

## Pharmacotherapy of Cardiovascular diseases

- Which of the following would be *most appropriate* for a patient with hypertension who has had a myocardial infarction?
  - Nifedipine
  - Doxazosin
  - Metoprolol
  - Acebutolol
  - Hydrochlorothiazide
- In order to minimize the risk of hypokalemia from diuretics, the *most appropriate* strategy would include
  - Limiting the dose of hydrochlorothiazide to 12.5 to 25 mg.
  - Using loop diuretics.
  - Using potassium-sparing diuretics as the primary therapy.
  - Having all patients switch their dietary salt to potassium chloride salt substitutes.
- Which drug is *most likely* to cause vasodilation-type side effects (headache, flushing) because it blocks the movement of calcium across smooth muscle cells?
  - Propranolol
  - Captopril
  - Enalapril
  - Clonidine
  - Nifedipine
- When patients with renal insufficiency develop severe cough from ACE inhibitors, what would be the best alternative to provide renal protection?
  - Propranolol
  - Hydrochlorothiazide
  - Losartan
  - Doxazosin
  - Clonidine
- Which of the following is a contraindication to enalapril?
  - Bilateral renal artery stenosis
  - A pheochromocytoma
  - Undetected diabetes
  - A family history of end-stage renal failure
- What potential side effects would you mention to a patient recently started on nifedipine?
  - Increased hair growth (hirsutism)
  - Painful or swollen breasts (gynecomastia)
  - Systemic lupus
  - Leg edema
  - Cough
- Which one of the following nondrug measures is likely to be most effective *to lower blood pressure chronically*?
  - Reduce caffeine
  - Start biofeedback
  - Lose 10-15 pounds
  - Begin garlic capsules
- The agent of choice for a patient with diabetes is
  - doxazosin.
  - propranolol.
  - amlodipine.
  - clonidine.
  - enalapril
- Which of the following patients should receive a medication to lower blood pressure?
  - A 58-year-old woman with diabetes and a baseline blood pressure of 128/75 mm Hg
  - A 45-year-old man with uncomplicated hypertension and a baseline blood pressure of 150/96 mm Hg
  - A 68-year-old man with heart failure and a baseline blood pressure of 148/88 mm Hg
  - A 35-year-old man with dyslipidemia and a baseline blood pressure of 130/70 mm Hg
- Which drug is *most likely* to cause vasodilation because it blocks postsynaptic alpha receptors?
  - Propranolol
  - Prazosin
  - Verapamil

- d) Clonidine
- e) Enalapril

11. What class of drugs would be BEST for a person with heart failure?

- A. Thiazide Diuretics
- B. Beta Blockers
- C. ACE/ ARB and Diuretic
- D. CCB

12. After post MI, you want to treat the patient's high blood pressure. What drugs should be used to do this.

- A. BB and CCB
- B. CCB and Aldosterone Antagonist
- C. b-adrenoblocker
- D. ACEI and ARBs

13. A 35 year old pregnant woman has severe, drug-resistant hypertension. Despite her cardiovascular conditions, the patient still has normal kidney function. An internist decides to try a potent vasodilator to control the patient's hypertension. Which vasodilator was administered to the patient?

- A. Amiodarone
- B. Captopril
- C. Hydralazine
- D. Losartan
- E. Methyldopa

14. African Americans respond best with

- A. ACEI and ARBs
- B. ACEI and b-adrenoblocker
- C. Thiazides and CCB
- D. CCB and BB
- E. CCB and ACEI

15. In pregnant patients you should use

- A. ACEI
- B. ARBs
- C. Methyldopa
- D. Aliskiren

16. In patients with angina, the best agents to use are

- A. Hydralazine
- B. b-adrenoblockers
- C. Minoxidil
- D. Aldosterone antagonist

17. In PVD, what drug classes should be used?

- A. ACEI/ARBs
- B. CCBs
- C. Aldosterone antagonists
- D. Beta blockers

18. Which of the following is the *most appropriate* blood pressure goal for a 55-year-old hypertensive patient?

- A. <130/85 mm Hg
- B. <140/90 mm Hg
- C. <130/80 mm Hg
- D. <125/75 mm Hg

19. The *most important* information to tell a patient started on prazosin is to

- A. watch out for the development of a rash.
- B. watch out for a dry cough.
- C. take the first dose at bedtime.
- D. not take the drug at the same time as antacids.
- E. be cautioned that it may cause a heart attack.

20. A 39-year-old woman with hypertension is taking HCTZ, enalapril (Vasotec), and diltiazem (Cardizem). She desires to become pregnant. The most important step would be to

- A. switch HCTZ to furosemide (Lasix).

- B. switch diltiazem to amlodipine (Norvasc).
  - C. discontinue diltiazem.
  - D. discontinue enalapril.
21. Cough is an adverse effect associated with which of the following medications?
    - a) Enalapril
    - b) Valsartan
    - c) Carvedilol
    - d) Spironolactone
  22. Which of the following is true regarding use of  $\beta$ -blockers for treating heart failure?
    - A. All  $\beta$ -blockers are equally effective for the treatment of heart failure.
    - B. Only cardioselective agents are effective.
    - C. Therapy should be initiated at the target dose and titrated down if not tolerated.
    - D. Therapy should be initiated in patients who are clinically stable without volume overload.
  23. Which of the following adverse effects of lisinopril can be avoided by switching to candesartan?
    - a) Hypotension
    - b) Cough
    - c) Hyperkalemia
    - d) Renal insufficiency
  24. Which of the following combinations represents optimal therapy for patients with chronic heart failure due to decreased left ventricular ejection fraction?
    - a) Hydrochlorothiazide, diltiazem, atenolol
    - b) Losartan, verapamil, amlodipine
    - c) Furosemide, enalapril, metoprolol succinate
    - d) Dobutamine, metoprolol tartrate, nesiritide
  25. Which of the following are risk factors for spironolactone-induced hyperkalemia?
    - a) Concomitant digoxin therapy
    - b) Increased peripheral edema
    - c) Concomitant furosemide therapy
    - d) Concomitant lisinopril therapy
  26. Which of the following should be used to monitor diuretic therapy in patients with heart failure?
    - a) Daily weights, serum potassium, serum magnesium
    - b) Plasma norepinephrine
    - c) Hemoglobin A1C and fasting blood sugar
    - d) Fasting lipid profile
  27. A patient with New York Heart Association class III heart failure who was recently hospitalized for heart failure exacerbation continues to experience symptoms of volume overload and dyspnea on exertion despite treatment with maximal doses of an angiotensin-converting enzyme (ACE) inhibitor,  $\beta$ -blocker, loop diuretic, and digoxin.
    - a) Which of the following would be the most appropriate addition to this patient's drug therapy?
    - b) Isosorbide dinitrate
    - c) Amlodipine
    - d) Amiodarone
    - e) Spironolactone
  28. A patient with a history of hypertension was recently diagnosed with stage C heart failure and reduced LVEF. Current medications include verapamil SR 120 mg qid, digoxin 0.25 mg, and furosemide 40 mg. The patient's current vital signs are blood pressure 145/90, pulse 82. Which of the following changes should be recommended in this patient's drug therapy?
    - a) Increase verapamil to 240 mg daily.
    - b) Add metolazone
    - c) Discontinue verapamil and initiate lisinopril and carvedilol therapy.
    - d) Add candesartan to the present therapy.
  29. What is the most appropriate vasodilator therapy for a patient with heart failure, left ventricular systolic dysfunction, and a history of losartan-induced angioedema?
    - a) Lisinopril

- b) Candesartan
  - c) Hydralazine/nitrates
  - d) Diltiazem
30. A 63-year-old woman with stage C heart failure and LVEF of 18% is currently taking lisinopril 20 mg qid, furosemide 40 mg qid, digoxin 0.25 mg qid, and carvedilol 3.125 mg bid. Today, she presents with increasing shortness of breath, fatigue, and ankle swelling. She also reports a 5 lb weight gain over the past week. Her labs are significant for a serum potassium of 5.2 mEq/L and serum creatinine of 2.2 mg/dL.
- a) Which of the following interventions is most appropriate?
  - b) Increase the dose of furosemide to 80 mg
  - c) Increase the dose of carvedilol to 6.25 mg
  - d) Start spironolactone 12.5 mg
  - e) Increase the dose of digoxin to 0.25 mg
31. A 55-year-old patient with heart failure who is in normal sinus rhythm is currently receiving an ACE inhibitor,  $\beta$ -blocker, and loop diuretic. Despite these therapies, the patient continues to experience symptoms. Current vital signs are blood pressure 120/75, pulse 88. Estimated creatinine clearance is 62 mL/min.
- a) Which of the following would be the preferred treatment option?
  - b) Add digoxin and titrate the dose until symptoms resolve.
  - c) Add digoxin 0.5 mg/day to target a serum digoxin concentration 2.0 ng/mL.
  - d) Digoxin should not be used because this patient is in sinus rhythm.
32. Despite treatment with enalapril 20 mg bid, metoprolol XL 200 mg qid, digoxin 0.125 mg qid, and furosemide 40 mg bid, an African American patient with stage C heart failure continues to experience shortness of breath and fatigue with minimal exertion. Vital signs are blood pressure 138/80, pulse 60, and there is no evidence of fluid overload on physical exam. Labs are significant for potassium 5.1 mEq/L and serum creatinine 1.6 mg/dL. Which of the following do you recommend?
- a) Add Candesartan 4mg
  - b) Increase metoprolol to 300 mg
  - c) Add spironolactone 25 mg
  - d) Add hydralazine/isosorbide dinitrate (ISDN).
33. Which of the following agents does *not* accelerate the enzymatic activity of antithrombin?
- A. Unfractionated heparin
  - B. Lepirudin
  - C. Dalteparin
  - D. Fondaparinux
34. Which of the following patients would be at *greatest risk* for developing deep vein thrombosis (DVT) in the next month?
- A. A 23-year-old man admitted to the ICU in diabetic ketoacidosis and with altered mental status
  - B. A 59-year-old man with three-vessel coronary artery disease who smokes 2 packs of cigarettes per day
  - C. A 46-year-old woman undergoing an abdominal total hysterectomy due to irregular menses
  - D. A 78-year-old obese woman with severe osteoarthritis for the past 15 years who is to have an elective knee replacement tomorrow
35. Which of the signs or symptoms listed below is *not* consistent with the diagnosis of DVT?
- A. The examiner feels a palpable cord in the right leg.
  - B. The patient's ankles are very swollen.
  - C. The patient complains of pain in the right leg when dorsiflexing the right foot.
  - D. The patient's left leg appears red and feels hot.
36. Which of the following statements regarding warfarin sodium is *true*?
- A. It slows the production of protein C in the liver.
  - B. It is effective for long-term treatment of VTE but not useful for short-term prophylaxis.
  - C. Although it has a long half-life, warfarin produces its anticoagulation effect rapidly.
  - D. It should never be used in combination with other anticoagulant drugs.
37. Which of the following statements regarding the low-molecular-weight heparins (LMWHs) is *true*?
- A. The LMWHs are identical to standard heparin but have greater potency.

- B. The LMWHs are a heterogeneous mixture of molecules of varying weights and lengths.
  - C. The LMWHs are more potent inhibitors of thrombin than unfractionated heparin.
  - D. The LMWHs are poorly absorbed following subcutaneous administration.
38. Which of the following statements regarding unfractionated heparin (UFH) is *true*?
- A. UFH is rapidly and completely absorbed when administered subcutaneously in doses of less than 7500 U.
  - B. UFH molecules with fewer than 18 saccharide units possess no anticoagulant activity.
  - C. UFH has a 15-hour half-life and should be given in significantly lower doses to patients with liver disease.
  - D. Despite weight-based dosing, UFH produces an unpredictable degree of anticoagulation.
39. A 76-year-old man who is taking amiodarone needs to start warfarin for DVT prophylaxis following hip replacement surgery. Which of the following would be the most appropriate *initial* dose of warfarin for this patient?
- A. 15 mg
  - B. 7.5 mg
  - C. 2.5 mg
  - D. 0.5 mg
40. A 55-year-old male presents to the emergency room with recent onset of crushing substernal chest pain radiating down his left arm. He undergoes multi-vessel coronary artery bypass grafting and is maintained on heparin (UFH) for one week. He presents again to the emergency room complaining of weakness and mild chest pain. His stool guaiac (blood test) was previously negative, but is now 4+. What laboratory parameter is most likely markedly elevated in this patient?
- A. lupus anticoagulant
  - B. D-dimer test
  - C. Activated partial thromboplastin time
  - D. Factor VIII inhibitor screen
  - E. Platelet count
41. For this same patient, which of the following drugs was most likely first given to counteract the bleeding?
- A. Protamine sulfate
  - B. Vitamin K
  - C. Recombinant factor VIII
  - D. c-Aminocaproic acid
  - E. Arginine vasopressin
42. The primary advantage of enoxaparin over heparin is that it
- A. is unlikely to cause bleeding
  - B. more effectively inhibits the synthesis of clotting factors
  - C. has a more rapid onset
  - D. does not cause thrombocytopenia
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  - D. does not cause thrombocytopenia
  - E. has a longer half-life

## Pharmacotherapy - Respiration

1. Which statement concerning the use of over-the counter (OTC) analgesic agents is true?  
(A) Aspirin is indicated for mild to moderate analgesia, inflammatory diseases, antipyresis, and prophylaxis for patients with ischemic heart disease.  
(B) Ibuprofen is indicated for mild to moderate analgesia, reduction of fever, and prophylaxis for patients with ischemic heart disease but not for inflammatory disorders.  
(C) Acetaminophen is indicated for mild to moderate analgesia but not for reduction of fever and osteoarthritis.  
(D) Naproxen sodium is indicated for mild to moderate analgesia, antipyresis, and prophylaxis for patients with ischemic heart disease.
2. All of the following statements concerning contraindications with chronic use of over-the counter (OTC) analgesic agents are correct except which one?  
(A) Aspirin, ibuprofen, and naproxen sodium are contraindicated in patients with bleeding disorders, peptic ulcer, and the third trimester of pregnancy.  
(B) Aspirin, acetaminophen, and ibuprofen are implicated in Reye syndrome.  
(C) Acetaminophen is contraindicated in patients with active alcoholism, hepatic disease, or viral hepatitis
3. Which statement concerning dosage recommendations for over-the-counter (OTC) analgesic agents is true?  
(A) Aspirin for analgesia or antipyresis in adults is 325 to 650 mg every 4 hrs or 650 to 1000 mg every 6 hrs, with a maximum daily dose of 4000 mg for no longer than 10 days for pain or 3 days for fever without consulting a physician; the antirheumatic dosage for adults is 3600 to 4500 mg daily in divided doses; and patients with ischemic heart disease should take 325 mg daily or every other day.  
(B) Ibuprofen for analgesia or antipyresis in adults is 300 to 600 mg every 6 to 8 hrs, with a maximum daily dose of 1800 mg for no longer than 10 days for pain or 3 days for fever without consulting a physician; the anti-inflammatory dosage for adults is 1800 to 3600 mg daily in divided doses.  
(C) Acetaminophen for analgesia or antipyresis in adults is 325 mg every 8 to 2 hrs, with a maximum daily dose of 2000 mg for no longer than 10 days for pain and 3 days for fever without consulting a physician; patients with ischemic heart disease take 325 mg daily or every other day.
4. Which of the following is an inhaler ingredient deemed safe and effective for nasal congestion?  
(A) oxymetazoline  
(B) phenylephrine  
(C) levmetamfetamine  
(D) pseudoephedrine
5. A 27-year-old presents with sneezing, rhinorrhea, and nasal itching, which started 2 days ago. She feels miserable with her symptoms, which worsen when she cleans the house. Her current medications include calcium carbonate and docusate sodium. Which of the following would be the best recommendation for immediate symptom alleviation?  
(A) chlorpheniramine  
(B) pseudoephedrine  
(C) topical nasal strips  
(D) intranasal cromolyn
6. A 48-year-old presents with a chief complaint of a dry, hacking cough, which started yesterday. He denies fever, chills, sore throat, or congestion. His only medical condition is hypertension, which is controlled with hydrochlorothiazide (HCTZ). What would be the best recommendation for alleviation of his cough?  
(A) dextromethorphan  
(B) phenylephrine  
(C) fexofenadine  
(D) guaifenesin
7. Which of the following is an appropriate candidate for self-treatment with codeine for cough?  
(A) 4-year-old with nonproductive cough  
(B) 6-year-old with nonproductive cough  
(C) 15-year-old with productive cough  
(D) 22-year-old with productive cough  
(E) 92-year-old with nonproductive cough

**For questions 8–9:** A 42-year-old male complains of a scratchy throat, nasal congestion, and a cough that started 2 days ago. When he coughs, he brings up yellow-white phlegm. He has hypertension and dyslipidemia. Current medications include simvastatin, lisinopril, hydrochlorothiazide, carvedilol, hydralazine, isosorbidedinitrate, and amlodipine.

**8.** Which of the following would be the best recommendation for this person's cough?

- (A) codeine
- (B) dextromethorphan
- (C) diphenhydramine
- (D) guaifenesin

**9.** Which of the following would be the most appropriate recommendation for his nasal congestion?

- (A) Oral pseudoephedrine
- (B) Oral phenylephrine
- (C) Topical oxymetazoline
- (D) Topical levmetamfetamine

**10.** A 22-year-old female presents with sneezing, watery and itchy eyes, and a runny nose. She has no significant medical history, but she is in the midst of final exams and must remain alert. What would be the best recommendation for her symptoms?

- (A) Fexofenadine
- (B) Diphenhydramine
- (C) Brompheniramine
- (D) Levmetamfetamine

**11.** Which of the following medications would not be likely to interfere with allergy skin testing?

- A. Loratadine
- B. Diphenhydramine
- C. Montelukast
- D. Levocetirizine
- E. Cetirizine

**12.** Which of the following antihistamines has the most anticholinergic side effects in normal doses?

- A. Cetirizine
- B. Cyproheptadine
- C. Loratadine
- D. Diphenhydramine
- E. Chlorpheniramine

**13.** For a patient receiving nasal steroids, which of the following agents would be helpful for a patient that also had ocular symptoms?

- A. Azelastine
- B. Levocabastine
- C. Pseudoephedrine
- D. Phenylephrine
- E. Montelukast

**14.** Rhinitis medicamentosa or rebound congestion is a complication from overusing

- A. Topical decongestants
- B. Systemic decongestants
- C. Nasal decongestants
- D. Nasal antihistamines
- E. Cromolyn sodium

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18. Pseudoephedrine was placed "behind the counter" in pharmacies primarily due to

- A. Changes in blood pressure with high doses
- B. Changes in heart rate with high doses
- C. Potential for abuse since it is a component in methamphetamine production
- D. Drug interactions with other allergic rhinitis treatments
- E. A potentially fatal drug interaction with monoamine oxidase inhibitors.

19. Common side effects to immunotherapy include

- A. Anaphylaxis
- B. Bronchospasm
- C. Swelling at the injection site
- D. Generalized urticaria
- E. All of the above

20. Montelukast is approved for children with seasonal allergic rhinitis down to the age of

- A. 2 years
- B. 1 year
- C. 6 months
- D. 2 months
- E. Newborns

21. Key elements of evaluating the therapeutic outcome of a patient with allergic rhinitis include which of the following?

- A. Effect of the disease on the patient's life
- B. Efficacy of the treatment regimen
- C. Tolerability of the treatment regimen
- D. Patient's satisfaction of the treatment regimen
- E. All of the above

22. In the absence of a complicating bacterial infection, which of the following is the most appropriate approach to treating acute bronchitis?

- A. Prescribing broad spectrum antibiotics
- B. Routinely recommending nonprescription cough and cold preparations.
- C. Providing symptomatic and supportive care
- D. Discouraging hydration and bed rest

23. Which of the following is true regarding chronic bronchitis?

- A. The majority of patients who suffer from chronic bronchitis have a negative smoking history.
- B. N-Acetylcysteine should be routinely prescribed to treat associated bronchospasm.
- C. Given the low incidence of bacterial resistance, broad spectrum antibiotics are rarely employed.
- D. During acute exacerbations, the use of systemic corticosteroids may be warranted.

24. Which of the following is the most common cause of bronchiolitis?

- A. Respiratory syncytial virus
- B. Parainfluenza virus
- C. Mycoplasma
- D. Adenovirus

25. Which of the following statements is true regarding the treatment of bronchiolitis?

- A. The routine use of systemic corticosteroids should be encouraged

- B. The use of aerosolized albuterol is associated with significant improvement in a majority of patients.
- C. Due to its clinical efficacy, ribavirin should be routinely prescribed
- D. Generous amounts of fluids should be provided

26. Community-acquired pneumonia is most commonly associated with

- A. Staphylococcus aureus
- B. Listeria monocytogenes
- C. Legionella species
- D. Streptococcus pneumonia

27. Which of the following would be the most appropriate choice as empiric therapy for hospital-acquired pneumonia?

- A. Amoxicillin
- B. Clindamycin
- C. Piperacillin/tazobactam
- D. Erythromycin

28. It is important to identify patients likely to have healthcare-associated pneumonia because

- A. Empiric therapy is very different compared to hospital-acquired pneumonia.
- B. These patients are more likely to receive inappropriate therapy and have a higher risk of mortality.
- C. These patients will not require hospitalization.
- D. Broad-spectrum antibiotics are not routinely recommended for empiric therapy since MDR pathogens are unlikely.

29. Which of the following would be the most appropriate therapy for the treatment of Mycoplasma pneumonia for a patient with compliance issues and currently receiving theophylline

- A. Erythromycin
- B. Azithromycin
- C. Clindamycin
- D. Clarithromycin

30. A 58 year old women presents to her primary care physician complaining of shortness of breath for the past two days. She also reports fever, chills and coughing up a lot of mucous during the same time period. Her past medical history is significant for diabetes mellitus Type 2 and systolic heart failure. The physician diagnoses her with acute community-acquired pneumonia. What would be the best single-antibiotic regimen to treat her infection?

- A. Piperacilin+tazobactam
- B. Levofloxacin
- C. Clindamycin
- D. Clarithromycin

31. Which of the following would be the most preferred antimicrobial agents in the treatment of aspiration pneumonia for a hospitalized patient?

- A. Clindamycin and gentamicin
- B. Gentamicin and oxacillin
- C. Tobramycin and oxacillin
- D. Tobramycin and erythromycin

32. Which of the following is true regarding avian influenza?

- A. Respiratory distress and clotting abnormalities manifest gradually
- B. Typical signs and symptoms include conjunctivitis, fever, and rhinitis
- C. Oxygen therapy is rarely warranted
- D. Due to potential resistance, amantadine remains the drug of choice

33. Which of the following concerning viral pneumonias is correct?

- A. With the exception of immunocompromised patients, viruses are a major cause of pneumonia in adult patients.
- B. Influenza virus, type B, is the most common isolate in the adult population.
- C. RSV, parainfluenza, and adenoviruses are common causes of pneumonia in children.
- D. With the availability of tissue cultures, the virus is often identified within 24 hours.

34. Which of the following is true regarding hospital-acquired pneumonias?

- A. Staphylococcus aureus and gram-negative bacilli are rarely associated with hospital-acquired pneumonia.
- B. Broad-spectrum antibiotics should be withheld until microbiological cultures are available.

- C. Diagnosis is often difficult due to underlying lung pathology of intensively ill patients.
- D. As a preventative measure, the use of histamine receptor antagonists should be encouraged.
35. Which of the following would be most appropriate for the empiric treatment of pneumonia, where *Pseudomonas* is a concern?
- A. Azithromycin plus doxycycline
- B. Cefotaxime plus clindamycin
- C. Amoxicillin/clavulanate plus levofloxacin
- D. Piperacillin/tazobactam plus ciprofloxacin
36. Acute tracheobronchitis is most commonly associated with which of the following pathogens?
- A. *Pseudomonas*
- B. *Klebsiella*
- C. virus A
- D. *Haemophilus influenzae*
37. Which of the following would be most appropriate for the empiric treatment of pneumonia, where *Pseudomonas* is a concern?
- E. Azithromycin plus doxycycline
- F. Cefotaxime plus clindamycin
- G. Amoxicillin/clavulanate plus levofloxacin
- H. Piperacillin/tazobactam plus ciprofloxacin
38. Choose the correct statement(s) regarding the white blood cell (WBC) count and differential.
- A. WBC are usually elevated in response to infection.
- B. The normal range of the WBC is 12,500 to 20,000 cells/mm<sup>3</sup>
- C. WBC is nonspecific and can be elevated in response to a number of noninfectious conditions.
- D. Neutrophils are the most common type of WBC in the blood.
- E. a, c and d
39. Which of the following is incorrect regarding the use of nucleic acid amplification?
- A. Polymerase chain reaction (PCR) is based on the capability of a DNA polymerase to copy and elongate a targeted strain of DNA.
- B. Each PCR cycle doubles the amount of DNA originally present.
- C. PCR techniques are useful for detecting fastidious or slowly growing organisms.
- D. Gene markers for resistance for *M. tuberculosis* and methicillin-resistant *S. aureus* are two examples where PCR techniques have been employed.
40. A patient suffers from troublesome allergic rhinitis due to pollen, and you want to prescribe a drug for her that is least likely to cause sedation. What would your best choice be?
- A. Betamethasone
- B. Cimetidine
- C. Hydroxyzine
- D. Loratadine
- E. Metoclopramide
41. A 43-year-old ship's captain complains of seasonal allergies. Which one of the following would be indicated?
- A. Cyclizine.
- B. Doxepin.
- C. Doxylamine.
- D. Hydroxyzine.
- E. Fexofenadine.
42. Which one of the following statements concerning H<sub>1</sub> antihistamines is correct?
- A. Second-generation H<sub>1</sub> antihistamines are relatively free of adverse effects.
- B. Because of the established long-term safety of first-generation H<sub>1</sub> antihistamines, they are the first choice for initial therapy.
- C. The motor coordination involved in driving an automobile is not affected by the use of first generation H<sub>1</sub> antihistamines.

- D. H<sub>1</sub> antihistamines can be used in the treatment of acute anaphylaxis.
- E. Both first- and second-generation H<sub>1</sub> antihistamines readily penetrate the blood-brain barrier.

43. Which one of the following drugs could significantly impair the ability to drive an automobile?

- A. Diphenhydramine.
- B. Ergotamine.
- C. Fexofenadine.
- D. Ranitidine.
- E. Sumatriptan.

44. A child suffering from asthma is to be treated with a drug that blocks leukotriene receptors. What drug would be an appropriate choice?

- A. Cromolyn
- B. Montelukast
- C. Ipratropium
- D. Zileuton
- E. Theophylline

45. A 55-year-old man with a 30-pack-year smoking history presents to his physician because of a 3-month history of productive cough. He is diagnosed with chronic obstructive pulmonary disease after x-ray of the chest demonstrates hyperinflated lungs and a flattened diaphragms. The physician prescribes inhaled steroids, a  $\beta_2$ -agonist, and ipratropium bromide. Ipratropium bromide will produce bronchodilation through which of the following mechanisms?

- A. Blockade of acetylcholine interaction at muscarinic receptors
- C. Inhibition of the degranulation of mast cells
- D. Inhibition of the synthesis of cytokines
- B. Inhibition of phosphodiesterase resulting in increased cAMP levels
- E. Stimulation of adenylyl cyclase resulting in increased cAMP levels

46. A 45-year-old woman with a history of asthma presents with a complaint of difficulty sleeping two to three times per week because of wheezing at night. She is currently taking cromolyn sodium by inhalation four times a day and intermittent albuterol by metered-dose inhaler. What is the mechanism by which cromolyn sodium acts?

- A. Inhibition of leukotriene receptors
- B. Inhibition of muscarinic receptors
- C. Inhibition of phosphodiesterase
- D. Stabilization of mast cells
- E. Stimulation of airway  $\beta_2$  adrenoceptors

47. Which of the following effects are characteristic of methylxanthine drugs such as theophylline?

- A. Activation of adenosine receptors
- B. Blockade of the enzyme phosphodiesterase
- C. Decrease in the amount of cAMP in mast cells
- D. Inhibition of cardiac  $\beta$  receptors
- E. Sedation

48. A 4-year-old boy is brought to the emergency department by his mother, who is concerned about his difficulty breathing. She said he was playing outside when his father was mowing the lawn. On physical examination, the patient's respiratory rate is 30/mm with occasional coughing spells, but he is still playful and interactive. Auscultation of his lungs is significant for the sound heard in the audio clip. The physician correctly orders a single pharmacologic agent Albuterol, that rapidly improves his symptoms. What is the molecular target of this agent?

- A.  $\alpha_1$ -adrenergic receptor
- B.  $\beta_1$ -adrenergic receptor
- C.  $\beta_2$ -adrenergic receptor

- D. Adenosine receptor
- F. Muscarinic receptor

49. A 54-year-old man comes to the emergency room complaining of shortness of breath, wheezing, increased expiratory time, and coughing up clear sputum. He does not have a history of smoking. He is given a medication to treat this acute episode of asthma. What is the mechanism of the medication most likely prescribed?

- A.  $\beta$ 2-Receptor antagonist
- B. Inhibition of cytokine synthesis
- C. Inhibition of mast cell degranulation
- D. Long-acting  $\beta$ 2-receptor agonist
- E. Short-acting  $\beta$ 2-receptor agonist

50. Leukotriene receptor antagonists include:

- a) Zafirlucast;
- b) Zileuton;
- c) Nedocromil;
- d) Cromolin

51. Zileuton mechanism of action:

- a) Stimulates Beta-2 adrenoceptors;
- b) Inhibits 5-lipoxygenase;
- c) Blocks  $M_3$ -muscarinic receptors;
- d) Inhibits phosphodiesterase

52. Theophylline mainly inhibits:

- a) Leukotriene receptors
- b) Acetylcholine synthesis
- c) Mast cell degranulation
- d) Phosphodiesterase

53. Which of these groups of drugs is used for management of acute asthma?

- a) Leukotriene receptor antagonists;
- b) 5-LO inhibitors;
- c) Cromolyn;
- d) Corticosteroids

54. The standard treatment regimen for asthma is best described by which of the following:

- a) Theophylline;
- b) Inhaled Beta-2 adrenoceptors agonists only;
- c) A combination of inhaled bronchodilators and inhaled corticosteroids;
- d) Inhaled corticosteroids only

55. Symptoms typically produced by inhaled beta adrenoceptor agonists are:

- a) Tachycardia, dizziness, nervousness;
- b) Candidiasis and sore throat;
- c) Nausea, agitation and convulsion;
- d) Diarrhea, vomiting and nausea

56. Cromolyn is useful in many patients with asthma because it:

- a) Inhibits cyclooxygenase-2;
- b) Blocks adenosine receptors in bronchiolar smooth muscle;
- c) Prevents antigen-induced degranulation of mast cells;
- d) Inhibits phosphodiesterase

57. Corticosteroids in the treatment of asthma:

- a) Relax smooth muscle;
- b) Inhibit the inflammatory response;
- c) Reduce patient responsiveness to beta-agonists;
- d) Increase airway obstruction in acute asthma and therefore should only be used for chronic treatment.

58. Which drug group used to treat asthma causes oral candidiasis?

- a) Leukotriene receptor antagonists;
- b) Anti IgE antibodies;
- c) Corticosteroids;

d) Beta-adrenoceptor agonists

59. Anti-IgE monoclonal antibodies used in the treatment of bronchial asthma:

a) Omalizumab;

b) Adalimumab;

c) Infliximab;

d) Etanercept

60. A child suffering from asthma is to be treated with a drug that blocks the synthesis of leukotrienes. What drug would be an appropriate choice?

a) Cromolyn

b) Montelukast

c) Ipratropium

d) Zileuton

e) Theophylline

61. The following statements are correct:

a) Steroids commonly used in asthma include beclomethasone, fluticasone and several others;

b) B<sub>2</sub> adrenoceptor selective agonist salmeterol is short acting drug;

c) Mast cell stabilizers include ipratropium;

d) Theophylline is a methylxanthine related to caffeine and theobromine, but is a less effective bronchodilator than either.

62. After successful treatment of the acute attack, the patient was referred to the outpatient clinic for follow-up treatment for asthma. Which of the following is *not* an established prophylactic strategy for asthma?

A. Avoidance of antigen exposure

B. Blockade of histamine receptors

C. Blockade of leukotriene receptors

D. IgE antibody blockade

E. Inhibition of phospholipase A

63. Oral medications are popular for the treatment of asthma in children because young children may have difficulty with the proper use of aerosol inhalers. Which of the following is an orally active inhibitor of leukotriene receptors?

A. Albuterol

B. Aminophylline

C. Ipratropium

D. Montelukast

E. Zileuton

64. Side effect of first-generation histamine H<sub>1</sub> antagonists is:

A. Aplastic anemia

B. Vomiting, tinnitus, decreased hearing

C. Sedation

D. Gastric ulcers and upper gastrointestinal bleeding

65. Select the side-effect characteristic for non-selective beta<sub>2</sub>-adrenomimics:

A. Depression of the breathing center

B. Tachycardia

C. Blood pressure

D. Dry mouth

66. Pick out the bronchodilator drug related to methylxanthines:

A. Atropine

B. Salbutamol

C. Adrenaline

D. Theophylline

67. Pick out the systemic decongestant:

A. Isoprenaline

B. Ephedrine

C. Atropine

D. Salbutamol

68. The mechanism of methylxanthines action is:

A. Inhibition of the enzyme phosphodiesterase

- B. Beta2 -adrenoreceptor stimulation
  - C. Inhibition of the production of inflammatory cytokines
  - D. Inhibition of M-cholinoreceptors
69. Which of the following M-cholinoblocking agents is used especially as an anti-asthmatic?
- A. Atropine
  - B. Ipratropium
  - C. Scopolamine
  - D. Metacin
70. Which of the following is *not* a risk factor for otitis media?
- A. Season
  - B. Cleft palate
  - C. Breastfeeding
  - D. Attendance at day care
  - E. Smoking
71. Which of the following is the predominant pathogen associated with recurrent acute otitis media?
- A. *Hemophilus influenzae*
  - B. *Chlamydia trachomatis*
  - C. *Moraxella catarrhalis*
  - D. *Staphylococcus aureus*
  - E. *Streptococcus pneumoniae*
72. According to the Centers for Disease Control (CDC), which of the following constitutes the first line of treatment of an initial episode of uncomplicated acute otitis media?
- A. Amoxicillin 90 mg/kg per day
  - B. Amoxicillin 40 mg/kg per day
  - C. Cefixime 8 mg/kg per day
  - D. Clarithromycin 15 mg/kg per day
  - E. Cefibuten 9 mg/kg per day
73. All the following regarding group A *Streptococcus* (GAS) pharyngitis are *true except*
- A. The peak incidence is between 4 and 14 years of age.
  - B. It is responsible for 70 percent of pharyngitis in children.
  - C. It can predispose to rheumatic fever.
  - D. The symptoms appear 1 to 5 days following exposure to the microorganism.
  - E. Symptoms can be difficult to differentiate from those of viral pharyngitis.
74. In a 36-year-old patient presenting with a sore throat, fever of 39°C, swollen anterior cervical nodes, and a cough, what would be the preferred treatment for streptococcal infection?
- A. Tetracycline
  - B. Streptomycin
  - C. Penicillin
  - D. Clindamycin
75. In a 45-year-old patient presenting with a sore throat, fever of 38,5°C, swollen anterior cervical nodes, no cough, and tonsillar exudates, the suggested actions would be
- A. No throat culture or antibiotic required.
  - B. Perform a throat culture, and treat with an antibiotic if culture is positive.
  - C. Perform a throat culture, and treat with an antibiotic on clinical grounds.
  - D. Do not perform a throat culture, and treat with an antibiotic on clinical grounds.
  - E. None of the above.
76. Symptoms and signs of acute sinusitis include all the following *except*
- A. Maxillary toothache.
  - B. Facial fullness.
  - C. Purulent nasal secretions.
  - D. Epistaxis (nasal bleeding).

- E. Fever.
77. All the following statements regarding the treatment of uncomplicated acute bacterial sinusitis are *true except*
- A. Duration of antibiotic treatment is 21 to 28 days.
  - B. Standard-dose amoxicillin is considered first-line treatment.
  - C. TMP-SMX is considered first-line treatment in penicillin-allergic individuals.
  - D. Cephalexin is a second-line treatment.
  - E. Levofloxacin offers excellent coverage against major pathogens.
78. Which of the following characteristics can help differentiate between acute otitis media and otitis media with effusion?
- A. Middle ear effusion
  - B. Fever
  - C. Ear pain
  - D. Middle ear effusion, ear pain and Fever.
79. Which of the following is considered to be a first-line recommendation for the treatment of a 6-year-old child with acute otitis media and a fever of 39.3°C (102.8°F)?
- A. Azithromycin 500 mg daily for 1 day, followed by 250 mg daily for 5 more days
  - B. Amoxicillin 90 mg/kg/day for 7 days
  - C. Ampicillin 90 mg/kg/day plus clavulanate 6.4 mg/kg/day for 7 days
  - D. Cefuroxime 250 mg twice daily for 10 days
80. A child with moderate symptoms of acute otitis media returns to the clinic after taking amoxicillin for 4 days without improvement. Which of these alternatives would you recommend?
- A. Cefuroxime
  - B. Trimethoprim/sulfamethoxazole
  - C. Azithromycin
  - D. Erythromycin-sulfisoxazole
81. Which of the following statements is accurate regarding the value of vaccines for the prevention of acute otitis media?
- A. The seven-valent pneumococcal conjugate vaccine is effective for the prevention of acute otitis media when administered only during infancy.
  - B. The seven-valent pneumococcal conjugate vaccine is effective for the prevention of recurrent acute otitis media infections.
  - C. The seasonal influenza vaccine may help prevent acute otitis media.
  - D. B and C are correct.
82. Which of the following is the most common pathogen in acute sinusitis?
- A. Viruses
  - B. Streptococcus pneumoniae
  - C. Haemophilus influenzae
  - D. Moraxella catarrhalis
83. Which of the following is suggestive of bacterial versus viral sinusitis?
- A. Persistent symptoms for 10 days or more
  - B. Worsening of symptoms after 7 days
  - C. Lack of symptomatic response to nonprescription nasal decongestants
  - D. All of the above are correct.
84. Which of the following is considered to be a first-line recommendation for the treatment of a 35-year-old woman with a 12-day history of persistent nasal congestion and sinus pain that is unresponsive to nonprescription nasal decongestants?
- A. Amoxicillin



- B. Clarithromycin
  - C. Levofloxacin
  - D. Clindamycin
85. Which of the following has been shown to result in reduced death and hospitalizations for patients with asthma?
- A. Inhaled corticosteroids
  - B. Nedocromil
  - C. Leukotriene modifiers
  - D. Salmeterol
86. Which of the following has been shown to provide a significant reduction in severe exacerbations when used in combination with inhaled corticosteroids for moderate persistent asthma?
- A. Long-acting b2-agonists
  - B. Cromolyn
  - C. Sustained-release theophylline
  - D. Leukotriene receptor antagonists
87. Which of the following statements is true concerning the use of inhaled corticosteroids in children with mild persistent asthma?
- A. Inhaled corticosteroids are no more effective than cromolyn or nedocromil
  - B. Inhaled corticosteroids are more effective than alternatives but are not recommended for safety reasons
  - C. Inhaled corticosteroids are the most effective and proven to reduce exacerbations at recommended doses
  - D. Inhaled corticosteroids are no more effective than the leukotriene receptor antagonists
88. Which of the following is true regarding the use of written action plans for patients with asthma?
- A. Written action plans should only be used in those patients with severe persistent asthma
  - B. Written action plans as part of self-management programs have been demonstrated to improve outcomes in patients with asthma
  - C. Written action plans based on peak flow monitoring are superior to those based on symptoms only
  - D. Written action plans are no longer recommended in asthma as they have been shown to be ineffective in improving outcomes
89. One of your adult patients with severe chronic asthma recently was placed on one inhalation of fluticasone propionate/salmeterol 250/50 mcg 3 months ago. He states that it has made a significant difference in his wellbeing and that he has never felt better. On questioning him he states that he continues to occasionally awaken at night although only one to two times per week, and that he did require a 7 days burst of prednisone for an upper respiratory tract infection last month so is in to refill his prescription. This patient should:
- A. with current therapy as he is improving
  - B. Consider increasing inhaled corticosteroid dose
  - C. Consider adding regular inhaled ipratropium bromide
  - D. Consider adding montelukast to his regimen
90. Which of the following is the primary long-term controller medication for a 4 year-old female with moderate persistent asthma?
- A. Salmeterol twice daily
  - B. Fluticasone propionate twice daily
  - C. Sustained-release theophylline twice daily
  - D. Montelukast once daily
91. Which of the following statements regarding short-acting inhaled b2-agonists is the most correct?

- A. Regular use of short-acting inhaled  $\beta_2$ -agonists worsens asthma increasing the morbidity from asthma
  - B. Regular use of short-acting inhaled  $\beta_2$ -agonists increases the risk of death and near death from asthma
  - C. Short-acting inhaled  $\beta_2$ -agonists should be used as needed so their use can be used as an outcome measure
  - D. Regular use of short-acting inhaled  $\beta_2$ -agonists produces tolerance so that patients will not respond during acute exacerbations
92. A 22-year-old female, diagnosed with moderate persistent asthma, goes to her pharmacy to pick up her prescription for fluticasone/salmeterol combination. She is dispensed the medication in a dry powder inhaler called a Diskus, which she has never used before. Which of the following is the appropriate way for her to use this device?
- A. Dispense the dose of medication, place lips around the mouthpiece, exhale into the device, inhale steadily and deeply, hold breath for 10 seconds, breathe out slowly
  - B. Shake the device, dispense the dose of medication, place lips around mouthpiece, breathe in steadily and deeply, hold breath for 10 seconds, breathe out slowly
  - C. Shake the device, dispense the dose of medication, place lips around mouth piece, exhale into the device, inhale steadily and deeply, hold breath for 10 seconds, breathe out slowly
  - D. Dispense the dose of medication, place lips around mouthpiece, inhale steadily and deeply, hold breath for 10 seconds, breathe out slowly
93. Which of the following will enhance the therapeutic index (efficacy-to-toxicity ratio) of an inhaled corticosteroid?
- A. Decrease the oral bioavailability
  - B. Increase receptor-binding affinity
  - C. Decrease the lipophilicity
  - D. Increase the volume of distribution
94. A 23-year-old college student with a history of asthma presents to the clinic taking only as needed albuterol by metered-dose inhaler (MDI). She states that she uses her inhaler just occasionally (once or twice monthly) for symptoms during the day but also five times weekly for pretreatment before she runs. She awakens at night with coughing and sometimes feels tight but only once or twice a week but more frequently when she has a "cold." The preferred therapy for this patient would be:
- A. Continue her current therapy and check her inhaler technique
  - B. Begin her on an inhaled long-acting  $\beta_2$ -agonist at night
  - C. Begin her on a dose of sustained-release theophylline at night
  - D. Begin her on regular low dose inhaled corticosteroid therapy
95. An 18-year-old patient complains of wheezing and chest tightness during basketball practice. She had asthma as a child but has "outgrown" it and does not report any day or nighttime symptoms consistent with asthma. Which of the following is the most appropriate?
- A. She should stop playing basketball and try swimming
  - B. She should be told she still has asthma and take regular inhaled corticosteroids
  - C. She should be started on two inhalations of albuterol prior to basketball practice
  - D. She should be started on once nightly montelukast 10 mg prior to basketball season
96. Which of the following statements is true concerning the potential for growth suppression from inhaled corticosteroids?
- A. Growth retardation only occurs at high doses of the inhaled corticosteroids
  - B. Growth retardation results in the cumulative loss of 1–2 cm/y
  - C. Attainment of predicted adult height does not appear to be affected
  - D. It is only a risk with a few of the older inhaled corticosteroids

97. Which of the following is the most effective antiinflammatory therapy for a 8-year-old boy with persistent asthma?
- A. Fluticasone 44 mcg two puffs twice daily
  - B. Montelukast 5 mg orally at night
  - C. Cromolyn MDI 2 puffs four times daily
  - D. Salmeterol 50 mcg twice daily
98. Which of the following would be most appropriately added to frequent doses of inhaled, short-acting  $\beta_2$ -agonists in the emergency department if the patient does not completely respond after the first three doses?
- A. Frequent doses of inhaled ipratropium bromide
  - B. Intravenous aminophylline
  - C. Intravenous magnesium sulfate
  - D. Inhalation of halothane
99. A 45-year-old long-haul trucker suffers from seasonal allergies. He asks advice on which over-the-counter product is best to relieve his symptoms. Which of the following choices is the best recommendation for this patient?
- A. diphenhydramine
  - B. promethazine
  - C. clemastine
  - D. chlorpheniramine
  - E. loratadine
100. Which of the following medications would not be likely to interfere with allergy skin testing?
- A. Loratadine
  - B. Diphenhydramine
  - C. Montelukast
  - D. Levocetirizine
  - E. Cetirizine
101. Which of the following antihistamines has the most anticholinergic side effects in normal doses?
- A. Cetirizine
  - B. Cyproheptadine
  - C. Loratadine
  - D. Diphenhydramine
102. For a patient receiving nasal steroids, which of the following agents would be helpful for a patient that also had ocular symptoms?
- A. Azelastine
  - B. Levocabastine
  - C. Pseudoephedrine
  - D. Phenylephrine
  - E. Montelukast
103. Pseudoephedrine was placed "behind the counter" in pharmacies primarily due to
- A. Changes in blood pressure with high doses
  - B. Changes in heart rate with high doses
  - C. Potential for abuse since it is a component in methamphetamine production
  - D. Drug interactions with other allergic rhinitis treatments
  - E. A potentially fatal drug interaction with monoamine oxidase inhibitors.
104. Candidates for immunotherapy may include
- A. Patients with asthma
  - B. Patients who are unable to achieve total avoidance of allergens
  - C. Patients who have failed pharmacotherapy
  - D. Patients who can not tolerate pharmacotherapy options

E. All of the above

105. Common side effects to immunotherapy include

- A. Anaphylaxis
- B. Bronchospasm
- C. Swelling at the injection site
- D. Generalized urticaria
- E. All of the above

106. Montelukast is approved for children with seasonal allergic rhinitis down to the age of

- A. 2 years
- B. 1 year
- C. 6 months
- D. 2 months
- E. Newborns

107. The second-generation antihistamines (H-receptor antagonists) are generally considered nonsedating because they

- (A) are more selective for H1 receptors than the first generation agents.
- (B) are metabolized faster than the first-generation agents.
- (C) actually function as H1 receptor inverse agonists.
- (D) do not cross the blood-brain barrier as easily as the first-generation agents.
- (E) are only applied topically and therefore do not enter the systemic circulation.

108. A 22-year-old female presents with sneezing, watery and itchy eyes, and a runny nose. She has no significant medical history, but she is in the midst of final exams and must remain alert. What would be the best recommendation for her symptoms?

- (A) Fexofenadine
- (B) Diphenhydramine
- (C) Brompheniramine
- (D) Levmetamfetamine

#### Pharmacotherapy – GI tract and other diseases

1. Which laxative should not be used to treat acute constipation because of its slow onset of action?

- a) glycerin
- b) bisacodyl suppository
- c) psyllium
- d) milk of magnesia

2. All of the following statements about emollient stool softener laxatives are true except which one?

- a) They are not first-line treatment for the typical individual with acute constipation.
- b) They are appropriate for individuals who should not strain by passing a hard stool.
- c) They are known as surfactants and include docusate calcium and docusate sodium.
- d) They are fast acting laxatives (1-3 hours)

3. Which of the following statements adequately describes bulk-forming laxatives?

- a) They can cause diarrhea if not taken with at least 250ml of water.
- b) They are derived from polysaccharides and resemble natural fiber in mechanism of action.
- c) They have a relatively fast onset of action of 4 to 8 hrs and duration of 12 to 24 hrs.
- d) They produce a more complete evacuation of the bowels than stimulant products.

4. The *preferred* drug treatment regimen for a penicillin-allergic *H. pylori*-positive 35-year-old man with epigastric pain and a duodenal ulcer documented by radiography is

- A. lansoprazole + metronidazole.
- B. ranitidine bismuth citrate + clarithromycin.
- C. omeprazole + metronidazole + clarithromycin.
- D. bismuth subsalicylate + metronidazole + tetracycline.

5. The *preferred* *H. pylori* eradication regimen for a patient with an active ulcer is

- A. amoxicillin + omeprazole ( 14 days).
- B. bismuth subsalicylate + metronidazole + tetracycline + ranitidine ( 7 days).
- C. lansoprazole + amoxicillin + clarithromycin ( 10 days).

- D. ranitidine bismuth citrate + clarithromycin + metronidazole ( 10 days).
6. The *most important* counseling information to convey to a patient prescribed an *H. pylori* eradication regimen containing ranitidine bismuth subsalicylate bismuth citrate (RBC) is
- A. RBC may cause ringing in the ears.
  - B. RBC may cause your urine to turn orange.
  - C. RBC may cause dry mouth.
  - D. RBC may cause your stool to turn dark brown or black.
7. The *preferred* management of a 70-year-old woman with rheumatoid arthritis who is at risk of developing an NSAID-induced ulcer or ulcer-related complication is
- A. calcium carbonate
  - B. bismuth subsalicylate twice daily.
  - C. sodium bicarbonate daily.
  - D. omeprazole 40 mg twice daily.
8. The *preferred* management of an *H. pylori*-negative 60-year-old woman with a documented NSAID-induced ulcer is
- A. misoprostol 100 µg four times a day.
  - B. ranitidine 150 mg twice daily.
  - C. famotidine 20 mg twice daily + sucralfate 1 g four times a day.
  - D. lansoprazole 30 mg twice daily.
9. The *most important* parameter to monitor in an ulcer patient receiving long-term maintenance therapy with a PPI is
- A. fasting serum gastrin concentrations.
  - B. recurrence of ulcer symptoms.
  - C. vitamin B<sub>12</sub> concentrations.
  - D. Followe-up endoscopy
10. The *most important* counseling information to convey to a 40-year-old man taking omeprazole for an NSAID-induced ulcer is
- A. take the omeprazole at the same time you take the NSAID.
  - B. take the omeprazole 15 to 30 minutes before breakfast.
  - C. take the omeprazole 1 hour before or 2 hours after a meal.
  - D. take omeprazole at bedtime.
11. A 50-year-old man with long-standing diabetes mellitus visits his primary care physician with complaints of early satiety, postprandial discomfort, and bloating. The physician decides the patient should have a gastric emptying study, which shows decreased motility. A medication is prescribed to facilitate gastric emptying. What drug is used for appropriate treatment regimen?
- A. Misoprostol
  - B. Bismuth subsalicylate
  - C. Calcium carbonate
  - D. Metoclopramide
12. A 75-year-old woman with a history of arrhythmias that have been controlled with verapamil presents to her physician with a 3-day history of diarrhea. She denies any recent fever, chills, nausea, or vomiting. The results of fecal occult blood testing are negative. The physician prescribes an antidiarrheal drug with action on opioid receptors. What was most likely prescribed?
- A. Aluminum chloride
  - B. Bismuth subsalicylate
  - C. Kaolin
  - D. Loperamide
  - E. Metoclopramide
13. Aggressive factors that can promote esophageal damage include all of the following except:
- A. Bicarbonate
  - B. Gastric acid
  - C. Pancreatic enzymes
  - D. Bile acids
  - E. Pepsin

14. A typical symptom associated with GERD is:
  - A. Dysphagia
  - B. Regurgitation
  - C. Weight loss
  - D. Barrett's esophagus
15. The following is true regarding patients who present with symptom-based esophageal GERD syndromes:
  - A. Symptoms are always less severe than those presenting with erosive esophagitis
  - B. Symptoms are always easier to treat than those presenting with erosive esophagitis
  - C. H2-receptor antagonists are the preferred treatment
  - D. Symptoms can be as severe as those seen in patients with erosive esophagitis
  - E. Maintenance therapy will not be needed
16. Which of the following statements about acute diarrhea is *true*?
  - A. It is mainly self-limiting, usually subsiding within 72 hours.
  - B. It is secondary to diseases such as diabetes.
  - C. It is treatable with bulk-forming laxatives.
  - D. It is a long-term condition that waxes and wanes throughout life
  - E. It is always a sign of significant gastrointestinal disease
17. Which of the following antisecretory agents used to treat diarrhea may cause black stool?
  - A. Polycarbophil
  - B. Bismuth subsalicylate
  - C. Loperamide
  - D. Paregoric
  - E. Diphenoxylate with atropine
18. Products such as psyllium, methylcellulose, and polycarbophil belong to the group of:
  - A. Stimulant laxatives.
  - B. Bulk-forming agents.
  - C. Cathartics.
  - D. Lubricants.
  - E. Diphenylmethane derivatives.
19. In addition to avoidance of certain food products, which of the following treatments is recommended in diarrhea-predominant IBS?
  - A. Saline cathartics
  - B. Loperamide
  - C. Mineral oil
  - D. Dietary fiber
  - E. Lactulose
20. Which of the following statements about irritable bowel syndrome (IBS) is/are *true*?
  - A. It affects up to 80 percent of adults worldwide.
  - B. It is equally prevalent in both men and women.
  - C. It is characterized by abdominal pain, disturbed defecation, and bloating.
  - D. It is known to be of viral origin.
  - F. All of the above
21. Which of the following treatment measures is recommended for use in constipation-predominant IBS?
  - A. Saline cathartics
  - B. Loperamide
  - C. Dietary fiber
  - D. Lactulose
22. A 78-year-old woman sees her primary care physician with complaints of "heartburn." Her history includes only hypertension. She lives on a fixed income and has no prescription coverage. Her doctor recommends over-the-counter antacids to be used regularly. Which of the following would be a good choice and why?
  - A. Sodium bicarbonate because it is good for long-term use
  - B. Calcium carbonate because it is good for long-term use and she could use the calcium
  - C. Magnesium hydroxide for short-term use only because of her hypertension
  - D. A combined agent to balance the constipation associated with magnesium hydroxide and the diarrhea associated with aluminum hydroxide
  - E. A combined agent to balance the diarrhea associated with magnesium hydroxide and the constipation associated with aluminum hydroxide.

23. A 45-year-old woman is distressed by the dissolution of her marriage. She has been drinking heavily and overeating. She complains of persistent heartburn, constipation and an unpleasant, acid-like taste in her mouth. The clinician suspects that she has gastrointestinal reflux disease and advises her to raise the head of her bed 6 to 8 inches, not to eat for several hours before retiring, to avoid alcohol, and to eat smaller meals. Two weeks later, she returns and says the symptoms have subsided slightly but still are a concern. The clinician prescribes which one of the following drugs?

- A. An antacid such as aluminum hydroxide.
- B. Dicyclomine.
- C. An antianxiety agent such as alprazolam.
- D. Esomeprazole.

24. A 45-year-old man with a duodenal ulcer was treated with a combination of drugs intended to heal the mucosal damage and to eradicate *Helicobacter pylori*. Which of the following antibacterial drugs is used commonly to eradicate intestinal *H pylori*?

- A. Cefazolin
- B. Ciprofloxacin
- C. Clarithromycin
- D. Clindamycin
- E. Vancomycin

25. Bismuth salts are thought to be effective in peptic ulcer disease because they have bactericidal properties against

- A. *Escherichia coli*
- B. *Bacteroides fragilis*
- C. *Clostridium difficile*
- D. *Helicobacter pylori*
- E. *Staphylococcus aureus*

26. A 40-year-old male CEO came to the emergency department with severe burning chest pain radiating into his neck. His electrocardiogram was normal and test for troponin was negative. A diagnosis of GERD was made and he was sent home with a prescription for a drug that inhibits stomach acid. Which of the following is a drug that irreversibly inhibits the H<sup>+</sup>/K<sup>+</sup> ATPase in the parietal cells?

- A. Cimetidine
- B. Diphenoxylate
- C. Esomeprazole
- D. Metoclopramide
- E. Sulfasalazine

27. The primary clinical application of the 5-HT<sub>2</sub> receptor antagonist trazodone is the treatment of

- A. Bipolar disorder
- B. Chronic pain
- C. Insomnia
- D. Major depressive disorder
- E. Premenstrual dysphoric disorder

28. Long-term use of meperidine for analgesia is avoided because the accumulation of a metabolite, normeperidine, is associated with risk of

- A. Constipation
- B. Dependence
- C. Neutropenia
- D. Renal impairment
- E. Seizures

29. Meperidine is similar to morphine in many ways, but has some decided differences that are clinically relevant: with very high blood levels or with true overdoses, meperidine can cause significant adverse responses that simply aren't seen with morphine or most other opioid analgesics. What is that rather *unique* effect of meperidine?

- A. Constipation leading to paralytic ileus
- B. Heightened response to pain (paradoxical hyperalgesia)
- C. Intense biliary tract spasm
- D. Psychosis-like state, possibly seizures
- E. Respiratory depression, apnea, ventilatory arrest

30. The pediatrician writes a prescription for a combination (of several drugs) product that contains dextromethorphan, which is an isomer of a codeine analog. The patient is a 12-year-old boy. What is the most

likely purpose for which the drug was prescribed?

Control mild-moderate pain after the lad broke his wrist playing soccer

- A. Manage diarrhea caused by food-borne bacteria
- B. Provide sedation because the child
- C. Suppress severe cough associated with an influenza

31. Treat nocturnal bed-wetting

A 57-year-old patient, living at home, has severe pain due to a metastatic carcinoma that is being managed with fentanyl, delivered transdermally from a patch. He should also be taking, or at least have on hand

- A. apomorphine
- B. docusate
- C. loperamide
- D. morphine

32. A 5-year-old child is admitted to the hospital with a low-grade fever and a persistent cough that has resulted in vomiting episodes following prolonged coughing spells. His throat culture is negative, his fever has resolved, and all that is left is a slight cough. He is discharged from the hospital by the pediatrician who recommends an over-the-counter opioid antitussive. Which of the following does he recommend?

- A. Tamadol
- B. Diphenoxylate
- C. Loperamide
- D. Dextromethorphan
- E. Naloxone

33. A 34-year-old man is somnolent and difficult to arouse on arrival at the emergency department. He has ataxia and poor memory function. He recently was treated for sleeplessness with a medication that is in the same class as some of the anticonvulsants. What is the mechanism of action of the most appropriate treatment for this patient?

- A. Chelating agent; derivative of penicillin
- B. Competitive antagonist at GABA receptors
- C. High affinity for opioid m-receptors
- D. Irritates gastric mucosa and stimulates medullary chemoreceptor trigger zone
- E. Raises the pH

34. The pain of a patient with bone cancer has been managed with a morphine pump. However, he has become tolerant to morphine. Which of the following might be indicated to ameliorate his pain?

- A. Meperidine.
- B. Codeine.
- C. Fentanyl.
- D. Methadone.
- E. Buprenorphine.

35. A patient with a migraine headache is treated with sumatriptan. This drug is beneficial because it

- A. blocks 5HT<sub>3</sub> receptors
- B. stimulates 5HT<sub>1D</sub> receptors
- C. blocks 5HT<sub>4</sub> receptors
- D. stimulates 5HT<sub>1C</sub> receptors
- E. blocks muscarinic receptors

36. William works the swing shift at the local manufacturing plant. Based on a recommendation from a friend at work, William would like to try melatonin to help him get to sleep faster. Which of the following is true regarding William's use of melatonin?

- A. An appropriate starting dose of melatonin is 5 mg/night.
- B. William may experience continued drowsiness the following morning owing to melatonin's long half-life.
- C. Recent trials have noted the effectiveness of melatonin in individuals participating in shift work.
- D. Tobacco use will increase endogenous melatonin production.

37. SB is a 28-year-old female who complains that she has had difficulty sleeping over the last several weeks and that it is beginning to interfere with her work. She states that she had been working long hours and feeling stressed, so she has been doing aerobics before bed around 10 PM. What would you recommend initially to SB?

- A. Trazodone
- B. Flurazepam
- C. Cognitive therapy
- D. Zolpidem



E. Sleep hygiene

38. Mrs. D, a 35-year-old female, complains of difficulty maintaining sleep for more than 6 weeks. She has appropriately tried sleep-hygiene therapy, but that has not worked. The plan is to initiate medication therapy. If the patient has no contraindications, and no medical causes for these sleep difficulties, which of the following therapies would you start with?

- A. Amitriptyline
- B. Fluoxetine
- C. Eszopiclone
- D. Ramelteon

39. A 42-year-old female who recently lost her husband tells you that she is not sleeping at night. After questioning her further, you determine that she does not have depression or substance abuse. What would you recommend?

- A. Educate her concerning sleep hygiene
- B. Recommend a trial of a short-acting BZDRA
- C. Recommend a trial of fluoxetine
- D. Recommend a trial of amitriptyline

40. A 27-year-old female has trouble with waking up in the middle of the night. Which of the following is least likely to be effective for her if taken at bedtime?

- A. Zaleplon
- B. Temazepam
- C. Zolpidem
- D. Estazolam

41. What is the best way to avoid tolerance and dependence in this patient?

- A. Use high-dose BZDRA therapy for as long as possible.
- B. Use high-dose BZDRA therapy for as short as possible.
- C. Use low-dose BZDRA therapy for as long as possible.
- D. Use low-dose BZDRA therapy for as short as possible.

42. A 28-year-old female has a chief complaint of insomnia occurring for the last 5 months. She just graduated from pharmacy school, and she spends the evening worrying if she has made a mistake during her busy days at work. All other psychiatric and medical conditions have been ruled out. How would you approach treating this patient?

- A. Recommend a short-term trial of lorazepam
- B. Recommend a short-term trial of clonazepam
- C. Recommend an approach that would include education concerning good sleep hygiene, supportive therapy, and trazodone as an adjunct if needed
- D. Recommend cognitive therapy alone

43. A 34-year-old male travels to Europe for a business trip. What is the best recommendation you can provide him to help avoid jet lag?

- A. Drink alcohol at target bedtime when you arrive at new location
- B. Take melatonin or a short-acting BZDRA at bedtime at new location
- C. Take an SSRI at bedtime at new location
- D. Exercise routinely immediately before bedtime at new location

44. A 76-year-old patient has been in the rehabilitation unit after a fall for the past 2 days. He complains of difficulty sleeping due to light and noise in the hallways. Which of the following would be the most appropriate?

- A. Diazepam
- B. Eszopiclone
- C. Quazepam
- D. Flurazepam

45. A 46-year-old male with chronic obstructive pulmonary disease recently completed a sleep study and was diagnosed with sleep apnea. Which pharmacologic agent would you want to avoid in this patient?

- A. Hydrochlorothiazide
- B. Diazepam
- C. Fluoxetine
- D. Levothyroxine

46. The most effective treatment for sleep apnea is:

- A. Tracheostomy
- B. Continuous positive airway pressure
- C. Uvulopalatopharyngoplasty

- D. Oral appliances
- E. Modafinil
- 47. Which of the following is the standard of treatment for daytime sleepiness associated with narcolepsy?
  - A. Methamphetamine
  - B. Modafinil
  - C. Zolpidem
  - D. Imipramine
- 48. Which of the following is the most effective treatment for cataplexy associated with narcolepsy?
  - A. Methamphetamine
  - B. Medroxyprogesterone acetate
  - C. Modafinil
  - D. Sodium oxybate
- 49. Migraine pain is believed to result from activity in which one of the following systems?
  - A. Perivascular
  - B. Trigeminovascular
  - C. Extravascular
  - D. Tuberofundibular
- 50. Which one of the following is the most common gastrointestinal symptom that accompanies migraine attack?
  - A. Constipation
  - B. Nausea
  - C. Abdominal bloating
  - D. Abdominal cramps
- 51. Which one of the following drug or drug classes is not used in the acute treatment of migraine headaches?
  - A. Ergot alkaloids
  - B. Antidepressants
  - C. NSAIDs
  - D. Serotonin agonists
  - E. Acetaminophen
- 52. Patients may benefit from adherence to a wellness program that may include all of the following except:
  - A. Regular exercise
  - B. Regular eating habits
  - C. Smoking cessation
  - D. Increasing caffeine intake
- 53. Which of the following is the most common adverse effect of the ergotamine derivatives?
  - A. Sedation
  - B. Vertigo
  - C. Nausea and vomiting
  - D. Hypotension
- 54. "Chest symptoms" commonly reported by patients receiving a triptan include:
  - A. Tightness and shortness of breath
  - B. Pressure and radiating pain
  - C. Tightness, pressure, and heaviness
  - D. Heaviness and shortness of breath
- 55. Which one of the oral triptans has the shortest half-life?
  - A. Sumatriptan
  - B. Eletriptan
  - C. Naratriptan
  - D. Frovatriptan
- 56. Triptans are selective agonists at which of the receptors?
  - A. 5-HT<sub>1B</sub> and 5-HT<sub>1D</sub>
  - B. Dopamine
  - C. Norepinephrine
  - D. Cholinergic
- 57. Which of the following would be appropriate for migraine prophylaxis?
  - A. Ergotamine
  - B. Beta-blockers
  - C. Acetaminophen
  - D. Aspirin

58. Which vitamins has demonstrated efficacy in migraine prophylaxis?
- Ascorbic acid
  - Riboflavin
  - Cyanocobalamin
  - Pyridoxine
59. Which is the typical clinical presentation of migraine headache?
- The majority of migraineurs experience an aura that precedes or accompanies the attack
  - Migraine headaches most often occur in the early evening.
  - The pain of migraine is most often described as sharp and stabbing.
  - Headache pain is typically unilateral in location
  - Nausea is an infrequent feature of migraine attacks.
60. Which agent is not associated with the development of medication-overuse headache?
- sumatriptan
  - oxycodone
  - ergotamine tartrate
  - ibuprofen
61. Headache relief with the triptans is attributed to all of the following actions:
- Vasodilation of intracranial blood vessels
  - Enhance of neuropeptide release
  - Stimulation of pain signal transmission
  - Activation of serotonergic neuronal discharge
62. Type 2 diabetes mellitus is characterized by:
- An autosomal dominant pattern of inheritance from one of six loci
  - A relative insulin deficiency with peripheral insulin resistance
  - Autoimmune destruction of b cells in the pancreas
  - The problem of subcutaneous insulin resistance, which often results in poor glucose control
  - Altered insulin levels in the brain
63. If one screening plasma glucose was diagnostic for diabetes mellitus, the diagnosis of diabetes mellitus could be confirmed if the second laboratory reading was a:
- Fasting plasma glucose of 123 mg/dL
  - Casual plasma glucose of 206 mg/dL without symptoms
  - Plasma glucose of 141 mg/dL at 2 hours on a oral glucose tolerance test (OGTT)
  - Fasting plasma glucose of 139 mg/dL
  - Two-hour plasma glucose level on a 75 gram OGTT of 140 mg/dL
64. The treatment of choice when dietary interventions have not normalized glucose levels in pregnancy is:
- To continue diet
  - Glyburide
  - Pioglitazone
  - Insulin
  - None of the above
65. The only medication recommended by the American Diabetes Association for the prevention of diabetes is:
- Metformin
  - Acarbose
  - Orlistat
  - Rosiglitazone
  - None of the above
66. Which drug may be useful adjunct to acid suppression therapy in patients with a delayed gastric emptying?
- Famotidine
  - Metoclopramide
  - Misoprostol
  - Omeprazole
67. What Lifestyle modifications are recommended for Gastroesophageal Reflux Disease?
- Elevating the head of the bed with three to four pillows
  - Eating larger meals less often
  - Decreasing protein intake
  - Elevating the head of the bed 6 to 8 inches with blocks
  - Wearing a girdle
68. Which drug classes can worsen the Gastroesophageal Reflux Disease symptoms?
- Calcium channel blockers
  - Angiotensin-converting enzyme inhibitors

- C. Cholinomimetics
  - D. Metoclopramide
69. What is the preferred initial treatment option for adult patient with a 3-month history of severe, continuous GERD symptoms?
- A. Patient-directed therapy with OTC omeprazole
  - B. Prescription-strength H<sub>2</sub>-receptor antagonist
  - C. Prescription-strength proton pump inhibitor
  - D. Antireflux surgery
  - E. Endoscopic therapy
70. What is the mechanism of action of proton pump inhibitors?
- A. Stimulating histamine-2 receptors in the gastric parietal cells
  - B. Inhibiting gastric H<sup>+</sup>/K<sup>+</sup>-adenosine triphosphate in gastric parietal cells
  - C. Inhibiting Na<sup>+</sup>/K<sup>+</sup>-adenosine biphosphate in the gastric parietal cells
  - D. Inhibiting epithelial growth factor in the stomach
  - E. Increasing GI motility
71. Antimicrobial resistance to *H. pylori* is *most likely* to occur with which of the antimicrobial agents?
- A. clarithromycin
  - B. azitromycin
  - C. amoxicillin
  - D. tetracycline
72. The *most appropriate regime* for taking omeprazole in patients with an NSAID-induced ulcer?
- A. take the omeprazole at the same time you take the NSAID.
  - B. take the omeprazole 15 to 30 minutes before breakfast.
  - C. take the omeprazole 1 hour before or 2 hours after a meal.
  - D. take omeprazole at bedtime.
73. What is more common for cimetidine compared to ranitidine?
- A. is more effective in healing duodenal ulcers
  - B. is less selective for H<sub>2</sub> receptors
  - C. produces a lower rate of recurrence of ulcers after cessation of treatment
  - D. is a more potent inhibitor of the hepatic P450 system
  - E. has little tendency to produce antiandrogenic effects
74. What is the common mechanism of action of sucralfate and bismuth subcitrate?
- A. eradicate *Helicobacter pylori* infections in the stomach
  - B. form a protective barrier on ulcer craters
  - C. have significant acid neutralizing capacity
  - D. have significant H<sub>2</sub> blocking actions
  - E. can produce AI toxicity in patients with renal failure
75. Which antacid can cause metabolic alkalosis?
- A. Sodium bicarbonate
  - B. Cimetidine
  - C. Bismut subsalicylate
  - D. Loperamide
76. Which antacid can cause constipation?
- A. Sodium bicarbonate
  - B. Aluminium hydroxide
  - C. Magnesium hydroxide
  - D. Magnesium oxide
77. Which antacid can cause diarrhea?
- a) Sodium bicarbonate
  - b) Aluminium hydroxide
  - c) Magnesium hydroxide
  - d) Calcium carbonate
78. What is the primary treatment measure of diarrhea episodes?
- a) Maintenance of water and electrolytes
  - b) Loperamide

- c) Antacids containing magnesium
- d) Antibiotics

79. What type of diarrhea occurs when a stimulating substance either increases secretion or decreases absorption of water and electrolytes?

- a) Osmotic
- b) Exudative
- c) Secretory
- d) Hydrostatic

80. What duration of diarrhea can be considered as acute diarrhea?

- A. Less than 1 month
- B. less than 14 days
- C. less than 24 hours
- D. less than one week

81. Which of the antisecretory agents used to treat diarrhea may cause black stool?

- A. Polycarbophil
- B. Bismuth subsalicylate
- C. Loperamide
- D. Paregoric
- E. Diphenoxylate with atropine

82. What are the known causes of constipation?

- A. Metabolic disorders (diabetes).
- B. Endocrine disorders (hypothyroidism).
- C. Disorders of the large bowel (irritable bowel syndrome).
- D. Disorders of the upper GI tract (ulceration, cancer).
- E. All of the above.

83. What is the cornerstone of therapy in the treatment of constipation?

- A. Decrease fluid intake.
- B. Increase in dietary fiber.
- C. Biofeedback therapy.
- D. Prolonged use of laxatives.
- E. Anticholinergic drugs.

84. Which clinical sign describes well irritable bowel syndrome (IBS)?

- A. It is characterized by nausea and vomiting
- B. It is characterized by acute onset of constipation
- C. It is characterized by abdominal pain, disturbed defecation, and bloating.
- D. It is known to be of viral origin.
- E. All of the above

85. Which drug is recommended in diarrhea-predominant IBS?

- A. Saline cathartics
- B. Loperamide
- C. Mineral oil
- D. Dietary fiber
- E. Lactulos

86. Why should be avoided Flurazepam in elderly people with insomnia?

- A. It has a high addiction potential.
- B. It has a long half-life and may cause falls.
- C. It results in tolerance in 2 to 4 weeks.
- D. Prolonged use results in daytime anxiety.

87. What is most common side effects seen with zolpidem use?

- A. Amnesia, dizziness, and headache.
- B. Psychotic reactions.
- C. Daytime anxiety.
- D. Rebound insomnia.

88. Which medications may be used to help normalize circadian rhythm disturbed by jet lag?

- A. Triazolam
- B. Zaleplon
- C. Estazolam
- D. Melatonin

89. What are the most important criteria when evaluating immediate postoperative pain of a 50-year-old woman who has just had her gall bladder removed?
- A. The history of past surgeries.
  - B. The time elapsed since the patient was in surgery.
  - C. Pain severity.
  - D. The amount of tissue damage.
  - E. The amount of time spent in surgery.
90. Which analgesic drug would be preferred when treating acute mild pain in a 30-year-old man with no significant medication history?
- A. Nalbuphine.
  - B. Propoxyphene.
  - C. Codeine with acetaminophen.
  - D. Acetaminophen.
  - E. Tramadol.
91. What would be the drug(s) of choice in severe acute pain secondary to trauma?
- A. Naloxone and nonsteroidal anti-inflammatory drug.
  - B. Morphine plus a nonsteroidal anti-inflammatory drug.
  - C. Acetaminophen
  - D. Aspirin
92. What is the correct approach to treatment of moderate to severe cancer pain?
- A. Assess the frequency/duration/occurrence/etiology of the pain.
  - B. Use sustained-release opioid in an around-the-clock fashion.
  - C. Use as needed immediate-release opioids with the sustained-release drugs.
  - D. Titrate opioids based on the response of the patient.
  - E. All of the above.
93. What is the best treatment of chronic nonmalignant pain?
- A. Is often psychosomatic.
  - B. Is best treated with nalbuphine.
  - C. Is exacerbated with the use of tricyclic antidepressants.
  - D. May be treated with anticonvulsants.
94. What is the best treatment of opioid-induced constipation?
- A. Methylnaltrexone
  - B. Concomitant use of acetaminophen with the opioid.
  - C. Concomitant use of aspirin.
  - D. All of the above.