

Medicine Sample Items

1. A 22-year-old woman with a 10-year history of asthma comes to the physician because she has had to increase her use of her albuterol inhaler during the past 6 weeks. Her asthma was previously well controlled with inhaled glucocorticoids. She has a 2-year history of generalized anxiety disorder controlled with fluoxetine and a 5-year history of migraines. The migraines were well controlled with sumatriptan until 4 months ago when she began to have headaches twice weekly; propranolol was added to her regimen at that time. She has been taking an oral contraceptive for the past year. She says she has been under increased stress at graduate school and in her personal life during the past 3 months; during this period, she has been drinking an average of four cups of coffee daily (compared with her usual one cup daily). She does not drink alcohol or use illicit drugs. She appears mildly anxious but is not in respiratory distress. Scattered end-expiratory wheezes are heard. The remainder of the examination shows no abnormalities. Which of the following is the most likely cause of the exacerbation of this patient's asthma?
 - (A) Fluoxetine therapy
 - (B) Increased caffeine intake
 - (C) Oral contraceptive therapy
 - (D) Propranolol therapy
 - (E) Sumatriptan therapy
2. A 28-year-old woman has palpitations that occur approximately once a week, last 1-5 minutes, and consist of rapid, regular heart pounding. The episodes start and stop suddenly and have not been associated with chest discomfort or dyspnea. There is no history of heart problems. She drinks two to three cups of coffee daily. She rarely drinks alcohol and does not smoke. Her pulse is 96/min and regular, and blood pressure is 120/88 mm Hg. A stare and lid lag are noted. The thyroid gland is firm and 1.5 times larger than normal. There is a midsystolic click at the apex and a grade 2/6, early systolic murmur at the upper left sternal border. An ECG is normal except for evidence of sinus tachycardia. Which of the following is the most appropriate next step in diagnosis?
 - (A) Ambulatory ECG monitoring
 - (B) Measurement of serum thyroid-stimulating hormone concentration
 - (C) Measurement of urine catecholamine concentration
 - (D) MUGA scan
 - (E) Echocardiography
3. A study is conducted to assess the benefits of a new drug to reduce the recurrence of colonic polyps. The results show a number needed to treat (NNT) of 16. Which of the following is the most accurate interpretation of this result?
 - (A) For every 16 patients treated, 1 would benefit from the new drug
 - (B) For every 100 patients treated, 16 would benefit from the new drug
 - (C) The new drug is 1.6 times more beneficial than a placebo
 - (D) 93% of patients taking the new drug would benefit from it
 - (E) 84% of patients taking the new drug would not have any benefit from it
4. A previously healthy 57-year-old woman comes to the physician 1 week after noticing a lump under her right arm. She is concerned that it is breast cancer because both her mother and maternal aunt died of breast cancer. She does not smoke, drink alcohol, or use illicit drugs. She has avoided the sun for the past 10 years. She notes that her skin has never tanned but always burned and freckled when exposed to the sun. She exercises daily on a stationary bicycle and eats a well-balanced diet. Her temperature is 37°C (98.6°F), pulse is 82/min and regular, respirations are 14/min, and blood pressure is 130/74 mm Hg. There are numerous freckles over the entire body. Examination of the right breast shows a 0.6-cm, flat, brown lesion; the lesion is mottled with deep purple and black areas and has an irregular border. There are no breast masses, dimpling, peau d'orange, or nipple discharge. The patient says that the lesion has been present for 1 year, but she has never had it examined. There is a firm, nontender mass in the right axilla. Examination shows no other abnormalities. Which of the following is the most likely diagnosis?
 - (A) Basal cell carcinoma
 - (B) Fibrocystic changes of the breast
 - (C) Mastitis
 - (D) Melanoma
 - (E) Pigmented nevus
 - (F) Port-wine stain
 - (G) Squamous cell carcinoma
 - (H) Superficial breast carcinoma

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5. Two days after receiving 3 units of packed red blood cells for postpartum hemorrhage, a 24-year-old woman has fatigue and slight jaundice. Laboratory studies show:

Hemoglobin	8.8 g/dL
Hematocrit	28%
Serum total bilirubin	5 mg/dL

Liver tests are otherwise within normal limits. Which of the following is the most appropriate next step in diagnosis?

- (A) Cytomegalovirus antibody titer
 - (B) Direct and indirect antiglobulin (Coombs) tests
 - (C) Monospot test
 - (D) Serology for hepatitis B markers
 - (E) Ultrasonography of the gallbladder
6. A 30-year-old man has had nausea, vomiting, and severe colicky right flank pain radiating into the thigh for 4 hours. He is afebrile. There is right costovertebral angle tenderness. Urinalysis shows RBCs too numerous to count and no bacteria. Which of the following is the most likely diagnosis?

- (A) Acute glomerulonephritis
- (B) Bacterial cystitis
- (C) Benign prostatic hyperplasia
- (D) Bladder carcinoma
- (E) Renal cell carcinoma
- (F) Urinary tract tuberculosis
- (G) Urolithiasis

7. A 66-year-old woman comes to the emergency department 1 hour after the sudden onset of retrosternal chest discomfort accompanied by nausea and diaphoresis. She has hypotension, jugular venous distention, and a murmur of tricuspid regurgitation. An ECG shows ST-segment elevation in the right precordial leads. Which of the following is the most likely diagnosis?

- (A) Constrictive pericarditis
- (B) Dissecting aortic aneurysm
- (C) Pericardial tamponade
- (D) Pulmonary emboli
- (E) Right ventricular infarction

8. A 20-year-old African American woman comes to the physician because of a 6-month history of diffuse joint pain, especially in her hips and knees. During this period, she occasionally has had a rash on her nose and cheeks. She has no history of serious illness and takes no medications. Her temperature is 38.1°C (100.5°F). Examination shows warmth and swelling of the knees. Laboratory studies show:

Hemoglobin	10.5 g/dL
Erythrocyte sedimentation rate	40 mm/h
Serum	
Urea nitrogen	30 mg/dL
Creatinine	1.8 mg/dL

Which of the following is the most likely diagnosis?

- (A) Ankylosing spondylitis
- (B) Gouty arthritis
- (C) Psoriatic arthritis
- (D) Reactive arthritis
- (E) Rheumatoid arthritis
- (F) Septic arthritis
- (G) Systemic lupus erythematosus

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9. A 37-year-old man with type 1 diabetes mellitus comes to the physician for a routine examination. His only medication is insulin. His pulse is 72/min, respirations are 12/min, and blood pressure is 138/88 mm Hg. Funduscopic examination shows microaneurysms and hemorrhages. Sensation to vibration and light touch is decreased over the lower extremities. His serum creatinine concentration is 1.6 mg/dL. A 24-hour urine collection shows 550 mg of protein. Treatment with which of the following is most likely to slow progression of this patient's renal disease?
- (A) Atenolol
 - (B) Clonidine
 - (C) Hydralazine
 - (D) Hydrochlorothiazide
 - (E) Lisinopril
10. A 50-year-old man is admitted to the hospital within 2 hours of the onset of nausea, vomiting, and acute crushing pain in the left anterior chest. He has a family history of early coronary artery disease. The pain does not subside with the administration of nitroglycerin, sublingually. An ECG shows ST-segment elevation in leads aVL and V₂ through V₄. Which of the following is the most appropriate management to decrease myocardial damage and mortality?
- (A) Administration of digitalis
 - (B) Administration of lidocaine
 - (C) Administration of quinidine
 - (D) Coronary artery bypass grafting within 1 week
 - (E) Thrombolytic therapy
11. A previously healthy 67-year-old woman comes to the physician with her husband because of a 4-month history of a resting tremor of her right arm. Her husband reports that her movements have been slower and that she appears less stable while walking. Examination shows increased muscle tone in the upper extremities that is greater on the right than on the left. There is decreased right arm swing. Her gait is slow and shuffling. Which of the following is the most likely explanation for this patient's symptoms?
- (A) Bilateral frontal lobe degeneration
 - (B) Decreased dopaminergic input to the striatum
 - (C) Decreased serotonergic activity in the brain stem
 - (D) Excessive output of oxytocin
 - (E) Excessive thalamic output of norepinephrine
12. A 47-year-old man comes to the physician because of a 4-week history of increased thirst and urination. He has had a 23-kg (50-lb) weight gain during the past 2 years. He has no history of serious illness and takes no medications. His mother and maternal grandfather have type 2 diabetes mellitus. The patient does not smoke and drinks one beer every night. He is 175 cm (5 ft 9 in) tall and now weighs 104 kg (230 lb); BMI is 34 kg/m². His pulse is 90/min, and blood pressure is 150/88 mm Hg. The remainder of the examination shows no abnormalities. His serum glucose concentration is 330 mg/dL. Which of the following is the most likely underlying cause of this patient's increased serum glucose concentration?
- (A) Autoimmune destruction of islet cells
 - (B) Chronic pancreatitis
 - (C) Exogenous production of corticosteroids
 - (D) Insulin resistance
 - (E) Pancreatic cancer

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13. A previously healthy 39-year-old woman is brought to the physician because of a tingling sensation in her fingers and toes for 2 days and rapidly progressive weakness of her legs. She had an upper respiratory tract infection 2 weeks ago. She was unable to get up from bed this morning. Examination shows weakness of all four extremities, distal greater than proximal. Deep tendon reflexes are absent. Sensation is mildly decreased over the feet. Which of the following is the most likely diagnosis?
- (A) Guillain-Barré syndrome
 - (B) Multiple sclerosis
 - (C) Myasthenia gravis
 - (D) Poliomyelitis
 - (E) Tick paralysis
14. A previously healthy 77-year-old woman who resides in a skilled nursing care facility is brought to the emergency department 6 hours after the onset of acute midback pain that began while lifting a box. The pain does not radiate, and she has no other symptoms. She continues to carry out her daily activities. She appears to be in mild distress. She is 157 cm (5 ft 2 in) tall and weighs 47 kg (104 lb); BMI is 19 kg/m². Examination shows mild tenderness over T11. There is no tremor. Serum studies show a calcium concentration of 9.1 mg/dL, a urea nitrogen concentration of 12 mg/dL, and a creatinine concentration of 0.5 mg/dL. An x-ray of the dorsal and lumbar spine shows an anterior wedge fracture of T11. In addition to treating the pain, supplementation with which of the following is most likely to improve this patient's underlying condition?
- (A) 25-Hydroxycholecalciferol
 - (B) Levothyroxine
 - (C) Selenium
 - (D) Vitamin C
 - (E) Vitamin E
15. A 52-year-old woman comes to the physician because of a 3-month history of diarrhea and intermittent abdominal pain that radiates to her back. The pain is exacerbated by eating. She describes her stools as greasy, foul-smelling, and difficult to flush. She has had a 4.5-kg (10-lb) weight loss during the past 4 months. She has a history of chronic alcohol abuse. Examination shows mild epigastric tenderness. An x-ray of the abdomen shows calcifications in the epigastrium. Which of the following is the most likely diagnosis?
- (A) Bacterial overgrowth
 - (B) Celiac disease
 - (C) Lactose intolerance
 - (D) Malabsorption of bile salts
 - (E) Pancreatic insufficiency
16. A 67-year-old woman comes to the physician because of an 8-month history of progressive shortness of breath. The shortness of breath initially occurred only with walking long distances but now occurs after walking ¼ mile to her mailbox. She also has a daily morning cough productive of whitish tan sputum. She has had no chest pain, palpitations, orthopnea, or paroxysmal nocturnal dyspnea. She has smoked one pack of cigarettes daily for 52 years. Her pulse is 88/min, respirations are 20/min, and blood pressure is 144/90 mm Hg. Examination shows a barrel-shaped chest. Breath sounds are decreased, and faint expiratory wheezes are heard in all lung fields. There is no peripheral edema. An x-ray of the chest shows no abnormalities except for hyperinflation. Which of the following is the most likely diagnosis?
- (A) Angina pectoris
 - (B) Asthma
 - (C) Chronic obstructive pulmonary disease
 - (D) Chronic pulmonary embolism
 - (E) Congestive heart failure
 - (F) Panic disorder

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17. A 22-year-old woman comes to the physician because of a 10-day history of pain in multiple joints. She first had pain in her right elbow, and then her right shoulder, and now has pain, redness, and swelling in her left knee that began 2 days ago. She currently has no pain in the right shoulder and elbow. There is no history of trauma. She is sexually active, and she and her partner use condoms for contraception inconsistently. Examination of the left knee shows warmth, erythema, tenderness, and soft-tissue swelling. Range of motion of the knee is limited to 10 degrees of flexion. The remainder of the examination, including pelvic examination, shows no abnormalities. Arthrocentesis of the knee joint yields 10 mL of cloudy fluid with a leukocyte count of $18,300/\text{mm}^3$ (97% segmented neutrophils). Microscopic examination of the leukocytes within the joint fluid is most likely to show which of the following?
- (A) Acid-fast bacteria
 - (B) Cuboidal positively birefringent crystals
 - (C) Gram-negative diplococci
 - (D) Gram-positive cocci in clusters
 - (E) Needle-shaped negatively birefringent crystals
18. A 47-year-old woman comes to the physician for a routine health maintenance examination. She feels well and has no history of serious illness. Her mother, brother, and sister have hypertension. The patient's pulse is 84/min, and blood pressure is 138/85 mm Hg. Examination shows no other abnormalities. The most appropriate recommendation is decreased intake of which of the following?
- (A) Calcium
 - (B) Carbohydrates
 - (C) Potassium
 - (D) Protein
 - (E) Sodium
19. A 32-year-old man comes to the physician because of a 12-day history of abdominal cramps and bloating, diarrhea, and flatulence. He says that he started a new exercise program 2 weeks ago and has been consuming a high quantity of yogurt bars, peanut butter, and protein- and calorie-enriched milk shakes to "bulk up." He has no history of serious illness and takes no medications. His temperature is 37°C (98.6°F). The abdomen is distended, nontender, and tympanitic to percussion. Bowel sounds are increased. The remainder of the examination shows no abnormalities. Which of the following is the most likely cause of this patient's symptoms?
- (A) Allergy to peanuts
 - (B) Fungal overgrowth in the small bowel
 - (C) Incarcerated hernia
 - (D) Irritable bowel syndrome
 - (E) Lactase deficiency
20. A 22-year-old college student comes to student health services because of a 7-day history of low-grade fever, sore throat, fatigue, and general malaise. One month ago, she had a painless vulvar ulcer that resolved spontaneously; she has been otherwise healthy. Her last menstrual period was 3 weeks ago; she uses tampons regularly. She is sexually active and has had three partners since the age of 15 years; she uses an oral contraceptive. Her temperature is 38°C (100.4°F), pulse is 100/min, and blood pressure is 110/60 mm Hg. Examination shows a rash over the palms and soles and mild cervical lymphadenopathy. Pelvic examination shows no abnormalities. Which of the following is the most appropriate pharmacotherapy?
- (A) Acyclovir
 - (B) Dexamethasone
 - (C) Interferon
 - (D) Penicillin
 - (E) Zidovudine (AZT)

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Answer Form for Medicine Sample Questions

(Questions 1–20)

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Answer Key for Medicine Sample Questions

(Questions 1–20)

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| 1. | D | 11. | B |
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