ordered."
   d. "You should limit your alcohol intake to no more than two servings of alcohol daily while on the pain medication."

   ANS: C
   Combining a hepatotoxic drug with other hepatotoxic agents increases the risk of hepatotoxicity. When even therapeutic doses of acetaminophen are taken with alcohol, the acetaminophen can cause liver damage. Patients should be cautioned not to drink alcohol; even two drinks with acetaminophen can produce this effect. Hydrocodone does not contribute to hepatotoxicity. Ibuprofen is not indicated for postoperative pain unless the pain is mild. Limiting alcohol intake to two servings per day still increases the risk of hepatotoxicity.

8. Which order for furosemide is written appropriately by the prescriber?
   a. Furosemide [Lasix] 20 mg PO QD
   b. Furosemide [Lasix] 20 mg PO qd
   c. Furosemide [Lasix] 20 mg daily
   d. Furosemide [Lasix] 20 mg PO daily

   ANS: D
   The correct answer is a complete order; it contains the medication, dose, route, and time. "QD" and "qd" are no longer accepted abbreviations; it should be written out as "daily" or "every day." The order of "20 mg daily" does not specify the route to be used.

9. A drug can cause symptoms that resemble those of Parkinson disease. What action should the prescriber take to minimize the potential patient risk?
   a. Explain that these are teratogenic effects that must be reported immediately.
   b. Thoroughly educate the patient about recognizing such symptoms and the need to notify the office immediately.
   c. Order an evaluation of the patient's genetic predisposition to these effects.
   d. Educate the patient about these symptoms and provide reassurance that the condition is expected.

   ANS: B

Some drugs can cause iatrogenic conditions, which are conditions whose symptoms are the same as those of a known disease. The patient should be prepared for this possibility and be prepared to recognize and report the symptoms immediately. Such effects are not teratogenic, since teratogenic effects affect the fetus. Patients with a genetic predisposition to respond differently to drugs are known to have idiosyncratic effects. Although reassurance may dispel some fear on the part of the patient, it does provide the patient with actions (e.g., notifying the provider) that can allow for symptom management.

10. A patient who has been taking sertraline for depression was prescribed azithromycin to treat an infection by a provider at an after-hours clinic. What action will the primary care provider take to address the risk this combination of medication has posed for the patient?
    a. Discontinue the azithromycin and write an order for an alternative antibiotic.
    b. Discontinue the sertraline and write an order for a different antidepressant medication.
    c. Reduce the sertraline dosage while taking azithromycin.
    d. Withhold the sertraline until the azithromycin therapy is completed.

    ANS: A
    Both sertraline and azithromycin prolong the QT interval, and when taken together, they increase the risk of fatal dysrhythmias. Because the antibiotic is used for a short time and because the patient was already taking sertraline, it is correct to consider using a different antibiotic. Reducing the dose of sertraline does not alter the combined effects of two drugs that lengthen the QT interval. Sertraline should not be stopped abruptly, so withholding it during antibiotic therapy is not indicated. Additionally, it is important to reinforce the need to tell all providers that sertraline is being taken.

11. A patient reports mild nausea within an hour after taking the first two doses of a newly approved medication. Nausea is not listed among the known side effects of this drug. What instructions will the provider give the patient?
    a. “Take the next dose with food and call the office if the nausea reoccurs or if other symptoms develop.”
    b. “Discontinue the medication and a substitute will be prescribed.”
    c. “Reporting the situation to the MEDWATCH program will get us a recommendation about continuing the drug.”
    d. “I’ll write a prescription for an antiemetic to counter this drug’s effects.”

    ANS: A
    Not all adverse drug reactions (ADRs) are detected during clinical trials, and prescribers should be alert to any effects that may result from drug administration. The time of nausea onset suggests that this is drug-related. Unless contraindicated, taking drugs with food will usually relieve or decrease nausea. Because there is a possibility that the nausea is not drug-related, it is important to ask the patient to report the recurrence or worsening of the symptom or the addition of new symptoms. It is not necessary to hold the drug, because nausea is not a serious side effect. The MEDWATCH program should be notified when there is a greater suspicion that the drug may have caused the nausea, e.g., if the nausea occurs with subsequent doses. Until there is greater suspicion that the drug caused this patient’s nausea and because the patient is not vomiting, giving an antiemetic is not indicated.

12. A patient develops shortness of breath shortly after taking the initial dose of a newly prescribed medication. The patient's heart rate is 86 beats/minute, the respiratory rate is 24 breaths/minute, and the blood pressure is 120/70 mm Hg. The prescriber will discontinue the drug based on the assumption the patient experienced what medication induced effect?
    a. An allergic reaction
    b. An idiosyncratic effect
    c. An iatrogenic response
    d. A side effect

    ANS: D
    A side effect is a secondary drug effect produced at therapeutic doses. This patient received the correct dose of the drug and developed shortness of breath, which, in this case, is a drug side effect. To experience an allergic reaction, a patient must have prior exposure to a drug and sensitization of the immune response. An idiosyncratic effect results from a genetic predisposition to an uncommon drug response. An iatrogenic response occurs when a drug causes symptoms of a disease.

13. A provider recommends genetic testing of a patient before prescribing a medication. What response should the provider give when asked by the patient about the purpose of genetic testing?
    a. "Genetic testing better establishes the drug's therapeutic index."
    b. "Such testing will tell us how quickly your body is likely to metabolize, or process, the drug."
    c. "The testing helps identify any factors that could affect psychosocial variation in the drug's response."
    d. "It guides the production of a drug that is tailored to your individual genetic makeup."

    ANS: B
    Pharmacogenomics is the study of the ways genetic variations affect individual responses to drugs through alterations in genes that code for drug-metabolizing enzymes and drug receptors. For some drugs, the FDA requires genetic testing, and for others, this testing is recommended but not required. Genetic testing does not determine a drug's therapeutic index; this is a measure of a drug's safety based on statistics of the drug's use in the general population (see Chapter 5). Any distinct physiologic differences in drug response among various racial populations are related to genetic differences and do not affect psychosocial differences in drug responses. Genetic testing is recommended to identify how a patient will respond to a drug and not to design a drug specific to an individual.

14. A patient is prescribed digoxin. Which screening will the provider order to monitor for potential adverse effects from this drug?
    a. Albumin
    b. Blood urea nitrogen (BUN) and creatinine
    c. Hepatic enzymes
    d. Serum electrolytes

    ANS: D

Patients with low serum potassium are at increased risk for fatal cardiac dysrhythmias when taking digoxin, and it is essential to know this level before this medication is administered. Knowing a patient's albumin level would be important when giving drugs that are highly protein bound. The BUN and creatinine levels are indicators of renal function. Hepatic enzymes are important to know when drugs are metabolized by the liver.

15. A provider considers prescribing tamoxifen for a woman with breast cancer. Upon reviewing results of genetic testing, the prescriber notes that the patient has variations in the CYP2Dy allele resulting in a deficiency of the CYP2D6 isoenzymes. What action will this deficiency warrant in the prescribing of tamoxifen, a CYP2D6 substrate?
    a. The tamoxifen will not be prescribed.
    b. The individual doses of tamoxifen will be increased.
    c. The tamoxifen will be ordered but in lower than normal dosage.
    d. The patient's serum tamoxifen level will be routinely monitored.

    ANS: A
    Women with a deficiency of CYP2D6 isoenzymes lack the ability to convert tamoxifen to its active form, endoxifen, and will not benefit from this drug. Another drug should be used to treat this patient's breast cancer. Increasing the dose, reducing the dose, or monitoring serum drug levels will not make this drug more effective in these women.

16. A patient has taken a narcotic analgesic for chronic pain for several months. At a follow-up appointment, the provider notes that the patient has been taking more than the prescribed dosage. The patient has normal vital signs, is awake and alert, and reports mild pain. What does the provider suspect is responsible for the patient's response?
    a. This patient exhibits a negative placebo effect with a reduced response to the drug.
    b. This patient has developed tachyphylaxis because of repeated exposure to the drug.
    c. This patient has developed pharmacodynamic tolerance, which has increased the minimal effective concentration (MEC) needed for analgesic effect.
    d. This patient has increased hepatic enzyme production as a result of prolonged exposure to the drug.

    ANS: C
    Pharmacodynamic tolerance results when a patient takes a drug over a long period of time. Adaptive processes occur in response to chronic receptor occupation. The result is that the body requires increased drug, or an increased MEC, to achieve the same effect. This patient is getting adequate pain relief, so there is no negative placebo effect. Tachyphylaxis is a form of tolerance that can be defined as a reduction in drug responsiveness brought on by repeated dosing over a short time. Induced synthesis of hepatic enzymes increases metabolism of a drug, but it does not increase the MEC.

17. Which patient ethnic ancestry creates a risk factor that may result in minimal beneficial response to tamoxifen therapy?
    a. African
    b. French
    c. Native American
    d. Japanese

    ANS: B

Between 8% and 10% of women of European ancestry have a gene variant that prevents the effective metabolism of tamoxifen that negatively affects the medication's therapeutic effect. None of the other options present with a similar risk factor.

18. Before initiating cetuximab therapy, the provider will order epidermal growth factor receptor (EGFR) testing for the patient having which condition?
    a. Breast cancer
    b. Colorectal cancer
    c. Bone cancer
    d. Brain cancer

    ANS: B
    Cetuximab is used mainly for metastatic colorectal cancer. The medication works only against tumors that express EGRF; all other tumors are unresponsive. This makes testing in advance of treatment required. Cetuximab is not appropriate for any of the other conditions listed.

19. When considering the benefit of pharmacogenomics, what information should the prescriber include when prescribing a new medication?
    a. Stress the need to contact the primary health care prescriber immediately if side effects occur.
    b. Provide definitions and possible examples of related idiosyncratic responses to this medication.
    c. Explain any necessary precautions to take regarding medication administration.
    d. Give a detailed explanation regarding the method for discontinuing the medication, should it become necessary.

    ANS: B
    A patient's unique genetic makeup can lead to drug responses that are qualitatively and quantitatively different from those of the population at large. Adverse effects and therapeutic effects may be increased or reduced. Idiosyncratic responses to drugs may also occur. Educating the patient on the concept and examples of idiosyncratic responses should be included in the medication education provided. The other options are appropriate but not directly related to pharmacogenomics.

MULTIPLE RESPONSE

1. 1. A provider has prescribed a female patient a medication that induces P-glycoprotein (PGP). The provider will be particularly concerned about which aspects of the patient's medical history? (*Select all that apply*.)
    a. Intestinal problems
    b. Kidney function
    c. Liver function
    d. Pregnancy
    e. Seasonal allergies

    ANS: A, B, C
    Drugs that induce PGP can increase drug export from cells of the intestinal epithelium into the intestinal lumen, thus decreasing absorption of the drug. PGP inducers also increase drug elimination and *decrease* brain and fetal drug exposure. Seasonal allergies are not generally a concern.

2. When prescribing medications to infants, it is important for the provider to consider which fact? (*Select all that apply*.)
   a. Breast-feeding infants are more likely to develop toxicity when the mother is taking lipid-soluble drugs.
   b. Immaturity of renal function in infancy causes infants to excrete drugs less efficiently.
   c. Infants have immature livers, which slows drug metabolism.
   d. Infants are more sensitive to medications that act on the central nervous system (CNS).
   e. Oral medications are contraindicated in infants.

   ANS: A, B, C, D
   Immature renal function causes infants to excrete drugs more slowly, and infants are at risk for toxicity until renal function is well developed. Infants' livers are not completely developed, and they are less able to metabolize drugs efficiently. Because the blood-brain barrier is not well developed in infants, caution must be used when administering CNS drugs. Lipid-soluble drugs may be excreted in breast milk if the mother is taking them. Oral medications may be given safely to infants as long as they are awake and can swallow the drug.

3. What will the provider consider when prescribing two drugs that compete for plasma albumin receptor sites? (*Select all that apply*.)
   a. Binding of one or both agents will be reduced.
   b. Plasma levels of free drug will rise.
   c. Plasma levels of free drug will fall.
   d. The increase in free drug will cause sustained intensification of effects.
   e. The increase in bound drug will cause sustained intensification of effects.

   ANS: A, B, C
   When two drugs bind to the same site on plasma albumin, coadministration of those drugs produces competition for binding. As a result, binding of one or both agents is reduced, causing plasma levels of free drug to rise. The increase in free drug can intensify the effect, but it usually undergoes rapid elimination; therefore, the increase in plasma levels of free drug is rarely sustained. Drug that is bound to protein in the circulation is inactive; therefore, it cannot cause an effect.

4. Which actions occur in most of the fatal medication errors? (*Select all that apply*.)
   a. Confusing drugs with similar packaging
   b. Giving a drug intravenously instead of intramuscularly
   c. Administering a drug that sounds like the prescribed drug
   d. Using an infusion device that malfunctions
   e. Writing a prescription illegibly

   ANS: B, C, E
   Ninety percent of fatal medication errors fall into three categories: human factors, communication mistakes, and name confusion. Giving a drug IV (intravenously) instead of IM (intramuscularly) is an example of a human factor; writing a prescription so that it is illegible is an example of a communication mistake; and giving a drug with a name that sounds like the name of another drug is an example of name confusion. Confusion of drugs with similar packaging and using a faulty device also can cause fatal drug errors, but these factors do not fall into the categories that account for most of fatal errors.

5. A patient is found to have a genetic deficiency in the biomarker CYP2C19. The provider recognizes that prescribing clopidogrel will increase the patient's risk for developing what serious conditions? (*Select all that apply*.)
   a. Myocardial infarction
   b. Stroke
   c. Peptic ulcer
   d. Dementia
   e. Stomach cancer

   ANS: A, B
   Clopidogrel, a drug that prevents platelet aggregation, is negatively affected by a variant in the genetic code of CYP2C19 resulting in a weak antiplatelet response, which increases their risk for stroke and myocardial infarction. The risk for the other options is not increased with this variant situation.