American Board of Family Medicine

2018 IN-TRAINING EXAMINATION

CRITIQUE BOOK

This book contains the answers to each question in the In-Training Examination, as well as a critique that provides a rationale for the correct answer. Bibliographic references are included at the end of each critique to facilitate any further study you may wish to do in a particular area.

Copyright© 2018 The American Board of Family Medicine, Inc. All rights reserved.

Item 1

ANSWER: E

A urine test for *Legionella pneumophila* antigen is the preferred method to confirm Legionnaires' disease. This test is rapid and will only detect *Legionella pneumophila* antigen. A sputum culture is the gold standard for the diagnosis of Legionnaires' disease but it requires 48–72 hours. A chest radiograph does not confirm the diagnosis but may show the extent of disease. Responding to antibiotic treatment does not confirm a specific diagnosis.

Ref: Mercante JW, Winchell JM: Current and emerging Legionella diagnostics for laboratory and outbreak investigations. *Clin Microbiol Rev* 2015;28(1):95-133. 2) National Center for Immunization and Respiratory Diseases: *Legionella* (Legionnaires' disease and Pontiac fever): Diagnosis, treatment, and prevention. Centers for Disease Control and Prevention, 2017.

Item 2

ANSWER: C

Risk factors for developmental dysplasia of the hip in infants include a breech presentation in the third trimester, regardless of whether the delivery was cesarean or vaginal. Other indications to evaluate an infant for this condition include a positive family history, a history of previous clinical instability, parental concern, a history of improper swaddling, and a suspicious or inconclusive physical examination. Twin birth, a large-for-gestational age infant, and prematurity are not considered risk factors.

Ref: Shaw BA, Segal LS; Section on Orthopaedics: Evaluation and referral for developmental dysplasia of the hip in infants. *Pediatrics* 2016;138(6):pii:e20163107. 2) Hauk L: Developmental dysplasia of the hip in infants: A clinical report from the AAP on evaluation and referral. *Am Fam Physician* 2017;96(3):196-197.

Item 3

ANSWER: C

Experts recommend that a refusal to vaccinate form be signed by patients or parents who refuse a recommended vaccine. This form should document that the patient/parents were provided the vaccine information statement (SOR C). The CDC recommends against dismissing a patient or family from a practice if they refuse vaccination. Physicians should continue to discuss the benefits of immunizations at subsequent visits, because some patients/parents may reconsider their decision not to vaccinate.

Ref: Spencer JP, Trondsen Pawlowski RH, Thomas S: Vaccine adverse events: Separating myth from reality. *Am Fam Physician* 2017;95(12):786-794.

Item 4

ANSWER: A

Prepatellar bursitis is a common superficial bursitis caused by microtrauma from repeated kneeling and crawling. Other terms for this include housemaid's knee, coal miner's knee, and carpet layer's knee. It is usually associated with minimal to no pain. This differs from inflammatory processes such as acute gouty superficial bursitis, which presents as an acutely swollen, red, inflamed bursa and, in rare cases, progresses to chronic tophaceous gout with minimal or no pain.

The proper management of prepatellar bursitis is conservative and includes ice, compression wraps, padding, elevation, analgesics, and modification of activity. There is little evidence that a corticosteroid injection is beneficial, even though it is often done. If inflammatory bursitis is suspected, a corticosteroid injection may be helpful. Fluid aspiration is indicated if septic bursitis is suspected. Surgery can be considered for significant enlargement of a bursa if it interferes with function.

Ref: Khodaee M: Common superficial bursitis. *Am Fam Physician* 2017;95(4):224-231.

Item 5

ANSWER: E

A history of an ischemic stroke within the past 3 months is an absolute contraindication to fibrinolytic therapy in patients with an ST-elevation myocardial infarction (STEMI), unless the stroke is diagnosed within 4½ hours. Poorly controlled hypertension, dementia, peptic ulcer disease, and major surgery less than 3 weeks before the STEMI are relative contraindications that should be considered on an individual basis.

Ref: O'Gara PT, Kushner FG, Ascheim DD, et al: 2013 ACCF/AHA guideline for the management of ST-elevation myocardial infarction: A report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. *Circulation* 2013;127(4):e362-e425.

Item 6

ANSWER: E

This patient has sudden sensorineural hearing loss (SSNHL) of the left ear without any accompanying features to suggest a clear underlying cause. An appropriate evaluation will fail to identify a cause in 85%–90% of cases. Idiopathic SSNHL can be diagnosed if a patient is found to have a 30-dB hearing loss at three consecutive frequencies and an underlying condition is not identified by the history and physical examination.

The most recent guideline from the American Academy of Otolaryngology–Head and Neck Surgery recommends that oral corticosteroids be considered as first-line therapy for patients who do not have a contraindication. While there is equivocal evidence of benefit, for most patients the risk of a short-term course of corticosteroids is thought to be outweighed by the potential benefit, especially when considering the serious consequences of long-term profound hearing loss. Because the greatest improvement in hearing tends to occur in the first 2 weeks, corticosteroid treatment should be started immediately. The recommended dosage is 1 mg/kg/day with a maximum dosage of 60 mg daily for 10–14 days.

Antiviral medications, antiplatelet agents, and vasodilators such as nifedipine have no evidence of benefit. Antibiotics also have no evidence of benefit in the absence of signs of infection.

Ref: Stachler RJ, Chandrasekhar SS, Archer SM, et al: Clinical practice guideline: Sudden hearing loss. *Otolaryngol Head Neck Surg* 2012;146(3 Suppl):S1-S35.

Item 7

ANSWER: D

The Ottawa foot and ankle rules should be used to determine the need for radiographs in foot and ankle injuries. A radiograph of the ankle is recommended if there is pain in the malleolar zone along with the inability to bear weight for at least four steps immediately after the injury and in the physician's office or emergency department (ED), or tenderness at the tip of the posterior medial or lateral malleolus. A radiograph of the foot is recommended if there is pain in the midfoot zone along with the inability to bear weight for four steps immediately after the injury and in the physician's office or ED, or tenderness at the base of the fifth metatarsal or over the navicular bone. The Ottawa foot and ankle rules are up to 99% sensitive for detecting fractures, although they are not highly specific. In this case there are no findings that would require radiographs, so treatment for the ankle sprain would be recommended. Compression combined with lace-up ankle support or an air cast, along with cryotherapy, is recommended and can increase mobility. Early mobilization, including weight bearing as tolerated for daily activities, is associated with better long-term outcomes than prolonged rest.

Ref: Tiemstra JD: Update on acute ankle sprains. *Am Fam Physician* 2012;85(12):1170-1176. 2) Bica D, Sprouse RA, Armen J: Diagnosis and management of common foot fractures. *Am Fam Physician* 2016;93(3):183-191.

Item 8

ANSWER: A

Alcohol consumption greater than one drink/day has been associated with atrial fibrillation. While not recommended to prevent atrial fibrillation, pioglitazone and lisinopril have both been associated with lower rates of atrial fibrillation compared to alternative therapies. Treatment of obstructive sleep apnea, along with a regular fitness regimen, has been associated with a decrease in the recurrence of atrial fibrillation.

Ref: Morin DP, Bernard ML, Madias C, et al: The state of the art: Atrial fibrillation epidemiology, prevention, and treatment. *Mayo Clin Proc* 2016;91(12):1778-1810.

Item 9

ANSWER: A

The reticulocyte count is the first and best indicator of iron absorption and bone marrow response to oral iron therapy in the treatment of iron deficiency anemia. An increase in reticulocytes is seen as early as 4 days, peaking at 7–10 days. The rate of production of new RBCs slows thereafter due to a compensatory decrease in erythropoietin as more iron becomes available. It typically takes 4–6 weeks before seeing recovery in the hematocrit, and for the RBC count and indices to normalize. However it is usually 4–6 months before iron stores are fully restored to normal levels, so treatment should continue for at least that long.

Ref: Killip S, Bennett JM, Chambers MD: Iron deficiency anemia. *Am Fam Physician* 2007;75(5):671-678. 2) Kasper DL, Fauci AS, Hauser SL, et al (eds): *Harrison's Principles of Internal Medicine*, ed 19. McGraw-Hill, 2015, pp 628-629.

Item 10

ANSWER: C

First- and second-generation H_1 antihistamine receptor antagonists are generally considered first-line treatment for chronic urticaria, and approximately 60% of patients experience a satisfactory result. Second-generation options such as loratadine have the added benefit of a lower likelihood of side effects such as drowsiness. For those who fail to achieve the desired result with monotherapy using an H_1 antihistamine receptor antagonist, the addition of an H_2 antihistamine receptor antagonist such as cimetidine or ranitidine is often beneficial. The tricyclic antidepressant doxepin has strong H_1 and H_2 antihistamine receptor antagonist effects and has been used as an off-label treatment option in some studies. A short course of oral corticosteroids, narrow-band UV light treatment, or cyclosporine can be used in the management of recalcitrant chronic urticaria, but these are considered second- or third-line adjunctive options.

Ref: Perera E, Sinclair R: Evaluation, diagnosis and management of chronic urticaria. *Aust Fam Physician* 2014;43(9):621-625.

Item 11

ANSWER: D

This patient's close contact with a person known to be infected with tuberculosis (TB) places him at risk for infection, so screening for TB is indicated. For this patient, testing with either a tuberculin skin test or an interferon-gamma release assay is appropriate. Based on CDC guidelines an induration ≥5 mm at 48–72 hours following an intradermal injection of tuberculin is a positive test in individuals who have been in recent contact with a person with infectious TB, those with radiographic evidence of prior TB, HIV-infected persons, and immunosuppressed patients. For other individuals at increased risk for TB, the threshold for a positive test is an induration ≥10 mm at 48–72 hours. For those with no known risks for TB infection, the induration must exceed 15 mm in size to be considered positive. Once positive, there is no indication for additional skin tests.

A positive screening test along with a review of systems, a physical examination, and a chest radiograph that do not show evidence of active infection confirms the diagnosis of latent TB. For children age 2–11 years, treatment with isoniazid, 10–20 mg/kg daily or 20–40 mg/kg twice weekly for 9 months, is the preferred and most efficacious treatment regimen. The shorter 6-month treatment course is considered an acceptable option for adults, but it is not recommended for children. The use of rifampin alone or in combination with isoniazid is also an acceptable option for adults but not for children under the age of 12.

Ref: National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention: *Latent Tuberculosis Infection: A Guide for Primary Health Care Providers*. Centers for Disease Control and Prevention, 2013. 2) Lewinsohn DM, Leonard MK, LoBue PA, et al: Official American Thoracic Society/Infectious Diseases Society of America/Centers for Disease Control and Prevention clinical practice guidelines: Diagnosis of tuberculosis in adults and children. *Clin Infect Dis* 2017;64(2):111-115.

Item 12

ANSWER: B

Evaluation of this patient should include CT of the abdomen and pelvis with oral and intravenous (IV) contrast. There is no reason to inquire about shellfish allergies prior to CT with IV contrast, because premedication is not needed. There is no correlation between shellfish allergies and allergic reactions to contrast. Patients with moderately severe to severe reactions to IV contrast in the past would need pretreatment with corticosteroids.

Ref: Narayan AK, Durand DJ, Feldman LS: Avoiding contrast-enhanced computed tomography scans in patients with shellfish allergies. *J Hosp Med* 2016;11(6):435-437.

Item 13

ANSWER: C

This patient's pain and weakness while pushing against resistance reveals weakness on internal rotation of the shoulder, which suggests a possible tear of the subscapularis tendon. The inability to keep her hand away from her body when it is placed behind her back describes a positive internal lag test, also suggesting involvement of the subscapularis tendon. The infraspinatus and teres minor are involved in external rotation rather than internal rotation. The supraspinatus and deltoid are involved in abduction of the shoulder.

Ref: Woodward TW, Best TM: The painful shoulder: Part I. Clinical evaluation. *Am Fam Physician* 2000;61(10):3079-3088. 2) Verry C, Fernando S: Rotator cuff disease: Diagnostic tests. *Am Fam Physician* 2016;94(11):925-926.

Item 14

ANSWER: B

Ultrasonography is recommended as the first imaging modality to evaluate acute abdominal pain in children. It avoids radiation exposure and is useful for detecting many causes of abdominal pain, including appendicitis. After ultrasonography, CT or MRI can be used if necessary to diagnose appendicitis. Abdominal radiography is helpful in patients with constipation, possible bowel obstruction, or a history of previous abdominal surgery.

The American Academy of Pediatrics Choosing Wisely recommendation on the evaluation of abdominal pain states that CT is not always necessary. The American College of Surgeons Choosing Wisely recommendation on the evaluation of suspected appendicitis in children says that CT should be avoided until after ultrasonography has been considered as an option.

Ref: American Academy of Pediatrics: Computed tomography (CT) scans are not necessary in the routine evaluation of abdominal pain. ABIM Foundation Choosing Wisely campaign, 2013. 2) Reust CE, Williams A: Acute abdominal pain in children. *Am Fam Physician* 2016;93(10):830-836. 3) ACR appropriateness criteria. American College of Radiology, 2018.

Item 15

ANSWER: B

The syndrome of inappropriate antidiuresis (SIAD, formerly SIADH) is related to a variety of pulmonary and central nervous system disorders in which hyponatremia and hypo-osmolality are paradoxically associated with an inappropriately concentrated urine. Most cases are associated with increased levels of the antidiuretic hormone arginine vasopressin (AVP). Making a diagnosis of SIAD requires that the patient be euvolemic and has not taken diuretics within the past 24–48 hours, and the urine osmolality must be high in conjunction with both low serum sodium and low osmolality. The BUN should be normal or low and the fractional excretion of sodium $>1\%$.

Fluid restriction (<800 cc/24 hrs) over several days will correct the hyponatremia/hypo-osmolality, but definitive treatment requires eliminating the underlying cause, if possible. In the case of severe, acute hyponatremia with symptoms such as confusion, obtundation, or seizures, hypertonic (3%) saline can be slowly infused intravenously but might have dangerous neurologic side effects.

Elevated serum glucose levels may cause a factitious hyponatremia, but not SIAD.

Ref: Ellison DH, Berl T: The syndrome of inappropriate antidiuresis. *N Engl J Med* 2007;356(2):2064-2072. 2) Verbalis JG, Goldsmith SR, Greenberg A, et al: Diagnosis, evaluation, and treatment of hyponatremia: Expert panel recommendations. *Am J Med* 2013;126(10 Suppl 1):S1-S42.

Item 16

ANSWER: A

Lifestyle modifications addressing diet, physical activity, and weight are important in the treatment of hypertension, particularly for African-American and Hispanic patients. When antihypertensive drugs are also required, the best options may vary according to the racial and ethnic background of the patient. The presence or absence of comorbid conditions is also important to consider. For African-Americans, thiazide diuretics and calcium channel blockers, both as monotherapy and as a component in multidrug regimens, have been shown to be more effective in lowering blood pressure than ACE inhibitors, angiotensin II receptor blockers, or β-blockers, and should be considered as first-line options over the other classes of antihypertensive drugs unless a comorbid condition is present that would be better addressed with a different class of drugs. Racial or ethnic background should not be the basis for the exclusion of any drug class when multidrug regimens are required to reach treatment goals.

Ref: James PA, Oparil S, Carter BL, et al: 2014 evidence-based guideline for the management of high blood pressure in adults: Report from the panel members appointed to the Eighth Joint National Committee (JNC 8). *JAMA* 2014;311(5):507-520. 2) Whelton PK, Carey RM, Aronow WS, et al: 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA guideline for the prevention, detection, evaluation, and management of high blood pressure in adults: A report of the American College of Cardiology/American Heart Association Task Force on clinical practice guidelines. *J Am Coll Cardiol* 2017;pii:S0735-1097(17)41519-1.

Item 17

ANSWER: D

Eligibility for hospice care is based on a life expectancy of 6 months or less in the natural course of an illness. A majority of hospice patients have cancer but it is not a requirement to qualify for hospice care. Age is not relevant. Comorbid conditions may affect longevity but are not required. For those insured by Medicare, Medicare Part A provides hospice care but Medicare Part B does not.

Ref: *Medicare Hospice Benefits*. Centers for Medicare & Medicaid Services, 2018, p 7.

Item 18

ANSWER: A

The U.S. Preventive Services Task Force recommends depression screening for all adolescents 12–18 years of age. Although this patient has abdominal pain, the history and physical examination suggest that depression may be playing a role in her somatic complaints. She had a positive initial depression screen on her PHQ-2. This is a brief screening tool, and a positive result merits further evaluation. The evaluation should include a full PHQ-A or a discussion with a qualified clinician. If the patient meets the criteria for major depressive disorder then she should receive treatment for her depression, which could include medication. Both fluoxetine and citalopram have been approved by the FDA to treat depression in this age group. She could also be referred for psychotherapy. Further laboratory studies and imaging may be appropriate at some point, but the most urgent need is to evaluate her positive depression screen.

Ref: Richardson LP, Rockhill C, Russo JE, et al: Evaluation of the PHQ-2 as a brief screen for detecting major depression among adolescents. *Pediatrics* 2010;125(5):e1097-e1103. 2) *Final Recommendation Statement: Depression in Children and Adolescents: Screening*. US Preventive Services Task Force, 2016.

Item 19

ANSWER: C

Liraglutide, exenatide, and dulaglutide are all GLP-1 receptor agonists. Of these, only liraglutide has been shown to lower the risk of recurrent cardiovascular events and has received FDA approval for this indication. Glipizide (a sulfonylurea), rosiglitazone, and sitagliptin have not been associated with improved cardiovascular outcomes. Empagliflozin, an SGLT2 inhibitor, has also been associated with secondary prevention of cardiovascular disease.

Ref: Marso SP, Daniels GH, Brown-Frandsen K, et al: Liraglutide and cardiovascular outcomes in type 2 diabetes. *N Engl J Med* 2016;375(4):311-322. 2) Sattar N, Petrie MC, Zinman B, Januzzi JL Jr: Novel diabetes drugs and the cardiovascular specialist. *J Am Coll Cardiol* 2017;69(21):2646-2656.

Item 20

ANSWER: E

Individuals with sickle cell disease are at increased risk for vascular disease, especially stroke. All sickle cell patients 2–16 years of age should be screened with transcranial Doppler ultrasonography (SOR A). A chest radiograph, abdominal ultrasonography, a DXA scan, and renal Doppler ultrasonography are not recommended for screening patients with sickle cell disease.

Ref: Yawn BP, John-Sowah J: Management of sickle cell disease: Recommendations from the 2014 Expert Panel report. *Am Fam Physician* 2015;92(12):1069-1076.

Item 21

ANSWER: A

In addition to clinodactyly, fetal alcohol syndrome is associated with camptodactyly (flexion deformity of the fingers), other flexion contractures, radioulnar synostosis, scoliosis, and spinal malformations. It is also associated with many neurologic, behavioral, and cardiovascular abnormalities, as well as other types of abnormalities. Plagiocephaly, supernumerary digits, syndactyly, and metatarsus adductus are common in newborns but are not related to fetal alcohol spectrum disorders.

Ref: Denny L, Coles S, Blitz R: Fetal alcohol syndrome and fetal alcohol spectrum disorders. *Am Fam Physician* 2017;96(8):515-522.

Item 22

ANSWER: A

This child has otitis media with effusion, and the recommended course of action is to follow up in 3 months. Medications, including decongestants, antihistamines, antibiotics, and corticosteroids, are not recommended.

Ref: Lambert M: AAO-HNS releases updated guideline on management of otitis media with effusion. *Am Fam Physician* 2016;94(9):747-749.

Item 23

ANSWER: D

This patient has acute to subacute nonspecific low back pain. Combination treatment with an NSAID and a skeletal muscle relaxant is recommended as second-line therapy when an NSAID is ineffective as monotherapy. Opioids have not been shown to have significant benefit when added to an NSAID and would not be recommended as a second-line treatment. Systemic corticosteroids do not have evidence to support their use in the treatment of acute nonspecific back pain. Gabapentin does not have evidence to support its use in treating acute back pain and has been shown to produce only minimal improvement in chronic back pain. This patient has no red-flag symptoms so imaging studies are not recommended at this time.

Ref: Qaseem A, Wilt TJ, McLean RM, et al: Noninvasive treatments for acute, subacute, and chronic low back pain: A clinical practice guideline from the American College of Physicians. *Ann Intern Med* 2017;166(7):514-530.

Item 24

ANSWER: E

This patient has polyneuropathy, macrocytic anemia, and a history of chronic proton pump inhibitor use. The most likely cause is vitamin B_{12} deficiency and a serum level is indicated. Her hemoglobin A_{1c} is 5.8%, which puts her at risk of developing diabetes mellitus but is not indicative of diabetes. Charcot-Marie-Tooth disease is a rare cause of polyneuropathy and unlikely in this case. Hypothyroidism, and not hyperthyroidism, is associated with polyneuropathy. Tarsal tunnel syndrome causes a mononeuropathy.

Ref: Langan RC, Goodbred AJ: Vitamin B_{12} deficiency: Recognition and management. *Am Fam Physician* 2017;96(6):384-389.

Item 25

ANSWER: C

Family physicians should be aware of the environmental exposures associated with pulmonary disease. Stone cutting, sand blasting, mining, and quarrying expose patients to silica, which is an inorganic dust that causes pulmonary fibrosis (silicosis). Occupational exposure to beryllium, which is also an inorganic dust, occurs in the high-tech electronics manufacturing industry and results in chronic beryllium lung disease. Exposure to organic agricultural dusts (fungal spores, vegetable products, insect fragments, animal dander, animal feces, microorganisms, and pollens) can result in "farmer's lung," a hypersensitivity pneumonitis. Other organic dust exposures, such as exposures to grain dust in bakers, can lead to asthma, chronic bronchitis, and COPD. Firefighters are at risk of smoke inhalation and are exposed to toxic chemicals that can cause many acute and chronic respiratory symptoms.

Ref: Kasper DL, Fauci AS, Hauser SL, et al (eds): *Harrison's Principles of Internal Medicine*, ed 19. McGraw-Hill, 2015, pp 1687-1694, 1708-1716.

Item 26

ANSWER: A

A plasma ACTH level is recommended to establish primary adrenal insufficiency. The sample can be obtained at the same time as the baseline sample in the corticotropin test. A plasma ACTH greater than twice the upper limit of the reference range is consistent with primary adrenal insufficiency. Aldosterone and renin levels should be obtained to establish the presence of adrenocortical insufficiency, but these do not differentiate primary from secondary adrenal insufficiency. The hyperpigmentation of Addison's disease is caused by the melanocyte-stimulating hormone (MSH)–like effect of the elevated plasma levels of ACTH. ACTH shares some amino acids with MSH and also produces an increase in MSH in the blood. TSH is not part of the feedback loop of adrenal insufficiency.

Ref: Bornstein SR, Allolio B, Arlt W, et al: Diagnosis and treatment of primary adrenal insufficiency: An Endocrine Society clinical practice guideline. *J Clin Endocrinol Metab* 2016;101(2):364-389.

Item 27

ANSWER: B

Family physicians often see patients with diarrheal illnesses and most of these are viral. Patients sometimes have misconceptions about preferred fluid and feeding recommendations during these illnesses. The World Health Organization recommends oral rehydration with low osmolarity drinks (oral rehydration solution) and early refeeding. Half-strength apple juice has been shown to be effective, and it approximates an oral rehydration solution. Its use prevents patient measurement errors and the purchase of beverages with an inappropriate osmolarity. Low osmolarity solutions contain glucose and water, which decrease stool frequency, emesis, and the need for intravenous fluids compared to higher osmolarity solutions like soda and most sports drinks. Water increases the risk of hyponatremia in children. This patient is not ill enough to need intravenous fluids. Early refeeding has been shown to decrease the duration of illness.

Ref: The treatment of diarrhoea: A manual for physicians and other senior health workers. World Health Organization, 2005. 2) Barr W, Smith A: Acute diarrhea. *Am Fam Physician* 2014;89(3):180-189. 3) Chang JG: Oral rehydration solutions for the treatment of acute watery diarrhea. *Am Fam Physician* 2017;96(11):700-701.

Item 28

ANSWER: E

Hypertrophic cardiomyopathy is the most common primary cardiomyopathy, with a prevalence of 1:500 persons. Many patients with hypertrophic cardiomyopathy are asymptomatic and are diagnosed during family screening, by auscultation of a heart murmur, or incidentally after an abnormal result on electrocardiography. On examination physicians may hear a systolic murmur that increases in intensity during Valsalva maneuvers. The main goals of therapy are to decrease exertional dyspnea and chest pain and prevent sudden cardiac death. β-Blockers are the initial therapy for patients with symptomatic hypertrophic cardiomyopathy. Nondihydropyridine calcium channel blockers such as verapamil can be used if β-blockers are not well tolerated.

Ref: Brieler J, Breeden MA, Tucker J: Cardiomyopathy: An overview. *Am Fam Physician* 2017;96(10):640-646.

Item 29

ANSWER: B

Nonpharmacologic interventions are the first-line treatment for patients with behavioral and psychological symptoms of dementia. Antipsychotic medications can be prescribed for refractory cases but this is an off-label use. Both the patient and family should be aware that the use of atypical antipsychotics for behavioral symptoms of dementia is associated with increased mortality. Patients should be monitored for side effects and the medication should be discontinued if there is no evidence of symptom improvement after a month.

Typical antipsychotics such as haloperidol have significant side effects and would not be a good choice. Donepezil is initiated early in the course of Alzheimer's disease to delay progression of the disease. Benzodiazepines are likely to cause significant side effects including sedation, increased confusion, and falls. Several of the antipsychotics, such as ziprasidone and clozapine, are ineffective. Results with olanzapine, quetiapine, and risperidone are inconsistent. Aripiprazole produces small reductions in behavioral and psychological symptoms of dementia, and it has the least adverse effects of the atypical antipsychotics.

Ref: Reese TR, Thiel DJ, Cocker KE: Behavioral disorders in dementia: Appropriate nondrug interventions and antipsychotic use. *Am Fam Physician* 2016;94(4):276-282.

Item 30

ANSWER: B

Few treatments for dysfunctional uterine bleeding have been studied. NSAIDs, oral contraceptive pills, and danazol have not been shown to have sufficient evidence of effect for the treatment of dysfunctional uterine bleeding. Progestin is effective when used on a 21-day cycle, but not if used only during the luteal phase. Hysterectomy and ablation are very effective, but both eliminate fertility. In a young woman unsure about having children, the levonorgestrel-releasing IUD is the most effective treatment that preserves fertility (SOR A).

Ref: Sweet MG, Schmidt-Dalton TA, Weiss PM, Madsen KP: Evaluation and management of abnormal uterine bleeding in premenopausal women. *Am Fam Physician* 2012;85(1):35-43. 2) Kellerman RD, Bope ET (eds): *Conn's Current Therapy 2018*. Elsevier Saunders, 2018, pp 1073-1074.

Item 31

ANSWER: D

Quadriceps-strengthening exercises have been shown in good studies to stabilize the knee and reduce pain for patients with degenerative arthritis. Acetaminophen has not been shown to produce clinically significant improvement from baseline pain. Intra-articular corticosteroids can acutely relieve pain and effusions but do not affect moderate-term outcomes. Hylan GF 20 products are minimally effective. Opiates and other similar drugs are addictive and should be avoided.

Ref: Cohen D: Exercise for osteoarthritis of the knee. *Am Fam Physician* 2015;92(9):774-776. 2) Bannuru RR, Schmid CH, Kent DM, et al: Comparative effectiveness of pharmacologic interventions for knee osteoarthritis: A systematic review and network meta-analysis. *Ann Intern Med* 2015;162(1):46-54.

Item 32

ANSWER: D

Patients < 75 years of age with established coronary artery disease should be on high-intensity statin regimens if tolerated. These regimens include atorvastatin, 40–80 mg/day, and rosuvastatin, 20–40 mg/day. Moderate-intensity regimens include simvastatin, 40 mg/day. Monotherapy with non-statin medications (bile acid sequestrants, niacin, ezetimibe, and fibrates) does not reduce cardiovascular morbidity or mortality. The PCSK9 inhibitors evolocumab and alirocumab are second-line or add-on therapies at this time.

Ref: Braun MM, Stevens WA, Barstow CH: Stable coronary artery disease: Treatment. *Am Fam Physician* 2018;97(6):376-384.

Item 33

ANSWER: B

This patient has subclinical hyperthyroidism as evidenced by her low TSH level with normal free T_4 and free T_3 levels. Common causes of subclinical hyperthyroidism include Graves disease, autonomous functioning thyroid adenoma, and multinodular toxic goiter. Subclinical hyperthyroidism may progress to overt hyperthyroidism; this is more likely in patients with TSH levels <0.1 μU/mL. Even in the absence of overt hyperthyroidism these patients are at higher risk for several health conditions, including atrial fibrillation, heart failure, and osteoporosis. For this reason it is important to assess for these conditions and consider treating the underlying thyroid condition, as well as the complication. The American Thyroid Association recommends treating patients with complications who are either over age 65 or have a TSH level <0.1 μU/mL.

Lipid and glucose abnormalities are not known to be related to subclinical hyperthyroidism. Calcium levels may be abnormal in hyperparathyroidism but not hyperthyroidism. Thyroid ultrasonography may be helpful to determine the cause of hyperthyroidism but is not used to help decide when to treat subclinical hyperthyroidism.

Ref: Donangelo I, Suh SY: Subclinical hyperthyroidism: When to consider treatment. *Am Fam Physician* 2017;95(11):710-716.

Item 34

ANSWER: A

Benign paroxysmal positional vertigo (BPPV) originates in the posterior semicircular canal in the majority of patients (85%–95% range reported). The Dix-Hallpike maneuver, which involves moving the patient from an upright to a supine position with the head turned 45° to one side and the neck extended 20° with the affected ear down, will elicit a specific series of responses in these patients. Following a latency period that typically lasts 5–20 seconds but sometimes as long as 60 seconds, the patient will experience the onset of rotational vertigo. The objective finding of a torsional, upbeating nystagmus will be associated with the vertigo. The vertigo and nystagmus typically increase in intensity and then resolve within 1 minute from onset.

Ref: Bhattacharyya N, Gubbels SP, Schwartz SR, et al: Clinical practice guideline: Benign paroxysmal positional vertigo (update). *Otolaryngol Head Neck Surg* 2017;156(3 Suppl):S1–S47.

Item 35

ANSWER: B

Escitalopram is a preferred antidepressant for older patients (SOR C). Paroxetine should generally be avoided in older patients due to a higher likelihood of adverse effects (SOR C). Amitriptyline, imipramine, and paroxetine are highly anticholinergic and sedating, and according to the Beers Criteria, they can cause orthostatic hypotension. They have an “avoid” recommendation (SOR A).

Ref: Kovich H, DeJong A: Common questions about the pharmacologic management of depression in adults. *Am Fam Physician* 2015;92(2):94-100. 2) CCSMH national guidelines for seniors' mental health. Canadian Coalition for Seniors' Mental Health. 3) By the American Geriatrics Society 2015 Beers Criteria Update Expert Panel: American Geriatrics Society 2015 updated Beers Criteria for potentially inappropriate medication use in older adults. *J Am Geriatr Soc* 2015;63(11):2227-2246.

Item 36

ANSWER: A

All patients with a smoking history and symptoms of COPD such as a chronic cough with sputum production and/or chronic and progressive dyspnea should be screened for COPD with spirometry. However, asymptomatic individuals such as this patient should not be screened with spirometry regardless of risk factors. Neither chest radiography nor chest CT has a role in screening for COPD. Screening for α_1-antitrypsin deficiency in the absence of a family history is not recommended.

Ref: *Final Recommendation Statement: Chronic Obstructive Pulmonary Disease: Screening*. US Preventive Services Task Force, 2016. 2) Press VG, Cifu AS, White SR: Screening for chronic obstructive pulmonary disease. *JAMA* 2017;318(17):1702-1703.

Item 37

ANSWER: C

St. John's wort can reduce the effectiveness of multiple medications because it is an inducer of CYP3A4 and P-glycoprotein synthesis. Concurrent use of St. John's wort with drugs that are metabolized with these systems should be avoided. These include cyclosporine, warfarin, theophylline, and oral contraceptives. St. John's wort should be avoided in patients taking either over-the-counter or prescription medications.

Ref: Asher GN, Corbett AH, Hawke RL: Common herbal dietary supplement—Drug interactions. *Am Fam Physician* 2017;96(2):101-107.

Item 38

ANSWER: C

Social anxiety disorder can be treated with psychotherapy, pharmacotherapy, or both. Several medications have been used for the treatment of social anxiety disorder. SSRIs are considered to be the first-line pharmacologic treatment. Response rates reported for the SNRI venlafaxine have been similar to those reported for SSRIs. Randomized trials have also supported the efficacy of benzodiazepines for social anxiety disorder, but they carry a risk of physiologic dependence and withdrawal symptoms and are not recommended for patients with coexisting depression or a history of substance abuse. Response rates to pregabalin have been lower than with SSRIs. Tricyclic antidepressants and bupropion are not considered to be useful in the treatment of social anxiety disorder.

Ref: Leichsenring F, Leweke F: Social anxiety disorder. *N Engl J Med* 2017;376(23):2255-2264.

Item 39

ANSWER: B

Fractures involving the distal end of the radius are the most common upper extremity fractures and are most common in elderly women. The mechanism of injury is usually from falling on an outstretched hand (FOOSH). Prompt surgical intervention is recommended in patients with neurovascular compromise, open fractures, or evidence of compartment syndrome. In general, circumferential casts should be avoided, as the underlying swelling can compromise distal circulation. The splint of choice in patients with these fractures is a sugar tong splint. Radial gutter splints are indicated for uncomplicated fractures of the second and third metacarpals. Thumb spica splints are often used in patients with suspected scaphoid fractures (SOR B).

Ref: Eiff MP, Hatch R: *Fracture Management for Primary Care*, ed 3. Elsevier Saunders, 2018, p 367.

Item 40

ANSWER: C

Pediatric asthma is the most commonly encountered chronic illness, occurring in nearly one out of seven individuals. Short-acting β-agonists in the form of metered-dose inhalers are clearly favored for acute exacerbations, as well as for intermittent asthma. Treatment for persistent asthma requires the use of inhaled corticosteroids, with short-acting β-agonists used for exacerbations. For patients not well controlled with those options, either a long-acting β-agonist or a leukotriene receptor antagonist may be added. While both cromolyn and nedocromil are fairly devoid of adverse effects, their use is limited because of a lack of efficacy in the prevention of acute asthma exacerbations.

Ref: Dunn NA, Neff LA, Maurer DM: A stepwise approach to pediatric asthma. *J Fam Pract* 2017;66(5):280-286. 2) Global strategy for asthma management and prevention. Global Initiative for Asthma, 2018.

Item 41

ANSWER: A

Palpitations are a common symptom in ambulatory care. Cardiac causes are the most worrisome so it is important to distinguish cardiac from noncardiac causes. Patients with a history of cardiovascular disease, palpitations that affect their sleep, or palpitations that occur at work have an increased risk of an underlying cardiac cause (positive likelihood ratio 2.0–2.3) (SOR C). Psychiatric illness, adverse effects of medications, and substance abuse are other common causes.

Palpitations that are worse in public places and those of very short duration (<5 minutes), especially if there is a history of anxiety, are often related to panic disorder. However, even a known behavioral issue should not be presumed to be the cause of palpitations, as nonpsychiatric causes are found in up to 13% of such cases. The use of illicit substances such as cocaine and methamphetamine can cause palpitations that are associated with dry mouth, pupillary dilation, sweating, and aberrant behavior. Excessive caffeine can also cause palpitations.

Ref: Wexler RK, Pleister A, Raman SV: Palpitations: Evaluation in the primary care setting. *Am Fam Physician* 2017;96(12):784-789.

Item 42

ANSWER: B

A Wood's lamp may assist with the diagnosis of certain skin conditions. This patient's presentation is consistent with erythrasma caused by a *Corynebacterium minutissimum* infection, and use of an ultraviolet light would reveal a coral pink color. Pale blue fluorescence occurs with *Pseudomonas* infections, yellow with tinea infections, and totally white with vitiligo. A lime green fluorescence is not characteristic of a particular skin condition.

Ref: Kasper DL, Fauci AS, Hauser SL, et al (eds): *Harrison's Principles of Internal Medicine*, ed 19. McGraw-Hill, 2015, pp 339-344. 2) Habif TP: *Clinical Dermatology: A Color Guide to Diagnosis and Therapy*, ed 6. Elsevier, 2016.

Item 43

ANSWER: E

Annual HPV screening in patients age 21–29 years has very little effect on cancer prevention and leads to an increase in procedures and treatments without significant benefit. In this age group there is a high prevalence of high-risk HPV infections but a low incidence of cervical cancer. If this patient were due for a Papanicolaou (Pap) test and results were ASC-US with a positive high-risk HPV or a higher grade abnormality, colposcopy would be recommended. Current recommendations are for a Pap test with cytology every 3 years for women age 21–29 years with normal results, and the frequency does not change with an increased number of normal screens. HPV is the most common sexually transmitted infection (STI) and up to 79% of sexually active women contract HPV infection in their lifetime, so the lack of other STIs does not preclude the possibility of an HPV infection.

Ref: Juckett G, Hartman-Adams H: Human papillomavirus: Clinical manifestations and prevention. *Am Fam Physician* 2010;82(10):1209-1213. 2) Massad LS, Einstein MH, Huh WK, et al: 2012 updated consensus guidelines for the management of abnormal cervical cancer screening tests and cancer precursors. *Obstet Gynecol* 2013;121(4):829-846. 3) ACOG releases guideline on cervical cancer screening. *Am Fam Physician* 2013;88(11):776-777.

Item 44

ANSWER: A

The first step in the management of severe hypertension is determining whether a hypertensive emergency is present. A thorough history and physical examination are crucial (SOR C). Severe hypertension (blood pressure >180 mm Hg systolic or >110 mm Hg diastolic) with end-organ damage constitutes a hypertensive emergency. A physical examination should center on evaluating for papilledema, neurologic deficits, respiratory compromise, and chest pain. If end-organ damage is present the patient should be hospitalized for monitored blood pressure reduction and further diagnostic workup. If end-organ damage is not present and the physical examination is otherwise normal, a 30-minute rest with reevaluation is indicated. Approximately 30% of patients will improve to an acceptable blood pressure without treatment (SOR C). Home medications should then be adjusted with outpatient follow-up and home blood pressure monitoring (SOR A). Short-acting antihypertensives are indicated if mild symptoms are noted such as headache, lightheadedness, nausea, shortness of breath, palpitations, anxiety, or epistaxis. Diagnostic testing is not immediately indicated for asymptomatic patients (SOR C). A basic metabolic panel or other testing should be considered if mild symptoms are present. Aggressive lowering of blood pressure can be detrimental and a gradual reduction over days to weeks is preferred (SOR C).

Ref: Oza R, Garcellano M: Nonpharmacologic management of hypertension: What works? *Am Fam Physician* 2015;91(11):772-776. 2) Gauer R: Severe asymptomatic hypertension: Evaluation and treatment. *Am Fam Physician* 2017;95(8):492-500.

Item 45

ANSWER: B

This patient presents with a typical example of nonalcoholic steatohepatitis (NASH) progressing toward cirrhosis, with multiple risk factors including diabetes mellitus, hyperlipidemia, obesity, and mildly elevated hepatic transaminases. Abnormalities of other cell lines would likely occur if a hematologic malignancy or bone marrow failure were present. While immune thrombocytopenic purpura is a diagnostic consideration, it is much less common than NASH and requires other causes to be ruled out. This patient is not taking any medications that have been frequently reported to cause drug-induced thrombocytopenia.

Ref: Gauer RL, Braun MM: Thrombocytopenia. *Am Fam Physician* 2012;85(6):612-622.

Item 46

ANSWER: D

NSAIDs such as ibuprofen are thought to increase the risk of anastomotic ulcerations or perforations in patients who have had bariatric surgery and should be completely avoided after such surgery if possible (C Recommendation, Level of evidence 3). It is also recommended that alternative pain medications that can be used are identified prior to the surgery (D Recommendation). Options such as acetaminophen, gabapentin, hydrocodone, and tramadol can be considered in patients who have had bariatric surgery if the medications are clinically appropriate otherwise.

Ref: Mechanick JI, Youdim A, Jones DB, et al: Clinical practice guidelines for the perioperative nutritional, metabolic, and nonsurgical support of the bariatric surgery patient—2013 update: Cosponsored by American Association of Clinical Endocrinologists, the Obesity Society, and American Society for Metabolic & Bariatric Surgery. *Obesity (Silver Spring)* 2013;21(Suppl 1):S1-S27. 2) Schroeder R, Harrison TD, McGraw SL: Treatment of adult obesity with bariatric surgery. *Am Fam Physician* 2016;93(1):31-37.

Item 47

ANSWER: B

It is important to distinguish serious illness from benign causes of proteinuria, which are the most common etiology in children. Confirming the presence of proteinuria is the next step in this case because functional (exercise/stress-induced) and orthostatic proteinuria are common types of proteinuria and are transient. A 24-hour urine for protein is a possible option, but would be impractical and burdensome for a healthy-acting 11-year-old. The pediatric nephrology panel of the National Kidney Foundation reported that a spot protein/creatinine ratio is a reliable test for ruling out proteinuria. A specialist referral, blood analysis, and ultrasonography are unnecessary unless persistent proteinuria is identified.

Ref: Hogg RJ, Portman RJ, Milliner D, et al: Evaluation and management of proteinuria and nephrotic syndrome in children: Recommendations from a pediatric nephrology panel established at the National Kidney Foundation conference on proteinuria, albuminuria, risk, assessment, detection, and elimination (PARADE). *Pediatrics* 2000;105(6):1242-1249. 2) Leung AK, Wong AH, Barg SS: Proteinuria in children: Evaluation and differential diagnosis. *Am Fam Physician* 2017;95(4):248-254.

Item 48

ANSWER: B

The only evidence-based treatment that confers significant benefits to children with autism is intensive behavioral interventions, which should be initiated before 3 years of age. Attention-deficit/hyperactivity disorder can be treated with cognitive-behavioral therapy (CBT) but medication is often required. CBT is as effective, if not more effective, than medication for treating anxiety, depression, and trauma-related disorders.

Ref: Coffey SF, Banducci AN, Vinci C: Common questions about cognitive behavior therapy for psychiatric disorders. *Am Fam Physician* 2015;92(9):807-812.

Item 49

ANSWER: A

The recombinant zoster vaccine is preferred over the live zoster vaccine due to its increased efficacy. The recombinant vaccine is estimated to be about 97% effective for preventing shingles, compared to 51% with the live vaccine. It requires two intramuscular doses separated by 2–6 months, compared to only one subcutaneous dose with the live vaccine. It is also slightly more expensive than the live vaccine. Although the recombinant vaccine is not a live vaccine, studies are still ongoing as to whether it is safe to give to immunocompromised patients.

Ref: Le P, Sabella C, Rothberg MB: Preventing herpes zoster through vaccination: New developments. *Cleve Clin J Med* 2017;84(5):359-366. 2) Shingrix: A new herpes zoster vaccine. *Prescriber's Letter* 2017;24(12).

Item 50

ANSWER: D

The increase in opiate-related accidental overdoses has become a significant concern in recent years, prompting the CDC to release updated guidelines for the use of narcotic medications for chronic noncancer pain. There are several concerning issues in this patient's care. Her obstructive sleep apnea, psychiatric ailments, and concurrent use of opiates and benzodiazepines all increase the risk of an accidental overdose. The CDC also warns against using opiates in patients with heart failure, chronic pulmonary diseases, and a personal history of drug or alcohol abuse.

These risks are so great that the CDC recommends that chronic noncancer pain be primarily treated with nonpharmacologic and nonopiate medications. The use of opioids should be reserved for recalcitrant cases under close supervision at the lowest effective dose for the shortest time possible. The CDC also recommends against using opiates in fibromyalgia and neuropathy due to limited efficacy and side-effect profiles (SOR B). The concurrent use of opiates and benzodiazepines should be avoided in nearly all situations (SOR C). Safety should never be compromised for reduced pain and increased functionality.

Ref: Hudson S, Wimsatt LA: How to monitor opioid use for your patients with chronic pain. *Fam Pract Manag* 2014;21(6):6-11. 2) Raleigh MF, Dunn AM: Controlled-release oxycodone for neuropathic pain and fibromyalgia in adults. *Am Fam Physician* 2015;91(5):286-287. 3) Bredemeyer M: CDC develops guideline for opioid prescribing. *Am Fam Physician* 2016;93(12):1042-1043. 4) Wingrove P, Park B, Bazemore A: Rural opioid use disorder treatment depends on family physicians. *Am Fam Physician* 2016;94(7):546. 5) Lembke A, Humphreys K, Newmark J: Weighing the risks and benefits of chronic opioid therapy. *Am Fam Physician* 2016;93(12):982-990.

Item 51

ANSWER: A

According to the CDC, cough is the most common symptom resulting in primary care visits. Chronic cough in adults is defined as one that lasts 8 weeks or more. The workup should include a history focusing on potential triggers, as well as the identification of any red flags. If the physical examination is normal and the patient's history does not indicate the cause of the cough, a chest radiograph is appropriate.

The most common cause of chronic cough in adults is upper airway cough syndrome. Patients might have nasal symptoms such as rhinorrhea or congestion. Physical findings can include swollen turbinates and posterior pharyngeal cobblestoning, or they can be unremarkable. Initial treatment may include the use of decongestants, oral or intranasal antihistamines, intranasal corticosteroids, or saline nasal rinses (SOR C). Symptoms should resolve within a few weeks, and referral for allergy testing can be considered if they are not resolved within 2 months. CT of the sinuses can be considered as well, but sinus radiographs are more specific.

Other common causes of chronic cough include asthma, nonasthmatic eosinophilic bronchitis, and GERD. If asthma is suspected, spirometry is indicated. If spirometry is positive for asthma, a trial of an inhaled bronchodilator is indicated. If there are other indications of GERD such as heartburn, globus sensation, or hoarseness, an antacid or a trial of a proton pump inhibitor is indicated.

Ref: Michaudet C, Malaty J: Chronic cough: Evaluation and management. *Am Fam Physician* 2017;96(9):575-580.

Item 52

ANSWER: D

Hypertonic osmotic laxatives such as milk of magnesia, magnesium citrate, and sodium phosphate draw water into the bowel and should be used with caution in older adults and those with renal impairment because of the risk of electrolyte abnormalities and dehydration in patients with irritable bowel syndrome (IBS). Lactulose, also an osmotic laxative, should be avoided in patients with IBS because it is broken down by colonic flora and produces excessive gas. Polyethylene glycol, a long-chain polymer of ethylene oxide, is a large molecule that causes water to be retained in the colon, which softens the stool and increases the number of bowel movements. It is approved by the FDA for short-term treatment in adults and children with occasional constipation and is commonly prescribed for patients with IBS. It is considered safe and effective for moderate to severe constipation when used either daily or as needed.

Ref: Sultan S, Malhotra A: Irritable bowel syndrome. *Ann Intern Med* 2017;166(11):ITC81-ITC96.

Item 53

ANSWER: C

Distal biceps tendon ruptures are relatively uncommon, accounting for about 3% of tendon ruptures. In a patient with a suspected distal biceps tendon rupture, clinical signs can be unreliable and MRI imaging is the test of choice. Bony abnormalities do not contribute to the evaluation of this tendon. A Speed's test is used to evaluate pain related to the long head of the biceps tendon. Surgical repair is the treatment of choice when the tendon is ruptured. Physical therapy and local corticosteroid injections are not beneficial.

Ref: Churgay CA: Diagnosis and treatment of biceps tendinitis and tendinosis. *Am Fam Physician* 2009;80(5):470-476. 2) Kane SF, Lynch JH, Taylor JC: Evaluation of elbow pain in adults. *Am Fam Physician* 2014;89(8):649-657.

Item 54

ANSWER: C

According to the American Diabetes Association's 2018 guidelines for the management of diabetes, a healthy person with a reasonable life expectancy should have a hemoglobin A_{1c} goal of $<7\%$. Metformin is recommended as first-line therapy as long as there are no contraindications. If the hemoglobin A_{1c} is not at the goal or is $\geq 9\%$, then adding another agent to metformin is recommended. Basal insulin at 10 units/day is an acceptable choice for additional therapy to improve blood glucose control. Diet, exercise, and home monitoring of blood glucose are recommended in addition to starting another agent for blood glucose control.

Ref: American Diabetes Association: 6. Glycemic targets: Standards of medical care in diabetes–2018. *Diabetes Care* 2018;41(Suppl 1):S55-S64. 2) American Diabetes Association: 8. Pharmacologic approaches to glycemic treatment: Standards of medical care in diabetes–2018. *Diabetes Care* 2018;41(Suppl 1):S73-S85.

Item 55

ANSWER: D

Nephrotic syndrome includes peripheral edema, heavy proteinuria, and hypoalbuminemia. Hyperlipidemia also occurs frequently and can be significant. Nephrotic-range proteinuria is a spot urine showing a protein/creatinine ratio >3.0–3.5 mg protein/mg creatinine or a 24-hour urine collection showing >3.0–3.5 g of protein. Testing urine for ketones, pH, specific gravity, or crystals does not help to diagnose nephrotic syndrome.

Ref: Kodner C: Diagnosis and management of nephrotic syndrome in adults. *Am Fam Physician* 2016;93(6):479-485.

Item 56

ANSWER: B

Most orally administered immediate-release opioids such as morphine, oxycodone, and hydromorphone reach their peak effect at about 1 hour, at which time additional medication can be given if the patient is still in pain. Intravenous opioids reach their peak effect at about 10 minutes and intramuscular and subcutaneous opioids at about 20–30 minutes. Additional medication may therefore be given at those intervals if additional pain relief is required.

Ref: Groninger H, Vijayan J: Pharmacologic management of pain at the end of life. *Am Fam Physician* 2014;90(1):26-32.

Item 57

ANSWER: A

The only proven therapy for pulmonary hypertension related to COPD is supplemental oxygen. Supplemental oxygen should be recommended when the PaO_2 is <60 mm Hg, because it has been shown to improve mortality by lowering pulmonary arterial pressures. Treatments effective for pulmonary artery hypertension should not be used. Pulmonary vasodilators such as nifedipine, sildenafil, and bosentan may cause a ventilation-perfusion mismatch. Pulmonary endarterectomy may be indicated for pulmonary hypertension caused by chronic thromboembolic disease.

Ref: Mandel J, Poch D: Pulmonary hypertension. *Ann Intern Med* 2013;158(9):ITC5-1-ITC5-16. 2) Dunlap B, Weyer G: Pulmonary hypertension: Diagnosis and treatment. *Am Fam Physician* 2016;94(6):463-469.

Item 58

ANSWER: E

Diuretics lessen the severity of obstructive sleep apnea and reduce blood pressure. Aldosterone antagonists offer further benefit beyond that of traditional diuretics. Resistant hypertension is common in patients with obstructive sleep apnea. Resistant hypertension is also associated with higher levels of aldosterone, which can lead to secondary pharyngeal edema, increasing upper airway obstruction.

Ref: Torres G, Sánchez-de-la-Torre M, Barbé F: Relationship between OSA and hypertension. *Chest* 2015;148(3):824-832.

Item 59

ANSWER: A

The number needed to treat (NNT) is defined as the number of people who would need to receive an intervention in order for one person to benefit. It is the inverse of the absolute risk reduction (ARR). The ARR is the difference in risk for a disease without and with an intervention. The correct formula for calculating NNT is 1/ARR.

Ref: *Final Recommendation Statement: Obesity in Adults: Screening and Management*. US Preventive Services Task Force, 2016. 2) EBM glossaries. *American Family Physician* website, 2018.

Item 60

ANSWER: C

The Endocrine Society recommends hormonal contraception as the first-line medication for women diagnosed with polycystic ovary syndrome (PCOS) who are experiencing irregular menses, acne, and hirsutism and do not desire pregnancy (SOR A). Metformin may help regulate menses but has not been shown to be as effective as oral hormone therapy. In a 2015 Cochrane review, oral contraceptives were recommended as the most effective treatment for hirsutism. Either letrozole or clomiphene is appropriate for women diagnosed with PCOS who want to become pregnant.

Ref: Williams T, Mortada R, Porter S: Diagnosis and treatment of polycystic ovary syndrome. *Am Fam Physician* 2016;94(2):106-113.

Item 61

ANSWER: A

Despite the prevalence of osteoarthritis of the knee and a myriad of treatment modalities available for those with symptomatic disease, there is very limited evidence to suggest that many of these treatments are effective. There is strong evidence to suggest that self-management programs, strengthening exercises, low-impact aerobic exercises, and neuromuscular education have some benefit. Moderate evidence recommends against the use of needle lavage of the knee; the two main studies of this modality showed little or no benefit. In 15 studies, 14 outcomes were not statistically significant, including three pain and three functional outcomes. There is also moderate evidence to recommend against the use of lateral wedge insoles. Four studies of lateral wedge insoles showed no significant change in pain or function of the knee when compared to neutral insoles. The evidence is inconclusive for platelet-rich plasma injections. A few studies have shown decreased pain in patients after injection, but there was no placebo control, so the effectiveness cannot be adequately assessed. Glucosamine and chondroitin have been shown with strong evidence to be ineffective when compared to placebo.

Ref: American Academy of Orthopaedic Surgeons (AAOS): American Academy of Orthopaedic Surgeons clinical practice guideline on treatment of osteoarthritis of the knee. 2nd ed. American Academy of Orthopaedic Surgeons, 2013.

Item 62

ANSWER: C

According to the Choosing Wisely recommendations from the American Society of Anesthesiologists, opioids should not be used as first-line therapy for chronic noncancer pain. However, more than one-half of patients who receive continuous opioids for 90 days are still receiving them after 4 years. Chronic opioids should not be abruptly discontinued. When discontinuing chronic opioid therapy, the best practice is to reduce the dosage by 5%–10% every 1–4 weeks, but even this may be too fast for some patients.

While controlled substance prescribing plans are considered good practice for long-term opioid use, continuing opioids for this patient would not be good practice given the indication of chronic noncancer pain and the need for safety in her work. Because her use of opioids should be tapered, weekly urine drug screens would continue to be positive and therefore would not be an appropriate management strategy for this patient. NSAIDs are not indicated for this patient due to her history of gastric bypass.

Ref: Lembke A, Humphreys K, Newmark J: Weighing the risks and benefits of chronic opioid therapy. *Am Fam Physician* 2016;93(12):982-990.

Item 63

ANSWER: B

Pain in the shoulder of a young athlete can be caused by many problems, including acromioclavicular strain, biceps tendinitis, glenohumeral instability, and rotator cuff pathology. Although rotator cuff pathologies are the most frequent cause of shoulder pain in adults, they are uncommon in children. Unique to children, however, is a repetitive use injury causing disruption at the proximal growth plate of the humerus. This condition is referred to as Little League shoulder and can be seen on plain radiographs as widening, demineralization, or sclerosis at the growth plate. If the radiograph is normal but suspicion for this condition is high, a bone scan or MRI can be ordered.

Ref: Cassas KJ, Cassettari-Wayhs A: Childhood and adolescent sports-related overuse injuries. *Am Fam Physician* 2006;73(6):1014-1022. 2) Dashe J, Roocroft JH, Bastrom TP, Edmonds EW: Spectrum of shoulder injuries in skeletally immature patients. *Orthop Clin North Am* 2013;44(4):541-551.

Item 64

ANSWER: E

This patient has a recurrent outbreak of genital herpes, and valacyclovir is the preferred treatment. Penicillin G benzathine is a treatment for syphilis, which usually begins as a painless papule that transforms into the classic chancre. Fluconazole and metronidazole are treatments for yeast vaginitis and bacterial vaginitis; these conditions present with itching and a vaginal discharge but not vesicular lesions. Doxycycline is a treatment for *Chlamydia* infection, which is often completely asymptomatic and detected only with screening.

Ref: Groves MJ: Genital herpes: A review. *Am Fam Physician* 2016;93(11):928-934.

Item 65

ANSWER: E

This patient has symptoms and examination findings that are concerning for acute angle-closure glaucoma. Her risk factors include her age, sex, and Asian ancestry. The examination findings include conjunctival redness, corneal edema, a poorly reactive mid-dilated pupil, decreased vision, severe eye pain, headache, and nausea. This condition needs to be evaluated and treated emergently to preserve vision. The examination is not consistent with infectious conjunctivitis, which generally does not cause severe pain, headache, or decreased pupillary response. Conditions such as scleritis or episcleritis may present with similar features, but the pupillary response may help differentiate them from glaucoma. Referral to an ophthalmologist would still be most prudent. This patient's presentation is not consistent with a vasculitis or multiple sclerosis.

Ref: Kasper DL, Fauci AS, Hauser SL, et al (eds): *Harrison's Principles of Internal Medicine*, ed 19. McGraw-Hill, 2015, pp 200, 205. 2) Walls RM, Hockberger RS, Gausche-Hill M, et al (eds): *Rosen's Emergency Medicine: Concepts and Clinical Practice*, ed 9. Elsevier Inc, 2018, p 807.

Item 66

ANSWER: A

Antidepressants in every class (SSRIs, SNRIs, tricyclic antidepressants, and monoamine oxidase inhibitors) have been shown to reduce bulimic symptoms and can be used safely to treat depression, with the exception of bupropion. Bupropion use has been associated with an increased risk of seizures in patients with bulimia and an FDA warning limits its use.

Ref: Katzung B, Trevor A: *Basic & Clinical Pharmacology*, ed 13. McGraw-Hill Education, 2015, pp 510-530. 2) Wellbutrin XL prescribing information. US Food and Drug Administration, 2017.

Item 67

ANSWER: A

Internal tibial torsion usually resolves spontaneously by age 5. Surgery may be considered in patients older than 8 years of age who have a severe residual deformity, especially if it is symptomatic or cosmetically unacceptable. Night splints, shoe modifications, other orthotics, casting, and braces are not recommended for this condition.

Ref: Rerucha CM, Dickison C, Baird DC: Lower extremity abnormalities in children. *Am Fam Physician* 2017;96(4):226-233.

Item 68

ANSWER: D

This patient's history and examination findings are typical for exercise-induced asthma. The most appropriate initial treatment for this condition is an inhaled short-acting β_2-agonist (SABA) 15 minutes before exercise (SOR A). Daily use of an inhaled long-acting β_2-agonist as a single agent is not recommended even for those who continue to experience symptoms when using an inhaled SABA (SOR B). The addition of a daily inhaled corticosteroid is an appropriate consideration for patients who require more than a SABA to control symptoms but these should not be used on an as-needed basis before exercise (SOR B). Use of an antihistamine in an individual with exercise-induced asthma but no known allergies is not recommended (SOR B). Other treatment considerations with weak recommendations include a low-sodium diet, air humidification, and supplemental dietary fish oils.

Ref: Parsons JP, Hallstrand TS, Mastronarde JG, et al: An official American Thoracic Society clinical practice guideline: Exercise-induced bronchoconstriction. *Am J Respir Crit Care Med* 2013;187(9):1016-1027.

Item 69

ANSWER: C

Hereditary hemochromatosis is a genetic disorder of iron regulation and subsequent iron overload. Possible end-organ damage includes cardiomyopathy, cirrhosis of the liver, and hepatocellular carcinoma. Symptoms are often nonspecific early on, but manifestations of iron overload eventually occur. The diagnosis should be suspected in patients with liver disease or abnormal iron studies indicative of iron overload. A liver biopsy can confirm the diagnosis and the degree of fibrosis. Identification of such patients and proper ongoing treatment with phlebotomy may prevent the development of hepatocellular carcinoma and other complications of this disease. There is some data that suggests an association of breast cancer with hereditary hemochromatosis but not with any of the other malignancies listed.

Ref: Crownover BK, Covey CJ: Hereditary hemochromatosis. *Am Fam Physician* 2013;87(3):183-190.

Item 70

ANSWER: E

Yersinia pestis is an aerobic fermentative gram-negative rod. It causes a zoonotic infection with humans as the accidental host. The disease is spread by a bite from a flea vector, direct contact with infected tissue, or inhalation of infectious aerosols from a person with pulmonary plague. Plague occurs in two regions in the western United States. One region includes northern New Mexico, northern Arizona, and southern Colorado, and the other region includes California, southern Oregon, and far western Nevada.

Escherichia coli is also an aerobic fermentative gram-negative rod but it generally causes symptoms of gastroenteritis, hemolytic-uremic syndrome, urinary tract infection, intra-abdominal infection, and meningitis. *E. coli* infection does not have a specific regional distribution. *Listeria monocytogenes* is a gram-positive rod and causes an influenza-like illness with or without gastroenteritis in adults. Infection occurs through ingestion of contaminated food products such as milk, cheese, processed meats, and raw vegetables. Outbreaks can occur in any geographic distribution.

Coxiella burnetii is a gram-negative intracellular bacterium that causes Q fever. Human infections are associated with contact with infected cattle, sheep, goats, dogs, and cats. *Brucella melitensis* is a gram-negative coccobacilli that causes brucellosis. Humans are accidental hosts who can develop the disease from contact with tissues rich in erythritol, and from shedding of organisms in milk, urine, and birth products from goats and sheep.

Ref: Murray P: *Basic Medical Microbiology*. Elsevier, 2017, pp 28-29, 50-51, 54-55, 60, 89. 2) Plague: Maps and statistics. Centers for Disease Control and Prevention, 2018.

Item 71

ANSWER: E

In young adults diagnosed with secondary hypertension, evaluation for fibromuscular dysplasia of the renal arteries with MR angiography or CT angiography is indicated (SOR C). The aldosterone/renin ratio is the most sensitive test to diagnose primary hyperaldosteronism. Renal ultrasonography is an indirect test that is not as sensitive or specific for fibromuscular dysplasia. Serum creatinine elevation shows renal involvement but does not identify the cause. Testing for metanephrines is indicated only if a pheochromocytoma is suspected.

Ref: Charles L, Triscott J, Dobbs B: Secondary hypertension: Discovering the underlying cause. *Am Fam Physician* 2017;96(7):453-461.

Item 72

ANSWER: E

Because debilitating knee osteoarthritis is a frequent health concern in older adults, physicians should try to identify and possibly modify factors that increase the risk for this condition. Pooled data from many large studies has been sufficient to clearly identify several major risk factors for the development and progression of osteoarthritis of the knees. Overweight and obesity have consistently been found to approximately double the risk for developing knee osteoarthritis. Other factors that have been identified as risk factors include female sex, advancing age (50–75 years of age), and previous trauma. Smoking, inactivity, moderate physical activity, and socioeconomic status have not been shown to affect one's risk for developing knee osteoarthritis. However, any of these factors in the extreme may be detrimental to joint health in general.

Ref: Ringdahl E, Pandit S: Treatment of knee osteoarthritis. *Am Fam Physician* 2011;83(11):1287-1292. 2) Hauk L: Treatment of knee osteoarthritis: A clinical practice guideline from the AAOS. *Am Fam Physician* 2014;89(11):918-920.

Item 73

ANSWER: E

This patient has asymptomatic bacteriuria and does not require antibiotic therapy at this time. In women age 70 and older the incidence of asymptomatic bacteriuria is 16%–18%, and in chronically incontinent and disabled older adults rates may reach 43%. Symptoms that raise concern for a urinary tract infection (UTI) include acute dysuria, new or worsening urinary urgency or frequency, new incontinence, gross hematuria, and suprapubic or costovertebral angle tenderness. General malaise in the absence of these symptoms is unlikely to represent a UTI and unlikely to improve with antibiotic therapy.

When antibiotic therapy is indicated for a UTI, trimethoprim/sulfamethoxazole remains the first-line agent. Nitrofurantoin may be used for those with a creatinine clearance >40 mL/min/1.73 m^2. Ciprofloxacin is recommended as a first-line agent only in communities with trimethoprim/sulfamethoxazole resistance rates above 10%–20%. Fosfomycin may be used for more highly resistant organisms. The choice of antibiotic should be guided by bacterial pathogens if they are known.

Ref: Mody L, Juthani-Mehta M: Urinary tract infections in older women: A clinical review. *JAMA* 2014;311(8):844-854.

Item 74

ANSWER: B

The panel members of the Eighth Joint National Committee for the management of blood pressure recommended that ACE inhibitors should be initiated for renal protection in adults with diabetes mellitus, hypertension, and microalbuminuria. This patient appears to be in an early stage of nephropathy, and ACE inhibitors will reduce the decline in renal function. β-Blockers are no longer recommended for first-line treatment. In white patients who do not have diabetes, therapy may be started with ACE inhibitors, thiazide diuretics, or calcium channel blockers.

Ref: James PA, Oparil S, Carter BL, et al: 2014 evidence-based guideline for the management of high blood pressure in adults: Report from the panel members appointed to the Eighth Joint National Committee (JNC 8). *JAMA* 2014;311(5):507-520.

Item 75

ANSWER: B

CT angiography (CTA) is the recommended imaging procedure for the diagnosis of acute mesenteric vascular disease. The procedure can also identify other possible intra-abdominal causes of pain. Duplex ultrasonography is also accurate, especially for proximal lesions, but can be difficult to perform in patients with obesity, bowel gas, and marked calcification of the vessels, and may be problematic in patients presenting acutely, due to the length of the study and the abdominal pressure required. It is more useful in cases of suspected chronic mesenteric ischemia. Endoscopy is often normal in acute ischemia and may not reach the ischemic section of bowel. MR angiography may be useful, but it takes longer to perform than CTA and lacks the necessary resolution. Catheter angiography is required for endovascular therapies such as thrombolysis or angioplasty with or without stenting, but is usually not performed for making the initial diagnosis in the acute setting.

Ref: Clair DG, Beach JM: Mesenteric ischemia. *N Engl J Med* 2016;374(10):959-968.

Item 76

ANSWER: C

Family physicians are often asked to provide contraception and need to be familiar with the current methods and contraindications. Estrogen-containing products, including the contraceptive patch and the vaginal ring, are contraindicated in smokers >35 years of age and in patients with migraine with aura.

Ref: Curtis KM, Tepper NK, Jatlaoui TC, et al: US medical eligibility criteria for contraceptive use, 2016. *MMWR Recomm Rep* 2016;65(3):62.

Item 77

ANSWER: B

Patients who are resistant to change require skillful management. Motivational interviewing is a technique that has been shown to improve the therapeutic physician-patient alliance and help to engage patients in their own care. The other options listed are not helpful and may damage the therapeutic relationship.

Ref: Cannarella Lorenzetti R, Jacques CH, Donovan C, et al: Managing difficult encounters: Understanding physician, patient, and situational factors. *Am Fam Physician* 2013;87(6):419-425.

Item 78

ANSWER: A

This patient initially showed signs of acute mountain sickness. These include headache in an unacclimated person who recently arrived at an elevation >2500 m (8200 ft), plus one or more of the following: anorexia, nausea, vomiting, insomnia, dizziness, or fatigue. The patient's condition then deteriorated to high-altitude cerebral edema, defined as the onset of ataxia and/or altered consciousness in someone with acute mountain sickness. The management of choice is a combination of descent and supplemental oxygen. Often, a descent of only 500–1000 m (1600–3300 ft) will lead to resolution of acute mountain sickness. Simulated descent with a portable hyperbaric chamber also is effective, but descent should not be delayed while awaiting helicopter delivery. If descent and/or administration of oxygen is not possible, medical therapy with dexamethasone and/or acetazolamide may reduce the severity of symptoms. Nifedipine has also been shown to be helpful in cases of high-altitude pulmonary edema where descent and/or supplemental oxygen is unavailable.

Ref: Walls RM, Hockberger RS, Gausche-Hill M, et al (eds): *Rosen's Emergency Medicine: Concepts and Clinical Practice*, ed 9. Elsevier Inc, 2018, pp 1791-1793, 1797-1798.

Item 79

ANSWER: C

This patient most likely has a basal cell carcinoma, which can be proven by a shave biopsy. Given its size and location, Mohs surgery would be the preferred treatment. It also has the highest cure rate of any of the options listed, including a standard wide excision, electrodesiccation and curettage, photodynamic therapy, and radiation therapy. It has a 99% cure rate for primary basal cell cancers, compared with just over 91% for other methods. Photodynamic therapy and radiation therapy should be used for lesions such as this only if surgery is not an option due to medical comorbidities and/or patient preference.

Ref: Firnhaber JM: Diagnosis and treatment of basal cell and squamous cell carcinoma. *Am Fam Physician* 2012;86(2):161-168.

Item 80

ANSWER: A

This 55-year-old patient is undergoing a low-risk procedure. While her diabetes mellitus is a cardiovascular risk factor, she is asymptomatic, her age lowers her risk, and her functional status is good. She should be allowed to undergo cataract surgery with no further evaluation. Guidelines from the American College of Cardiology and the American Heart Association recommend that the patient be allowed to undergo surgery with no further testing.

Ref: Fleisher LA, Fleischmann KE, Auerbach AD, et al: 2014 ACC/AHA guideline on perioperative cardiovascular evaluation and management of patients undergoing noncardiac surgery: A report of the American College of Cardiology/American Heart Association Task Force on practice guidelines. *J Am Coll Cardiol* 2014;64(22):e77-e137. 2) Arnold MJ, Beer J: Preoperative evaluation: A time-saving algorithm. *J Fam Pract* 2016;65(10):702-710.

Item 81

ANSWER: E

The novel anticoagulants (NOACs) require dosage adjustments based on renal function. There are no dosing recommendations for NOACs based on liver function or albumin level. The INR is used to adjust warfarin dosing and the partial thromboplastin time is used to adjust heparin dosing.

Ref: Steinberg BA, Piccini JP: Anticoagulation in atrial fibrillation. *BMJ* 2014;348:g2116. 2) Gutierrez C, Blanchard DG: Diagnosis and treatment of atrial fibrillation. *Am Fam Physician* 2016;94(6):442-452.

Item 82

ANSWER: A

For this patient, acamprosate is the most effective medication to help maintain alcohol abstinence. Antidepressants may be beneficial in patients with coexisting depression. The antiemetic ondansetron may also help decrease alcohol consumption in patients with alcohol use disorder.

Ref: Winslow BT, Onysko M, Hebert M: Medications for alcohol use disorder. *Am Fam Physician* 2016;93(6):457-465.

Item 83

ANSWER: E

This patient has risk factors and symptoms that suggest esophageal cancer. According to the Society of Thoracic Surgeons and the National Comprehensive Cancer Network, upper endoscopy with a biopsy of suspicious lesions is the recommended initial evaluation for symptoms of esophageal cancer (SOR C). Esophagography would be appropriate in patients unable to undergo endoscopy but would not be the preferred test. CT of the abdomen is not indicated in the initial evaluation for esophageal cancer but can be integrated with a PET scan for staging. Esophageal manometry is reserved for patients with dysphagia if upper endoscopy does not establish a diagnosis and a motility disorder is suspected. Increasing the dosage of the proton pump inhibitor would not be an appropriate treatment for this patient's condition and may delay the diagnosis and treatment of suspected cancer if the patient is not referred promptly for upper endoscopy.

Ref: Short MW, Burgers KG, Fry VT: Esophageal cancer. *Am Fam Physician* 2017;95(1):22-28.

Item 84

ANSWER: D

This adolescent has findings of Marfan syndrome. It is associated with arachnodactyly, an arm span greater than height, a high arched palate, kyphosis, lenticular dislocation, mitral valve prolapse, myopia, and pectus excavatum. The cardiac examination may reveal an aortic insufficiency murmur, or a murmur associated with mitral valve prolapse. Cardiovascular defects are progressive, and aortic root dilation occurs in 80%–100% of affected individuals. Aortic regurgitation becomes more common with increasing age.

Ref: Mirabelli MH, Devine MJ, Singh J, Mendoza M: The preparticipation sports evaluation. *Am Fam Physician* 2015;92(5):371-376. 2) Kliegman RM, Stanton BF, Geme JW III, et al (eds): *Nelson Textbook of Pediatrics*, ed 20. Elsevier Saunders, 2016, pp 3384-3386.

Item 85

ANSWER: B

While a plain chest radiograph should come first in the workup for hemoptysis, patients with normal radiographs who have a higher risk of malignancy (age ≥40 and a smoking history of ≥30 years) should undergo CT, usually with contrast. If CT is negative, pulmonary consultation and possible bronchoscopy should be pursued. Nasolaryngoscopy is not indicated if the initial history and examination do not indicate an upper airway source. Observation alone is not appropriate in patients with risk factors for malignancy.

Ref: Ketai LH, Mohammed TL, Kirsch J, et al: ACR appropriateness criteria hemoptysis. *J Thorac Imaging* 2014;29(3):W19-W22. 2) Earwood JS, Thompson TD: Hemoptysis: Evaluation and management. *Am Fam Physician* 2015;91(4):243-249.

Item 86

ANSWER: E

This patient has severe symptomatic aortic stenosis. The only therapy shown to improve symptoms and mortality in such patients is an aortic valve replacement. In patients with asymptomatic disease, watchful waiting is usually the recommended course of action. No medications or other therapies have been shown to prevent disease progression or alleviate symptoms. Patients with coexisting hypertension should be managed medically according to accepted guidelines. Diuretics should be used with caution due to their potential to reduce left ventricular filling and cardiac output, which leads to an increase in symptoms.

Ref: Nishimura RA, Otto CM, Bonow RO, et al: 2014 AHA/ACC guideline for the management of patients with valvular heart disease: A report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. *Circulation* 2014;129(23):e521-e643. 2) Grimard BH, Safford RE, Burns EL: Aortic stenosis: Diagnosis and treatment. *Am Fam Physician* 2016;93(5):371-378.

Item 87

ANSWER: A

The Rome IV criteria are widely used as guidelines to diagnose suspected irritable bowel syndrome. These criteria specify that there should be recurrent abdominal pain associated with two or more additional symptoms at least 1 day per week in the last 3 months. These symptoms include pain related to defecation, a change in stool frequency, or a change in stool form. Pain brought on by eating and increased gas and bloating are observed in irritable bowel syndrome but are not included in the Rome IV criteria. Weight loss and waking at night to defecate are not typically seen in this disorder.

Ref: Mearin F, Lacy BE, Chang L, et al: Bowel disorders. *Gastroenterology* 2016;pii:S0016-5085(16)00222-5. 2) Lacy BE, Patel NK: Rome criteria and a diagnostic approach to irritable bowel syndrome. *J Clin Med* 2017;6(11):pii:E99.

Item 88

ANSWER: C

The U.S. Preventive Services Task Force recommends screening for gestational diabetes mellitus after 24 weeks gestation with a fasting blood glucose level, a 50-g oral glucose challenge, or an assessment of risk factors (A recommendation). Screening at an earlier date receives a rating of insufficient evidence, and screening at later dates is not recommended (SOR C).

Ref: *Final Recommendation Statement: Gestational Diabetes Mellitus, Screening*. US Preventive Services Task Force, 2016.

Item 89

ANSWER: D

A stress fracture in the proximal fifth metatarsal is particularly prone to nonunion and completion of the fracture. Because complete non–weight bearing or surgical intervention may be necessary with this high-risk fracture, MRI is indicated as the most sensitive test. Bone scans are sensitive but nonspecific. Most stress fractures of the metatarsals occur distally and can be managed with a hard shoe initially, with progressive activity as tolerated. NSAIDs are discouraged because of possible effects on fracture healing.

Ref: Pegrum J, Dixit V, Padhiar N, Nugent I: The pathophysiology, diagnosis, and management of foot stress fractures. *Phys Sportsmed* 2014;42(4):87-99.

Item 90

ANSWER: E

Both typical and atypical antipsychotics increase the risk of mortality in patients with dementia. The FDA has a black box warning on these medications, including risperidone, about the increased risk of mortality in patients with dementia. Risperidone is not approved by the FDA for dementia-related psychosis. The typical antipsychotics are more commonly associated with extrapyramidal side effects. Diabetes mellitus and agranulocytosis are associated with the atypical antipsychotics, including risperidone. Periodic monitoring of serum glucose levels and CBCs is recommended.

Ref: Reese TR, Thiel DJ, Cocker KE: Behavioral disorders in dementia: Appropriate nondrug interventions and antipsychotic use. *Am Fam Physician* 2016;94(4):276-282. 2) Risperdal prescribing information. US Food and Drug Administration, revised 2017.

Item 91

ANSWER: B

Since many patients with diabetes mellitus are obese, the impact of medications on the patient's weight is important to consider. Treatment with sulfonylureas, including glimepiride, is associated with weight gain. Empagliflozin, liraglutide, metformin, and sitagliptin are not associated with weight gain. In particular, the SGLT2 inhibitors such as empagliflozin and the GLP1 agonists such as liraglutide are associated with clinically significant weight loss.

Ref: George CM, Brujin LL, Will K, Howard-Thompson A: Management of blood glucose with noninsulin therapies in type 2 diabetes. *Am Fam Physician* 2015;92(1):27-34.

Item 92

ANSWER: E

This patient's EKG shows atrial fibrillation with a rapid ventricular response. A TSH level should be obtained in all patients presenting with acute atrial fibrillation, because patients with subclinical hyperthyroidism have a threefold increased risk of developing atrial fibrillation. D-dimer has a negative predictive value in the diagnosis of pulmonary embolism. Elevated troponin is a diagnostic marker of acute myocardial infarction and a troponin level should be obtained when acute coronary syndrome is being considered as a cause of acute atrial fibrillation. Elevated lactic acid is associated with sepsis. BNP levels should be ordered if heart failure is suspected (SOR C).

Ref: Selmer C, Olesen JB, Hansen ML, et al: The spectrum of thyroid disease and risk of new onset atrial fibrillation: A large population cohort study. *BMJ* 2012;345:e7895. 2) Zipes DP, Libby P, Bonow RO, et al (eds): *Braunwald's Heart Disease: A Textbook of Cardiovascular Medicine*, ed 11. Elsevier Health Sciences, p 1807.

Item 93

ANSWER: A

This patient's history and the examination support the diagnosis of adolescent physiologic gynecomastia. The most appropriate next step is follow-up with this patient in 6–12 months. One-half of all adolescent males will experience some form of gynecomastia. This condition is often bilateral, but it is more common on the left side if it is unilateral. It will typically resolve 6–24 months after onset. Patients should be asked about medications and supplements, because these may be a cause of nonphysiologic breast enlargement. Concerning factors include persistence for longer than 2 years; hard, immobile, nontender masses; masses >5 cm; nipple discharge; testicular masses; and systemic symptoms such as weight loss. Evaluation for persistent gynecomastia can include laboratory studies to exclude hepatic, renal, and thyroid disorders, and can progress to include tests to detect gonadotropin and hormone-related tumors and disorders. Imaging and/or a biopsy would be indicated if signs of a carcinoma were noted. The additional options listed are not indicated at this point, although they are a part of the recommended algorithm for further evaluation and treatment considerations.

Ref: Dickson G: Gynecomastia. *Am Fam Physician* 2012;85(7):716-722.

Item 94

ANSWER: B

Seborrheic dermatitis is commonly seen in the office setting and affects the scalp, eyebrows, nasolabial folds, and anterior chest. The affected skin appears as erythematous patches with white to yellow greasy scales. The etiology is not exactly known, but it is likely that the yeast *Malassezia* plays a role. Topical antifungals are effective and recommended as first-line agents. Topical low-potency corticosteroids are also effective alone or when used in combination with topical antifungals, but they should be used sparingly due to their adverse effects. The other agents listed have no role in the management of seborrheic dermatitis (SOR A).

Ref: Clark GW, Pope SM, Jaboori KA: Diagnosis and treatment of seborrheic dermatitis. *Am Fam Physician* 2015;91(3):185-190.

Item 95

ANSWER: C

The U.S. Preventive Services Task Force (USPSTF) recommends one-time screening for hepatitis C virus infection for adults born between 1945 and 1965. Abdominal aortic aneurysm screening with ultrasonography is recommended for men 65–75 years of age who have any history of smoking. The USPSTF recommends annual screening for lung cancer with low-dose CT in adults 55–80 years of age who have a 30-pack-year smoking history and currently smoke or have quit within the past 15 years. Fall risk screening is recommended in community-dwelling adults 65 years of age or older.

Ref: USPSTF A and B Recommendations. US Preventive Services Task Force, 2018.

Item 96

ANSWER: E

This patient has peripartum depression. All women should be screened for depression during pregnancy and the postpartum period (SOR B). Reassurance may be appropriate for the baby blues, which usually start 2–3 days after birth and last less than 10 days. First-time mothers, adolescent mothers, and mothers who have experienced a traumatic delivery may benefit from home health visits or peer support to prevent but not treat peripartum depression. Mild to moderate peripartum depression can be treated with psychotherapy or SSRIs, with consideration of medications with the lowest serum medication levels in breastfed infants. Tricyclic antidepressants such as trazodone are not considered first-line treatment for peripartum depression.

Ref: Langan R, Goodbred AJ: Identification and management of peripartum depression. *Am Fam Physician* 2016;93(10):852-858.

Item 97

ANSWER: D

The American College of Rheumatology recommends methotrexate, a nonbiologic disease-modifying antirheumatic drug (DMARD), as a first-line agent in the treatment of rheumatoid arthritis in the absence of contraindications, such as underlying liver disease. Starting DMARDs within 3 months of the onset of rheumatoid arthritis symptoms is more likely to result in sustained remissions. The addition of short-term prednisone is indicated in select cases when disease activity is high. The use of biological agents such as adalimumab, etanercept, and others is indicated only in refractory cases and in patients who cannot tolerate nonbiologic DMARDs.

Ref: Wasserman A: Rheumatoid arthritis: Common questions about diagnosis and management. *Am Fam Physician* 2018;97(7):455-462.

Item 98

ANSWER: A

Family physicians are often consulted for perioperative medical management. Studies have shown decreased perioperative mortality in patients who continue statins and in patients with clinical indications for statin therapy who start statins prior to undergoing vascular or high-risk surgeries such as joint replacement. A meta-analysis of 223,000 patients showed a significant reduction in perioperative mortality in patients receiving statin therapy versus placebo who underwent noncardiac surgical procedures. This patient has a clinical indication (multiple risk factors) to start statin therapy now.

Ref: Fleisher LA, Fleischmann KE, Auerbach AD, et al: 2014 ACC/AHA guideline on perioperative cardiovascular evaluation and management of patients undergoing noncardiac surgery: Executive summary: A report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. *Circulation* 2014;130(24):2215-2245. 2) Mikhail MA, Mohabbat AB, Ghosh AK: Perioperative cardiovascular medication management in noncardiac surgery: Common questions. *Am Fam Physician* 2017;95(10):645-650.

Item 99

ANSWER: C

Asymptomatic microhematuria is defined as 3 or more RBCs/hpf on a properly collected urine specimen in the absence of an obvious benign cause. Vigorous exercise, viral illness, trauma, and infection have been ruled out as a cause of hematuria in this patient. His renal function is normal. The most appropriate next step in evaluating a patient ≥35 years of age is to perform a urologic evaluation with cystoscopy. Cystoscopy is also recommended for patients of any age who have risk factors for urinary tract malignancy.

The initial examination should also include CT urography with and without contrast. When CT with contrast is contraindicated, an alternative is retrograde pyelography in conjunction with noncontrast CT, MR urography, or ultrasonography. Obtaining urine cytology and urine markers is not recommended as part of the routine evaluation of asymptomatic microhematuria. A repeat urinalysis with microscopy is not needed to confirm asymptomatic microhematuria. According to the American Urological Association, one positive urine sample is sufficient to prompt an evaluation.

Ref: Davis R, Jones JS, Barocas DA, et al: Diagnosis, evaluation and follow-up of asymptomatic microhematuria (AMH) in adults: AUA guideline. *J Urol* 2012;188(6 Suppl):2473-2481. 2) American Urological Association: Fifteen things physicians and patients should question. ABIM Foundation Choosing Wisely campaign, 2015.

Item 100

ANSWER: C

This patient's presentation is concerning for hematologic malignancy, in particular multiple myeloma. Along with radiography, the next appropriate step is serum protein electrophoresis. If laboratory work shows a monoclonal spike or if a skeletal survey indicates lytic lesions, referral to an oncologist is indicated for a bone marrow biopsy. MRI of the lumbar spine would be premature and obtaining iron studies, a TSH level, or a vitamin B_{12} level would not adequately address the initial abnormal laboratory studies or facilitate making the diagnosis of multiple myeloma.

Ref: Michels TC, Petersen KE: Multiple myeloma: Diagnosis and treatment. *Am Fam Physician* 2017;95(6):373-383.

Item 101

ANSWER: D

Metformin should be the first medication prescribed for diabetes mellitus when an oral agent is required (SOR A). Metformin can efficiently lower glycemic levels and is linked to weight loss and fewer occurrences of hypoglycemia. It is also less expensive than most other options. If more than one agent is required, continuing metformin is recommended along with the addition of one or more of the following: a sulfonylurea such as glipizide, a thiazolidinedione such as pioglitazone, an SGLT2 inhibitor such as empagliflozin, or a DPP-4 inhibitor such as alogliptin.

Ref: Hauk L: Type 2 diabetes mellitus: ACP releases updated recommendations for oral pharmacologic treatment. *Am Fam Physician* 2017;96(7):472-473. 2) Qaseem A, Barry MJ, Humphrey LL, et al: Oral pharmacologic treatment of type 2 diabetes mellitus: A clinical practice guideline update from the American College of Physicians. *Ann Intern Med* 2017;166(4):279-290. 3) Armstrong C: ADA updates standards of medical care for patients with diabetes mellitus. *Am Fam Physician* 2017;95(1):40-43.

Item 102

ANSWER: D

This patient has symptoms consistent with allergic rhinitis, and the presence of symptoms more than 4 days per week and for more than 4 weeks places her into the persistent symptoms category. In addition to allergen avoidance and patient education, an intranasal corticosteroid should be the first-line treatment for allergic rhinitis with persistent symptoms (SOR A).

The Choosing Wisely recommendations from the American Academy of Otolaryngology-Head and Neck Surgery Foundations include avoiding sinonasal imaging in patients with symptoms limited to a primary diagnosis of allergic rhinitis. Impermeable pillow or mattress covers are often recommended but there is no evidence of any benefit (SOR A). Intranasal saline irrigation is beneficial and can be used as monotherapy for mild intermittent symptoms, but intranasal corticosteroids are likely to provide more benefit for more persistent symptoms. Intranasal antihistamines such as azelastine are more expensive, less effective, and more likely to produce adverse effects than intranasal corticosteroids, so they are not recommended as first-line therapy (SOR B).

Ref: Sur DK, Plesa ML: Treatment of allergic rhinitis. *Am Fam Physician* 2015;92(11):985-992.

Item 103

ANSWER: C

This patient likely has a venous stasis ulceration. The use of compression therapy with a pressure of 30–40 mm Hg is the mainstay of treatment. There is no evidence for the use of systemic antibiotics for lower-extremity ulcerations. Likewise, there is no evidence to support the use of either silver-based or honey-based preparations in ulcerations with no infection. Foam dressings are no more effective than other standard dressings.

Ref: Singer AJ, Tassiopoulos A, Kirsner RS: Evaluation and management of lower-extremity ulcers. *N Engl J Med* 2017;377(16):1559-1567.

Item 104

ANSWER: C

Although lead poisoning in children has decreased over the past few decades it is still a problem in the pediatric population. The most reliable and cost-effective way to protect U.S. children from lead toxicity is primary prevention, which includes reducing or eliminating the sources of lead in the community. Checking serum lead levels after exposures, anticipatory guidance regarding hand washing or dust control, iron and calcium supplementation, and providing cleaning equipment have been shown to have either little or no effect, or they address high lead levels only after the lead poisoning has occurred.

Ref: Council on Environmental Health: Prevention of childhood lead toxicity. *Pediatrics* 2016;138(1):pii:e20161493.

Item 105

ANSWER: D

The use of gadolinium contrast has been associated with acute kidney injury and also with the development of nephrogenic systemic sclerosis in patients with stage 4 or 5 chronic kidney disease. Because of these risks, the FDA recommends avoiding gadolinium contrast in patients with a glomerular filtration rate < 30 mL/min/1.73 m^2, as well as in patients with acute renal failure. The risk of nephrogenic systemic sclerosis is not affected by blood pressure, medications, intravenous hydration, or pretreatment with n-acetylcysteine.

Ref: Rivera JA, O'Hare AM, Harper GM: Update on the management of chronic kidney disease. *Am Fam Physician* 2012;86(8):749-754.

Item 106

ANSWER: D

Postpartum hemorrhage (PPH) is the cause of one-fourth of maternal deaths worldwide and 12% in the United States. It is defined as the loss of 1000 mL of blood or the loss of blood with coinciding signs and symptoms of hypovolemia within 24 hours after delivery. Twenty percent of PPH occurs in patients without risk factors, so methods to prevent this common problem should be in place with every delivery.

Active management of the third stage of labor (AMTSL) is crucial in the prevention of PPH. Administering oxytocin with or soon after the delivery of the anterior shoulder is the most important step of this process (SOR A). Even if oxytocin is used for induction, or as a part of AMTSL, it is still the most effective treatment for PPH (SOR A). Controlled cord traction is part of AMTSL and is necessary for the delivery of the placenta. If a retained placenta occurs it may be necessary to manually remove the placenta with necessary anesthesia. Trauma such as lacerations and episiotomies increases the risk of postpartum hemorrhage, so routine episiotomy should be avoided (SOR A).

Ref: American College of Obstetricians and Gynecologists: ACOG Practice Bulletin: Clinical management guidelines for obstetrician-gynecologists number 183, October 2017: Postpartum hemorrhage. *Obstet Gynecol* 2017;130(4):e168-e186. 2) Evensen A, Anderson JM, Fontaine P: Postpartum hemorrhage: Prevention and treatment. *Am Fam Physician* 2017;95(7):442-449.

Item 107

ANSWER: E

Pulseless ventricular tachycardia (VT) should be treated the same as ventricular fibrillation. The first step is defibrillation. If that is unsuccessful, epinephrine is administered and defibrillation is reattempted. Lidocaine, adenosine, and procainamide may be used for the initial treatment of a wide-complex tachycardia of uncertain type, but should not be used for the initial treatment of pulseless VT. Synchronized cardioversion alone would be indicated for the initial treatment of rapid unstable tachycardia with a pulse.

Ref: Link MS, Berkow LC, Kudenchuk PJ, et al: Part 7: Adult advanced cardiovascular life support: 2015 American Heart Association guidelines update for cardiopulmonary resuscitation and emergency cardiovascular care. *Circulation* 2015;132(18 Suppl 2):S444-S464. 2) Walls RM, Hockberger RS, Gausche-Hill M, et al (eds): *Rosen's Emergency Medicine: Concepts and Clinical Practice*, ed 9. Elsevier Inc, 2018, p 90.

Item 108

ANSWER: E

A Cochrane review found that the long-acting antimuscarinic agent tiotropium improved quality of life and reduced exacerbations and exacerbation-related hospitalizations in patients with underlying COPD. Tiotropium was noted to be superior to long-acting β-agonists such as salmeterol. Albuterol, fluticasone, and ipratropium have not been shown to have these effects (SOR A).

Ref: Chong J, Karner C, Poole P: Tiotropium versus long-acting β-agonists for stable chronic obstructive pulmonary disease. *Cochrane Database Syst Rev* 2012;(9):CD009157. 2) Karner C, Chong J, Poole P: Tiotropium versus placebo for chronic obstructive pulmonary disease. *Cochrane Database Syst Rev* 2014;(7):CD009285.

Item 109

ANSWER: A

Mild asymptomatic elevations (< 5 times the upper limit of normal) of ALT and AST are common in primary care. It is estimated that approximately 10% of the U.S. population has elevated transaminase levels. The most common causes of elevated transaminase levels are nonalcoholic fatty liver disease and alcoholic liver disease. The initial evaluation should include assessment for metabolic syndrome and insulin resistance. Waist circumference, blood pressure, a fasting lipid level, and a fasting glucose level or hemoglobin A_{1c} should be obtained. A CBC with platelets and measurement of serum albumin, iron, total iron-binding capacity, and ferritin levels would also be indicated. Iron studies should be ordered to rule out hereditary hemochromatosis, which is an autosomal recessive disease that causes increased iron absorption in the intestines and release by tissue macrophages.

Ref: Oh RC, Hustead TR, Ali SM, Pantsari MW: Mildly elevated liver transaminase levels: Causes and evaluation. *Am Fam Physician* 2017;96(11):709-715.

Item 110

ANSWER: C

Until recently metformin was contraindicated for patients with renal dysfunction suggested by a creatinine level of 1.5 mg/dL for men and 1.4 mg/dL for women. However, available evidence now supports the use of metformin in individuals with mild to moderate chronic renal disease, defined by the estimated glomerular filtration rate (eGFR). Patients with an eGFR between 45 and 60 mL/min/1.73 m^2 (chronic mild kidney disease) are now permitted to take metformin. Metformin should not be used in patients with an eGFR < 45 mL/min/1.73 m^2 (moderate kidney disease), as lactic acidosis is more likely to occur. The eGFR is used instead of the serum creatinine level because the equation includes age, sex, race, and other parameters.

Ref: Inzucchi SE, Lipska KJ, Mayo H, et al: Metformin in patients with type 2 diabetes and kidney disease: A systematic review. *JAMA* 2014;312(24):2668-2675. 2) Lowes R, Nainggolan L: FDA: Metformin safe for some patients with renal problems. Medscape, 2016. 3) Choby B: Diabetes update: New pharmacotherapy for type 2 diabetes. *FP Essent* 2017;456:27-35.

Item 111

ANSWER: C

Pain located between the myotendinous junction and the insertion of the Achilles tendon that occurs during prolonged walking or running is typical for midsubstance Achilles tendinopathy. The mechanisms resulting in pain are complex and not fully understood but inflammation is believed to contribute little to the process. This is evidenced in part by the ineffectiveness of treatments typically used to reduce inflammation such as NSAIDs and corticosteroids, which are not recommended in the treatment of this condition (SOR A). Other commonly used musculoskeletal therapeutic modalities such as immobilization, ultrasonography, orthotics, massage, and stretching exercises have not been shown to consistently offer significant benefits and are not considered to be first-line therapy for Achilles tendinopathy.

A gastrocnemius-strengthening eccentric exercise program performed in sets of controlled, slow, active release from weight-bearing full extension to full flexion of the foot at the ankle has been shown to reduce pain and improve function in the 60%–90% range, making this the logical first-line treatment for Achilles tendinopathy (SOR A).

The less common insertional Achilles tendinopathy localized to the enthesis is typically more recalcitrant, and immobilization in a walking boot for a period of time may be necessary before eccentric exercise can be tolerated.

Ref: Childress MA, Beutler A: Management of chronic tendon injuries. *Am Fam Physician* 2013;87(7):486-490.

Item 112

ANSWER: E

This patient has sarcoidosis that has been confirmed by a biopsy. He is symptomatic so treatment would be indicated. The recommended initial treatment for sarcoidosis is oral corticosteroids. Anti-infective agents are not appropriate treatment for sarcoidosis. Immunosuppressants are second- and third-line therapy for sarcoidosis and would not be recommended as first-line treatment.

Ref: Soto-Gomez N, Peters JI, Nambiar AM: Diagnosis and management of sarcoidosis. *Am Fam Physician* 2016;93(10):840-848.

Item 113

ANSWER: C

Psychological disorders, including anxiety, depression, and dysthymia, are frequently confused with premenstrual dysphoric disorder, and must be ruled out before initiating therapy. Symptoms are cyclic in true premenstrual dysphoric disorder. The most accurate way to make the diagnosis is to have the patient carefully record daily symptoms on a menstrual calendar for at least two cycles. Dysthymia consists of a pattern of ongoing, mild depressive symptoms that have been present for at least 2 years and are less severe than those of major depression, which is consistent with the findings in this case.

Ref: American Psychiatric Association: *Diagnostic and Statistical Manual of Mental Disorders*, ed 5. American Psychiatric Association, 2013, pp 372-379. 2) Hofmeister S, Bodden S: Premenstrual syndrome and premenstrual dysphoric disorder. *Am Fam Physician* 2016;94(3):236-240.

Item 114

ANSWER: D

Tdap is recommended for all women with each pregnancy, preferably between 27 and 36 weeks gestation. Live vaccines such as varicella and MMR are contraindicated during pregnancy. There is inadequate data to recommend vaccination against pneumococcal disease during pregnancy. Hepatitis B vaccine is recommended during pregnancy only for women at high risk for infection.

Ref: Omer SB: Maternal immunization. *N Engl J Med* 2017;376(13):1256-1267.

Item 115

ANSWER: B

This patient has pseudofolliculitis barbae, which is a common condition affecting the face and neck in people with tightly curled hair. The condition occurs when hairs are cut at an angle and curl in on themselves, creating a foreign body reaction. The condition may progress to scarring and keloid formation. Cessation of hair removal improves the condition. If this is not desired, less aggressive hair trimming is recommended. Clippers generally result in a less close shave and contribute less to pseudofolliculitis barbae. Multi-blade razors, pulling the skin taut, and plucking hairs all result in shorter hair and are likely to exacerbate the problem. The description of the rash is not consistent with secondary infection, so oral cephalexin would not be indicated at this time. Treatment is similar to the treatment of acne, with benzoyl peroxide, topical retinoids, and topical antibiotics having a role, along with topical corticosteroids.

Ref: Kundu RV, Patterson S: Dermatologic conditions in skin of color: Part II. Disorders occurring predominately in skin of color. *Am Fam Physician* 2013;87(12):859-865.

Item 116

ANSWER: B

This patient has severe asymptomatic hypertension (systolic blood pressure ≥180 mm Hg or diastolic blood pressure ≥110 mm Hg). If there were signs or symptoms of acute target organ injury, such as neurologic deficits, altered mental status, chest pain, shortness of breath, or oliguria, hospitalization for a hypertensive emergency would be indicated. Because this patient was asymptomatic and has a known history of hypertension, restarting his prior antihypertensive regimen and following up in 2 weeks would be the most appropriate management option. If he had no past history of hypertension it would be reasonable to consider out-of-office monitoring with an ambulatory device for 2 weeks before initiating treatment. In the absence of acute target organ injury, blood pressure should be gradually lowered to less than 160/100 mm Hg over several days to weeks. Aggressively lowering blood pressure can lead to adverse events such as myocardial infarction, cerebrovascular accident, or syncope, so administering a short-acting antihypertensive medication in the office should be reserved for the management of hypertensive emergencies.

Ref: Gauer R: Severe asymptomatic hypertension: Evaluation and treatment. *Am Fam Physician* 2017;95(8):492-500.

Item 117

ANSWER: D

Relative energy deficiency in sport (RED-S), formerly known as the female athlete triad, is a relatively common condition in female athletes, and is characterized by amenorrhea, disordered eating, and osteoporosis. It is more common in sports that promote lean body mass. Female athletes should be screened for the disorder during their preparticipation evaluations. Individuals who present with one or more components of RED-S should be evaluated for the other components. This patient has a low BMI for her age, which indicates an eating disorder, and secondary amenorrhea, and should be screened for osteoporosis using a DXA scan. The International Society for Clinical Densitometry recommends using the Z-score, rather than the T-score, when screening children or premenopausal women. The T-score is based on a comparison to a young adult at peak bone density, whereas the Z-score uses a comparison to persons of the same age as the patient. A Z-score less than –2.0 indicates osteoporosis. The American College of Sports Medicine defines low bone density as a Z score of –1.0 to –2.0.

An EKG is not required in this patient since she has normal vital signs. Pelvic ultrasonography is not necessary unless an abnormal finding is identified on a pelvic examination. Abdominopelvic CT would be inappropriate given the patient's age and lack of abdominopelvic symptoms such as pain or a mass. A nuclear bone scan likewise is not recommended, as it is not used to diagnose osteoporosis (SOR C).

Ref: Joy EA, Van Hala S, Cooper L: Health-related concerns of the female athlete: A lifespan approach. *Am Fam Physician* 2009;79(6):489-495. 2) Mendelsohn FA, Warren MP: Anorexia, bulimia, and the female athlete triad: Evaluation and management. *Endocrinol Metab Clin North Am* 2010;39(1):155-167. 3) Javed A, Tebben PJ, Fischer PR, Lteif AN: Female athlete triad and its components: Toward improved screening and management. *Mayo Clin Proc* 2013;88(9):996-1009.

Item 118

ANSWER: A

This patient presents with chronic olecranon bursitis. The diagnosis can be made from his history and the physical examination, and no additional workup is indicated at this time. Chronic bursitis is due to repetitive microtrauma, and the olecranon is the most common location. Patients typically have minimal pain, no history of injury, no systemic symptoms, and no signs of acute infection or inflammation. Treatment initially consists of avoiding recurrent trauma by protecting the area with an elbow pad and not leaning on it, as well as cryotherapy, compression of the affected area, and over-the-counter analgesics. If the lesion is inflamed or appears septic then laboratory testing should be performed, including a CBC with differential, a glucose level, an erythrocyte sedimentation rate, and a C-reactive protein level. Joint aspiration and/or ultrasonography may be indicated if the diagnosis is not apparent. A plain radiograph would be indicated to rule out a fracture in a patient with traumatic bursitis.

Ref: Khodaee M: Common superficial bursitis. *Am Fam Physician* 2017;95(4):224-231.

Item 119

ANSWER: D

Enoxaparin is the most appropriate pharmacologic therapy for anticoagulation in patients who are pregnant. Aspirin is not used as treatment for deep vein thrombosis. Apixaban, warfarin, and heparin either have not been studied for use in pregnancy or there is data indicating potential fetal harm.

Ref: Kearon C, Akl EA, Ornelas J, et al: Antithrombotic therapy for VTE disease: CHEST guideline and Expert Panel report. *Chest* 2016;149(2):315-352.

Item 120

ANSWER: C

Melasma is a progressive, macular, nonscaling hypermelanosis of skin exposed to the sun, typically involving the face and dorsal forearms. It is often associated with pregnancy and the use of oral contraceptives or anticonvulsants (SOR C). Some melasma is idiopathic. Women are nine times more likely to be affected than men, and darker-skinned individuals are also at greater risk. There are three common patterns of melasma: centrofacial, malar, and mandibular.

Ref: Plensdorf S, Livieratos M, Dada N: Pigmentation disorders: Diagnosis and management. *Am Fam Physician* 2017;96(12):797-804.

Item 121

ANSWER: B

This patient has signs of mild neurocognitive impairment. In this case one possible contributor to this condition is hypoglycemia. While it is unknown whether minor hypoglycemic events can contribute to dementia, major events have been associated with a greater risk of dementia. The sulfonylurea glyburide carries a risk of significant hypoglycemia, especially in elderly patients. Her hemoglobin A_{1c} of 6.1% correlates with an estimated average glucose of 128 mg/dL, corroborating this concern. Glyburide in particular is listed on the Beers Criteria because of its potential to cause prolonged hypoglycemia.

Ref: Whitmer RA, Karter AJ, Yaffe K, et al: Hypoglycemic episodes and risk of dementia in older patients with type 2 diabetes mellitus. *JAMA* 2009;301(15):1565-1572. 2) Erlich DR, Slawson DC, Shaughnessy AF: "Lending a hand" to patients with type 2 diabetes: A simple way to communicate treatment goals. *Am Fam Physician* 2014;89(4):256, 258. 3) American Geriatrics Society 2015 Beers Criteria Update Expert Panel: American Geriatrics Society 2015 updated Beers Criteria for potentially inappropriate medication use in older adults. *J Am Geriatr Soc* 2015;63(11):2227-2246.

Item 122

ANSWER: D

For patients with left ventricular systolic dysfunction, clinical trials have demonstrated that ACE inhibitors, β-blockers, angiotensin receptor blockers, and aldosterone antagonists decrease hospitalizations and all-cause mortality. In African-American patients, all-cause mortality and hospitalizations have been reduced by hydralazine and isosorbide dinitrate.

Aldosterone antagonists such as spironolactone, as well as β-blockers, decrease mortality in patients with symptomatic heart failure (SOR A). Digoxin improves symptoms of heart failure but does not improve mortality.

Ref: Chavey WE, Hogikyan RV, Van Harrison R, Nicklas JM: Heart failure due to reduced ejection fraction: Medical management. *Am Fam Physician* 2017;95(1):13-20.

Item 123

ANSWER: A

Enoxaparin and other low molecular weight heparins are effective and are the preferred agents for acute and long-term anticoagulation in patients with an active malignancy (SOR B). Warfarin has been shown to be less effective in cancer patients and is not recommended to treat venous thromboembolic disease in this setting (SOR B). The novel oral anticoagulants including rivaroxaban have not been studied in the setting of malignancy and are not recommended.

Ref: Kearon C, Akl EA, Ornelas J, et al: Antithrombotic therapy for VTE disease: CHEST guideline and expert panel report. *Chest* 2016;149(2):315-352.

Item 124

ANSWER: B

A full history and physical examination are indicated for all refugees within 30 days of arrival in the United States, with a professional medical interpreter if needed (SOR C). In addition to addressing medical needs, the focus should be on emotional support and barriers to health care access (SOR C). All refugees should be screened for depression, anxiety, and posttraumatic stress disorder (SOR C). They should also be screened for anemia, hypertension, impaired fasting glucose, nutritional deficiencies, tuberculosis, and COPD (SOR C). If there is no vaccination documentation, routine vaccines should be provided except for varicella and hepatitis B. Serology should be performed before these vaccines are administered (SOR C).

Ref: Mishori R, Aleinikoff S, Davis D: Primary care for refugees: Challenges and opportunities. *Am Fam Physician* 2017;96(2):112-120.

Item 125

ANSWER: D

An AST (SGOT) to ALT (SGPT) ratio greater than 2:1 suggests alcoholic liver disease, and a ratio of 3:1 or higher is highly suggestive of alcoholic liver disease. With most hepatocellular disorders, including nonalcoholic fatty liver disease, viral hepatitis, and iron overload disorder, the patient will have an AST to ALT ratio < 1.

Ref: Kasper DL, Fauci AS, Hauser SL, et al (eds): *Harrison's Principles of Internal Medicine*, ed 19. McGraw-Hill, 2015, p 1997.

Item 126

ANSWER: B

This patient is a nonsmoker but has typical symptoms and findings of COPD. α_1-Antitrypsin deficiency should be considered in patients with very premature COPD or in patients without risk factors for COPD such as smoking, secondhand smoke exposure, or other smoke exposure. Dyspnea would be present and lung function would be normal in patients with primary pulmonary hypertension or hypertrophic obstructive cardiomyopathy. Hemochromatosis may cause liver function abnormalities but not abnormal lung function. Allergic bronchopulmonary aspergillosis is associated with asthma, not COPD.

Ref: Gentry S, Gentry B: Chronic obstructive pulmonary disease: Disease and management. *Am Fam Physician* 2017;95(7):433-441.

Item 127

ANSWER: E

Carpal tunnel syndrome is the most common entrapment neuropathy of the upper extremity. It is caused by compression of the median nerve as it travels through the carpal tunnel. Classically, patients with this condition experience pain and paresthesias in the distribution of the median nerve, which includes the palmar aspect of the thumb, index, and middle fingers, and the radial half of the ring finger. In more severe cases motor fibers are affected, leading to weakness of thumb abduction and opposition. Sensation over the thenar eminence should be normal in patients with carpal tunnel syndrome because it is in the distribution of the palmar cutaneous branch of the median nerve, which branches off proximal to the carpal tunnel.

Ref: Wipperman J, Goerl K: Carpal tunnel syndrome: Diagnosis and management. *Am Fam Physician* 2016;94(12):993-999.

Item 128

ANSWER: E

Perioperative management of chronic anticoagulation requires an assessment of the patient's risk for thromboembolism and the risk of bleeding from the surgical procedure. High-risk patients include those with mechanical heart valves, a stroke or TIA within the past 3 months, venous thromboembolism within the past 3 months, or coronary stenting within the previous 12 months. High-risk patients require bridging therapy with low molecular weight heparin, while patients at low risk do not require bridging anticoagulation. For low-risk patients, it is recommended that warfarin be discontinued 5 days prior to surgery and restarted 12–24 hours postoperatively. This patient is at low risk for thromboembolism because her CHA_2DS_2-VASc score is 3. A patient with atrial fibrillation should receive bridging therapy with a CHA_2DS_2-VASc score ≥6. This patient's surgery is associated with a high risk for bleeding, so it is preferable to stop her warfarin 5 days before the operation.

Ref: Douketis JD, Spyropoulos AC, Spencer FA, et al: Perioperative management of antithrombotic therapy: Antithrombotic therapy and prevention of thrombosis, 9th ed: American College of Chest Physicians evidence-based clinical practice guidelines. *Chest* 2012;141(2 Suppl):e326S-e350S. 2) January CT, Wann LS, Alpert JS, et al: 2014 AHA/ACC/HRS guideline for the management of patients with atrial fibrillation: A report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines and the Heart Rhythm Society. *J Am Coll Cardiol* 2014;64(21):e1-e76.

Item 129

ANSWER: D

Solid but not liquid dysphagia suggests a structural lesion. A location in the chest indicates esophageal dysphagia. Endoscopy is the single most useful test for esophageal dysphagia and can visualize mucosal lesions better than barium radiography. Therapy can also be performed during the procedure. A fluoroscopic swallowing study would be indicated if the patient's history pointed to oral or pharyngeal dysphagia. Even if it is thought that the dysphagia is caused by a motility disorder, endoscopy is still preferred, because neoplastic and inflammatory conditions can produce spasm and motility symptoms. Manometry can be performed if endoscopy does not adequately explain the symptoms.

Ref: Kasper DL, Fauci AS, Hauser SL, et al (eds): *Harrison's Principles of Internal Medicine*, ed 19. McGraw-Hill, 2015, pp 254-258.

Item 130

ANSWER: A

This patient most likely has Henoch-Schönlein purpura. In addition to close observation, the only treatment is supportive care, including adequate oral hydration. There is no indication for antibiotics, and oral corticosteroids have not been shown to be beneficial. In patients with progressive renal impairment, referral to a nephrologist is warranted, but given this patient's normal renal function at this time it is not indicated. A skin biopsy of the purpura would most likely show a leukocytoclastic vasculitis and would not help in the diagnosis.

Ref: Trnka P: Henoch-Schönlein purpura in children. *J Paediatr Child Health* 2013;49(12):995-1003.

Item 131

ANSWER: C

This patient has symptoms consistent with croup, a lower respiratory infection that is common in the winter months in children ages 6 months to 3 years. The diagnosis is clinical and should be suspected in children with a history of a sudden onset of a deep cough, hoarseness, and a low-grade fever. Randomized studies have shown that even with mild croup (an occasional barking cough with no stridor at rest), oral corticosteroids provide some benefit.

A Cochrane review of two randomized trials with a total of 2024 patients found that chest radiographs did not change the outcome of ambulatory children with lower respiratory tract infections. A patient such as this would not need antiviral treatment for influenza.

Ref: Bjornson CL, Johnson DW: Croup in children. *CMAJ* 2013;185(15):1317-323. 2) Smith DK, McDermott AJ, Sullivan JF: Croup: Diagnosis and management. *Am Fam Physician* 2018;97(9):575-580.

Item 132

ANSWER: B

Hypoxemia following an acute illness is often short-lived and as many as half the patients prescribed home oxygen on discharge from the hospital will not meet criteria supporting continuation after 3 months. For this group of patients there is no apparent benefit derived from supplemental oxygen once their oxygen saturation is 88% or greater on room air. Potential harmful effects of continuing unnecessary home oxygen include decreased mobility, falls, house fires, and mucosal irritation, and oxygen toxicity must be considered as well. Continuing home oxygen beyond what is needed also results in a misallocation of resources. According to the American Thoracic Society and the American College of Chest Physicians, prescriptions for supplemental home oxygen should not be renewed for patients who have recently been hospitalized for acute illnesses without assessing them for ongoing hypoxemia.

Ref: Wiener RS, Ouellette DR, Diamond E, et al: An official American Thoracic Society/American College of Chest Physicians policy statement: The Choosing Wisely top five list in adult pulmonary medicine. *Chest* 2014;145(6):1383-1391.

Item 133

ANSWER: B

In a double-blind randomized trial, letrozole was associated with greater live-birth and ovulation rates compared to clomiphene (SOR A). A Cochrane review indicated that metformin does not increase fertility in patients diagnosed with polycystic ovary syndrome (PCOS). Spironolactone and finasteride are both used to treat PCOS in women who do not desire pregnancy.

Ref: Legro RS, Brzyski RG, Diamond MP, et al: Letrozole versus clomiphene for infertility in the polycystic ovarian syndrome. *N Engl J Med* 2014;371(2):119-129. 2) Williams T, Mortada R, Porter S: Diagnosis and treatment of polycystic ovary syndrome. *Am Fam Physician* 2016;94(2):106-113.

Item 134

ANSWER: E

This patient's age, risk factors, red-flag symptoms, and other clinical findings indicate the need for endoscopy. The Leser-Trélat sign may be defined as the abrupt onset of multiple seborrheic keratoses, which is an unusual finding that often indicates an underlying malignancy, most commonly an adenocarcinoma of the stomach. CT is not an initial approach for diagnosing a suspected malignancy of the stomach or colon. Further skin evaluation and lifestyle changes, which are indicated, will not address the need for evaluation of weight loss and other abnormal symptoms and findings.

Ref: Higgins JC, Maher MH, Douglas MS: Diagnosing common benign skin tumors. *Am Fam Physician* 2015;92(7):601-607. 2) Bernett CN, Schmieder GJ: Leser Trelat sign. StatPearls Publishing, 2017.

Item 135

ANSWER: C

The treatment of Rocky Mountain spotted fever (RMSF) must be started as soon as the diagnosis is suspected in order to decrease mortality. Doxycycline is the only approved therapy for RMSF for individuals of all ages, including children < 8 years of age. Of the other options listed, only rifampin and chloramphenicol have been used for the treatment of RMSF, but they are not FDA approved.

Providing supportive care or waiting for confirmation of the diagnosis would not be appropriate. Laboratory tests such as a CBC and chemistries can be helpful in looking for other causes of a patient's symptoms but findings will not be specific for RMSF. Serologies may be helpful but are not available immediately and may be negative early in the disease process.

Ref: Biggs HM, Behravesh CB, Bradley KK, et al: Diagnosis and management of tickborne rickettsial diseases: Rocky Mountain spotted fever and other spotted fever group rickettsioses, ehrlichioses, and anaplasmosis—United States. *MMWR Recomm Rep* 2016;65(2):1-44.

Item 136

ANSWER: B

Metformin should be used as first-line therapy in type 2 diabetes to reduce microvascular complications, assist in weight management, reduce the risk of cardiovascular events, and reduce the risk of mortality in patients (SOR A). Patients who are intolerant of metformin are unlikely to be successful with a third trial of that agent. Empagliflozin, an SGLT2 inhibitor, is considered a second-line choice for patients who are intolerant of metformin. Both sitagliptin, a DPP-4 inhibitor, and liraglutide, a GLP-1 receptor agonist, should be avoided or used with caution in patients with a history of pancreatitis.

Ref: George CM, Brujin LL, Will K, Howard-Thompson A: Management of blood glucose with noninsulin therapies in type 2 diabetes. *Am Fam Physician* 2015;92(1):27-34. 2) Reusch JE, Manson JE: Management of type 2 diabetes in 2017: Getting to goal. *JAMA* 2017;317(10):1015-1016. 3) Gomez-Peralta F, Abreu C, Lecube A, et al: Practical approach to initiating SGLT2 inhibitors in type 2 diabetes. *Diabetes Ther* 2017;8(5):953-962.

Item 137

ANSWER: E

Head lice is a relatively common infestation in school-aged children and adolescents, but it is often unnecessarily feared and affected children are stigmatized. Since transmission rates are relatively low in the classroom setting and treatments can be expensive and difficult, children suspected of having head lice should remain in class and should not be treated unless there is a clear diagnosis. Nits are louse eggs and do not necessarily represent an active, infectious case of head lice. Children's privacy should be respected appropriately, and in most cases there is no need to notify an entire class or school of the presence of a case of lice.

Ref: Devore CD, Schutze GE; Council on School Health and Committee on Infectious Diseases, American Academy of Pediatrics: Head lice. *Pediatrics* 2015;135(5):e1355-e1365.

Item 138

ANSWER: C

Several factors can alter the hemoglobin A_{1c} value, including variability and erythrocyte lifespan. When the mean erythrocyte lifespan is increased by a condition such as asplenia, hemoglobin A_{1c} increases because of increased RBC exposure time for glycation. Conversely, when the mean erythrocyte lifespan is decreased by conditions such as hemolytic anemia, hemoglobin A_{1c} is decreased because of reduced RBC exposure time for glycation. Conditions that decrease erythropoiesis, such as iron deficiency anemia, increase the mean age of the RBC, thereby increasing hemoglobin A_{1c}. Severe chronic kidney disease may increase RBC glycation through lipid peroxidase of hemoglobin and by extending the erythrocyte lifespan due to decreased erythropoietin levels, causing a false elevation of hemoglobin A_{1c}. Vitamin B_{12} deficiency also decreases erythropoiesis and leads to falsely elevated hemoglobin A_{1c}.

Ref: O'Keeffe DT, Maraka S, Rizza RA: HbA_{1c} in the evaluation of diabetes mellitus. *JAMA* 2016;315(6):605-606.

Item 139

ANSWER: C

Lithium is a drug with a narrow therapeutic index and a low volume of distribution. Elderly patients are more likely to develop lithium toxicity due to their lower muscle mass and age-related decreased glomerular filtration rate (GFR). Chronic toxicity is more common than acute toxicity and is often precipitated by events causing volume depletion, such as vomiting, diarrhea, and acute gastroenteritis. Drugs that impact renal function or volume status, such as ACE inhibitors, NSAIDs, and diuretics, can also precipitate toxicity. Chronic toxicity often presents with signs and symptoms related to the gastrointestinal tract (nausea, vomiting, and diarrhea, which can further worsen toxicity), heart (arrhythmias and conduction delays), and central nervous system (coarse tremors, ataxia, agitation, and confusion). Albuterol and tiotropium both cause transient tremors and tachycardia, but are not associated with ataxia. Atenolol is associated with bradycardia, but not tremors or ataxia (SOR B).

Ref: Katzung B, Masters S, Trevor A: *Basic and Clinical Pharmacology*, ed 11. The McGraw-Hill Companies Inc, 2009, pp 487-508. 2) Kasper DL, Fauci AS, Hauser SL, et al (eds): *Harrison's Principles of Internal Medicine*, ed 19. McGraw-Hill, 2015, p 2718.

Item 140

ANSWER: E

A 5-day course of antibiotics for community-acquired pneumonia produces the same clinical success rates as longer treatment programs. There is no difference in the rate of clinical improvement, hospital readmissions, or mortality between longer or shorter treatment courses. Patients are often discharged from the hospital before significant clinical improvement occurs, leading both patients and physicians to believe that longer antibiotic courses must be prescribed. Physicians must educate their patients about the benefit of shorter antibiotic courses, including fewer adverse effects, lower cost, and lower rates of bacterial resistance.

Ref: Uranga A, España PP, Bilbao A, et al: Duration of antibiotic treatment in community-acquired pneumonia: A multicenter randomized clinical trial. *JAMA Intern Med* 2016;176(9):1257-1265.

Item 141

ANSWER: C

This patient has intermittent asthma that has become at least moderate persistent as defined by the frequency of her symptoms. The National Asthma Education and Prevention guidelines recommend a moderate-dose inhaled corticosteroid (ICS) with a long-acting bronchodilator as the preferred treatment in moderate persistent asthma. Fluticasone/salmeterol at a dosage of 250/50 μg is the only option that fits this category. Montelukast alone is an alternative treatment for mild persistent asthma (SOR A).

Ref: McCracken JL, Veeranki SP, Ameredes BT, Calhoun WJ: Diagnosis and management of asthma in adults: A review. *JAMA* 2017;318(3):279-290.

Item 142

ANSWER: A

Newborns with sepsis may have focal signs of infection such as pneumonia or respiratory distress syndrome, but they also may have nonfocal signs and symptoms. In the newborn period the two most common causes of neonatal sepsis are group B *Streptococcus* and *Escherichia coli*. *Listeria monocytogenes* was once a more common cause but it is now uncommon. Streptococcal pneumonia is an uncommon cause of sepsis in neonates. *Staphylococcus aureus* and group A *Streptococcus* are not as common but should be considered in newborns with cellulitis.

Ref: Polin RA, Watterberg K, Benitz W, Eichenwald E: The conundrum of early-onset sepsis. *Pediatrics* 2014;133(6):1122-1123. 2) Hay WW Jr, Levin MJ, Deterding RR, Abzug MJ: *Current Diagnosis & Treatment: Pediatrics*, ed 23. McGraw-Hill Education, 2016, pp 1150-1169.

Item 143

ANSWER: D

The U.S. Preventive Services Task Force (USPSTF) recommends screening for major depressive disorder (MDD) in adolescents 12–18 years of age. Screening should be implemented with systems in place to ensure adequate diagnosis, effective treatment, and appropriate follow-up (B recommendation). The USPSTF found adequate evidence that screening instruments for depression in adolescents can accurately identify MDD in this age group in primary care settings, and that the treatment of MDD detected through screening in this age group is associated with moderate benefits. Based on current evidence, the USPSTF also concluded that the evidence is insufficient to assess the balance of benefits and harms from screening for MDD in children 11 years of age and younger.

Ref: *Final Recommendation Statement: Depression in Children and Adolescents: Screening*. US Preventive Services Task Force, 2016.

Item 144

ANSWER: D

Although tinnitus is idiopathic, sensorineural hearing loss is the most common identified cause. It can also be caused by other otologic, vascular, neoplastic, neurologic, pharmacologic, dental, and psychological factors. Almost all patients with tinnitus should undergo audiometry with tympanometry, and some patients require neuroimaging or assessment of vestibular function with electronystagmography. Counseling may also improve the chances of successful subsequent treatment. Several medications can cause tinnitus, but allopurinol is not one of them.

Ref: Yew KS: Diagnostic approach to patients with tinnitus. *Am Fam Physician* 2014;89(2):106-113.

Item 145

ANSWER: D

Penile lesions are usually easily diagnosed from clinical findings. Pearly penile papules are common and benign, and present as small, skin-colored, dome-shaped papules in a circular pattern around the coronal sulcus.

Lichen nitidus is benign but uncommon. It presents as discrete, pinhead-sized hypopigmented papules that are asymptomatic. Papules are often found scattered all over the penis, as well as on the abdomen and upper extremities.

Lichen sclerosus is more common and appears as hypopigmented lesions with the texture of cellophane. The lesions are usually located on the glans or prepuce. Atrophy, erosions, and bullae are common, and patients often present with itching, pain, bleeding, and possibly phimosis or obstructed voiding. Lichen sclerosus is associated with squamous cell cancer in a small percentage of cases.

Carcinoma in situ is a premalignant condition that is more common in uncircumcised males over age 60. Lesions are typically beefy red, raised, irregular plaques and can be found on the glans, meatus, frenulum, coronal sulcus, and prepuce. Lesions can be ulcerated or crusted. Pruritus and pain are common. A biopsy is important for making the diagnosis.

Angiokeratomas are lesions that are usually asymptomatic, circumscribed, red or bluish papules. They may appear solely on the glans of the penis, but are also found on the scrotum, abdomen, thighs, groin, and extremities. They may be misdiagnosed as pearly papules or carcinoma. Treatment is not necessary unless the lesions are bleeding or extensive. It is important to realize that angiokeratomas on the shaft of the penis, the suprapubic region, or the sacral region can be associated with Fabry disease. Patients with this finding should be promptly referred.

Ref: Buechner SA: Common skin disorders of the penis. *BJU Int* 2002;90(5):498-506. 2) Teichman JM, Sea J, Thompson IM, Elston DM: Noninfectious penile lesions. *Am Fam Physician* 2010;81(2):167-174. 3) Habif TP: *Clinical Dermatology: A Color Guide to Diagnosis and Therapy*, ed 6. Elsevier, 2016, p 914.

Item 146

ANSWER: A

Amitriptyline may reduce headache duration and severity compared with placebo for chronic tension-type headaches (SOR B). SSRIs have no proven benefit for headache prophylaxis over placebo or tricyclic antidepressants in patients with chronic daily headaches. Propranolol reduces the frequency of migraine headaches, although its effectiveness for chronic migraine is unclear. Propranolol is not effective for tension headaches. Topiramate can reduce the frequency of chronic migraine headaches by 50% but is not effective for tension-type headaches. OnabotulinumtoxinA has been shown to reduce headache frequency in chronic migraine, but evidence of its effectiveness is lacking for chronic tension-type headaches.

Ref: Yancey JR, Sheridan R, Koren KG: Chronic daily headache: Diagnosis and management. *Am Fam Physician* 2014;89(8):642-648.

Item 147

ANSWER: D

Pregabalin is considered first-line therapy for painful diabetic peripheral neuropathy (SOR A). Based on a meta-analysis, the American Academy of Neurology recommends pregabalin as first-line medication and gabapentin as a first-line alternative. While opioids such as oxycodone may provide a possible benefit in the treatment of neuropathy, the risk of dependency and adverse effects limits their use to patients with pain not relieved by first-line therapies. Acupuncture is not recommended as a first-line therapy due to the lack of high-quality, randomized, controlled trials. Venlafaxine and lidocaine 5% spray are considered second-line therapies.

Ref: Snyder MJ, Gibbs LM, Lindsay TJ: Treating painful diabetic peripheral neuropathy: An update. *Am Fam Physician* 2016;94(3):227-234.

Item 148

ANSWER: E

This patient has alopecia areata, which is a chronic, relapsing, immune-mediated inflammatory disorder affecting hair follicles that results in patchy hair loss. The treatment of choice is intralesional corticosteroid injections. Topical immunotherapy is reserved for patients with extensive disease, such as >50% scalp involvement. Topical corticosteroids are less effective and are usually reserved for children and adults who cannot tolerate intralesional injections. Minoxidil is used for androgenetic alopecia and is less effective for alopecia areata. Oral antifungal drugs are used to treat tinea capitis.

Ref: Phillips TG, Slomiany WP, Allison R: Hair loss: Common causes and treatment. *Am Fam Physician* 2017;96(6):371-378.

Item 149

ANSWER: E

The Surviving Sepsis Campaign recommends that patients with elevated serum lactate or hypotension receive isotonic intravenous fluids such as normal saline or lactated Ringer's solution at an initial rate of 30 mL/kg in the first 3 hours using small boluses of approximately 500 mL. A serum lactate value >36 g/dL (4 mmol/L) is correlated with increased severity of illness and poorer outcomes even if hypotension is not yet present. Patients who are hypotensive or whose serum lactate level is >36 g/dL require intravenous fluids or colloid to expand their circulating volume and effectively restore perfusion pressure. The administration of 30 mL/kg of fluid is recommended as a fluid challenge, which should be started as early as possible in the course of septic shock.

Ref: Rhodes A, Evans LE, Alhazzani W, et al: Surviving Sepsis Campaign: International guidelines for management of sepsis and septic shock: 2016. *Crit Care Med* 2017;45(3):486-552.

Item 150

ANSWER: D

MRI of the breasts should be reserved for women at very high risk for breast cancer such as those with genetic mutations, a history of breast irradiation, or a very high-risk family history. Women who had chest radiation therapy during childhood or adolescence, generally for Hodgkin's disease, are at an extremely high risk for breast cancer.

Ref: Nattinger AB, Mitchell JL: Breast cancer screening and prevention. *Ann Intern Med* 2016;164(11):ITC81-ITC96.

Item 151

ANSWER: D

A recent office-based, randomized, controlled trial demonstrated that over 40% of parents made dosing errors with medicine cups compared to a 17% error rate with an oral syringe. Oral syringes are marked with milliliters, not cubic centimeters, so dosages should use milliliters. Tableware varies in volume and should not be used. Medication bottles are not marked for measuring dosing volumes. Discharge instructions are important, but a written copy of this prescription will not help the guardian measure to the nearest milliliter.

Ref: Yin HS, Parker RM, Sanders LM, et al: Liquid medication errors and dosing tools: A randomized controlled experiment. *Pediatrics* 2016;138(4):e20160357. 2) Ebell MH, Grad R: Top 20 research studies of 2016 for primary care physicians. *Am Fam Physician* 2017;95(9):572-579.

Item 152

ANSWER: B

This patient has celiac disease with both intestinal and extraintestinal manifestations (diarrhea and dermatitis herpetiformis, respectively). Iron deficiency anemia due to chronic blood loss is a common finding in patients with celiac disease.

Eczema herpeticum is the appearance of a herpetic infection complicating eczema. This is a serious acute problem that can be life-threatening in severe cases. Lichen simplex chronicus is a chronic skin condition that is perpetuated by scratching. Lesions are commonly thickened and excoriated. Diarrhea and anemia are not associated with this disorder. While eczema is possible based on the description of the rash, the intestinal manifestations and positive tissue transglutaminase antibody in this patient point to celiac disease. This patient's rash does not suggest cutaneous lupus, which is also unlikely given the negative antinuclear antibody test.

Ref: Pelkowski TD, Viera AJ: Celiac disease: Diagnosis and management. *Am Fam Physician* 2014;89(2):99-105.

Item 153

ANSWER: B

With a history of major depression and mania, this patient would be classified as having bipolar I disorder. SSRIs can be used to treat major depression in these patients, but they are insufficient as monotherapy for controlling or preventing mania. They may even precipitate a manic episode in patients with bipolar I disorder and are contraindicated as monotherapy for these patients (SOR B). Patients with bipolar I disorder are sometimes treated with a combination of antidepressants such as an SSRI, plus a mood stabilizer, which includes anticonvulsants (lamotrigine, divalproex), atypical antipsychotics (quetiapine), or lithium, but this is considered second-line therapy. All of these mood stabilizers are effective in the treatment and prevention of mania. The use of these medications in combination with psychotherapy generally provides the best results in patients with bipolar I disorder.

Ref: Bobo WV: The diagnosis and management of bipolar I and II disorders: Clinical practice update. *Mayo Clin Proc* 2017;92(10):1532-1551.

Item 154

ANSWER: A

Allergic bronchopulmonary aspergillosis (ABPA) affects 1%–12% of immunocompetent patients with asthma and is important to consider in patients with recurrent exacerbations because it can cause permanent lung damage if it is undetected and untreated. The symptoms alone are insufficient for a diagnosis, but this clinical presentation should prompt consideration of the diagnosis, and some of the symptoms and findings noted are included in the diagnostic criteria. The major diagnostic criteria include the presence of asthma or cystic fibrosis and immediate skin reactivity to *Aspergillus* antigens, peripheral eosinophilia, transient pulmonary infiltrates or opacities, central bronchiectasis on a chest radiograph or CT, serum precipitating antibodies to *Aspergillus fumigatus*, and elevated *Aspergillus* IgE- and/or IgG-specific antibodies.

Minor criteria that support the diagnosis include production of brownish mucus plugs, identification of *Aspergillus* in the sputum, and delayed skin sensitivity to *Aspergillus*. Pneumonia is unlikely in this case given recent treatment with a respiratory fluoroquinolone and a lack of common symptoms such as fever, chills, tachycardia, tachypnea, and pleuritic chest pain, along with a cough productive of mucopurulent sputum. The most common symptoms of pulmonary embolism include dyspnea, chest pain, syncope, tachypnea, and a cough. While medication nonadherence may increase asthma exacerbations and wheezing, it would be unlikely to be related to the new brown mucus production.

Ref: Watkins RR, Lemonovich TL: Diagnosis and management of community-acquired pneumonia in adults. *Am Fam Physician* 2011;83(11):1299-1306. 2) Wilbur J, Shian B: Diagnosis of deep venous thrombosis and pulmonary embolism. *Am Fam Physician* 2012;86(10):913-919. 3) Greenberger PA, Bush RK, Demain JG, et al: Allergic bronchopulmonary aspergillosis. *J Allergy Clin Immunol Pract* 2014;2(6):703-708. 4) Mouthon L, Dunogue B, Guillevin L: Diagnosis and classification of eosinophilic granulomatosis with polyangiitis (formerly named Churg-Strauss syndrome). *J Autoimmun* 2014;48-49:99-103.

Item 155

ANSWER: D

Takotsubo cardiomyopathy (TTC) is also known as apical ballooning syndrome and stress-induced cardiomyopathy. It generally occurs in postmenopausal women with a mean age of 62–76 years. The clinical presentation is similar to that of acute coronary syndrome. Evaluation with an EKG, cardiac biomarkers, and imaging is needed to differentiate between these two conditions. This patient presents with classic apical and midsegment left ventricular hypokinesis, or apical ballooning, and a new T-wave inversion with modest elevations in cardiac troponin. While she has an identifiable characteristic emotional stressor, up to one-third of patients with TTC do not have an identifiable stressor.

In this scenario, a negative myocardial perfusion scan makes coronary artery disease or acute coronary syndrome unlikely. Patients with viral myocarditis typically present with fever, myalgia, and signs and symptoms of heart failure following a viral syndrome. Cardiac amyloidosis is a restrictive cardiomyopathy that is typically associated with thickened walls of both ventricles and markedly dilated atria. Patients with acute pericarditis present with chest pain, a pericardial friction rub on examination, an ST-segment elevation on EKG, and a pericardial effusion on echocardiography.

Ref: Scantlebury DC, Prasad A: Diagnosis of Takotsubo cardiomyopathy. *Circ J* 2014;78(9):2129-2139. 2) Kasper DL, Fauci AS, Hauser SL, et al (eds): *Harrison's Principles of Internal Medicine*, ed 19. McGraw-Hill, 2015, pp 1553-1577.

Item 156

ANSWER: C

According to the CDC, the leading causes of cancer death in men from 2011–2015 were lung cancer (53.8 deaths per 100,000 per year), prostate cancer (19.5 deaths per 100,000 per year), colorectal cancer (17.3 deaths per 100,000 per year), and pancreatic cancer (12.6 deaths per 100,000 per year).

Ref: US Cancer Statistics Working Group: US cancer statistics data visualization tool, based on November 2017 submission data (1999–2015). Centers for Disease Control and Prevention and National Cancer Institute, 2018.

Item 157

ANSWER: A

Clonidine (0.1–0.3 mg every 6–8 hours) is a useful adjunct to buprenorphine in the treatment of opioid use disorder to help increase the rates of abstinence and decrease stress-related opioid cravings (SOR C). Naloxone is an opioid antagonist used to treat overdoses. Nifedipine is a common antihypertensive like clonidine but it has no role in the treatment of opioid use disorder. Methadone and naltrexone are used to treat opioid use disorder but neither of these agents would be used simultaneously with buprenorphine.

Ref: Zoorob R, Kowalchuk A, Mejia de Grubb M: Buprenorphine therapy for opioid use disorder. *Am Fam Physician* 2018;97(5):313-320.

Item 158

ANSWER: B

For children with a fever without localizing signs, management depends on the child's age and findings on examination. For children 3–36 months of age with a fever ≤39°C (102°F), reassurance that this is likely a self-limited viral infection is appropriate, with instructions to return if there are new signs or symptoms. If the temperature is >39° and the child has received appropriate vaccines on schedule, then a urinalysis and culture should be performed for all children <6 months of age and for uncircumcised boys <2 years of age. A more extensive workup would be appropriate for children <3 months of age.

Ref: Kliegman RM, Stanton BF, Geme JW III, et al (eds): *Nelson Textbook of Pediatrics*, ed 20. Elsevier Saunders, 2016, pp 1280-1283.

Item 159

ANSWER: E

The core elements of antibiotic stewardship are commitment, action for policy and practice, tracking and reporting, and education and expertise. Delayed prescription strategies for appropriate conditions such as upper respiratory infections and otitis media are effective in reducing antibiotic use. Using evidence-based guidelines, clinical support tools, and triage systems also results in decreased antibiotic use. Using call centers or nurse triage reduces unnecessary visits, and nurses can effectively manage upper respiratory infection symptoms via phone consultations.

Ref: Sanchez GV, Fleming-Dutra KE, Roberts RM, Hicks LA: Core elements of outpatient antibiotic stewardship. *MMWR Recomm Rep* 2016;65(6):1-12.

Item 160

ANSWER: A

The presence of RBC casts on microscopic examination of fresh spun urine sediment indicates acute glomerulonephritis, which may be due to a variety of immunologic, infectious, or postinfectious causes, with the classic example being poststreptococcal glomerulonephritis. Many cases of acute glomerulonephritis require renal biopsies for definitive diagnosis and treatment. Acute pyelonephritis causes bacteriuria, pyuria, and possibly WBC casts. Acute tubular necrosis is usually associated with hypotension, acute blood loss, sepsis, or rhabdomyolysis, and there may be granular or epithelial casts in the urine sediment, but not RBC casts. Acute papillary necrosis is the result of medullary (not cortical) renal injury, and although gross hematuria may be present, there are no RBC casts. Nephrotic syndrome is not associated with hematuria but rather with massive proteinuria (>3.5 g/24 hr).

Ref: Kasper DL, Fauci AS, Hauser SL, et al (eds): *Harrison's Principles of Internal Medicine*, ed 19. McGraw-Hill, 2015, pp 289, 294, 1834-1836.

Item 161

ANSWER: C

Mallet finger, an injury to the distal extensor tendon of the finger at the distal interphalangeal (DIP) joint, is usually caused by forceful flexion of an extended DIP joint. This is frequently the result of being struck by an object such as a ball. The inability to actively extend the DIP joint is a hallmark of mallet finger. The inability to passively extend the DIP joint completely may be an indication of trapped soft tissue or bone that may require surgery. Up to one-third of distal extensor tendon injuries are associated with an avulsion fracture, and if the avulsion is greater than 30% of the joint space, referral to an orthopedist is recommended. Splinting with strict use of the splint and avoidance of any flexion of the DIP joint is the recommended treatment, and is beneficial even with a delayed presentation. Athletic activities may be continued with the splint in place.

Ref: Leggit JC, Meko CJ: Acute finger injuries: Part I. Tendons and ligaments. *Am Fam Physician* 2006;73(5):810-816. 2) Daniels JM, DeCastro A, Stanton RN: Finger injuries: 5 cases to test your skills. *J Fam Pract* 2013;62(6):300-304.

Item 162

ANSWER: C

NSAIDs such as ibuprofen should be used as first-line treatment for the control of pleuritic pain (SOR B). While NSAIDs do not have the analgesic potency of narcotics, they do not cause respiratory suppression or change the patient's sensorium. Corticosteroids should be reserved for patients who cannot take NSAIDs.

Ref: Reamy BV, Williams PM, Odom MR: Pleuritic chest pain: Sorting through the differential diagnosis. *Am Fam Physician* 2017;96(5):306-312.

Item 163

ANSWER: B

Patients with drug-eluting stents should be on dual antiplatelet therapy with aspirin plus a thienopyridine such as clopidogrel for a minimum of 1 year. At the time of this patient's visit, 2 years after the stent placement, there is no indication to continue clopidogrel, but aspirin therapy should be continued indefinitely. All of the patient's other medications have current active indications and should be continued, although if the patient experiences hypoglycemia, the sulfonylurea could be decreased or discontinued.

Ref: Levine GN, Bates ER, Bittl JA, et al: 2016 ACC/AHA guideline focused update on duration of dual antiplatelet therapy in patients with coronary artery disease: A report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines: An update of the 2011 ACCF/AHA/SCAI guideline for percutaneous coronary intervention, 2011 ACCF/AHA guideline for coronary artery bypass graft surgery, 2012 ACC/AHA/ACP/AATS/PCNA/SCAI/STS guideline for the diagnosis and management of patients with stable ischemic heart disease, 2013 ACCF/AHA guideline for the management of ST-elevation myocardial infarction, 2014 AHA/ACC guideline for the management of patients with non–ST-elevation acute coronary syndromes, and 2014 ACC/AHA guideline on perioperative cardiovascular evaluation and management of patients undergoing noncardiac surgery. *Circulation* 2016;134(10):e123-155.

Item 164

ANSWER: B

Both 13-valent pneumococcal conjugate vaccine (PCV13) and 23-valent pneumococcal polysaccharide vaccine (PPSV23) are recommended for patients with chronic renal failure. Indications for PPSV23 alone in immunocompetent persons younger than 65 include chronic lung disease, diabetes mellitus, chronic heart disease, smoking, and alcoholism.

Ref: Kobayashi M, Bennett NM, Gierke R, et al: Intervals between PCV13 and PPSV23 vaccines: Recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR Morb Mortal Wkly Rep* 2015;64(34):944-947.

Item 165

ANSWER: D

Early recognition and effective treatment of acute Bell's palsy (idiopathic facial paralysis) has been shown to decrease the risk of chronic partial paralysis and pain. Corticosteroids have been shown in a meta-analysis to decrease chronic symptoms, but a Cochrane meta-analysis of 10 studies concluded that antiviral medication along with corticosteroids is significantly more effective than corticosteroids alone. The medications are most effective if started within 72 hours of symptom onset. The same analysis showed that antiviral medications alone were less effective than corticosteroids alone. This patient's presentation is not consistent with stroke or another emergency. Because supranuclear input to the facial nerves comes from both cerebral hemispheres, strokes and other central pathologies affecting the facial nerves typically spare the forehead, which is not the case in this patient.

Ref: Baugh RF, Basura GJ, Ishii LE, et al: Clinical practice guideline: Bell's palsy executive summary. *Otolaryngol Head Neck Surg* 2013;149(5):656-663. 2) Gagyor I, Madhok VB, Daly F, et al: Antiviral treatment for Bell's palsy (idiopathic facial paralysis). *Cochrane Database Syst Rev* 2015;(11):CD001869.

Item 166

ANSWER: B

25-Hydroxyvitamin D levels should not be measured in patients presenting with fatigue (SOR A). A serum antibody test for Lyme disease or a D-dimer would not be indicated for this patient based on her history and symptoms. Because of the patient's history of irregular menses, a β-hCG level would be indicated.

Ref: LeFevre ML, LeFevre NM: Vitamin D screening and supplementation in community-dwelling adults: Common questions and answers. *Am Fam Physician* 2018;97(4):254-260.

Item 167

ANSWER: E

In a patient presenting with obesity, hypertension, type 2 diabetes mellitus, and hirsutism, who also has thin skin and osteopenia, an elevated 24-hour collection showing high urinary free cortisol confirms the presence of Cushing syndrome. The dexamethasone suppression test, though still commonly used, no longer has a place in the diagnosis and treatment of patients with Cushing syndrome. Corticotropin-dependent and corticotropin-independent causes of Cushing syndrome can be separated by measuring plasma corticotropin. Plasma free cortisol measurements should be obtained only to determine the success or failure of transsphenoidal microadenomectomy or adrenalectomy. Inferior petrosal sinus sampling is used to confirm the source of corticotropin secretion before surgical intervention.

Ref: Loriaux DL: Diagnosis and differential diagnosis of Cushing's syndrome. *N Engl J Med* 2017;376(15):1451-1459.

Item 168

ANSWER: D

This patient has obesity hypoventilation syndrome (OHS), a disorder in which central obesity leads to chronic hypoventilation due at least in part to restricted diaphragm excursion. Current criteria for this condition include hypoventilation leading to carbon dioxide retention ($PaCO_2 > 45$ mm Hg) in an individual with a BMI > 30 kg/m^2 when other causes of chronic alveolar hypoventilation have been ruled out. These patients retain bicarbonate to compensate for the respiratory acidosis. It has been suggested that an increased serum bicarbonate level (>29 mEq/L) in the absence of another cause for metabolic alkalosis should be included in the definition of OHS.

OHS leads to a restrictive pattern on spirometry, which this patient has. Asthma and COPD are obstructive lung diseases and can therefore be ruled out in this patient who has no signs of airway obstruction on spirometry. Obstructive sleep apnea is often present in patients with OHS, but sleep apnea alone does not lead to daytime hypoventilation and carbon dioxide retention. Pulmonary fibrosis is a cause of restrictive lung disease and has not yet been completely ruled out in this patient, but a normal chest radiograph makes this less likely. Comprehensive pulmonary function testing, including the diffusion capacity of the lung for carbon monoxide (DLCO), would help rule this out. Pulmonary fibrosis leads to a decreased DLCO while OHS does not.

Ref: Johnson JD, Theurer WM: A stepwise approach to the interpretation of pulmonary function tests. *Am Fam Physician* 2014;89(5):359-366. 2) Piper A: Obesity hypoventilation syndrome: Weighing in on therapy options. *Chest* 2016;149(3):856-868.

Item 169

ANSWER: D

Coronary artery stenting is a common procedure, and stent restenosis carries a high mortality rate. Current American College of Cardiology guidelines recommend dual antiplatelet therapy (aspirin with a second agent such as clopidogrel) for at least 12 months following the placement of a drug-eluting stent. Dual antiplatelet therapy with aspirin plus clopidogrel for more than 1 year gives no additional benefit and carries an additional risk of bleeding. Aspirin has been shown to be effective for the secondary prevention of heart disease and should be continued after 1 year.

Ref: Ebell MH: No benefit to prolonged dual antiplatelet therapy after drug-eluting stent placement. *Am Fam Physician* 2014;90(7):502. 2) Smith JN, Negrelli JM, Manek MB, et al: Diagnosis and management of acute coronary syndrome: An evidence-based update. *J Am Board Fam Med* 2015;28(2):283-293. 3) Mukherjee D: ACC/AHA guideline update on duration of dual antiplatelet therapy in CAD patients. American College of Cardiology, 2016. 4) Mikhail MA, Mohabbat AB, Ghosh AK: Perioperative cardiovascular medication management in noncardiac surgery: Common questions. *Am Fam Physician* 2017;95(10):645-650.

Item 170

ANSWER: D

Plantar fasciitis is the most common cause of heel pain, with a prevalence of 10% in the general population. It often presents with throbbing heel pain that is worst in the morning with the first step after rest. Palpation of the medial calcaneal tuberosity and dorsiflexion of the affected foot will elicit sharp pain. Diagnostic imaging is not required. Heel spurs are present in approximately 50% of patients with plantar fasciitis, but can also be found in patients without plantar fasciitis.

Calcaneal stress fractures are caused by repetitive overuse and the pain usually begins after an increase in weight-bearing activities or a change in activities. It usually occurs only with activity, but may eventually also occur at rest. Heel pad syndrome causes pain with deep palpation of the middle of the heel or walking barefoot on harder surfaces. Sever's disease is the most common cause of heel pain in children and adolescents 8–12 years of age.

Ref: Tu P: Heel pain: Diagnosis and management. *Am Fam Physician* 2018;97(2):86-93.

Item 171

ANSWER: A

Complete vocal rest, including no whispering or throat clearing, is the most effective and quickest initial remedy for short-duration laryngitis, whether viral or due to vocal overuse or abuse. Limiting voice use or whispering, as opposed to complete vocal rest, will likely prolong and possibly worsen hoarseness. Clearing the throat of mucus should also be avoided for the same reason. Inhaled corticosteroids and antibiotics are not effective treatments for laryngitis. Hypertonic saline nebulization treatments would likely cause violent coughing fits that would worsen the condition. Nebulized ribavirin is never indicated for use in adults.

Ref: House SA, Fisher EL: Hoarseness in adults. *Am Fam Physician* 2017;96(11):720-728.

Item 172

ANSWER: A

Second degree Mobitz type I (Wenckebach) heart block is characterized by an intermittent blockade of electrical impulses from the atria to the ventricles at the level of the atrioventricular node. This prevents generation of a QRS complex. It is characterized by progressive prolongation of the PR interval until a P wave is not followed by a QRS complex. P waves come at regular intervals so PP intervals are normal. Following the missed QRS complex, the PR interval returns to its baseline duration. A pacemaker is not recommended in patients with second degree Mobitz type I heart block who are asymptomatic. It is recommended in symptomatic patients, however, and is guided by electrophysiologic studies.

Ref: Kasper DL, Fauci AS, Hauser SL, et al (eds): *Harrison's Principles of Internal Medicine*, ed 19. McGraw-Hill, 2015, pp 1470-1476.

Item 173

ANSWER: C

This patient has symptoms of anaphylaxis. Symptoms include an acute onset (minutes to several hours); involvement of the skin, mucosal tissue, or both; plus one of the following: respiratory compromise (dyspnea, wheezing, bronchospasm, stridor, reduced peak expiratory flow, hypoxemia), reduced blood pressure, or associated symptoms of end-organ dysfunction (hypotonia, collapse, syncope, incontinence).

The first and most important treatment in anaphylaxis is intramuscular epinephrine, 1:1000 dilution dosed at 0.01 mg/kg (maximal dose of 0.3 mg in children and 0.5 mg in adults) (SOR B). Management of the airway, breathing, and circulation is also essential (SOR B).

Other essential treatments include volume replacement with normal saline for the treatment of hypotension that does not respond to epinephrine (SOR B). Histamine H_1-receptor antagonists such as diphenhydramine and corticosteroids may be considered as second-line treatments in patients with anaphylaxis (SOR C). Glucagon can be considered for patients who are taking β-blockers.

Ref: Arnold JJ, Williams PM: Anaphylaxis: Recognition and management. *Am Fam Physician* 2011;84(10):1111-1118. 2) Commins SP: Outpatient emergencies: Anaphylaxis. *Med Clin North Am* 2017;101(3):521-536.

Item 174

ANSWER: C

Low-dose aspirin therapy is recommended by the U.S. Preventive Services Task Force for the primary prevention of cardiovascular disease (CVD) in patients 50–59 years of age who have a risk of CVD ≥10% (USPSTF B recommendation). The recommendation statement adds that the patient should have a life expectancy of at least 10 years, should be willing to take daily aspirin for at least 10 years, and should not be at increased risk for gastrointestinal bleeding. The decision to start aspirin therapy for patients 60–69 years of age should be based on individual considerations (USPSTF C recommendation). For adults younger than 50 or age 70 or older, the evidence is insufficient to assess the balance of benefits and harms (C recommendation). The recent Aspirin in Reducing Events in the Elderly (ASPREE) trial indicated that daily aspirin use in those over age 70 did not significantly lower the risk of cardiovascular disease, and did not increase disability-free survival.

Ref: *Final Recommendation Statement: Aspirin Use to Prevent Cardiovascular Disease and Colorectal Cancer: Preventive Medication*. US Preventive Services Task Force, 2017. 2) McNeil JJ, Nelson MR, Woods RL, et al: Effect of aspirin on all-cause mortality in the healthy elderly. *N Engl J Med* 2018;[Epub ahead of print]. 3) McNeil JJ, Wolfe R, Woods RL, et al: Effect of aspirin on cardiovascular events and bleeding in the healthy elderly. *N Engl J Med* 2018;[Epub ahead of print].

Item 175

ANSWER: B

The Baby-Friendly Hospital Initiative is a global program established by UNICEF and WHO to promote healthy infant feeding and mother-baby bonding. The primary objective is to educate the public on the benefits of breastfeeding and encourage, promote, and facilitate breastfeeding as outlined in the UNICEF/WHO Ten Steps to Successful Breastfeeding chart. These steps promote breastfeeding to the public and provide guidelines for hospitals and birthing centers for the successful initiation and continuation of breastfeeding.

Baby-friendly facilities must have a written breastfeeding policy that is routinely communicated to all health care staff, and all health care staff must be trained in the skills necessary to implement this policy. All pregnant women should be informed about the benefits and management of breastfeeding. Mothers should be helped to initiate breastfeeding within an hour after birth and shown how to breastfeed and to maintain lactation, even if they are separated from their infants. Breastfeeding infants should not be given food other than breast milk, unless medically indicated. If mothers choose to give formula after appropriate education, they should be instructed in proper preparation and use.

Rooming in should be practiced, allowing mothers and infants to remain together 24 hours a day. Mothers should be encouraged to breastfeed on demand. Breastfeeding infants should not be given pacifiers or artificial nipples. Mothers should be referred to breastfeeding support groups on discharge from the hospital. In addition, the hospital must comply with the International Code of Marketing of Breast Milk Substitutes, which requires that formula companies cannot give free gifts to staff or mothers, that breast milk substitutes are not marketed in the maternity unit, and that breast milk supplements and infant feeding supplies are purchased at fair market price.

Ref: Perrine CG, Galuska DA, Dohack JL, et al: Vital signs: Improvements in maternity care policies and practices that support breastfeeding—United States, 2007–2013. *MMWR Morb Mortal Wkly Rep* 2015;64(39):1112-1117. 2) Guidelines and evaluation criteria for facilities seeking baby-friendly designation. Baby-Friendly USA, 2016.

Item 176

ANSWER: A

This patient has a pituitary microadenoma. Microadenomas <10 mm in size that are secreting prolactin may be treated with a dopaminergic agent such as bromocriptine. This will lower the prolactin level and shrink the adenoma. Nonprolactin-secreting adenomas, especially those >10 mm in size (macroadenomas), require neurosurgical evaluation.

Ref: Molitch ME: Diagnosis and treatment of pituitary adenomas: A review. *JAMA* 2017;317(5):516-524.

Item 177

ANSWER: B

Inclusion criteria for bariatric surgery include a BMI ≥ 40 kg/m^2 without coexisting medical problems or a BMI ≥ 35 kg/m^2 with one or more severe obesity-related comorbidities such as diabetes mellitus. Exclusion criteria include active substance abuse, uncontrolled severe psychiatric illness, severe cardiopulmonary disease that makes the surgical risk prohibitive, and lack of cognitive function to comprehend the associated risks, benefits, and required lifestyle changes.

Ref: Schroeder R, Harrison TD, McGraw SL: Treatment of adult obesity with bariatric surgery. *Am Fam Physician* 2016;93(1):31-37.

Item 178

ANSWER: C

Maintaining and communicating accurate patient medication information is one of the goals of the Joint Commission National Patient Safety Goals program. This includes medication reconciliation, which is intended to identify and resolve discrepancies. In this process, a clinician compares the medications a patient should be using and is actually using with the new medications that are ordered. While adverse drug effects, potentially inappropriate medication use in the elderly, high-risk medication use, or polypharmacy might also occur and might be beneficial to address, these are not the primary focus of medication reconciliation.

Ref: National Patient Safety Goals Effective January 1, 2015: Hospital Accreditation Program. The Joint Commission, 2015. 2) AHRQ patient safety primer: Medication reconciliation. Agency for Healthcare Research and Quality, updated 2017.

Item 179

ANSWER: A

The defining symptom of acute bronchitis is cough. Even in smokers the etiologic agent is viral at least 90% of the time, so antibiotics are not indicated. Unless wheezing is noted, albuterol is not helpful. Inhaled corticosteroids are used in maintenance therapy for asthma. Indications for an adult patient with acute bronchitis to have a chest radiograph include: bloody sputum, rusty-colored sputum, or dyspnea; a pulse rate >100 beats/min; a respiratory rate >24/min; or a temperature >37.8°C (100.0°F). A chest radiograph is also indicated if there are abnormal findings on a chest examination such as fremitus, egophony, or focal consolidation. Supportive care is made easier by informing the patient that symptoms are likely to last 2–3 weeks. Symptoms may be managed with measures such as dextromethorphan, guaifenesin, or honey.

Ref: Kinkade S, Long NA: Acute bronchitis. *Am Fam Physician* 2016;94(7):560-565.

Item 180

ANSWER: D

The American Heart Association and the American College of Cardiology have decreased the number of indications for antibiotic prophylaxis prior to dental procedures. Currently antibiotics are indicated for prosthetic cardiac valves, previous infective endocarditis, unrepaired cyanotic congenital heart disease or a repaired congenital defect with a residual shunt, and a cardiac transplant with valve regurgitation due to a structurally abnormal valve. Amoxicillin, 2 g, is the antibiotic prophylaxis of choice.

Ref: Wilson W, Taubert KA, Gewitz M et al: Prevention of infective endocarditis: Guidelines from the American Heart Association: A guideline from the American Heart Association Rheumatic Fever, Endocarditis, and Kawasaki Disease Committee, Council on Cardiovascular Disease in the Young, and the Council on Clinical Cardiology, Council on Cardiovascular Surgery and Anesthesia, and the Quality of Care and Outcomes Research Interdisciplinary Working Group. *Circulation* 2007;116(15):1736-1754. 2) Oral health topics: Antibiotic prophylaxis prior to dental procedures. American Dental Association, updated 2018.

Item 181

ANSWER: B

This patient has a history and physical examination concerning for septic arthritis, which is a rheumatologic emergency due to the potential for joint destruction. Joint swelling, redness, and warmth may accompany the pain but these are more difficult to detect at the hip than the knee. Systemic symptoms such as fever may occur but are absent in more than 40% of patients, particularly elderly patients and those who are immunocompromised. Risk factors for septic arthritis include underlying joint disease such as rheumatoid arthritis or osteoarthritis, and immunosuppressive states such as HIV infection, diabetes mellitus, and taking immunosuppressive medications. This patient has a history of osteoarthritis and is taking adalimumab, an immunosuppressive agent. Although there may be clues to the diagnosis of septic arthritis on imaging and laboratory assessment, the diagnostic test of choice is analysis of synovial fluid obtained through arthrocentesis. A radionuclide bone scan, CT, MR arthrography, and MRI are not sensitive enough to rule out septic arthritis.

Ref: Horowitz DL, Katzap E, Horowitz S, Barilla-LaBarca ML: Approach to septic arthritis. *Am Fam Physician* 2011;84(6):653-660. 2) Goldman L, Schafer AI (eds): *Goldman's Cecil Medicine*, ed 25. Elsevier Saunders, 2016, pp 1806-1807.

Item 182

ANSWER: B

Cognitive-behavioral therapy, specifically exposure and response prevention, is considered the most effective psychotherapy method (SOR A). There is no evidence for psychodynamic or "talk" therapy. Traditional psychotherapy and psychoanalysis are less effective than cognitive-behavioral therapy.

Ref: Fenske JN, Petersen K: Obsessive-compulsive disorder: Diagnosis and management. *Am Fam Physician* 2015;92(10):896-903.

Item 183

ANSWER: B

Proton pump inhibitors (PPIs) are safe and well tolerated for short-term use. It is recommended that the lowest dosage and shortest duration of therapy be used to control symptoms of GERD. Long-term PPI use is associated with fractures, hypomagnesemia, vitamin B_{12} deficiency, iron deficiency, and acute interstitial nephritis with progression to chronic kidney disease. Use of PPIs has also been associated with community-acquired pneumonia and *Clostridium difficile* infection, although studies have been conflicting. Vitamin D deficiency, nephrotic syndrome, gastrointestinal malignancy, and myocardial infarction are not proven complications of long-term PPI use.

Ref: Anderson WD 3rd, Strayer SM, Mull SR: Common questions about the management of gastroesophageal reflux diseases. *Am Fam Physician* 2015;91(10):692-697. 2) Safety of long-term PPI use. *JAMA* 2017;318(12):1177-1178. 3) Vaezi MF, Yang YX, Howden CW: Complications of proton pump inhibitor therapy. *Gastroenterology* 2017;153(1):35-48.

Item 184

ANSWER: A

Molluscum contagiosum is a common disease during childhood, but can also occur in adolescents and adults. It is caused by a poxvirus and is characterized by flesh-colored, dome-shaped papules with central umbilication, most commonly on the trunk, axilla, popliteal or antecubital fossae, and crural folds. If lesions are asymptomatic and not inflamed, the initial treatment is observation, with most lesions resolving spontaneously within 2–12 months. If the lesions are inflamed or pruritic, then topical corticosteroid treatment, chemical treatment with cantharidin, podofilox 0.5% solution, curettage, or cryotherapy may be indicated.

Atopic dermatitis (eczema) is initially treated with emollients and by avoiding frequent hot baths. Verruca (warts) are commonly treated with paring, followed by topical salicylic acid or cryotherapy. Antifungal cream would not be appropriate.

Ref: Allmon A, Deane K, Martin KL: Common skin rashes in children. *Am Fam Physician* 2015;92(3):211-216.

Item 185

ANSWER: D

This patient presents with symptoms of acute rhinosinusitis. In the first 3–4 days, viral and bacterial rhinosinusitis are indistinguishable. Guidelines from the American Academy of Otolaryngology—Head and Neck Surgery suggest that antibiotics should not be routinely prescribed for acute mild to moderate sinusitis unless symptoms persist for 7 days or worsen after initial improvement. Watchful waiting without antibiotic treatment is appropriate when follow-up is accessible (SOR A). In this scenario antibiotic therapy is not indicated.

Amoxicillin with or without clavulanate is appropriate for symptoms lasting 7 or more days without improvement and is the first-line antibiotic treatment for acute bacterial rhinosinusitis (SOR A). Due to the risk of adverse effects and no benefit over β-lactams, respiratory fluoroquinolones are not considered first-line antibiotic therapy. Symptomatic treatment is recommended within the first 10 days of the onset of symptoms and may be continued if antibiotics are started. Intranasal corticosteroid use has a modest therapeutic benefit for patients with acute rhinosinusitis. Decongestants and antihistamines have not been proven effective for the treatment of acute rhinosinusitis.

Ref: Aring AM, Chan MM: Current concepts in adult acute rhinosinusitis. *Am Fam Physician* 2016;94(2):97-105.

Item 186

ANSWER: D

Although national guidelines vary, it is generally advised to start routine colon cancer screening between ages 45 and 50, and to screen with a more individualized approach between ages 75 and 85. Factors to consider include life expectancy, the patient's overall health, whether the patient has been screened previously, and patient preference. Most guidelines recommend stopping colon cancer screening in patients older than 85 years or when their life expectancy falls below 10 years (SOR B).

Ref: AGS Choosing Wisely Workgroup: American Geriatrics Society identifies another five things that healthcare providers and patients should question. *J Am Geriatr Soc* 2014;62(5):950-960. 2) Salzman B, Beldowski K, de la Paz A: Cancer screening in older patients. *Am Fam Physician* 2016;93(8):659-667. 3) *Final Recommendation Statement: Colorectal Cancer: Screening*. US Preventive Services Task Force, 2016.

Item 187

ANSWER: B

Some abnormal gross motor developmental findings suggest muscular dystrophy. Signs of increased muscular tone, such as cross-legged posturing, neck stiffness, and hyperreflexia, suggest a central cause of motor delay such as cerebral palsy. Head lag due to neck muscle weakness in infants is a classic early finding of muscular dystrophies. Hemiparesis similarly suggests a central nervous system abnormality. Toe walking can be seen with both central and peripheral neuromuscular abnormalities, including muscular dystrophy, but is less specific, and therefore less helpful, in differentiating the cause of motor delay. In muscular dystrophies it is a sign of quadriceps weakness.

Ref: Lurio JG, Peay HL, Mathews KD: Recognition and management of motor delay and muscle weakness in children. *Am Fam Physician* 2015;91(1):38-44.

Item 188

ANSWER: E

Amniotic fluid volume is regulated in part by fetal swallowing, inspiration, and urination. Some malformations of the urinary tract, including renal agenesis and persistent obstruction from posterior urethral valves, lead to oliguria or anuria, and are associated with marked oligohydramnios.

Anencephaly, esophageal atresia, heart failure, and maternal α-thalassemia are associated with polyhydramnios. Anencephaly is probably the most common cause of polyhydramnios, via transudation from the exposed meninges; swallowing difficulties and excessive urination may also be contributing factors. Esophageal atresia is almost always associated with polyhydramnios due to an inability to swallow. Intrauterine heart failure, whether due to dysrhythmias, structural defects, or severe anemia, often leads to fetal hydrops, which is associated with polyhydramnios. α-Thalassemia, relatively common in Asians, can also cause fetal hydrops and polyhydramnios.

Ref: Cunningham FG, Leveno KJ, Bloom SL, et al (eds): *Williams Obstetrics*, ed 23. McGraw-Hill Medical, 2010, pp 495-496.

Item 189

ANSWER: E

Clindamycin or a combination of trimethoprim/sulfamethoxazole (or doxycycline or minocycline) plus cephalexin (or dicloxacillin or amoxicillin/clavulanate) should provide adequate coverage for *Streptococcus* and methicillin-resistant *Staphylococcus aureus* (MRSA) for mild to moderate cellulitis.

Doxycycline plus trimethoprim/sulfamethoxazole would provide inadequate coverage for streptococcal bacteria. Cephalexin plus dicloxacillin would provide inadequate coverage for MRSA. The primary indication for ciprofloxacin is treatment of infections with gram-negative rods. Fosfomycin is indicated only for urinary tract infections. Neither is typically used in the treatment of cellulitis.

Ref: Raff AB, Kroshinsky D: Cellulitis: A review. *JAMA* 2016;316(3):325-337.

Item 190

ANSWER: A

This patient most likely has iron deficiency anemia. The low normal mean corpuscular volume, low serum ferritin, and low reticulocyte index are all consistent with iron deficiency. Vitamin B_{12} deficiency would be indicated by low vitamin B_{12} and a macrocytic anemia. Serum ferritin would be higher with anemia of chronic disease and myelodysplastic anemia. The reticulocyte index would be high with hemolysis.

Ref: Kasper DL, Fauci AS, Hauser SL, et al (eds): *Harrison's Principles of Internal Medicine*, ed 19. McGraw-Hill, 2015, pp 393-399.

Item 191

ANSWER: B

In many normally developing infants there may be imperfect coordination of eye movements and alignment during the early days and weeks of life, but proper coordination should be achieved by age 4–6 months. Persistent deviation of an eye in an infant requires evaluation.

Ref: Bell AL, Rodes ME, Collier Kellar L: Childhood eye examination. *Am Fam Physician* 2013;88(4):241-248. 2) Kliegman RM, Stanton BF, Geme JW III, et al (eds): *Nelson Textbook of Pediatrics*, ed 20. Elsevier Saunders, 2016, pp 3026-3031.

Item 192

ANSWER: C

This patient has clinically diagnosable acute bacterial prostatitis, and no further testing, including imaging, is required to establish the diagnosis. Culture of a midstream voided urine may aid in identifying the pathogen, but prostate massage should be avoided because it may increase the risk of bacteremia. A prostate biopsy is not indicated in the presence of acute infection, and a prostate-specific antigen level is not indicated because it is likely to be elevated in the presence of infection.

Ref: Coker TJ, Dierfeldt DM: Acute bacterial prostatitis: Diagnosis and management. *Am Fam Physician* 2016;93(2):114-120.

Item 193

ANSWER: D

Insulin therapy should be initiated in hospitalized patients with persistent hyperglycemia, starting at a threshold of 180 mg/dL. Once insulin therapy is started, a target glucose range of 140–180 mg/dL is recommended for the majority of hospitalized patients, regardless of whether they have a critical illness.

Ref: American Diabetes Association: 14. Diabetes care in the hospital: Standards of medical care in diabetes—2018. *Diabetes Care* 2018;41(Suppl 1):S144-S151.

Item 194

ANSWER: E

Traveler's diarrhea is caused predominantly by bacterial pathogens (up to 80%–90%) and is associated with hygiene practices. Handwashing has been shown to reduce the risk of traveler's diarrhea by 30%. The use of alcohol-based hand sanitizer is also effective. Although it is considered traditional advice, avoiding street vendor foods, tap water, ice, and raw foods has not been shown to reduce the risk of traveler's diarrhea. There is not sufficient evidence to recommend taking a probiotic to reduce the risk of traveler's diarrhea. Due to concerns about antimicrobial resistance and altering protective bowel flora, taking prophylactic antibiotics is generally not recommended for healthy travelers. However, using an antibiotic for as-needed treatment is appropriate.

Ref: Sanford C, McConnell A, Osborn J: The pretravel consultation. *Am Fam Physician* 2016;94(8):620-627. 2) Chen LH, Hochberg NS, Magill AJ: The pretravel consultation. Centers for Disease Control and Prevention, 2017.

Item 195

ANSWER: C

This patient has findings consistent with influenza, including a rapid onset of fever, nausea, and sore throat, and negative pulmonary findings. Influenza is considered a clinical diagnosis and confirmation of the diagnosis with laboratory testing is not required. Treatment of influenza is recommended for individuals at a high risk of influenza-related complications. High-risk individuals include those with chronic lung disease; cardiovascular (excluding hypertension), renal, hepatic, hematologic, or neurologic disease; or age >65. Children on long-term aspirin therapy, and pregnant and postpartum women are also considered high risk. This patient should be treated with antiviral medication because of his chronic pulmonary disease. While pneumonia and streptococcal pharyngitis should be considered in the differential diagnosis, these are less likely given the examination findings, and antibiotics are not recommended. Prednisone is not indicated for influenza-like illness and may cause harm.

Ref: Influenza antiviral medications: Summary for clinicians. Centers for Disease Control and Prevention, 2018.

Item 196

ANSWER: D

This patient presents with secondary amenorrhea. The differential diagnosis includes polycystic ovary syndrome (PCOS), intrauterine synechiae (Asherman syndrome), functional hypothalamic amenorrhea, hypothyroidism, hyperprolactinemia, and primary ovarian insufficiency (also known as premature ovarian failure). This patient's presentation and the laboratory findings are most consistent with a diagnosis of primary ovarian insufficiency. This is defined as menopause before the age of 40 due to ovarian follicular depletion. Laboratory findings will usually reveal a low serum estradiol and elevated FSH and LH levels. This condition is different than menopause because of the age of presentation and the unpredictability of long-term ovarian function (up to 10% of cases spontaneously remit and patients have a temporary return of fertility).

Patients with PCOS typically present with obesity, difficulty conceiving, and normal or low FSH and LH levels. This patient's normal weight and prior history of normal menses make this diagnosis less likely. Intrauterine synechiae is characterized by scar tissue inside the uterus. Risk factors include intrauterine procedures, pregnancy, inflammation, and infection. Patients present with abnormal uterine bleeding, recurrent pregnancy loss, dysmenorrhea, and infertility. FSH and LH levels are usually normal.

Functional hypothalamic amenorrhea is characterized by suppression of the hypothalamic-pituitary-ovarian axis, usually due to extreme stress, excessive exercise, marked weight loss, and/or dysfunctional eating. LH and FSH levels are usually low or low-normal. Turner's syndrome is caused by the 45,X genotype, and patients have short stature, a webbed neck, a low hairline, and cardiac abnormalities. This is unlikely in a patient who is 178 cm (70 in) tall and has a normal examination.

Ref: Klein DA, Poth MA: Amenorrhea: An approach to diagnosis and management. *Am Fam Physician* 2013;87(11):781-788.

Item 197

ANSWER: D

The U.S. Preventive Services Task Force recommends screening for hepatitis C virus (HCV) infection in persons at risk for infection and also one-time screenings for adults born between 1945 and 1965 (Grade B recommendation). HCV is the most common chronic bloodborne pathogen in the United States and a leading cause of complications of chronic liver disease. The prevalence of the anti-HCV antibody in the United States is approximately 1.6% in non-institutionalized persons. According to data from 1999 to 2008, approximately 75% of patients in the United States living with HCV infection were born between 1945 and 1965. This patient has a normal weight so diabetes screening is not recommended. Screening for asymptomatic bacteriuria is not recommended in nonpregnant patients.

Ref: *Final Update Summary: Hepatitis C: Screening*. US Preventive Services Task Force, 2016.

Item 198

ANSWER: D

The most common cause of hypercalcemia is hyperparathyroidism. This is seldom symptomatic and is often discovered through routine blood testing. Hypercalcemia due to cancer can be caused by secretion of the parathyroid hormone–related protein and by osteoclastic bone resorption. Other causes of hypercalcemia include thiazide diuretics, lithium, vitamin D intoxication, hyperthyroidism, milk alkali syndrome from excessive calcium antacid ingestion, adrenal insufficiency, and lymphoma.

Ref: Barstow C: Electrolytes: Calcium disorders. *FP Essent* 2017;459:29-34.

Item 199

ANSWER: D

The mainstay of therapy for acute respiratory syncytial virus bronchiolitis is supportive care, and maintaining hydration is important. Infants with respiratory rates >60/min may have poor feeding secondary to difficulty breathing and oral rehydration may increase the risk of aspiration. In these cases, nasogastric or intravenous fluids should be administered. Oxygen saturation of 90% or more on room air is sufficient for infants with bronchiolitis, and using supplemental oxygen to maintain higher oxygen saturations only prolongs hospitalization because of an assumed need for oxygen. Bronchodilators should not be administered to infants with bronchiolitis, because they have not been shown to have any effect on the need for hospitalization, oxygen saturation, or disease resolution. In addition, there is no evidence to support the use of epinephrine or corticosteroids in the inpatient setting.

Ref: Smith DK, Seales S, Budzik C: Respiratory syncytial virus bronchiolitis in children. *Am Fam Physician* 2017;95(2):94-99.

Item 200

ANSWER: A

Gallstones are often asymptomatic and found incidentally on imaging. However, they may become symptomatic, which usually causes pain in the right upper quadrant or epigastrium. Most patients with symptomatic gallstones present with chronic cholecystitis, which causes recurrent attacks of pain. The pain is constant, increases in severity at the beginning, and lasts from 1 to 5 hours. It often starts during the night after a fatty meal and may be associated with nausea and vomiting. Abdominal ultrasonography is the initial imaging method.

The two main complications of choledochal stones are cholangitis and pancreatitis. Acute cholangitis is a bacterial infection. Bacterial growth is enhanced by obstruction of the duct. It may present as a mild self-limited disease but can also lead to sepsis. Cases typically present with fever, pain, and jaundice. Laboratory findings include an elevated WBC count and elevated bilirubin, transaminases, and alkaline phosphatase. Ultrasonography will show a dilated bile duct in many cases, although it might not be dilated in acute obstruction.

Patients with pancreatitis present with pain, nausea, and vomiting. The pain is usually epigastric and radiates to the back. It reaches its maximum intensity within 1 hour and may last for days. The physical examination may reveal tachycardia, hypotension, tachypnea, and fever. The abdomen may be distended and is typically tender to palpation. The diagnosis requires two of three primary features: abdominal pain, elevation of serum amylase or lipase, and findings on imaging studies that are consistent with the diagnosis. Ultrasonography can show pancreatic enlargement or edema, and visualization of gallstones will suggest choledocholithiasis as the cause of the pancreatitis.

Ref: Brunicardi FC (ed): *Schwartz's Principles of Surgery*, ed 10. McGraw Hill Medical, 2015, pp 1317-1323. 2) Goldman L, Schafer AI (eds): *Goldman's Cecil Medicine*, ed 25. Elsevier Saunders, 2016, pp 961-962, 1038-1044.

Item 201

ANSWER: C

This patient's radiographs show an anterior shoulder dislocation on anteroposterior and scapular Y views. Treatment of this condition includes reduction of the dislocation, which can be accomplished in this case with a local anesthetic or conscious sedation. An acute shoulder dislocation reduction may be attempted without pain medication. Surgical decompression and figure-of-eight bandaging are not indicated. Sling immobilization and physical therapy may be appropriate after shoulder reduction.

Ref: Monica J, Vredenburgh Z, Korsh J, Gatt C: Acute shoulder injuries in adults. *Am Fam Physician* 2016;94(2):119-127.

Item 202

ANSWER: C

To prevent neural tube defects in newborns, the U.S. Preventive Services Task Force recommends folic acid, 0.4–0.8 mg daily, for all women who are planning on or are capable of becoming pregnant (USPSTF A recommendation).

Ref: *Final Recommendation Statement: Folic Acid for the Prevention of Neural Tube Defects: Preventive Medication.* US Preventive Services Task Force, 2017.

Item 203

ANSWER: B

There are three major risk factors for curve progression of idiopathic scoliosis: the magnitude of the curve at presentation, the potential for future growth, and female sex. Of these factors, curve progression has the most impact on the need for referral versus observation. The Cobb angle is based on spine radiology that quantifies the magnitude of the scoliosis curve. If the Cobb angle is ≥20° there is a high risk that the curve will progress and that the patient may need treatment. Age, sex, menstrual status, pubertal status, and growth potential are less important factors. Scoliosis typically does not cause pain and it is more likely that this patient's weight is contributing to her back pain.

Ref: Horne JP, Flannery R, Usman S: Adolescent idiopathic scoliosis: Diagnosis and management. *Am Fam Physician* 2014;89(3):193-198.

Item 204

ANSWER: C

Although behavioral interventions are the mainstay of treatment for insomnia, they often need to be supplemented by pharmacologic therapy. When both doxepin and extended-release melatonin fail to provide benefit, a member of the Z-drug class should be tried next. Among the Z-drugs only eszopiclone provides an early peak onset and a long half-life, with a 1-hour approximate time to peak and a 6-hour half-life. While zaleplon has an equally short time to peak of 1 hour, it also has a 1 hour half-life. Antihistamines, including diphenhydramine and doxylamine, as well as atypical antipsychotics such as olanzapine, are not indicated unless used primarily to treat another condition.

Ref: Matheson E, Hainer BL: Insomnia: Pharmacologic therapy. *Am Fam Physician* 2017;96(1):29-35.

Item 205

ANSWER: B

Chronic cough is defined as a cough lasting at least 8 weeks. If a thorough history (with attention to ACE inhibitor use), a physical examination, and a plain-film chest radiograph do not suggest an obvious cause for the cough, experts suggest that the three most common etiologies are gastroesophageal reflux, persistent postnasal drip, and unrecognized asthma. Treating a chronic cough empirically with a high-dose proton pump inhibitor for 2–3 months is considered a reasonable choice before further investigations are attempted. Ordering an esophageal pH probe or esophagogastroduodenoscopy would also be considered appropriate. Postnasal drip is often due to allergic rhinitis or another noninfectious condition and some guidelines recommend empiric nasal corticosteroid sprays and/or first-generation oral antihistamine use.

CT of the chest and bronchoscopy may become necessary if the evaluation and treatment for these three common conditions does not improve the patient's symptoms. Since there are no symptoms of bacterial sinusitis, the use of a broad-spectrum antibiotic is not justified.

Ref: Irwin RS, Baumann MH, Bolser DC, et al: Diagnosis and management of cough executive summary: ACCP evidence-based clinical practice guidelines. *Chest* 2006;129(1 Suppl):1S-23S. 2) Broaddus VC, Mason RJ, Ernst JD, et al: *Murray & Nadel's Textbook of Respiratory Medicine*, ed 6. Elsevier Saunders, 2016, pp 497-514. 3) Smith JA, Woodcock A: Chronic cough. *N Engl J Med* 2016;375(16):1544-1551.

Item 206

ANSWER: D

Physicians should use trained interpreters whenever possible to avoid mistakes and pitfalls associated with using family members or untrained interpreters for medical interviews. Simply being bilingual does not mean someone will be an appropriate interpreter. Although it is technically legal to use a nontrained interpreter for this patient, title VI of the Civil Rights Act requires interpreter services for all patients with limited English capabilities who are receiving federal assistance (except Medicare Part B). This patient does not have Medicaid, but ethically it would be appropriate to extend the same courtesy to her.

It is difficult to predict what may occur in any visit, and a physician is open to serious medical mistakes by assuming a visit does not require an interpreter, because the patient may bring up a serious medical issue. Confidentiality is a concern when using family members to interpret, since they may not have an understanding of the need for confidentiality. It is not appropriate to ask the patient through her family member about her preferences for interpreting.

Ref: Juckett G, Unger K: Appropriate use of medical interpreters. *Am Fam Physician* 2014;90(7):476-480.

Item 207

ANSWER: C

The National Osteoporosis Foundation recommends pharmacologic treatment when a DXA scan reveals a T-score ≤–2.5 (the cutoff for a diagnosis of osteoporosis), or when the T-score falls between –1.0 and –2.5 (the diagnosis criterion for osteopenia) and the 10-year risk of a major fracture reaches 20%. The T-score of –2.0 places this patient in the "osteopenic" range. A 10-year probability of a hip fracture ≥3% is also an indication for treatment.

Ref: Cosman F, de Beur SJ, LeBoff MS, et al: Clinician's guide to prevention and treatment of osteoporosis. *Osteoporosis Int* 2014;25(10):2359-2381. 2) Jeremiah MP, Unwin BK, Greenawald MH, Casiano VE: Diagnosis and management of osteoporosis. *Am Fam Physician* 2015;92(4):261-268.

Item 208

ANSWER: C

Overt hyperthyroidism during pregnancy is associated with adverse effects to the mother and fetus, so treatment is required. Since methimazole is associated with birth defects when used in the first trimester, propylthiouracil is preferred. Methimazole should be considered after the first trimester because the risk of congenital anomalies is less than the risk of liver failure associated with propylthiouracil. Surgery and radioactive iodine should only be used if there is a clear indication, and radioactive iodine would not be appropriate during pregnancy.

Ref: Carney LA, Quinlan JD, West JM: Thyroid disease in pregnancy. *Am Fam Physician* 2014;89(4):273-278.

Item 209

ANSWER: C

This patient has a classic presentation of podagra (acute metatarsophalangeal joint gout). Without an overlying skin lesion as an indicator of infection, this patient can be assumed to have gout in this classic presentation. Low-dose colchicine, 1.2 mg initially, followed by 0.6 mg in 1 hour, is recommended over high-dose colchicine, 1.2 mg initially, followed by 0.6 mg hourly for 6 hours. The high-dose regimen increases side effects but the effectiveness is not improved. This case should not be assumed to represent a septic joint and treated with cephalexin, given the typical podagra presentation. Febuxostat and allopurinol are urate-lowering drugs used as treatment for intercritical gout and not for acute treatment. Generally, treatment with urate-lowering therapy is not necessary in patients having fewer than two attacks per year.

Ref: Qaseem A, McLean RM, Starkey M, et al: Diagnosis of acute gout: A clinical practice guideline from the American College of Physicians. *Ann Intern Med* 2017;166(1):52-57. 2) Qaseem A, Harris RP, Forciea MA; Clinical Guidelines Committee of the American College of Physicians: Management of acute and recurrent gout: A clinical practice guideline from the American College of Physicians. *Ann Intern Med* 2017;166(1):58-68.

Item 210

ANSWER: C

Tetracycline and its derivatives have historically been used for the treatment of papulopustular rosacea and there is data to support their use. A modified-release doxycycline is FDA-approved for this indication. Amoxicillin, cephalexin, erythromycin, and trimethoprim/sulfamethoxazole lack evidence to support their use in the treatment of papulopustular rosacea.

Ref: Oge LK, Muncie HL, Phillips-Savoy AR: Rosacea: Diagnosis and treatment. *Am Fam Physician* 2015;92(3):187-196.

Item 211

ANSWER: B

Pessaries are considered first-line treatment for pelvic organ prolapse (SOR C). Ring pessaries provide support and are the initial choice in most circumstances. Sexual intercourse can still occur with a ring pessary, which can be inserted and removed by the patient. Space-occupying pessaries are associated with more vaginal discharge and irritation and do not allow for sexual intercourse. While they can improve stress and urge urinary incontinence, Kegel exercises do not treat pelvic organ prolapse. Surgery, including hysterectomy or hysteropexy that conserves the uterus, can be considered after first-line treatment with a pessary.

Ref: Iglesia CB, Smithling KR: Pelvic organ prolapse. *Am Fam Physician* 2017;96(3):179-185.

Item 212

ANSWER: D

The American Academy of Pediatrics recommends a daily intake of 400 IU of vitamin D in infants, children, and adolescents (SOR C). Breastfeeding does not provide adequate levels of vitamin D. Exclusive formula feeding probably provides adequate levels of vitamin D, but infants who consume less than 1 liter of formula per day need supplementation with 400 IU of vitamin D daily. Vitamin D supplementation should be started within the first 2 months of life.

Ref: Wagner CL, Greer FR: American Academy of Pediatrics Section on Breastfeeding; American Academy of Pediatrics Committee on Nutrition: Prevention of rickets and vitamin D deficiency in infants, children, and adolescents. *Pediatrics* 2008;122(5):1142-1152. 2) Casey CF, Slawson DC, Neal LR: Vitamin D supplementation in infants, children, and adolescents. *Am Fam Physician* 2010;81(6):745-748. 3) Insititute of Medicine: *Dietary Reference Intakes for Calcium and Vitamin D*. The National Academies Press, 2011. 4) Bly E, Huntington J, Harper AL: Clinical inquiry. What is the best age to start vitamin D supplementation to prevent rickets in breastfed newborns? Breastfed infants who take vitamin D beginning at 3 to 5 days of life don't develop rickets. *J Fam Pract* 2013;62(12):755-763. 5) Munns CF, Shaw N, Kiely M, et al: Global consensus recommendations on prevention and management of nutritional rickets. *J Clin Endocrinol Metab* 2016;101(2):394-415.

Item 213

ANSWER: E

The American Society of Anesthesiologists (ASA) has recently revised its physical status classification system. A healthy patient would be classified as ASA I, while a patient with mild systemic disease would be classified as ASA II. All patients who are having major surgery should be offered preoperative laboratory testing, including a CBC and renal function testing. For patients who are ASA III or IV and have chronic liver disease or take anticoagulants, coagulation testing should be considered. There is no compelling evidence to support either a chest radiograph or an EKG as part of a routine preoperative evaluation.

Ref: Martin SK, Cifu AS: Routine preoperative laboratory tests for elective surgery. *JAMA* 2017;318(6):567-568.

Item 214

ANSWER: D

The most common hip disorder in adolescents (ages 8–15) is slipped capital femoral epiphysis (SCFE). Early diagnosis and treatment are critical in preventing disability related to early-onset degenerative disease of the hip. In the past, SCFE has been more common in boys than in girls but that prevalence is changing due to the rise in obesity. SCFE should be suspected in an adolescent who has unexplained pain in the hip, groin, thigh, or knee. It is rarely associated with trauma, overuse, or prior illness. On examination the most indicative sign is limited internal rotation of the involved hip. Bilateral radiographs of the hips, including frog-leg lateral views, should be obtained in any adolescent who presents with a new limp and pain in the groin, hip, thigh, or knee (SOR C).

Adductor muscle strain (groin strain) is very uncommon in adolescents. Patients suspected of having a groin strain should also undergo radiography. Legg-Calvé-Perthes disease and transient synovitis are more common in children under age 10. The presenting symptoms of hip pain and a limp are similar to SCFE. Apophysitis of the anterior superior iliac spine is common in adolescents but is caused by overuse. It is mostly seen in runners, dancers, and ice hockey and soccer players ages 14–18.

Ref: Peck DM, Voss LM, Voss TT: Slipped capital femoral epiphysis: Diagnosis and management. *Am Fam Physician* 2017;95(12):779-784.

Item 215

ANSWER: A

In addition to nasal corticosteroids, saline irrigation is a mainstay in the treatment of chronic rhinosinusitis. Low-pressure, high-volume irrigation, such as with a neti pot, is superior to nasal saline spray (SOR B). There is no evidence that one nasal corticosteroid is better than another. The role of antibiotics in the treatment of chronic rhinosinusitis is unclear. Antibiotics may be helpful in patients with signs of bacterial infection, such as mucopurulent drainage or acute worsening of symptoms. Oral corticosteroids are an option for the short-term improvement of severe symptoms in patients with nasal polyps who are already on maintenance therapy with both nasal saline irrigation and an intranasal corticosteroid spray.

Ref: Sedaghat AR: Chronic rhinosinusitis. *Am Fam Physician* 2017;96(8):500-506.

Item 216

ANSWER: B

This patient has COPD and is in a risk category of A (low risk, fewer symptoms) based on the Global Initiative for Chronic Obstructive Lung Disease (GOLD) combined assessment of COPD. As a result, either a short-acting anticholinergic or a short-acting β_2-agonist should be selected as the initial pharmacologic management. Long-acting β_2-agonists or long-acting anticholinergics are indicated for patients with a GOLD combined assessment category of B or worse. Long-acting inhaled corticosteroids are indicated for patients with a GOLD combined assessment category of C or worse. Due to its narrow therapeutic window, modest benefit, and need for monitoring, theophylline is not recommended as an initial agent and should be considered as an alternative only for patients with severe refractory symptoms.

Ref: Gentry S, Gentry B: Chronic obstructive pulmonary disease: Diagnosis and management. *Am Fam Physician* 2017;95(7):433-441. 2) Pocket guide to COPD diagnosis, management, and prevention: A guide for health care professionals. Global Initiative for Chronic Obstructive Lung Disease, 2017.

Item 217

ANSWER: D

This patient has essential hypertension and her goal blood pressure is $<140/90$ mm Hg based on JNC 8 guidelines, or 130/80 mm Hg based on the more recent recommendations of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. Until recently, it was recommended that physicians should tolerate a rise of $<30\%$ in serum creatinine after ACE inhibitor or angiotensin receptor blocker (ARB) initiation. Rises in serum creatinine of $>30\%$ from baseline increase the risk of renal failure, adverse cardiac outcomes, and death. A recent study suggests that rises in serum creatinine of $<30\%$ also put patients at risk for these outcomes, with a dose-response relationship between the magnitude of creatinine change and the risk of adverse outcomes.

This patient has more than a 30% rise in creatinine and has no other factors, such as diabetes mellitus, heart failure, or chronic kidney disease, that would indicate a need for ACE or ARB therapy for her hypertension. Discontinuing her ACE inhibitor and starting a medication from a different class is the most appropriate treatment at this time. Based on JNC 8 guidelines, additional options for blood pressure medications include thiazide diuretics and calcium channel blockers.

Ref: James PA, Oparil S, Carter BL, et al: 2014 evidence-based guideline for the management of high blood pressure in adults: Report from the panel members appointed to the Eighth Joint National Committee (JNC 8). *JAMA* 2014;311(5):507-520. 2) Schmidt M, Mansfield KE, Bhaskaran K, et al: Serum creatinine elevation after renin-angiotensin system blockade and long term cardiorenal risks: Cohort study. *BMJ* 2017;356:j791. 3) Whelton PK, Carey RM, Aronow WS, et al: 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA guideline for the prevention, detection, evaluation, and management of high blood pressure in adults. *J Am Coll Cardiol* 2018;71(19):e127-e248.

Item 218

ANSWER: C

The recommended treatment for metatarsal stress fractures is no weight bearing for a few days, possibly using a posterior splint, transitioning to a walking boot or short leg cast, and then a rigid-soled shoe in 4–6 weeks. Callus formation on a radiograph and a lack of point tenderness signify adequate healing, and immobilization can be discontinued. Other recommended conservative therapy includes modified rest for 6–8 weeks with continuation of activities of daily living and limited walking. Normal activity can be resumed after 2–3 weeks with no pain. Additionally, the use of NSAIDs, ice, and stretching, as well as cross-training is recommended. Resuming regular activity after only 1 week of pain-free rest would not be recommended. Fractures of the fifth metatarsal should be carefully investigated to rule out a Jones fracture that may require orthopedic treatment. Treatment of the more common second and third metatarsal stress fractures is relatively straightforward.

Ref: Bica D, Sprouse RA, Armen J: Diagnosis and management of common foot fractures. *Am Fam Physician* 2016;93(3):183-191. 2) Brukner P, Clarsen B, Cook J, et al: *Brukner & Khan's Clinical Sports Medicine*, ed 5. McGraw Hill, 2017, pp 959-961.

Item 219

ANSWER: A

A systematic evidence review released by the U.S. Preventive Services Task Force (USPSTF) noted that the most active people had median cardiovascular risk reductions of about 30%–35% when compared with the least active. Statins are beneficial for both primary and secondary prevention of cardiovascular disease, but the benefit is greater when the baseline risk is greater. Current guidelines would not support statin therapy for a patient with a 10-year risk of atherosclerotic cardiovascular disease (ASCVD) $<5\%$. Fish oil supplements have not proven to be useful for primary prevention of ASCVD. Aspirin is recommended for the prevention of cardiovascular disease in adults 50–59 years of age with a $>10\%$ 10-year ASCVD risk who are not at increased risk of bleeding, are expected to live at least 10 years, and are willing to take low-dose daily aspirin for 10 years (USPSTF B recommendation). Niacin is no longer recommended for cardiovascular risk reduction due to a lack of evidence for benefit.

Ref: Shiroma EJ, Lee IM: Physical activity and cardiovascular health: Lessons learned from epidemiological studies across age, gender, and race/ethnicity. *Circulation* 2010;122(7):743-752. 2) *Final Recommendation Statement: Aspirin Use to Prevent Cardiovascular Disease and Colorectal Cancer: Preventive Medication.* US Preventive Services Task Force, 2017. 3) Last AR, Ference JD, Menzel ER: Hyperlipidemia: Drugs for cardiovascular risk reduction in adults. *Am Fam Physician* 2017;95(2):78-87.

Item 220

ANSWER: A

Uterine fibroid tumors (leiomyomas) are the most common tumors of the female reproductive tract, with some evidence suggesting that the cumulative incidence in women age 25–45 years is approximately 30%. Symptoms related to fibroids can include menorrhagia, pelvic pain, obstructive symptoms, infertility, or pregnancy loss. However, many fibroids are asymptomatic and are discovered incidentally, with observation being the preferred management in this situation (SOR B). The risk of malignant leiomyosarcoma is exceedingly small (0.23% in one study) and there is a risk of side effects or complications from other treatment modalities.

For women who are symptomatic, the data is insufficient regarding the most appropriate therapy. Surgical options include myomectomy, hysterectomy, uterine artery embolization, and myolysis, but data to allow direct comparison is lacking. With the exception of trials of GnRH-agonist therapy as an adjunct to surgery, there is not enough randomized trial data to support the use of medical therapies such as oral contraceptives, NSAIDs, or progestins in the treatment of symptomatic fibroids.

Ref: Hartmann KF, Fonnesbeck C, Surawicz T, et al: Management of uterine fibroids. Agency for Healthcare Research and Quality, 2017. 2) De La Cruz MS, Buchanan EM: Uterine fibroids: Diagnosis and treatment. *Am Fam Physician* 2017;95(2):100-107.

Item 221

ANSWER: B

Diarrhea that develops in patients with ileal Crohn's disease or following ileal resection is usually due to increased amounts of bile acid remaining in the stool. This affects colonic secretion and motility and various protein factors in the gut, resulting in the development of bile acid diarrhea (BAD). Although various tests can be performed to evaluate the stool, gut flora, and bowel function, a therapeutic trial with a bile acid sequestrant such as cholestyramine is most often used for both the diagnosis and treatment of BAD. Reducing fat intake may also be beneficial. Loperamide can lessen the diarrhea in some patients but should not be the primary treatment because chronic use can result in constipation. Fiber supplementation may help to produce a more formed stool and could be used as an adjunct treatment when appropriate.

Ref: Kasper DL, Fauci AS, Hauser SL, et al (eds): *Harrison's Principles of Internal Medicine*, ed 19. McGraw-Hill, 2015, pp 1934-1935. 2) Goldman L, Schafer AI (eds): *Goldman's Cecil Medicine*, ed 25. Elsevier Saunders, 2016, pp 928-929.

Item 222

ANSWER: C

An SSRI or SNRI should be used first as monotherapy for posttraumatic stress disorder (PTSD), and should be optimized before an additional agent is added. Prazosin is an effective augmenting therapy for patients with PTSD and sleep disturbance (SOR B). Other α-blockers and β-blockers have been shown to be ineffective in the treatment of PTSD. Benzodiazepines such as lorazepam can treat symptoms of hyperarousal but have been associated with adverse effects and should be avoided in the treatment of PTSD (SOR B). Hypnotics such as zolpidem are generally reserved for short-term use. There is no evidence to support the use of atypical antipsychotics for PTSD and their use should be avoided (SOR C).

Ref: Warner CH, Warner CM, Appenzeller GN, Hoge CW: Identifying and managing posttraumatic stress disorder. *Am Fam Physician* 2013;88(12):827-834.

Item 223

ANSWER: D

This patient has a typical presentation of impingement syndrome of the shoulder. Subacromial injection of a corticosteroid may provide pain relief for up to several weeks but does not alter long-term outcomes. According to some studies, these injections are associated with greater health care utilization. Injection of a corticosteroid has not been shown to provide superior pain relief compared to oral NSAIDs. Physical therapy is superior for long-term pain relief.

Ref: Foster ZJ, Voss TT, Hatch J, Frimodig A: Corticosteroid injections for common musculoskeletal conditions. *Am Fam Physician* 2015;92(8):694-699.

Item 224

ANSWER: B

Statins such as atorvastatin, antiplatelet drugs such as aspirin, angiotensin inhibitors such as lisinopril, and β-blockers such as metoprolol have all been shown to increase survival after an acute coronary artery event. Calcium channel blockers such as amlodipine, fibrates such as gemfibrozil, and nitroglycerins such as isosorbide mononitrate have not been shown to increase survival. Spironolactone has been shown to increase survival in patients with heart failure and reduced ejection fractions but not in those with ischemic heart disease with preserved ejection fractions.

Ref: O'Gara PT, Kushner FG, Ascheim DD, et al: 2013 ACCF/AHA guideline for the management of ST-elevation myocardial infarction: A report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. *Circulation* 2013;127(4):e362-e425.

Item 225

ANSWER: C

As many as 20% of newborns will be affected by neonatal acne, usually in the form of pustules confined to the cheeks, chin, eyelids, and forehead. This is typically mild, self-limited, and best managed by reassuring the parents. Acne can also appear in infants, typically males 6–12 months of age, and is also usually self-limited and not associated with underlying endocrine pathology in the absence of any other findings suggesting hormonal abnormalities such as clitoromegaly, breast or testicular development, pubic hair growth, hirsutism, or a growth abnormality consistent with increased muscle development. Acne appearing during mid-childhood is rare and, if present, warrants referral for extensive laboratory testing to identify an underlying endocrine abnormality. Preadolescents and adolescents are very likely to develop acne as a result of normal ovarian/testicular development. In the absence of other findings to suggest an endocrine problem, developing an effective treatment regimen is most appropriate for these individuals.

Ref: Eichenfield LF, Krakowski AC, Piggott C, et al: Evidence-based recommendations for the diagnosis and treatment of pediatric acne. *Pediatrics* 2013;131(Suppl 3):S163-S186.

Item 226

ANSWER: B

Using a procalcitonin-guided therapy algorithm reduces antibiotic use by 3.47 days without increasing either morbidity or mortality in adults with acute respiratory infections. If the procalcitonin level is <0.10 mg/dL, a bacterial infection is highly unlikely and it is strongly recommended that antibiotics not be prescribed. If the procalcitonin level is 0.10–0.24 mg/dL a bacterial infection is still unlikely and it is recommended that antibiotics not be used. If the level is 0.25–0.50 mg/dL a bacterial infection is likely and antibiotics are recommended. It is strongly recommended that antibiotics be given if the level is >0.50 mg/dL, because a bacterial infection is very likely.

Ref: Morris C, Paul K, Safranek S: Procalcitonin-guided antibiotic therapy for acute respiratory infections. *Am Fam Physician* 2016;94(1):53-58.

Item 227

ANSWER: A

This case and image are consistent with *Ascaris lumbricoides* infestation. *A. lumbricoides* is a large roundworm that typically infects the ileum. Symptoms are variable but large infections can lead to intestinal obstruction. Pinworms are much smaller and typically present with anal pruritus. Tapeworms can be large, but are flat and segmental in appearance, and are typically found in the stool as segments called proglottids. Hookworms are also round, but are typically 6–12 mm in length. They are a significant cause of anemia in children globally. *Giardia lamblia* is a microscopic protozoan parasite that is not visible on gross examination.

Ref: Kucik CJ, Martin GL, Sortor BV: Common intestinal parasites. *Am Fam Physician* 2004;69(5):1161-1168. 2) Weatherhead JE, Hotez PJ: Worm infections in children. *Pediatr Rev* 2015;36(8):341-352.

Item 228

ANSWER: C

Screening for colorectal cancer (CRC) is recommended for average-risk individuals beginning at age 50 (SOR A). Individuals at higher risk include those with a personal history of adenomatous polyps, CRC, inflammatory bowel disease, genetic cancer syndromes, or a family history of either adenomatous polyps or CRC. Patients with a first degree relative with CRC or adenomatous polyps discovered before age 60, or two or more first degree relatives at any age with CRC or advanced adenoma, should undergo colonoscopy screening starting at age 40 or 10 years before the youngest age a family member was diagnosed, whichever comes first. The maximum surveillance interval for these patients is 5 years (SOR C). Patients with a single first degree relative diagnosed at age 60 or older, and patients with two affected second degree relatives, should undergo screening starting at age 40 by any recommended method, and at the same intervals for average-risk individuals (SOR C). Patients with small, distal hyperplastic polyps are considered to have a normal colonoscopy (SOR C). There is no need for referral to a gastroenterologist or interval fecal immunochemical testing (FIT) following an adequate colonoscopy.

Ref: Short MW, Layton MC, Teer BN, Domagalski JE: Colorectal cancer screening and surveillance. *Am Fam Physician* 2015;91(2):93-100. 2) Rex DK, Boland CR, Dominitz JA, et al: Colorectal cancer screening: Recommendations for physicians and patients from the US Multi-Society Task Force on Colorectal Cancer. *Am J Gastroenterol* 2017;112(7):1016-1030.

Item 229

ANSWER: D

Penile enlargement in an 8-year-old male is a sign of precocious puberty. Isolated sparse pubic and axillary hair growth and axillary odor is referred to as premature adrenarche, and represents high levels of dehydroepiandrosterone rather than activation of the hypothalamic-pituitary-gonadal axis that leads to puberty. The isolated findings of premature adrenarche are generally considered benign. An 8-year-old with breast buds and a 10-year-old with menarche are within the normal range of expected pubertal development. Penile enlargement typically represents full activation of the hypothalamic-pituitary-gonadal axis and warrants endocrinologic evaluation in boys younger than 9 years of age.

Ref: Kaplowitz P, Bloch C: Evaluation and referral of children with signs of early puberty. *Pediatrics* 2016;137(1). 2) Klein DA, Emerick JE, Sylvester JE, Vogt KS: Disorders of puberty: An approach to diagnosis and management. *Am Fam Physician* 2017;96(9):590-599.

Item 230

ANSWER: B

Leukocytosis is a relatively common finding with many possible etiologies. For most cases without a clear cause, a repeat CBC with differential and a peripheral smear review are indicated to confirm leukocytosis, determine subtypes, and look for concerning abnormalities on the smear. Given this patient's fatigue, a hematologic referral may be indicated if leukocytosis is confirmed on repeat testing. Similar recommendations would apply to flow cytometry testing. Blood cultures are not necessary in cases of leukocytosis without evidence of infection. Obesity can cause leukocytosis, but because of the patient's fatigue it would not be appropriate at this time to attribute the leukocytosis to obesity alone.

Ref: Herishanu Y, Rogowski O, Polliack A, Marilus R: Leukocytosis in obese individuals: Possible link in patients with unexplained persistent neutrophilia. *Eur J Haematol* 2006;76(6):516-520. 2) Riley LK, Rupert J: Evaluation of patients with leukocytosis. *Am Fam Physician* 2015;92(11):1004-1011.

Item 231

ANSWER: E

When administered at appropriate doses, opiates do not reduce or compromise respiratory status and do not hasten dying. Opiates help to reduce the sense of air hunger in patients with dyspnea. The use of opiates for palliative therapy in advanced pulmonary disease is supported by clinical guidelines from the American Thoracic Society.

Ref: Albert RH: End-of-life care: Managing common symptoms. *Am Fam Physician* 2017;95(6):356-361.

Item 232

ANSWER: D

This patient's back pain is most consistent with an inflammatory cause rather than a mechanical cause. Morning stiffness and improvement with physical activity are key features of inflammatory back pain. Ankylosing spondylitis (AS), one subset of the broader diagnostic category of axial spondyloarthritis, is the likely diagnosis in this patient. Delays in diagnosis are common due to the widespread presence of mechanical low back pain. The identification of patients with inflammatory back pain is important, because early intervention with disease-modifying agents can preserve long-term joint function. HLA-B27 is found in 74%–89% of patients with AS and it can be diagnostic in a patient with typical inflammatory back pain symptoms.

Inflammatory markers such as the erythrocyte sedimentation rate and C-reactive protein are often elevated in patients with AS but are not specific to this diagnosis. Rheumatoid arthritis is not a likely cause of back pain in this patient without any other joint findings. Antinuclear antibody testing can assist in the diagnosis of systemic lupus erythematosus, which can cause an inflammatory arthritis, but it is similarly nonspecific and lupus typically has other findings in addition to back pain.

Ref: Taurog JD, Chhabra A, Colbert RA: Ankylosing spondylitis and axial spondyloarthritis. *N Engl J Med* 2016;374(26):2563-2574. 2) Strand V, Singh JA: Evaluation and management of the patient with suspected inflammatory spine disease. *Mayo Clin Proc* 2017;92(4):555-564.

Item 233

ANSWER: A

The 2015 American Geriatrics Society Beers Criteria for potentially inappropriate medication use in older adults ≥65 years of age states that donepezil use should be avoided in patients with syncope, due to an increased risk of bradycardia (Moderate Evidence Level; Strong Strength of Recommendation). Donepezil is a cholinesterase inhibitor. Due to their cholinergic effect, these medications have a vagotonic effect on the sinoatrial and atrioventricular nodes. This can cause bradycardia or heart block in patients with or without underlying cardiac conduction abnormalities. Syncope has been reported with these medications.

Memantine is an N-methyl-D-aspartate receptor antagonist and is not associated with bradycardia. Escitalopram, lisinopril, and zolpidem are also not associated with bradycardia.

Ref: Aricept (donepezil hydrochloride) label. US Food and Drug Administration, 2012. 2) American Geriatrics Society 2015 Beers Criteria Update Expert Panel: American Geriatrics Society 2015 updated Beers Criteria for potentially inappropriate medication use in older adults. *J Am Geriatr Soc* 2015;63(11):2227-2246.

Item 234

ANSWER: D

In a pediatric patient, blood pressure should be evaluated using comparisons based on age, sex, and height. Although this adolescent's blood pressure is prehypertensive for an adult according to JNC 8 guidelines, it is stage 1 hypertension (between 95% and 99%) for her age, sex, and height. All pediatric patients with confirmed hypertension should have further evaluation to check for renal dysfunction as well as other cardiac risk factors. Additionally, renal ultrasonography is recommended to evaluate for renal disease and echocardiography to evaluate for end-organ damage that would affect treatment goals. Additional studies, such as plasma renin and catecholamine levels or renovascular imaging, may be indicated in children with abnormalities on initial evaluation that suggest secondary causes of hypertension.

Pharmacologic therapy is usually recommended for pediatric patients with symptomatic hypertension, secondary hypertension, target organ damage, diabetes mellitus, or persistent hypertension in spite of nonpharmacologic treatment. A low-sodium diet may be helpful for decreasing blood pressure, and given this patient's obesity, intensive counseling about lifestyle changes is appropriate.

Ref: Flynn JT, Kaelber DC, Baker-Smith CM, et al: Clinical practice guideline for screening and management of high blood pressure in children and adolescents. *Pediatrics* 2017;140(3):e20171904.

Item 235

ANSWER: A

Patients treated with valproic acid (VPA) have a higher incidence of hyperammonemia. Although the incidence of VPA-induced hyperammonemia varies, it should be considered in patients taking VPA who present with altered mental status or encephalopathy. In addition to discontinuing VPA, the encephalopathy should be managed with ammonia-lowering drugs such as lactulose. Ammonia levels can also be elevated in patients taking VPA who do not have encephalopathy, and close monitoring of these patients for the development of encephalopathy is recommended. Gilbert syndrome causes an asymptomatic elevation of bilirubin in the absence of underlying hepatic disease. Occult gastrointestinal bleeding should be suspected in patients with an elevated BUN level in the absence of underlying renal disease or volume depletion. Patients with portal vein thrombosis present with abdominal pain and other symptoms of an underlying predisposing disease such as cirrhosis (SOR C).

Ref: Kasper DL, Fauci AS, Hauser SL, et al (eds): *Harrison's Principles of Internal Medicine*, ed 19. McGraw-Hill, 2015, pp 2026, 2028, 2056.

Item 236

ANSWER: A

Current guidelines recommend that patients with an ST-elevation myocardial infarction (STEMI) who also have atrial fibrillation take dual antiplatelet therapy such as aspirin plus clopidogrel and a vitamin K antagonist, with a goal INR of 2.0–3.0. If a patient was already taking a direct-acting oral anticoagulant (DOAC) instead of warfarin for atrial fibrillation, the patient should continue with the DOAC in addition to dual antiplatelet therapy. The duration of triple therapy should be as short as possible, and aspirin can often be discontinued after 1–3 months. However, this patient's STEMI occurred less than 2 weeks ago and he should continue triple therapy.

Ref: Anderson JL, Morrow DA: Acute myocardial infarction. *N Engl J Med* 2017;376(21):2053-2064.

Item 237

ANSWER: E

Somatic symptom disorder (formerly called somatization disorder) usually begins in the teens or twenties and is characterized by multiple unexplained physical symptoms, insistence on surgical procedures, and an imprecise or inaccurate medical history. These patients also commonly abuse alcohol, narcotics, or other drugs.

Patients with illness anxiety disorder are overly concerned with bodily functions, and can often provide accurate, extensive, and detailed medical histories. Malingering is an intentional pretense of illness to obtain personal gain. Patients with panic disorder have episodes of intense, short-lived attacks of cardiovascular, neurologic, or gastrointestinal symptoms. Generalized anxiety disorder is characterized by unrealistic worry about life circumstances accompanied by symptoms of motor tension, autonomic hyperactivity, or vigilance and scanning.

Ref: Kurlansik SL, Maffei MS: Somatic symptom disorder. *Am Fam Physician* 2016;93(1):49-54.

Item 238

ANSWER: C

The Lachman test is the most accurate test for an anterior cruciate ligament (ACL) tear (SOR A). Accurate testing can lead to appropriate referral and treatment for ACL tears, and early detection can lead to better outcomes. The Lachman test has higher validity based on a sensitivity of 68% for partial ruptures and 96% for complete ruptures. The other two commonly used tests are the anterior drawer test, which has a sensitivity of 38% and a specificity of 81%, and the pivot shift test, which is more technically difficult than the other two tests and has a sensitivity ranging from 24% to 85%. The pivot shift test is effective if done correctly but should not be used alone to diagnose an ACL tear (SOR A).

The lever sign test is a newer test that holds promise for detecting ACL tears and is easily performed in the office. However, sensitivity and specificity reports vary (SOR B). The McMurray test is used to detect meniscal tears.

Ref: Grover M: Evaluating acutely injured patients for internal derangement of the knee. *Am Fam Physician* 2012;85(3):247-252. 2) Koster Ch, Harmsen AM, Lichtenberg MC, Bloemers FW: ACL injury: How do the physical examination tests compare? *J Fam Pract* 2018;67(3):130-134.

Item 239

ANSWER: E

Testosterone replacement has significant risks and contraindications. Absolute contraindications include breast cancer, prostate cancer, a prostate-specific antigen (PSA) level >4 ng/dL, an abnormal rectal examination with nodules, and polycythemia with a hematocrit >54%. Relative contraindications include a baseline hematocrit >50%, a desire for fertility, uncontrolled heart failure, untreated sleep apnea, and severe lower tract symptoms. This patient has polycythemia with a hematocrit >54% and should not be started on testosterone. Testosterone stimulates erythropoiesis and increases the risk of thrombosis. Although there may be an association between testosterone deficiency and coronary artery disease, a history of coronary artery disease is not a contraindication to testosterone replacement. Patients with chronic renal disease who are on chronic opioid therapy are at higher risk of developing secondary testosterone deficiency. Testosterone replacement may increase PSA levels and should not be used in patients with known or suspected prostate cancer.

Ref: Petering RC, Brooks NA: Testosterone therapy: Review of clinical applications. *Am Fam Physician* 2017;96(7):441-449.

Item 240

ANSWER: C

De Quervain's tenosynovitis usually occurs with repeated use of the thumb and is characterized by pain in the radial wrist. The course is typically self-limited but can last for up to a year, so waiting would not be a good option for this patient who wants to continue her usual activities as soon as possible. Conservative therapy with immobilization and NSAIDs is recommended if there are no contraindications to NSAIDs. A corticosteroid injection is helpful but is typically reserved for severe cases or if conservative therapy fails. Surgery may be beneficial but is generally not recommended unless the course is severe, given the natural history of resolution.

Ref: Tallia AF, Cardone DA: Diagnostic and therapeutic injection of the wrist and hand region. *Am Fam Physician* 2003;67(4):745-750. 2) Huisstede BM, Coert JH, Fridén J, Hoogvliet P; European HANDGUIDE Group: Consensus on a multidisciplinary treatment guideline for de Quervain disease: Results from the European HANDGUIDE study. *Phys Ther* 2014;94(8):1095-1110.