

# American Board of Family Medicine



**IN-TRAINING EXAMINATION**

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1. A 67-year-old male sees you for a Medicare annual wellness visit. He tells you that his best friend had a stroke and he asks about his risk for stroke. He has no history of stroke, TIA, or neurologic symptoms. He has a family history of cardiovascular disease in his father, who had a myocardial infarction at age 65 and died from a thrombotic stroke at age 71. The patient exercises regularly and has a BMI of 27 kg/m<sup>2</sup>. His only current medical condition is hyperlipidemia, and his cholesterol level is at goal on rosuvastatin (Crestor), 10 mg daily. He also takes aspirin, 81 mg daily. His blood pressure is 125/78 mm Hg.

Based on U.S. Preventive Services Task Force guidelines, which one of the following would be most appropriate at this time?

- A) No additional testing for stroke risk
  - B) Auscultation for carotid bruits
  - C) Carotid duplex ultrasonography
  - D) Magnetic resonance angiography
  - E) CT angiography of the carotid arteries
2. A 28-year-old female presents for evaluation of nasal congestion, sneezing, watery eyes, and postnasal drip. This has been an intermittent issue for her every spring and she would like to manage it more effectively.

Which one of the following treatments has been shown to be the most effective and best tolerated first-line therapy for this patient's condition?

- A) A leukotriene receptor antagonist
  - B) Intranasal corticosteroid monotherapy
  - C) Intranasal corticosteroids plus an oral antihistamine
  - D) Inhaled corticosteroids
  - E) Annual triamcinolone injections
3. A 68-year-old female presents with a 2-month history of watery diarrhea. She has not had any blood or pus in her stools, and the stools are not oily. She has not had any history of fever, chills, or weight loss, and has not traveled recently. She smokes one pack of cigarettes per day. Her medications include ibuprofen, sertraline (Zoloft), and pantoprazole (Protonix). A CBC, metabolic panel, C-reactive protein level, IgA anti-tissue transglutaminase level, total IgA level, and stool guaiac test are all normal.

Which one of the following tests would be most likely to yield a diagnosis?

- A) *Clostridioides (Clostridium) difficile* toxin
- B) Colonoscopy
- C) Fecal calprotectin
- D) A stool culture
- E) Stool examination for ova and parasites

4. A 23-year-old male with opioid use disorder requests buprenorphine therapy. He is still actively using immediate-release oxycodone (Roxicodone) and he took a dose 2 hours ago.

This patient should begin buprenorphine induction

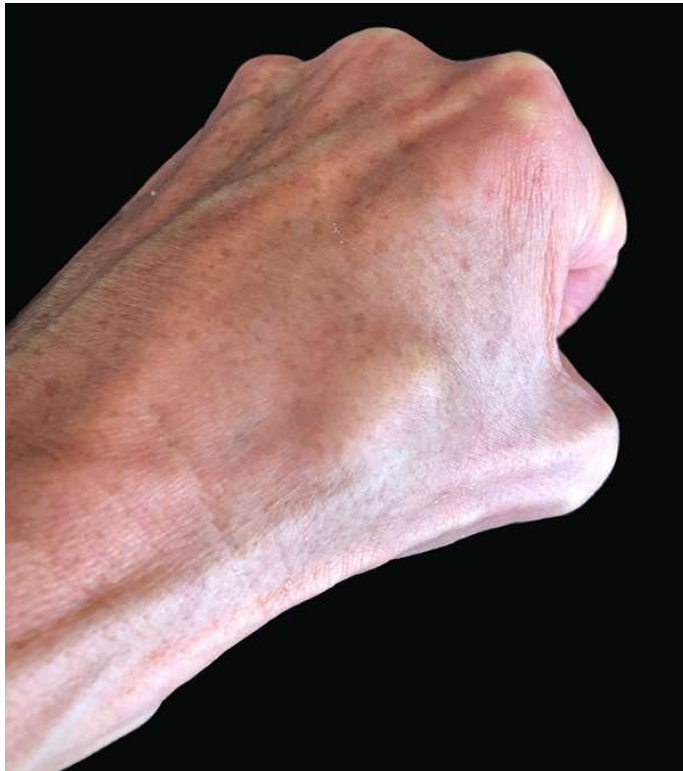
- A) now
  - B) in 2 hours
  - C) 8–12 hours after his last opioid use
  - D) 24 hours after his last opioid use
  - E) 1 week after his last opioid use
5. A 45-year-old left hand–dominant female presents to your office with a lump on her hand. She first noticed the lump 2 weeks ago and thinks it has gotten bigger. She does not recall any injury. She has not had any numbness, weakness, or tingling. She has minimal discomfort when she presses on the lump, and it does not affect her activity. On examination her left wrist is neurovascularly intact. You note the volar wrist mass shown below.

Which one of the following management options would you recommend?

- A) Re-examination if she develops numbness, weakness, or increased pain
  - B) Immobilization of the wrist for 6 weeks and then re-examination
  - C) Aspiration of the lesion
  - D) Aspiration and injection of the lesion with a corticosteroid
  - E) Referral for excision of the lesion
6. A 57-year-old female with diabetes mellitus comes to your office for a routine follow-up. Her current medications include metformin (Glucophage), 1000 mg twice daily. She tells you that she does not exercise regularly and finds it difficult to follow a healthy diet. A hemoglobin A<sub>1c</sub> today is 7.5%. She does not want to add medications at this time, but she does want to get her hemoglobin A<sub>1c</sub> below 7%, which is the goal that was previously discussed.

Which one of the following would be the most effective way to improve glucose control for this patient?

- A) Discuss the components of a healthy diabetic diet and encourage her to follow it more closely
- B) Discuss the importance of regular exercise and encourage her to exercise 30–45 minutes daily
- C) Recommend that she check her glucose level 1–3 times daily to help determine what adjustments need to be made
- D) Start her on an additional medication
- E) Refer her to a diabetes educator for medical nutrition therapy



Item #5

7. During a newborn examination the patient's mother asks what she can do to decrease the risk of food allergies in her newborn son. She tells you that there is no family history of atopic dermatitis or asthma but she has a cousin with a peanut allergy. The remainder of the examination is unremarkable.

You tell her that food allergy risk can be reduced by

- A) breastfeeding for at least 1 year
  - B) using soy-based formula instead of cow's milk-based formula
  - C) introducing peanut-containing foods when solids are started
  - D) avoiding all house pets
  - E) avoiding a day care setting
8. Which one of the following antihypertensive medications is LEAST likely to exacerbate erectile dysfunction?

- A) Clonidine (Catapres)
- B) Doxazosin (Cardura)
- C) Hydrochlorothiazide
- D) Losartan (Cozaar)
- E) Metoprolol

9. You are providing end-of-life care for a 53-year-old female with end-stage colon cancer. Her family reports that she is having significant abdominal pain, nausea, and vomiting, and she is not able to tolerate oral intake. You suspect a malignant bowel obstruction.

Which one of the following interventions would be most likely to significantly improve her symptoms?

- A) Medical cannabis
- B) Dexamethasone
- C) Morphine
- D) Octreotide (Sandostatin)
- E) Polyethylene glycol (MiraLAX)

10. A 3-year-old male has developed multiple large areas of bullous impetigo on the legs, buttocks, and trunk after being bitten numerous times by ants. Which one of the following would be the most appropriate treatment?

- A) Topical mupirocin ointment
- B) Oral azithromycin (Zithromax)
- C) Oral tetracycline
- D) Oral trimethoprim/sulfamethoxazole (Bactrim)
- E) Intramuscular penicillin G benzathine (Bicillin L-A)

11. A 60-year-old male with diabetes mellitus and hypertension sees you for routine follow-up. He has no acute health concerns during today's visit. His current medications include metformin (Glucophage), lisinopril (Prinivil, Zestril), and hydrochlorothiazide. He smokes cigarettes and has a 40-pack-year smoking history. His vital signs and a physical examination are normal. An in-office dipstick urinalysis reveals 1+ blood and trace protein but is otherwise normal.

Which one of the following would be the most appropriate follow-up?

- A) Repeat dipstick urinalysis in 3 months
  - B) Microscopic urinalysis
  - C) Renal ultrasonography
  - D) CT urography
  - E) Referral for cystoscopy
12. A 33-year-old gravida 2 para 1 presents to the hospital at 35 weeks estimated gestation with premature rupture of membranes. A decision is made to manage the pregnancy expectantly and delay delivery unless signs of infection or fetal distress are noted.

Based on current evidence, expectant management rather than immediate delivery increases the risk of which one of the following complications?

- A) Cesarean delivery
  - B) Antepartum or postpartum maternal hemorrhage
  - C) Time spent in the neonatal intensive-care unit
  - D) Neonatal sepsis
  - E) Perinatal or infant mortality
13. Which one of the following represents a CONTRAINDICATION to statin use?
- A) Current pregnancy
  - B) Chronic hepatitis C infection
  - C) End-stage renal disease
  - D) Myositis associated with a creatine kinase level five times the upper limit of normal
  - E) Transaminitis due to nonalcoholic steatohepatitis

14. A 2-year-old female is brought to the urgent care clinic because of a fever. On examination she has a temperature of 39.7°C (103.5°F). Within a short period of time while at the clinic she develops a barking cough and respiratory distress, and you note rapid deterioration of her condition.

Which one of the following is the most likely diagnosis?

- A) Bacterial tracheitis
- B) Epiglottitis
- C) Foreign body aspiration
- D) Peritonsillar abscess

15. A 13-year-old baseball player who is right-hand dominant is brought to your office because of a 3-week history of pain in the right shoulder. He recalls no specific injury but has been pitching at least weekly for the past 3 months. He has moderate tenderness about the anterior and lateral deltoid.

In addition to radiographic studies, the best initial management would include

- A) complete rest from throwing activities
  - B) a sling and swathe
  - C) sugar-tong splints both proximal and distal to the elbow
  - D) physical therapy
16. A 24-year-old female comes to your office with a 1-day history of the gradual onset of nonradiating worsening right lower quadrant abdominal pain, nausea, emesis, and chills. Her symptoms are minimally relieved with ibuprofen, 400 mg. Her menstrual period 2 weeks ago was normal. She has not had any dysuria, vaginal discharge, or change in bowel habits. Her past medical and surgical histories are notable only for dysmenorrhea managed with an anti-inflammatory medication as needed.

An examination reveals a temperature of 38.1°C (100.6°F), discomfort with position change, right lower quadrant abdominal tenderness and guarding, and diminished bowel sounds. Point-of-care testing shows an elevated WBC count, and a urinalysis and pregnancy test are negative.

Which one of the following would you recommend at this time?

- A) A plain film of the abdomen
  - B) Abdominal ultrasonography
  - C) Pelvic ultrasonography with transvaginal ultrasonography if needed
  - D) CT of the abdomen and pelvis
  - E) MRI of the abdomen and pelvis
17. A 45-year-old female comes to your office for an annual health maintenance visit. She has a family history of type 2 diabetes in her mother and a personal history of obesity for many years.

If verified with a second test, which one of the following would confirm a diagnosis of diabetes mellitus?

- A) A hemoglobin A<sub>1c</sub> of 6.4%
- B) A 2-hour plasma glucose level of 190 mg/dL on an oral glucose tolerance test
- C) A random glucose level of 190 mg/dL
- D) A fasting plasma glucose level of 130 mg/dL

18. A 57-year-old male recently diagnosed with acute lymphoblastic leukemia presents to the emergency department with intractable nausea, vomiting, and myalgias. His first chemotherapy infusion was administered earlier in the day.

Which one of the following electrolyte disturbances would be consistent with tumor lysis syndrome?

- A) Hypocalcemia
  - B) Hypokalemia
  - C) Hyponatremia
  - D) Hypophosphatemia
  - E) Hypouricemia
19. Which one of the following is needed to calculate the number needed to treat (NNT)?
- A) Number needed to harm
  - B) Pretest probability
  - C) Absolute risk reduction
  - D) Relative risk reduction
  - E) Likelihood ratio
20. A 30-year-old male comes to your office for evaluation of hand weakness. On examination you detect weakness when he tries to bring his thumb and index finger together. For confirmation you ask him to try to hold on to a piece of paper between his thumb and index finger while you try to pull it away. He is unable to resist when you pull on the paper.

The most likely explanation for these findings is an injury to the

- A) brachial plexus
  - B) median nerve
  - C) musculocutaneous nerve
  - D) radial nerve
  - E) ulnar nerve
21. A 30-year-old male is diagnosed with hereditary hemochromatosis. Periodic therapeutic phlebotomy may be appropriate to prevent
- A) chronic liver disease
  - B) chronic renal disease
  - C) encephalopathy
  - D) myelofibrosis
  - E) Wilson disease



22. A 14-year-old male is brought to your office by his parents, who are concerned about his behavior. Recently he was caught shoplifting video games. He started smoking cigarettes at age 10, and he has a history of truancy from school for the past 2 years. His parents report that they have caught him starting fires outside of their home, and he often teases the family dog, whom he has injured on several occasions.

The most likely diagnosis is

- A) antisocial personality disorder
  - B) attention-deficit/hyperactivity disorder (ADHD)
  - C) avoidant personality disorder
  - D) conduct disorder
  - E) substance abuse
23. A 70-year-old female sees you for a Medicare annual wellness visit. Her past medical history includes hypertension treated with enalapril (Vasotec). She states that she “couldn't be better” and says that she has no new symptoms or health concerns. She has a blood pressure of 159/90 mm Hg, a temperature of 36.7°C (98.1°F), a heart rate of 76 beats/min, a respiratory rate of 17/min, and an oxygen saturation of 98% on room air. On examination you note a new harsh systolic murmur that is heard best at the second right intercostal space and can also be heard over the right carotid artery. A transthoracic echocardiogram reveals severe aortic stenosis.

Which one of the following should you recommend for this patient?

- A) Antibiotic prophylaxis for dental procedures
  - B) Transesophageal echocardiography
  - C) Repeat echocardiography in 6 months
  - D) Referral for aortic valve replacement
24. A 4-month-old female is brought to your office by her mother for a well child visit. The mother tells you about some red patches on the child's cheeks and legs that do not seem to bother the infant. She says that the patches sometimes appear very irritated and improve with occasional lotion use but keep coming back. The mother has not noticed any signs of illness. An examination reveals a well appearing infant with normal growth, development, and vital signs. You note slightly rough erythematous patches on both cheeks and her chin, as well as on her thighs.

Which one of the following would be most appropriate at this time?

- A) Twice-daily application of a fragrance-free moisturizer with a high lipid-to-water ratio
- B) Twice-daily application of a low-potency topical corticosteroid
- C) Application of a topical calcineurin inhibitor for the facial lesions and a low-potency topical corticosteroid for the other areas
- D) Allergy testing
- E) Referral to a dermatologist

25. After a thorough history and examination you determine that a 30-year-old male has an upper respiratory infection with a persistent cough. He is afebrile and is otherwise healthy.

The best treatment for symptomatic relief of his persistent cough would be intranasal

- A) antibiotics
- B) antihistamines
- C) corticosteroids
- D) ipratropium (Atrovent)
- E) saline

26. A 30-year-old female presents for evaluation of chronic abdominal bloating, cramping, diarrhea, and recent weight loss. An abdominal examination is unremarkable, and stool guaiac testing is negative. She requests testing for celiac disease.

Which one of the following would be most likely to cause a false-negative result on serologic testing for celiac disease?

- A) A recent increase in dietary wheat consumption
- B) Recent use of loperamide (Imodium A-D)
- C) A skin rash consistent with dermatitis herpetiformis
- D) IgA deficiency
- E) Iron deficiency anemia

27. A 20-year-old male presents with a painful second finger after his right hand was stepped on 3 days ago while he was playing basketball. He has marked pain as well as numbness of the distal finger. There are no open wounds and the skin color and nail appear normal other than moderate edema of the fingertip. A radiograph reveals a distal phalanx fracture.

Which one of the following would be the most appropriate next step?

- A) Treat symptomatically with ice and an anti-inflammatory medication
- B) Tape the first and second digits together until symptoms resolve
- C) Splint the affected digit for 2–4 weeks
- D) Remove the nail to evaluate for a nail bed injury
- E) Refer to a hand surgeon

28. A 72-year-old female with a history of type 2 diabetes and hypertension presents to your clinic because of fatigue and depression for the last 5–6 months. She has gained about 7 kg (15 lb) and now has a BMI of 32 kg/m<sup>2</sup>. A physical examination is otherwise unremarkable. Laboratory studies reveal a TSH level of 8.2  $\mu$ U/mL (N 0.4–4.0). A repeat test 1 month later shows a TSH level of 7.4  $\mu$ U/mL and a free T<sub>4</sub> level of 1.6 ng/dL (N 0.8–2.8).

Treatment of this patient with L-thyroxine

- A) has no proven benefit
  - B) can increase grip strength
  - C) can increase her energy level
  - D) can help improve depression symptoms
  - E) can reduce her BMI
29. A 58-year-old male is brought to your office by his wife for follow-up after an urgent care clinic visit 3 days ago where he was diagnosed with pneumonia based on a chest radiograph. He has been taking his antibiotics as prescribed. He had shaking chills last night, and this morning at home he had a fever and has been very fatigued and slightly confused. He has a blood pressure of 110/70 mm Hg, a respiratory rate of 27/min, and a temperature of 38.7°C (101.7°F). Laboratory studies reveal elevated WBCs and elevated creatinine and lactate levels.

Which one of the following would be the most appropriate next step?

- A) Adjust his antibiotic therapy to cover health care–associated pneumonia
  - B) Obtain intravenous access and begin fluid resuscitation
  - C) Order a procalcitonin level
  - D) Order repeat chest radiography
  - E) Order CT of the chest
30. Which one of the following is most appropriate for the initial management of volume overload due to an acute exacerbation of heart failure with preserved ejection fraction?
- A) Carvedilol (Coreg)
  - B) Furosemide (Lasix)
  - C) Lisinopril (Prinivil, Zestril)
  - D) Sacubitril/valsartan (Entresto)
  - E) Spironolactone (Aldactone)

31. A 62-year-old male was hospitalized for an upper gastrointestinal (GI) bleeding episode and the gastroenterologist arranges for you to provide follow-up care. The patient's medications include atorvastatin (Lipitor), metformin (Glucophage), lisinopril/hydrochlorothiazide (Zestoretic), citalopram (Celexa), and omeprazole (Prilosec).

Which one of the following medications in his current regimen increases the risk of an upper GI bleeding episode?

- A) Atorvastatin
- B) Citalopram
- C) Lisinopril/hydrochlorothiazide
- D) Metformin
- E) Omeprazole

32. A 55-year-old female with diabetes mellitus and hypertension sees you because of a 3-month history of a persistent nonproductive cough. Two weeks after the cough began she presented to a local urgent care center with additional symptoms of sinus pressure, rhinorrhea, and subjective wheezing. A lung examination and chest radiograph performed at that visit were unremarkable. She was diagnosed with acute bronchitis and prescribed benzonatate (Tessalon). Since then, her sinus-related symptoms have abated, although her cough has not improved. Her current medications include metformin (Glucophage), lisinopril (Prinivil, Zestril), and hydrochlorothiazide, all of which were initiated 6 months ago. She has no known allergies and has never smoked. A physical examination today is unremarkable.

Which one of the following is the most likely cause of her cough?

- A) Chronic lung disease
- B) Infection
- C) Malignancy
- D) A medication side effect
- E) A psychogenic habit

33. A 72-year-old male with a history of hypertension, heart failure, and chronic kidney disease sees you for evaluation of gradually worsening lumbar pain. The pain worsens with walking but improves when he sits. He says that the pain radiates to the buttocks and down the right leg, especially with activity. He has not had any fevers, chills, or new urinary symptoms. MRI indicates severe degenerative changes resulting in moderate to severe canal stenosis at the L4-L5 level.

Which one of the following would be most appropriate at this point?

- A) Oral diclofenac, 75 mg twice daily
- B) Oral pregabalin (Lyrica), 75 mg twice daily
- C) Physical therapy
- D) Referral to an orthopedic surgeon for elective surgical resolution
- E) Referral to a neurosurgeon for urgent surgical resolution

34. A 42-year-old female presents to your office to discuss bariatric surgery and its potential complications. Her BMI is 40 kg/m<sup>2</sup> and she has hypertension, type 2 diabetes, and osteoarthritis of both knees.

If she opts to have a sleeve gastrectomy, which one of the following complications is most likely in the first 6 months?

- A) Cholelithiasis
- B) Dumping syndrome
- C) GERD
- D) Leaking at the surgical site
- E) Small bowel obstruction

35. A 14-year-old female is brought to your office for a well child check and a sports physical examination. During the substance abuse screening she says that she does not drink alcohol or smoke marijuana or traditional cigarettes, but occasionally uses e-cigarettes with her friends.

Which one of the following statements describing e-cigarettes is true?

- A) E-cigarettes do not contain heavy metals
- B) The nicotine in e-cigarettes is not addictive
- C) Teens who use e-cigarettes are less likely to use marijuana
- D) More teens use traditional cigarettes than e-cigarettes
- E) E-cigarette use among teens increases the likelihood of cigarette smoking

36. An otherwise healthy 58-year-old female presents with several noduloulcerative lesions ascending up her arm from a lesion on her index finger. A fungal culture of drainage from one of the lesions reveals *Sporothrix schenckii*.

Which one of the following would be the most appropriate initial management strategy?

- A) Observation for spontaneous resolution for 1 month
- B) Local application of heat
- C) Oral itraconazole (Onmel)
- D) Oral saturated solution of potassium iodide
- E) Intravenous liposomal amphotericin B (AmBisome)

37. During a quality improvement project you notice significant variations in the ordering patterns of physicians in your group when checking for proteinuria. Some physicians routinely order spot protein/creatinine ratios while others order spot albumin/creatinine ratios.

When comparing these two options, one advantage of spot albumin/creatinine ratios is that they are

- A) more convenient for the patient
- B) unaffected by exercise
- C) unaffected by menstruation
- D) elevated only in patients with diabetes mellitus
- E) able to detect lower levels of proteinuria

38. A 72-year-old female with a history of type 2 diabetes presents with a 4-month history of a burning sensation along her tongue. Her diabetes is currently well controlled with metformin (Glucophage). Her other medications include atorvastatin (Lipitor) and lisinopril (Prinivil, Zestril). Her past medical history is otherwise unremarkable. An examination reveals a smooth, glossy, erythematous tongue (shown below).

A laboratory evaluation should include which one of the following tests?

- A) Angiotensin converting enzyme
  - B) Antineutrophil cytoplasmic antibody
  - C) Serotonin
  - D) TSH
  - E) Vitamin B<sub>12</sub>
39. A 52-year-old male with known hypertension and hyperlipidemia comes to your office for a follow-up visit. His last visit was more than a year ago. He was unemployed for several months and lost his health insurance. Two months ago he ran out of his medications, which included amlodipine (Norvasc), hydrochlorothiazide, and atorvastatin (Lipitor). He says that he feels fine and has not had any chest pain, changes in vision, difficulty breathing, or lower extremity edema. He is a nonsmoker, and he does not drink alcohol or use illicit drugs. He drinks one cup of coffee daily. He does not take any over-the-counter medications.

On examination his vital signs include a blood pressure of 190/120 mm Hg, a pulse rate of 80 beats/min, and an oxygen saturation of 96% on room air. You recheck his blood pressure after he sits quietly for 30 minutes and there is no significant change. A physical examination, including funduscopy, is normal.

Which one of the following would be the most appropriate next step?

- A) Administer clonidine (Catapres), 0.1 mg orally, and recheck his blood pressure in 30 minutes
- B) Administer nifedipine (Procardia), 60 mg orally, and recheck his blood pressure in 30 minutes
- C) Order laboratory studies to look for end-organ damage, and tell him to restart his previous medications
- D) Admit him to the intensive-care unit for intravenous treatment to lower his blood pressure
- E) Call 911 and have him transported to the emergency department



Item #38

40. A 28-year-old female presents with a depressed mood and sleep disturbance. She tells you that this has occurred for the past 4 years but only during the winter months. Her past medical history and a physical examination are unremarkable.

Which one of the following interventions has the strongest evidence for preventing recurrence of her condition?

- A) Exercise
- B) Light therapy
- C) Cognitive-behavioral therapy
- D) Bupropion (Wellbutrin XL)
- E) Fluoxetine (Prozac)

41. A 69-year-old male sees you for a routine examination and asks about lung cancer screening. He smoked one pack of cigarettes per day for about 35 years but quit 11 years ago.

According to the U.S. Preventive Services Task Force and the American College of Chest Physicians, which one of the following should you recommend?

- A) No screening
- B) An annual history and examination focusing on lung symptoms
- C) Annual chest radiography
- D) Annual low-dose chest CT

42. A 34-year-old female presents with a 1-month history of increasing foot pain. She does not have any significant past musculoskeletal history, and she started a new exercise program 6 weeks ago. She has pain in the lateral side of her heel that is present both with activity and at rest. On examination you note tenderness below the lateral malleolus extending to the midfoot.

Which one of the following is the most likely diagnosis?

- A) Calcaneal apophysitis (Sever's disease)
- B) Calcaneal stress fracture
- C) Peroneal tendinopathy
- D) Plantar fasciitis
- E) Tarsal tunnel syndrome

43. A 30-year-old female with type 2 diabetes and obesity sees you for follow-up. She has experienced several episodes of symptomatic hypoglycemia, and because of this she stopped all of her medications except metformin (Glucophage). Her hemoglobin A<sub>1c</sub> has increased to 8.4%.

Which one of the following would be the best additional treatment for this patient?

- A) Basal insulin (Lantus)
- B) Rapid-acting insulin (Humalog)
- C) Exenatide (Byetta)
- D) Glipizide (Glucotrol)
- E) Repaglinide



44. Polypharmacy increases the risk of adverse health outcomes. According to the Choosing Wisely campaign, adding to a threshold of how many medications in a patient's regimen should prompt a thorough review to determine if any of the medications can be discontinued?
- A) 3
  - B) 5
  - C) 7
  - D) 10

45. An 18-month-old female is brought to your office for a well child check. During the examination you note that she is unable to say any words. She can follow a one-step command and point to three body parts. She does wave goodbye and babble, and she appears to have normal comprehension, emotional relationships, and fine and gross motor movements.

Which one of the following is the most likely diagnosis based on this patient's speech development?

- A) Autism spectrum disorder
  - B) Cerebral palsy
  - C) Congenital hearing loss
  - D) Developmental speech and language delay
  - E) Receptive language disorder
46. A 43-year-old female comes to your clinic for a routine health maintenance examination. She has a past medical history of diarrhea-predominant irritable bowel syndrome (IBS-D), recurrent urinary tract infections (UTIs), and bacterial vaginosis. She has no new health concerns today. She does not take any medications on a regular basis, and states that she prefers natural supplements to prescription medications. She says that she has heard that oral probiotics are beneficial and asks if they might be the right choice for her.

Which one of the following is the best evidence-based approach to counseling her about oral probiotics?

- A) There is no evidence that they will improve her IBS
- B) There is no evidence that they will decrease the risk of *Clostridioides (Clostridium) difficile* diarrhea when she is treated for a UTI
- C) There is strong evidence that they will decrease the risk of antibiotic-associated diarrhea when she is treated for a UTI
- D) There is strong evidence that they will decrease the risk of UTI recurrence
- E) There is strong evidence that they will decrease the risk of bacterial vaginosis recurrence

47. An 86-year-old male is brought to your office by his daughter for follow-up of hypertension. His blood pressure is well controlled on amlodipine (Norvasc), 5 mg daily. His daughter is concerned about the safety of her father driving because he has become confused on several occasions. He tells you that he only drives short distances to familiar places during the daytime, and he is somewhat agitated that his daughter mentioned this topic. He has no cognitive deficits noted on a 3-item recall or a clock drawing test. Neurologic and musculoskeletal examinations reveal no deficits.

Which one of the following would be the most appropriate next step in management?

- A) No further interventions
  - B) Discontinuing amlodipine
  - C) Reinforcing safe driving practices with education on age-related changes that may affect safe driving
  - D) Recommending that he stop driving and surrender his license
48. A 70-year-old female with a history of coronary artery disease, a femorofemoral bypass 3 years ago, and hypertension sees you for a follow-up visit. She has intermittent right arm pain that is worse with exercise. The pain increases with all arm exercises and improves with rest. The patient's blood pressure is 140/70 mm Hg in the left arm and 120/64 mm Hg in the right arm.

Which one of the following would be the most appropriate next step?

- A) Radiographs of the right shoulder
  - B) Arterial duplex ultrasonography of the upper extremities
  - C) MR angiography
  - D) No imaging, and referral to physical therapy
49. A 2-year-old female is brought to your office by her mother because of a cough and fever. The mother also tells you that the child has had a reduced appetite but she is drinking fluids normally. The child was born at term and has previously been healthy.

On examination the child appears alert and happy. She has a temperature of 37.2°C (99.0°F), a pulse rate of 100 beats/min, a respiratory rate of 30/min, and an oxygen saturation of 98% on room air. An HEENT examination reveals clear rhinorrhea. Auscultation of the lungs reveals mild expiratory wheezing throughout with no crackles, and you note no signs of respiratory distress such as retractions or use of accessory muscles of respiration.

Which one of the following would be the most appropriate next step?

- A) Reassurance only
- B) A nasal swab for respiratory syncytial virus
- C) A chest radiograph
- D) Nebulized albuterol
- E) Oral amoxicillin

50. A 19-year-old female presents with a 4-year history of intermittent facial acne. She tells you that her acne has never completely resolved, and it worsens during her menstrual period. She has tried various over-the-counter facial cleansers although she does not recall what they contained. On examination she has scattered open and closed comedones, and pustules on her forehead and around her mouth.

Which one of the following treatments would you recommend?

- A) Topical adapalene (Differin)
  - B) Topical clindamycin (Cleocin T)
  - C) Oral doxycycline
  - D) Oral isotretinoin (Absorica)
51. Which one of the following has been shown to be an appropriate therapeutic intervention for nonspecific low back pain?
- A) Bed rest
  - B) A lumbar brace
  - C) Muscle relaxants
  - D) Shoe insoles
  - E) Yoga

52. A 79-year-old male presents to your primary care clinic as a new patient. He is unaccompanied and tells you that he has no acute concerns and takes no regular medications, but just “needed a doctor.” He is a retired lawyer and states that he lives alone. He has no significant past medical history but you are able to access his electronic medical records and note that he has a history of diabetes mellitus and hypertension, and has been to the local emergency department (ED) twice in the last 4 months for headaches. A workup from the ED was notable only for moderately elevated blood pressure. When asked, he does not appear to recall these visits.

His vital signs are notable only for a blood pressure of 165/90 mm Hg. A physical examination reveals a thin but well appearing older adult who is mildly disheveled in appearance, with no other abnormalities.

Which one of the following would be the most appropriate next step in the care of this patient?

- A) A cognitive assessment
- B) Immediate referral to adult protective services
- C) Immediate referral to a neurologist
- D) Immediate referral to a psychiatrist

53. An otherwise healthy 21-year-old male sees you for follow-up after a hospitalization for pneumonia. This was his second pneumonia infection of the year. He reports a history of multiple sinus infections and upper respiratory infections over the years that were treated with antibiotics on an outpatient basis. Laboratory studies reveal a normal CBC and a decreased IgA level. A trial of pneumococcal polysaccharide vaccine (PPSV23, Pneumovax 23) reveals no measurable response.

This presentation is most consistent with

- A) selective IgA deficiency
  - B) common variable immunodeficiency
  - C) severe combined immunodeficiency
  - D) DiGeorge syndrome
  - E) Wiskott-Aldrich syndrome
54. Which one of the following vitamins is a well established therapy for the treatment of nausea and vomiting in pregnancy?

- A) Vitamin A
- B) Vitamin B<sub>6</sub>
- C) Vitamin B<sub>12</sub>
- D) Vitamin C
- E) Vitamin E

55. A 62-year-old female sees you for a routine health maintenance visit and asks for your advice regarding vitamin D supplementation. She is healthy and active, and jogs 1–2 hours three times weekly.

Which one of the following would be the most appropriate advice regarding vitamin D supplementation in this patient?

- A) It is not recommended because she is asymptomatic
- B) It will reduce the risk of certain cancers
- C) It will reduce the risk of depression
- D) It will reduce the risk of diabetes mellitus
- E) It will reduce the risk of fractures

56. A 35-year-old male with type 1 diabetes asks you what his hemoglobin A<sub>1c</sub> goal should be. His blood pressure and lipids are well controlled and he has not had any episodes of hypoglycemia. He recently saw an ophthalmologist and a podiatrist.

You advise him that based on current American Diabetes Association recommendations his goal should be to keep his hemoglobin A<sub>1c</sub> below a threshold value of

- A) 6.0%
- B) 7.0%
- C) 8.0%
- D) 9.0%

57. You diagnose major depressive disorder in a 69-year-old male. He has benign prostatic hyperplasia and is treated with prazosin (Minipress) for nocturia but he is otherwise healthy. He agrees to cognitive-behavioral therapy and starting an antidepressant but is concerned about side effects, especially falls.

Which one of the following would be the safest medication for this patient?

- A) Amitriptyline
  - B) Duloxetine (Cymbalta)
  - C) Escitalopram (Lexapro)
  - D) Paroxetine (Paxil)
  - E) Phenelzine (Nardil)
58. A 27-year-old soccer player presents with anterior hip pain along with a clicking sensation in the hip when he runs or attempts lateral movements. The flexion, adduction, and internal rotation (FADIR) test and the flexion, abduction, and external rotation (FABER) test both elicit pain. You suspect a labral tear.

The most accurate imaging test for the suspected diagnosis is

- A) a standing radiograph of the hip
  - B) anteroposterior and frog-leg lateral radiographs of the hip
  - C) CT of the hip
  - D) a bone scan
  - E) MR arthrography
59. A 74-year-old male with type 2 diabetes, severe peripheral artery disease, and a history of tobacco use is admitted to the hospital with wet gangrene of his right foot that does not improve with appropriate wound care and antibiotics. His vascular surgeon recommends a below-the-knee amputation of the right leg but the patient has not given his consent.

Which one of the following would suggest that this patient lacks capacity to make this decision?

- A) He has a fear of having surgery
  - B) He wants to consult with his family first
  - C) He consistently believes that his foot will improve
  - D) He understands that he may die if he forgoes the amputation
  - E) He states that his brother had the same surgery and died a week later
60. The most common symptom of obstructive sleep apnea is
- A) cough
  - B) excessive sleepiness
  - C) leg swelling
  - D) palpitations
  - E) weight gain

61. A 56-year-old male who has heart failure with reduced ejection fraction sees you for follow-up. He is stable but over the past year has noted an increase in dyspnea with moderate activity. His blood pressure is well controlled today. His current medications include carvedilol (Coreg), losartan (Cozaar), and escitalopram (Lexapro).

Which one of the following additions to his current medication regimen has the best evidence for reducing his risk of mortality from heart failure?

- A) Aspirin
- B) Atorvastatin (Lipitor)
- C) Furosemide (Lasix)
- D) Hydrochlorothiazide
- E) Spironolactone (Aldactone)

62. Chronic kidney disease is defined by abnormal kidney structure or function lasting a minimum of

- A) 2 months
- B) 3 months
- C) 6 months
- D) 12 months
- E) 24 months

63. A 55-year-old female with type 2 diabetes sees you because of early satiety, nausea, vomiting, bloating, and postprandial fullness that is sometimes accompanied by upper abdominal pain. Since these symptoms have developed she has also noted increasing difficulty with blood glucose control.

Which one of the following would be the best study for confirming the most likely diagnosis?

- A) Gastric emptying scintigraphy with a solid meal
- B) Hepatobiliary scintigraphy (HIDA)
- C) An upper gastrointestinal series with small-bowel follow-through
- D) Abdominal ultrasonography
- E) Abdominal CT

64. The administrator in your practice recently attended a quality improvement conference. He would like to start a clinic-wide program to focus on lead screening in asymptomatic children 5 years of age and younger.

After reviewing U.S. Preventive Services Task Force guidelines, which one of the following should you tell the practice administrator?

- A) There is insufficient evidence to recommend for or against lead screening in children 5 years of age and younger
- B) All children 5 years of age and younger should undergo lead screening
- C) All children who live in housing built before 1978 should undergo lead screening
- D) There are accurate and reliable screening questionnaires to guide lead screening

65. A 60-year-old male who has type 2 diabetes comes to your office with an acute onset of fever, chills, and malaise. He says that he is feeling progressively worse. His temperature is 40°C (104°F). An examination reveals redness, tenderness, and swelling of the penis, scrotum, and perineal area.

Which one of the following medications is most likely to cause this condition?

- A) Dapagliflozin (Farxiga)
- B) Exenatide (Byetta)
- C) Insulin glargine (Lantus)
- D) Pioglitazone (Actos)
- E) Sitagliptin (Januvia)

66. A 70-year-old male presents with a 2-year history of gradually progressive exertional dyspnea associated with a dry cough and fatigue. A physical examination reveals bilateral basilar fine inspiratory crackles on lung auscultation and acrocyanosis. A chest radiograph demonstrates hazy opacities and reticular infiltrates of both lower lung fields. You suspect interstitial lung disease.

Assuming that no underlying connective tissue disease is identified on serologic testing, which one of the following additional studies could confirm a diagnosis of idiopathic pulmonary fibrosis for this patient, potentially preventing the need for a subsequent lung biopsy?

- A) Spirometry
- B) High-resolution chest CT
- C) Polysomnography
- D) Echocardiography
- E) Right heart catheterization

67. A 47-year-old female presents with a 2-month history of generalized left shoulder pain. She does not have any ongoing illnesses. On examination you note generally impaired range of motion in the shoulder, but a radiograph of the shoulder is normal. You diagnose adhesive capsulitis.

Which one of the following tests would be most appropriate at this time?

- A) Antinuclear antibody
- B) Erythrocyte sedimentation rate
- C) Hemoglobin A<sub>1c</sub>
- D) IgA tissue transglutaminase
- E) MRI without contrast

68. A 3-year-old male is brought to your office by his mother because he stepped on a large wooden splinter that broke off at the surface of his left foot and since then he has been avoiding walking on that foot. On examination the bottom of the left heel is red and inflamed.

Which one of the following would be most appropriate initially to visualize the splinter?

- A) Radiography
- B) Fluoroscopy
- C) Ultrasonography
- D) CT
- E) MRI

69. A 55-year-old male sees you because of a second flare of gout. He has also had an elevated blood pressure at the last few visits to your clinic and is hypertensive again today.

In addition to treating his gout flare, which one of the following would be the most appropriate agent to treat his hypertension in light of his presenting problem?

- A) Atenolol (Tenormin)
- B) Hydralazine
- C) Hydrochlorothiazide
- D) Lisinopril (Prinivil, Zestril)
- E) Losartan (Cozaar)

70. A 60-year-old male comes to your office with a 1-year history of the gradual onset of mild fatigue and dyspnea. There are no symptom triggers. He has a 20-pack-year history of cigarette smoking but stopped at age 35. An examination is significant only for a BMI of 30 kg/m<sup>2</sup>. Office spirometry reveals a decreased FVC and a normal FEV<sub>1</sub>/FVC ratio, and there are no changes after bronchodilator administration.

Which one of the following would you recommend at this point?

- A) The 6-minute walk test
- B) Bronchoprovocation testing such as a methacholine challenge test
- C) Full pulmonary function testing
- D) Bronchoscopy
- E) A ventilation-perfusion scan

71. Which one of the following is the preferred method of diagnosing lymphoma in a 60-year-old male who presents with weight loss, unexplained fever, and axillary adenopathy?

- A) CT of the chest, pelvis, and abdomen pre- and post-contrast
- B) A PET-CT scan
- C) A bone scan
- D) A bone marrow aspiration and biopsy
- E) An open lymph node biopsy



72. Which one of the following types of complementary/integrative therapy is a form of mental training that requires calming of thoughts with the goal of achieving a state of detached observation?
- A) Aerobic exercise
  - B) Cognitive-behavioral therapy
  - C) Mindfulness-based meditation
  - D) Tai chi and qi gong
  - E) Yoga
73. To determine compliance with prescribed medications and detect use of illicit substances, your clinic uses urine drug screening with an immunoassay qualitative point-of-care test to monitor patients who are on long-term opioid therapy. Which one of the following is most likely to result in a false-negative result and require confirmatory testing for detection?
- A) Cannabis
  - B) Cocaine
  - C) Codeine
  - D) Morphine
  - E) Oxycodone (OxyContin)
74. A 3-year-old male undergoes surgery for intestinal malrotation (volvulus). A preoperative comprehensive metabolic panel was normal. The patient's postoperative potassium level is 4.6 mEq/L (N 3.4–4.7).

In addition to maintenance potassium, which one of the following fluids should be administered in the postoperative period?

- A) 0.2% NaCl with 5% dextrose
  - B) 0.45% NaCl with 5% dextrose
  - C) 0.9% NaCl with 5% dextrose
  - D) 3% saline
  - E) 5% dextrose in water
75. A 60-year-old female with a BMI of 24 kg/m<sup>2</sup> presents with bilateral knee pain that is greater in the left knee. She has no morning stiffness but the pain sometimes prevents her from completing normal activities such as grocery shopping. You perform an evaluation and diagnose osteoarthritis of the knee. She does not want to take prescription medications and asks you if supplements or other treatments would be helpful.
- Which one of the following would you recommend?
- A) Lateral wedge insoles
  - B) Vitamin D supplements
  - C) Glucosamine and chondroitin supplements
  - D) Hyaluronic acid injections
  - E) Physical therapy

76. A 30-year-old female who is an established patient calls your office to request a test for COVID-19. The patient spent several hours inside the home of another individual who just received a positive COVID-19 test result. She states that her sense of taste seems diminished, but she has no respiratory symptoms and otherwise feels well.

Which one of the following is the typical incubation period for COVID-19?

- A) 1 day
- B) 5 days
- C) 14 days
- D) 30 days

77. A 45-year-old female with a 4-year history of type 2 diabetes is taking only metformin (Glucophage) and maintaining a hemoglobin A<sub>1c</sub> of 6.6%. Her LDL-cholesterol level is 94 mg/dL. She has no complications related to diabetes and her medical history is otherwise unremarkable.

Which one of the following should be added to her current medication regimen?

- A) A DPP-4 inhibitor
- B) An SGLT2 inhibitor
- C) A low-intensity statin
- D) A moderate-intensity statin
- E) A high-intensity statin

78. A 70-year-old male is brought to your office by a family member. The patient is concerned about a tremor, which is most noticeable at rest and seems to get better with voluntary movements. On examination his vital signs are unremarkable. He blinks infrequently during the examination, his face seems to be relatively immobile, and he feels rigid. He has some difficulty rising from a chair and he walks with small, shuffling steps. The remainder of the neurologic examination is normal. You note some seborrhea of the scalp. A recent comprehensive laboratory evaluation is unremarkable.

Which one of the following is necessary to confirm the diagnosis?

- A) No diagnostic testing
- B) CT of the brain
- C) MRI of the brain
- D) EEG
- E) A lumbar puncture

79. A 45-year-old female presents with a lesion on her mid-back (shown below) that measures 1.2 mm in diameter. A punch biopsy confirms nodular basal cell carcinoma. She is otherwise healthy and does not take any daily medications. She is concerned about the cosmetic appearance after treatment.

Which one of the following would be the most appropriate treatment strategy?

- A) No further management
  - B) Topical fluorouracil 5% (Efudex)
  - C) Cryotherapy
  - D) Curettage and electrodesiccation
  - E) Standard excision with 4-mm margins
80. A 23-year-old primigravida comes to your office for her initial obstetric visit. She is at 13 weeks gestation based on the dates of her last menstrual period. She is a nonsmoker and does not drink alcohol or use illicit substances. Her vital signs are remarkable for a blood pressure of 142/92 mm Hg and a BMI of 32 kg/m<sup>2</sup>. She says that she has been diagnosed with hypertension in the past but has not taken any medications for it.

In addition to a prenatal vitamin, which one of the following would you recommend for her?

- A) No additional medications
  - B) Aspirin
  - C) Ferrous sulfate
  - D) Folic acid
  - E) Labetalol (Trandate)
81. A 68-year-old female comes to your office for a follow-up visit for diabetes mellitus. Her home glucose monitor record shows a range of 68–125 mg/dL. Her medications include atorvastatin (Lipitor), 40 mg daily; metformin (Glucophage), 750 mg twice daily; and insulin glargine (Lantus), 10 U nightly. Laboratory studies are remarkable for a hemoglobin A<sub>1c</sub> of 5.8% and a creatinine level of 0.98 mg/dL (N 0.6–1.1). She maintains healthy lifestyle behaviors such as walking 30 minutes 5 days per week and avoiding sweetened beverages.

Which one of the following would be the most appropriate treatment plan?

- A) Continue the current medication regimen
- B) Increase the insulin glargine dosage
- C) Increase the metformin dosage
- D) Discontinue insulin glargine
- E) Discontinue metformin



**Item #79**

82. A 70-year-old female comes to your office for a routine health maintenance examination. Her past medical history is notable for well controlled hypertension and right knee osteoarthritis, and she underwent total knee replacement 1 year ago with an uncomplicated postoperative course. She mentions that she has an appointment to have a tooth filled and asks for your advice on antibiotics to prevent infection in her prosthetic joint. She has no medication allergies, has no previous history of joint infection, and is not immunocompromised.

Which one of the following would be the most appropriate recommendation regarding antibiotic prophylaxis for her upcoming dental procedure?

- A) No antibiotic treatment
  - B) A single dose of oral amoxicillin
  - C) A 3-day course of oral amoxicillin
  - D) A single dose of oral clindamycin (Cleocin)
  - E) A single dose of intravenous cefazolin
83. A 78-year-old male with terminal lung cancer and long-standing COPD is admitted to a regular medical-surgical care unit pending transfer to the hospice unit within the next day. You are called about worsening anxiety and dyspnea. The patient is alert and anxious. He has a blood pressure of 150/94 mm Hg, a pulse rate of 96 beats/min, a respiratory rate of 24/min, and an oxygen saturation of 93% on 2 L/min of oxygen via nasal cannula.

Which one of the following would be most effective in this situation?

- A) 40% oxygen by venti-mask
  - B) Dexamethasone
  - C) Hyoscyamine (Anaspaz)
  - D) Lorazepam (Ativan)
  - E) Morphine sulfate
84. A 34-year-old female with asthma sees you for routine follow-up. She tells you that she uses her short-acting  $\beta$ -agonist (SABA) approximately twice a week.

Which one of the following management strategies would you recommend for prevention of exacerbations?

- A) Continued use of a SABA as needed
- B) An inhaled corticosteroid (ICS)/long-acting  $\beta$ -agonist (LABA) as needed
- C) A daily maintenance ICS/LABA
- D) A daily maintenance ICS plus a SABA as needed
- E) A daily maintenance ICS plus a daily leukotriene receptor antagonist

85. A 55-year-old male presents to your office to establish care. He has a history of hypertension, hypercholesterolemia, and coronary artery disease. He had a non-ST-elevation myocardial infarction (NSTEMI) 3 years ago. An echocardiogram at that time was normal and he received a single drug-eluting stent. He has not seen a cardiologist since then and would prefer not to see one unless it is necessary, due to his high insurance copayments for specialist visits.

His current medications include clopidogrel (Plavix), aspirin, atorvastatin (Lipitor), lisinopril (Prinivil, Zestril), and carvedilol (Coreg). A review of systems is negative. His vital signs include a blood pressure of 120/72 mm Hg, a heart rate of 80 beats/min, and a respiratory rate of 12/min. A physical examination is unremarkable, a basic metabolic panel is normal, and his hemoglobin A<sub>1c</sub> is 5.7%. His LDL-cholesterol level is 60 mg/dL, his HDL-cholesterol level is 49 mg/dL, and his total cholesterol level is 147 mg/dL.

The patient would like to reduce the number of medications he takes because of the cost. Which one of the following medications in his current regimen would be most appropriate to discontinue at this time?

- A) Aspirin
  - B) Atorvastatin
  - C) Carvedilol
  - D) Clopidogrel
  - E) None of his current medications
86. A 42-year-old female sees you because of intermittent right upper abdominal pain that occurs after eating. The episodes have been gradually worsening and now last up to an hour. She has tried over-the-counter antacids, ibuprofen, and acetaminophen, which have not helped. She tells you that the last episode occurred earlier this week and the pain was so severe that it woke her up and she went to the emergency department (ED). A comprehensive metabolic panel, CBC, and lipase level performed in the ED were all normal. Right upper quadrant abdominal ultrasonography today is negative for gallstones but notable for increased echogenicity of the liver.

Which one of the following would be the most appropriate next step in the evaluation?

- A) Plain radiography of the abdomen
- B) CT of the abdomen
- C) Hepatobiliary scintigraphy (HIDA)
- D) Magnetic resonance cholangiopancreatography (MRCP)
- E) Endoscopic retrograde cholangiopancreatography (ERCP)

87. A 6-month-old male is brought to your office by his mother for a well child examination. The mother does not have any concerns. Interactions between the mother and child are appropriate and the child appears well.

Which one of the following screenings is recommended at this visit?

- A) Autism
- B) Iron deficiency
- C) Maternal depression
- D) Otoacoustic emissions (OAE) testing

88. A 42-year-old female presents to your office with heavy menstrual periods and pelvic pressure. Her symptoms began several years ago and have gradually worsened. Laboratory findings are notable for a mild microcytic anemia. Pelvic ultrasonography identifies a 7-cm submucosal mass. She wants to avoid a hysterectomy but desires a treatment that will provide symptom relief, decrease the volume of the mass, and have a sustained effect.

Which one of the following would be most appropriate for this patient?

- A) Expectant management
- B) A GnRH agonist
- C) A selective estrogen receptor modulator
- D) A levonorgestrel-releasing IUD (Mirena)
- E) Uterine artery embolization and occlusion

89. A 65-year-old female sees you because of increased irritability and confusion. She has a history of major depression, essential hypertension, and type 2 diabetes. Her medications include sertraline (Zoloft), 100 mg daily; lisinopril (Prinivil, Zestril), 20 mg daily; and metformin (Glucophage), 500 mg twice daily. She recently sustained a right distal radius fracture as a result of a fall, and she has been taking tramadol, 50 mg, every 6 hours for pain control.

On examination the patient has a temperature of 38.2°C (100.8°F), a pulse rate of 96 beats/min, a respiratory rate of 16/min, and a blood pressure of 124/78 mm Hg. She appears confused and you note a bilateral tremor in the upper extremities, brisk reflexes, and two beats of clonus on a bilateral foot examination. The examination is otherwise normal. A CBC, comprehensive metabolic panel, chest radiograph, and CT of the head are all within normal limits.

Which one of the following is the most likely cause of this patient's symptoms?

- A) Acute cerebral infarction
- B) Meningitis
- C) Sepsis syndrome
- D) Serotonin syndrome

90. A 13-year-old male is brought to your office for evaluation of back pain. Plain radiography would be indicated at this time if the patient has
- A) pain that awakens him at night
  - B) pain that is localized to the midthoracic spine
  - C) pain that is increased with flexion
  - D) intermittent pain that has persisted for 2 weeks
  - E) a recent history of an upper respiratory infection

91. The U.S. Preventive Services Task Force recommends one-time screening for abdominal aortic aneurysm in
- A) men 55–75 years of age who have ever smoked
  - B) men 65–75 years of age who have ever smoked
  - C) men and women 65–75 years of age who have ever smoked
  - D) men and women 65–75 years of age who currently smoke

92. A 67-year-old female who is a retired teacher presents with generalized itching. She tells you that she is convinced that she has acquired a skin infestation from small mites. She gives you a matchbox containing what appears to be crusts, dried blood, and bits of skin as evidence of this problem. A previous physician had obtained a CBC, comprehensive metabolic panel, TSH level, chest radiograph, and drug screen, which were all normal. An examination today reveals excoriations on her arms, abdomen, and legs in easily reached areas. Her skin is not dry and there are no lesions in her axillae or web spaces.

Which one of the following medications would be most likely to help this patient?

- A) Cholestyramine (Questran)
  - B) Hydroxyzine (Vistaril)
  - C) Ivermectin (Stromectol)
  - D) Olanzapine (Zyprexa)
  - E) Prednisone
93. A 6-year-old female who recently moved to the United States from India requires a physical examination prior to entering the public school system. Her immunizations are up to date, including bacillus Calmette-Guérin vaccine at birth. Her family history is positive for her paternal grandfather being treated for latent tuberculosis infection. Her past medical history and a physical examination are otherwise unremarkable.

Which one of the following would be most appropriate at this time?

- A) An interferon-gamma release assay (IGRA, QuantiFERON-TB Gold)
- B) A nucleic acid amplification test
- C) A tuberculin skin test, and follow-up in 72 hours
- D) Three acid-fast bacilli sputum samples and N95 mask use
- E) A chest radiograph



94. A 30-year-old female presents with episodes of severe vertigo lasting 4–5 hours and associated with tinnitus, nausea, and vomiting. On examination the Dix-Hallpike maneuver is negative. She has no focal weakness, numbness, or paresthesia. She does not take any medications and her medical history is remarkable only for frequent headaches and seasonal allergies. Audiometry is abnormal due to low- and high-frequency hearing loss in her right ear, with preservation of the midrange.

Which one of the following is the most likely diagnosis?

- A) Benign paroxysmal positional vertigo
- B) Meniere's disease
- C) Multiple sclerosis
- D) Vestibular migraines
- E) Vestibular schwannoma

95. A 6-year-old female is brought to your office by her parents for a routine well child visit. On examination the patient's height is 121 cm (48 in), which is the 91st percentile for her age, and her weight is 27 kg (59 lb), which is the 92nd percentile for her age. Her parents ask you about the recommended car safety restraints.

Which one of the following would be an appropriate recommendation regarding vehicular safety for this child?

- A) She should use a rear-facing car seat
- B) She may use either a booster seat or a car seat
- C) She can safely wear a seatbelt without a booster seat when she reaches 127 cm (50 in)
- D) She should not use a car seat because her height exceeds the limit of common car seats
- E) She may sit in the front seat once she turns 11 years of age

96. A 58-year-old male with a history of a neurogenic bladder comes to your office as a new patient. He recently elected to have placement of a chronic indwelling urethral catheter rather than performing intermittent catheterization at home, and he asks how to reduce his risk of urinary tract infections (UTIs). His last UTI was approximately 1 year ago and required intravenous antibiotics.

Which one of the following is most effective for preventing UTIs in patients with chronic indwelling urethral catheters?

- A) Routine daily hygiene of the meatal surface with soap and water
- B) Daily periurethral cleaning with iodine
- C) Daily oral antibiotics based on prior urine culture sensitivities
- D) Routine instillation of an antimicrobial solution into the drainage bag
- E) Regularly scheduled catheter exchanges at fixed intervals

97. A 68-year-old male presents with a burn on his lower leg after trying to light a bonfire with kerosene. Examination of the affected leg reveals the presence of blistering, along with a denuded central area that does not blanch with pressure. The underlying fat and connective tissue are not involved.

Which one of the following is the proper classification of this burn?

- A) Superficial burn
- B) Superficial partial-thickness burn
- C) Deep partial-thickness burn
- D) Full-thickness burn

98. A 63-year-old female sees you for follow-up after an emergency department (ED) visit. CT performed in the ED confirmed diverticulitis and she was treated as an outpatient. The discharge paperwork and radiology reports also indicate that she has a left superior adrenal nodule measuring 1.2 cm.

Which one of the following concurrent conditions should prompt a hormonal workup?

- A) Hyperlipidemia
- B) Hypertension
- C) Renal cell carcinoma
- D) Rheumatoid arthritis
- E) Type 2 diabetes

99. A 39-year-old male with no significant past medical history presents to your office to establish care. He does not take any medications. A review of systems is negative. He has a BMI of 22 kg/m<sup>2</sup> and a blood pressure of 141/82 mm Hg.

Which one of the following would be the most appropriate next step?

- A) Ambulatory blood pressure monitoring
- B) Recommending a weight loss of 5 lb
- C) Hydrochlorothiazide, 25 mg daily
- D) Lisinopril (Prinivil, Zestril), 10 mg daily
- E) Metoprolol tartrate (Lopressor), 25 mg twice daily

100. A 4-month-old female is brought to your office by her parents as a new patient for a well child visit. The infant is healthy and the parents have no concerns. You have records from her previous physician that indicate the parents refused all vaccinations other than hepatitis B at birth.

Which one of the following communication strategies is recommended to promote vaccine acceptance?

- A) Emphasize the benefits and downplay the risks of vaccines
- B) Clarify specific concerns and provide factual information
- C) Avoid future discussions with the family about vaccines
- D) Dismiss the family from the practice

101. A 71-year-old female with a history of well controlled hypertension, diabetes mellitus, and osteoporosis presents with a 2-day history of fever, chills, and a productive cough. She lives at home with her husband, who has not noted any confusion but says she has been weak and unable to bathe herself.

On examination the patient has a temperature of 38.2°C (100.8°F), a blood pressure of 110/68 mm Hg, unlabored respirations at a rate of 22/min, and an oxygen saturation of 94% on room air. You note that she has good air entry, there are no abnormal breath sounds, and there is no egophony or increased fremitus. The cardiovascular examination is unremarkable.

Laboratory Findings

WBCs .....	14,000/mm <sup>3</sup> (N 4500–11,000)
Hemoglobin .....	12.5 g/dL (N 14.0–17.5)
Platelets.....	250,000/mm <sup>3</sup> (N 150,000–350,000)
Creatinine .....	1.0 mg/dL (N 0.6–1.2)
BUN .....	14 mg/dL (N 8–23)

Posteroanterior and lateral chest radiographs show an infiltrate in the right middle lobe.

Which one of the following would be the most appropriate treatment for this patient?

- A) Azithromycin (Zithromax)
- B) Amoxicillin plus metronidazole (Flagyl)
- C) Amoxicillin/clavulanate (Augmentin) plus azithromycin
- D) Azithromycin plus levofloxacin
- E) Clindamycin (Cleocin) plus doxycycline

102. An 8-year-old female is brought to your office because of left arm pain after she fell down on the sidewalk while roller skating. She has pain, swelling, and a mild deformity of her distal forearm over the radius. Posteroanterior and lateral radiographs confirm an incomplete compression fracture of the distal radius.

In addition to a short arm splint, which one of the following would be appropriate management of this fracture?

- A) Ultrasonography in 3 weeks
- B) Repeat radiography in 4 weeks
- C) Return to activity in 4 weeks if she is pain free
- D) Follow-up and reevaluation in 6 weeks
- E) Referral to an orthopedist

103. While on rounds in the newborn nursery, you receive a call about a 2-day-old infant born at 39 weeks gestation. According to the American Academy of Pediatrics standard treatment guidelines for infants at high risk of bilirubin encephalopathy, the infant has an elevated total serum bilirubin level that is approaching the threshold for initiating phototherapy.

Which one of the following additional factors would be the strongest indication for phototherapy in this infant?

- A) East Asian ethnicity
- B) Exclusive breastfeeding
- C) A positive direct antibody titer (Coombs test)
- D) A sibling with a history of neonatal jaundice
- E) Untreated maternal group B streptococcal colonization

104. An obese 32-year-old male is admitted to the hospital with a new onset of acute pancreatitis. A lipid panel reveals a triglyceride level of 1150 mg/dL and an HDL-cholesterol level of 30 mg/dL. Other laboratory studies are normal. His 10-year risk of atherosclerotic cardiovascular disease is <5%. His family history is positive for recurrent pancreatitis in his father and paternal grandfather.

In addition to lifestyle modifications, which one of the following would be most appropriate for this patient after he is discharged?

- A) Atorvastatin (Lipitor)
- B) Colesevelam (Welchol)
- C) Ezetimibe (Zetia)
- D) Fenofibrate (Tricor)
- E) Omega-3-acid ethyl esters (Lovaza)

105. A 23-year-old gravida 1 para 1 who is a single mother of a 3-day-old infant comes to your office for a newborn follow-up. She reports some sleep disturbance, mild depression without suicidal ideation, and financial concerns. Her past medical history is significant for persistent depressive disorder.

The U.S. Preventive Services Task Force recommends which one of the following to help prevent perinatal depression in patients such as this?

- A) Exercise
- B) Amitriptyline
- C) Sertraline (Zoloft)
- D) Referral for cognitive-behavioral therapy

106. A 34-year-old male sees you because he was recently informed that a partner he had unprotected sex with last month has been diagnosed with HIV. You would advise this patient to initiate ongoing antiretroviral therapy
- A) immediately, because HIV testing is not necessary prior to initiation
  - B) at the time of diagnosis of HIV infection
  - C) when his CD4 cell count drops to  $<200$  cells/ $\mu\text{L}$
  - D) when his CD4 cell count drops to  $<500$  cells/ $\mu\text{L}$
  - E) when he develops an AIDS-defining illness

107. An 82-year-old female with atrial fibrillation treated with digoxin is started on verapamil sustained-release capsules (Calan SR) for hypertension and angina. Although she initially tolerates the medication and has a good clinical response, when you see her 1 month later she has lost 3 kg (7 lb) and reports persistent anorexia and nausea over the past 2–3 weeks. A serum chemistry profile, TSH level, and CBC are normal. Her serum digoxin level is 1.4 ng/mL (therapeutic range 0.8–1.5). Her vital signs are stable and a physical examination is notable only for rate-controlled atrial fibrillation.

Which one of the following would be most appropriate at this point?

- A) Prescribe a therapeutic trial of an  $\text{H}_2$ -blocker
  - B) Order an upper gastrointestinal contrast study
  - C) Withhold digoxin for several days and reinstitute at a lower dosage if necessary
  - D) Order imaging to look for a central nervous system abnormality
108. In a patient with persistent respiratory symptoms, which one of the following pulmonary function abnormalities after bronchodilator administration is required for the diagnosis of COPD?
- A) Low residual volume
  - B) Low total lung capacity
  - C) An  $\text{FEV}_1/\text{FVC}$  ratio  $<0.70$
  - D) An  $\text{FEV}_1 < 85\%$  of predicted
  - E) A peak flow  $<90\%$  of predicted

109. A 58-year-old male sees you for evaluation of left ankle pain after he slipped on some ice in his driveway last night. He felt immediate pain over the lateral ankle, which started swelling over the next hour. He elevated his foot, applied ice, and took ibuprofen. This morning the ankle remains swollen and also appears bruised. He is able to walk on it with some pain. On examination you note typical findings of an ankle sprain. He asks you for medication to manage his pain.

Which one of the following medications has the best evidence for providing pain relief while also minimizing side effects?

- A) Topical diclofenac gel (Pennsaid)
- B) Topical menthol gel
- C) Oral hydrocodone/acetaminophen (Lortab)
- D) Oral ibuprofen
- E) Oral tramadol

110. A 7-year-old male is brought to the urgent care clinic with a 2-day history of fever and sore throat, with no associated cough. His temperature is 38.3°C (100.9°F) and a rapid antigen test confirms a group A  $\beta$ -hemolytic *Streptococcus* infection. A prescription for penicillin is sent to the pharmacy, but the medication is never picked up due to a lack of transportation. The patient is brought to your office 2 weeks later with a fever, joint pain, shortness of breath, and chest pain. His vital signs are significant for a temperature of 38.8°C (101.8°F) and a heart rate of 118 beats/min.

On examination the patient's affect is appropriate, he has a 3/6 holosystolic murmur heard best over the apex, and he has tenderness and swelling of his knees bilaterally and of his left ankle. An antistreptolysin O titer is positive, his erythrocyte sedimentation rate is 124 mm/hr (N < 10), and a chest radiograph is significant for cardiomegaly.

Which one of the following would be the most appropriate therapy?

- A) Hydroxychloroquine (Plaquenil)
  - B) Methylprednisolone acetate (Depo-Medrol)
  - C) Naproxen
  - D) Intravenous immunoglobulins
  - E) Plasmapheresis
111. A 60-year-old male is referred to you by his dermatologist for additional workup of a symmetric vesicular rash that was diagnosed as dermatitis herpetiformis. This rash is associated with
- A) food allergy
  - B) gluten sensitivity
  - C) HIV infection
  - D) immunodeficiency
  - E) internal malignancy
112. A 51-year-old female presents with concerns about a change in her cognition. She says she has difficulty retrieving words, loses her train of thought, and goes into a room and forgets why she came there. She also has had more frequent hot flashes and sleep disturbances. She still menstruates but has noticed a change from her previous pattern. A physical examination is unremarkable, and recent laboratory tests were all normal, including vitamin B<sub>12</sub> and thyroid studies. Cognitive testing is normal.

Which one of the following would be the most appropriate next step?

- A) Reassurance only
- B) CT of the head
- C) MRI of the brain
- D) Hormone therapy
- E) Referral to a neurologist

113. An otherwise healthy 46-year-old female presents with a 10-day history of recurring pain in the right cheek and gums. She says the pain feels like electric shocks lasting a few seconds and recurring “hundreds of times a day.” She says that smiling and brushing her teeth can trigger the pain. She does not have a history of recent dental work, trauma, fever, or myalgia. She feels well aside from the facial pain. She has tried over-the-counter analgesics without relief. Her vital signs and an HEENT examination are normal. There is no pain with dental percussion, and the skin and mucous membranes of the nose and mouth are unremarkable.

Which one of the following would be the most appropriate treatment for this patient’s condition?

- A) Carbamazepine (Tegretol), 200 mg twice daily
- B) Prednisone, 40 mg daily
- C) Sumatriptan (Imitrex), 6 mg subcutaneously
- D) Valacyclovir (Valtrex), 1000 mg three times daily
- E) High-flow oxygen for 20 minutes

114. An asymptomatic 55-year-old female sees you for the first time. She asks for advice about laboratory results from a health maintenance examination performed last month by her previous physician. These results included a TSH level of 0.2  $\mu\text{U}/\text{mL}$  (N 0.4–4.2). Other laboratory results, including free  $T_4$  and free  $T_3$  levels, were normal. Her past medical history and a physical examination today, including a thyroid examination, are unremarkable.

Which one of the following would you recommend at this time?

- A) Observation only
- B) A thyroglobulin level
- C) Thyroid antibody studies
- D) Thyroid ultrasonography
- E) A thyroid uptake scan with radioactive iodine

115. An exclusively breastfed 2-month-old male is brought to your office by his mother for a routine well child visit. His mother indicates that the infant received all recommended care at birth, is feeding well, and is meeting expected developmental milestones. Growth parameters are consistent with previously charted data. A physical examination is unremarkable except for bruising of the right lateral arm and left anterior thigh. When questioned about these findings, the mother states that she is not overly concerned, as he is “quite an active little kicker” when he is lying in his crib. She says that his 4-year-old and 6-year-old brothers are both physically active and bruise easily as well.

Which one of the following would be most appropriate at this point?

- A) Reassurance that bruising of the extremities is common in this age group
- B) A serum vitamin D level
- C) A serum vitamin K level
- D) Abdominal ultrasonography
- E) Immediate referral for a child abuse investigation

116. A 73-year-old female sees you because of a 2-month history of the gradual onset of bilateral swelling of several metacarpophalangeal joints with associated joint stiffness, which lasts for about 1 hour each morning. Her past medical history and an examination are otherwise unremarkable.

Elevation of which one of the following would provide the most support for a specific diagnosis of her new arthritis symptoms?

- A) Anti-citrullinated protein antibody
- B) C-reactive protein
- C) Erythrocyte sedimentation rate
- D) Leukocyte count and differential
- E) Rheumatoid factor

117. A 68-year-old male with a history of COPD, hypertension, and hyperlipidemia presents with a worsening cough and dyspnea with exertion over the past 3 months. His symptoms were previously well controlled with tiotropium (Spiriva) daily and albuterol (Proventil, Ventolin) as needed, and he has not had any COPD exacerbations in the past year until these symptoms began. He has not had any change in sputum production. Recently he has been using his albuterol inhaler several times a day to help relieve his shortness of breath with exertion.

A physical examination reveals a temperature of 37.0°C (98.6°F), a heart rate of 78 beats/min, a respiratory rate of 16/min, a blood pressure of 144/82 mm Hg, and an oxygen saturation of 95% on room air. A cardiac evaluation reveals a regular rate and rhythm and he has no peripheral edema or cyanosis. His lungs are clear with no wheezes or crackles, and there is a mild prolonged expiratory phase.

According to current GOLD guidelines, which one of the following would be the most appropriate next step in the management of this patient's symptoms?

- A) Add azithromycin (Zithromax)
- B) Add inhaled fluticasone (Flovent)
- C) Add inhaled salmeterol (Serevent)
- D) Add inhaled fluticasone/salmeterol (Advair)
- E) Discontinue tiotropium and start inhaled fluticasone

118. A 45-year-old male comes to your office for a routine health maintenance examination. He reports frequently drinking five 12-oz beers per day despite trying to cut down. He tells you that he had an abnormal liver profile in the past and sometimes drives under the influence of alcohol. He asks for your help to decrease his alcohol consumption.

Which one of the following medications would be most likely to help this patient decrease his alcohol use?

- A) Baclofen intrathecal (Lioresal)
- B) Disulfiram (Antabuse)
- C) Naltrexone (Vivitrol)
- D) Pregabalin (Lyrica)
- E) Sertraline (Zoloft)



119. A 60-year-old female sees you for evaluation of a recent syncopal episode. She tells you that she recently fainted during a routine walk with a friend, who told her that everything seemed fine and suddenly the patient fell to the ground and was unresponsive. The patient does not recall having any symptoms before the episode. She did not have any associated symptoms, abnormal movement, or incontinence and was not injured in the fall. The episode lasted a few seconds and then she regained consciousness, stood, and finished the walk without difficulty. She has not had any similar episodes before this. Her past medical history and family history are unremarkable. She has been in good health and takes no medications except a multivitamin each day. An examination is normal and an EKG shows normal sinus rhythm with no other abnormalities.

Which one of the following would most likely help confirm the diagnosis?

- A) Orthostatic blood pressure measurements
  - B) An external cardiac event monitor
  - C) Ultrasonography of the carotid arteries
  - D) CT of the head
  - E) MRI of the brain
120. A 69-year-old male presents with a several-week history of difficulty swallowing that has gradually worsened. At first he noted trouble with passing larger boluses of food through his mid-chest area. Now he states that even ice cream is a problem. He has a past history of GERD that he has treated with omeprazole (Prilosec) intermittently over the past several years. He also takes enteric-coated aspirin, 81 mg daily, for his heart. There is no history of tobacco use. He drinks about six beers a week. On examination you note a 5-kg (11-lb) weight loss over the past 3 months but the remainder of the examination is normal.

Which one of the following would be the most appropriate next step in the evaluation?

- A) A trial of omeprazole, 40 mg daily, for 8 weeks
  - B) Chest CT with and without contrast
  - C) Barium esophagography
  - D) High-resolution esophageal manometry
  - E) Esophagogastroduodenoscopy
121. A 5-year-old female is brought to your office by her mother because she has not wanted to eat or drink anything since she woke up this morning. She has also had a temperature of 100.2°F for the last 2 days. She usually attends day care 3 days a week but has been kept at home because of the fever. She is up to date on all age-appropriate recommended immunizations. On examination you notice several oral ulcerations that are painful to palpation, and several erythematous, vesicular lesions on the patient's palms.

Which one of the following is the most likely diagnosis?

- A) Erythema multiforme
- B) Hand-foot-and-mouth disease
- C) Herpetic gingivostomatitis
- D) Oral candidiasis
- E) Varicella

122. A 38-year-old female presents with a 1-week history of pain in her left heel. The pain started abruptly while she was playing tennis and she was unable to finish the game. She has been applying ice, taking ibuprofen, and wearing an ankle brace without improvement. She walks with a limp.

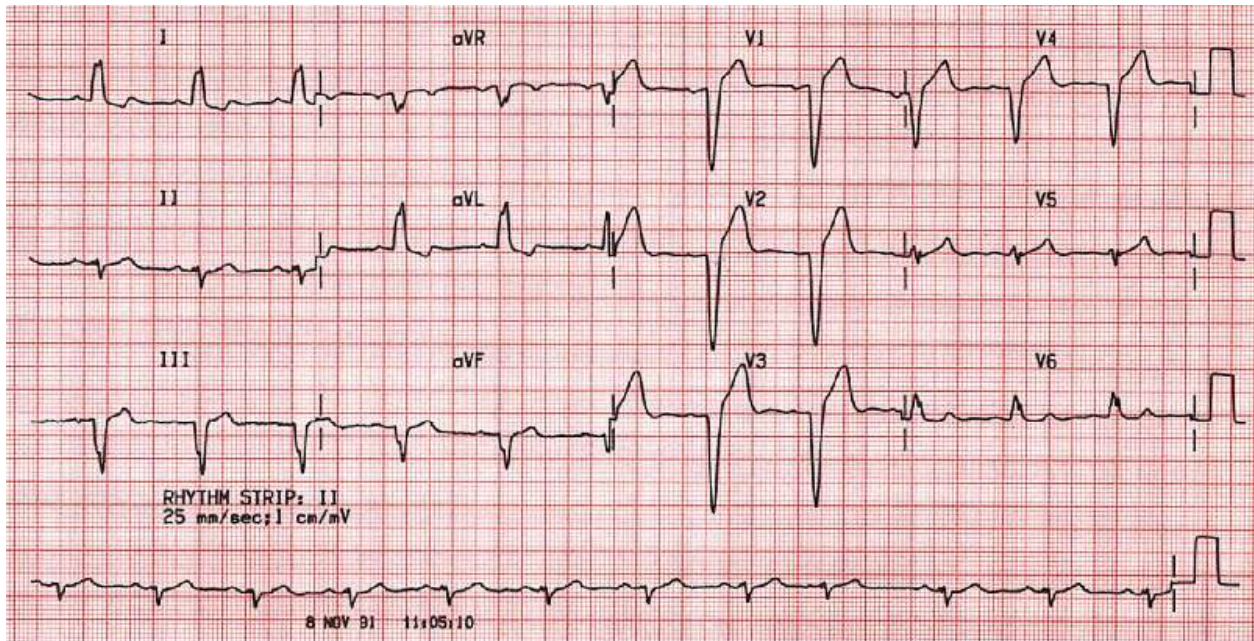
An examination is significant for localized tenderness over the left posterior leg approximately 3 cm above the calcaneus. The Thompson test (squeezing the calf) is significant for the absence of plantar flexion of the left foot. Her strength is decreased with plantar flexion of the left ankle. There is normal passive range of motion, as well as normal pulses and sensation in the left foot.

Which one of the following is the most likely cause of her pain?

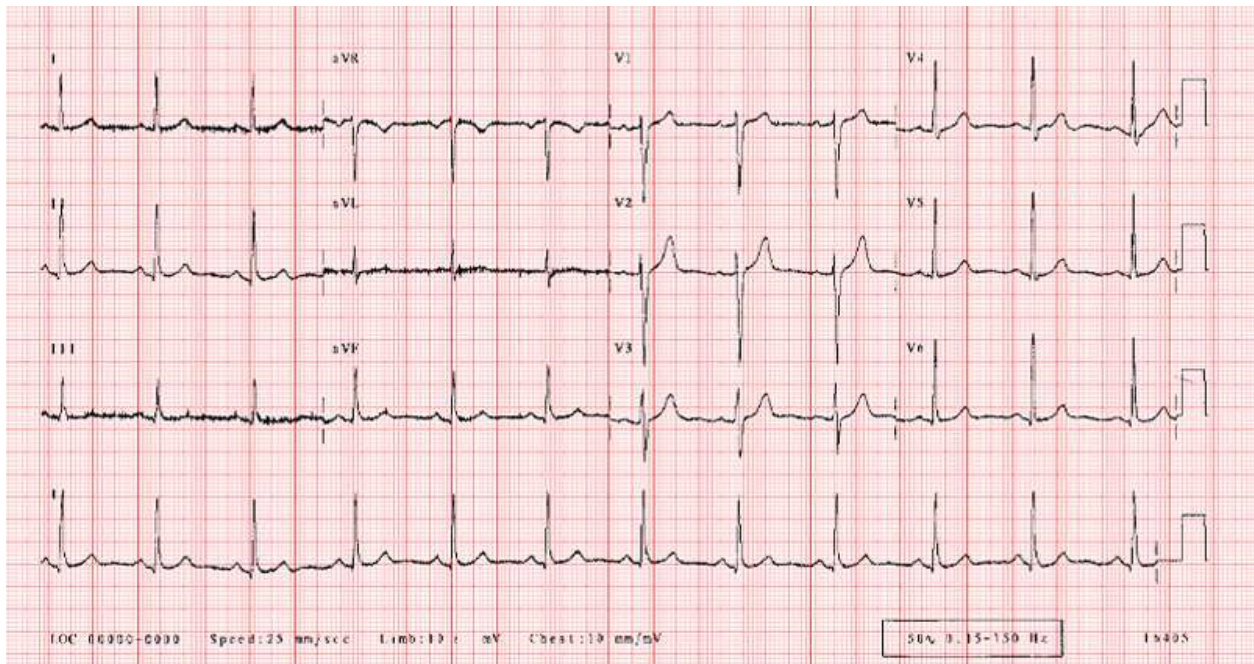
- A) Achilles tendon rupture
  - B) Plantar fasciitis
  - C) Proximal fifth metatarsal fracture
  - D) Stress fracture of the fibula
  - E) Syndesmosis injury (high ankle sprain)
123. A 5-year-old female has acute, severe bacterial sinusitis. Which one of the following would be most appropriate for this patient?
- A) Amoxicillin/clavulanate (Augmentin)
  - B) Cephalexin
  - C) Clarithromycin (Biaxin)
  - D) Doxycycline
  - E) Levofloxacin
124. A 45-year-old male presents to your office with intermittent chest pain for the past few days, although he is currently pain free after taking aspirin at home. He tells you that while running this morning he had pain every time he ran uphill. The pain is a dull ache on his left chest wall. He has no other associated symptoms and no significant past medical history or family history. His vital signs are stable and a physical examination is unremarkable. An EKG performed at this visit is shown below, along with a previous EKG.

Which one of the following would be most appropriate at this point?

- A) An exercise stress test
- B) Stress echocardiography
- C) Coronary CT angiography
- D) Referral to a cardiologist
- E) Transportation via ambulance to the emergency department



**Current EKG**



**Previous EKG**

Item #124

125. A 15-year-old male presents to the emergency department after falling on his bicycle and hitting his head while not wearing a helmet. He was dropped off by a friend's father because he was unable to reach his parents. The patient tells you that he has a headache and slight nausea but otherwise feels fine. The triage nurse is also unable to reach a parent or guardian.

While continuing to try to reach the child's parent or guardian, which one of the following would be most appropriate regarding care for this patient?

- A) Observe him in the waiting room until his parent or guardian can be reached
  - B) Complete the initial screening and provide any emergent treatment
  - C) Ask two physicians to document an intent to treat prior to any screening or emergent treatment
  - D) Contact a court official to obtain an emergency consent for medical treatment prior to any screening or emergent treatment
  - E) Contact the child protective services agency and arrange for emergency guardianship prior to any screening or emergent treatment
126. A 32-year-old male comes to your office for a follow-up visit after spontaneously passing a renal stone. This is his third such episode. Analysis of a previous stone showed that it was composed of calcium oxalate. After the first episode he increased his fluid intake and is drinking more than 3 L of water daily. He does not take any medications. An examination is unremarkable.

Which one of the following should you recommend at this time?

- A) A very-low-calcium diet
  - B) Furosemide (Lasix)
  - C) Potassium citrate
  - D) Probenecid
127. An asymptomatic 53-year-old female recently underwent a right breast lumpectomy and radiation therapy with curative intent. Over the next 5 years routine surveillance should include
- A) annual unilateral left breast mammography
  - B) annual bilateral mammography
  - C) annual bilateral mammography and radionuclide bone scans
  - D) biannual bilateral mammography
  - E) biannual bilateral mammography and annual radionuclide bone scans

128. A 42-year-old transgender male comes to your office for a routine health maintenance examination. The patient's current medications include testosterone enanthate (Xyosted), 100 mg subcutaneously every 7 days, for gender affirmation, and medroxyprogesterone acetate (Depo-subQ Provera 104), 104 mg subcutaneously every 12 weeks, for contraception. The patient has no current chronic health conditions and no current sexual partners, but he has previously been sexually active with men and women.

Which one of the following health conditions is more likely to occur in this patient compared to a female cisgender patient?

- A) Anemia
  - B) Cervical cancer
  - C) Dyslipidemia
  - D) Kidney disease
  - E) Venous thromboembolism
129. In a patient diagnosed with major depressive disorder, which one of the following factors should raise suspicion for a bipolar disorder?

- A) Diminished interest in almost all activities
- B) Fatigue or loss of energy
- C) Feelings of worthlessness or inappropriate guilt
- D) A parent diagnosed with a bipolar disorder
- E) Psychomotor retardation

130. A 33-year-old female presents with palpitations and excessive sweating. A physical examination is normal. Laboratory findings include a TSH level of 0.02  $\mu\text{U}/\text{mL}$  (N 0.40–4.00) and a free  $\text{T}_4$  level of 3.9 ng/dL (N 0.7–1.9). Radionuclide scanning reveals no uptake.

Which one of the following would explain these findings?

- A) Thyroid hormone resistance
  - B) Graves disease
  - C) A toxic nodular goiter
  - D) Excess thyroid hormone intake
  - E) A thyrotropin-secreting pituitary tumor
131. A 72-year-old female presents with pain, swelling, and decreased range of motion in her right great toe for several months. There is no history of injury or overuse. On examination the metatarsophalangeal joint is swollen and mildly tender, but not red. Dorsiflexion and plantar flexion are approximately  $30^\circ$ . A radiograph shows joint space narrowing and a small bone spur.

Recommended management at this time would be

- A) stretching and strengthening exercises
- B) a rigid shoe insert
- C) ibuprofen
- D) a corticosteroid injection
- E) surgical referral

132. A 12-year-old male with type 1 diabetes is brought to your office for routine follow-up. Laboratory work performed prior to the appointment shows an LDL-cholesterol level of 120 mg/dL.

In addition to counseling the patient on a heart-healthy diet and daily physical activity, which one of the following would you recommend?

- A) No additional measures
- B) Fish oil supplements
- C) Atorvastatin (Lipitor)
- D) Ezetimibe (Zetia)
- E) Gemfibrozil (Lopid)

133. You are reviewing and updating your routine health care examination electronic health record templates to include formal recommendations from the U.S. Preventive Services Task Force. You also consider age-specific causes of mortality in order to create corresponding preventive strategies.

Which one of the following is the leading cause of mortality among people 45–64 years of age?

- A) Accidents
- B) Diabetes mellitus
- C) Heart disease
- D) Malignancy
- E) Suicide

134. A 64-year-old female presents to the emergency department with a 10-day history of increasing shortness of breath and mild tachycardia. On examination she has an oxygen saturation of 75% on room air.

Which one of the following additional findings would suggest a diagnosis of acute respiratory distress syndrome (ARDS)?

- A) Improved oxygen saturation with supplemental oxygen
- B) Improvement of her symptoms with diuretic therapy
- C) Bilateral airspace opacities seen on a chest radiograph
- D) A flattened diaphragm seen on a chest radiograph
- E) A right lower lobe infiltrate seen on a chest radiograph

135. A 61-year-old female comes to your office for a routine health maintenance visit. She brings in laboratory results from a local blood donation facility. She donated blood for the first time in several years but was informed afterward that she is ineligible and should follow up with her primary care physician. She feels well and is asymptomatic. She does not recall receiving the hepatitis B immunization series. The letter she received included the following hepatitis B test results:

Anti-HBc screening test . . . . .	positive
HBsAg screening test . . . . .	negative
HBV nucleic acid test (NAT). . . . .	negative

You order additional hepatitis B testing, with the following notable results:

Anti-HBs . . . . .	56 mIU/mL (N < 10)
Anti-HBc IgM . . . . .	nonreactive

Which one of the following is the most likely explanation of these laboratory results?

- A) These results indicate a false positive
- B) She was never infected with hepatitis B
- C) She has an acute hepatitis B infection
- D) She has a chronic hepatitis B infection
- E) She has recovered from a past hepatitis B infection

136. A 6-week-old female is brought to your office by her parents to establish care after the family recently moved from out of state. The infant was born at term after an uncomplicated normal spontaneous vaginal delivery but failed her initial newborn hearing screen in the right ear only. Both parents are confident that she is able to hear out of both ears because she turns her head toward their voices regardless of where they are standing. A physical examination is within normal limits.

Which one of the following would be the most appropriate next step in response to this patient's abnormal hearing screen?

- A) No further testing
- B) A bilateral audiology evaluation before 3 months of age
- C) A bilateral audiology evaluation at 6 months of age
- D) A bilateral audiology evaluation at 12 months of age
- E) A bilateral audiology evaluation immediately before entering kindergarten

137. A previously healthy 38-year-old female with a normal BMI has a few warts at the base of her great toe on the plantar surface. She noticed them a few years after she started to run regularly for exercise but has not tried any at-home treatments. They are minimally raised and rarely painful but occasionally cause irritation and she would like to get rid of them.

Which one of the following would be the most appropriate treatment?

- A) Over-the-counter salicylic acid
- B) *Candida* injections
- C) Application of duct tape
- D) Manual paring and extraction
- E) Laser treatment

138. Which one of the following best explains the pathophysiology of cytokine storm?

- A) Anaphylaxis
- B) Immune dysregulation
- C) Immunodeficiency
- D) Normal physiologic response
- E) Serum sickness

139. A 44-year-old male with diabetes mellitus, hypertension, obesity, and chronic pain is on chronic opiate therapy. He comes to your office because of a lack of sex drive, decreasing strength, low overall energy levels, and hot flashes. After ruling out other causes you confirm that he has a low total testosterone level on two separate early morning laboratory tests. He would like to start testosterone therapy.

Which one of the following would be the most appropriate next step?

- A) Order a PSA level and perform a digital rectal examination
- B) Order LH and FSH levels
- C) Order chromosomal studies
- D) Discuss risks and benefits of testosterone replacement therapy and start low-dose replacement
- E) Inform him that testosterone replacement therapy would not be beneficial for him because of its high risk



140. A 42-year-old female who owns a bakery presents with a several-month history of gradually worsening pain, swelling, and paresthesia affecting her entire right arm whenever she has to blend ingredients by hand. She says that her “arm veins pop out” and her arm develops a deep aching pain if she has to stir mixes for very long. The pain and swelling have become so severe that she is no longer able to make wedding cakes and is concerned she will be unable to continue running her business. She does not recall any trauma and has no swelling in her left arm. She has a history of essential hypertension that is treated with losartan (Cozaar). On examination the patient has full active range of motion and the Neer and Hawkins impingement tests of the shoulder are negative.

Based on this patient’s history and the physical examination findings, which one of the following is the most likely diagnosis?

- A) Carpal tunnel syndrome
  - B) Cervical radiculopathy
  - C) Complex regional pain syndrome
  - D) Raynaud’s disease
  - E) Thoracic outlet syndrome
141. A patient’s office spirometry results demonstrate an obstructive pattern. This would be seen with which one of the following?
- A) Asbestosis exposure
  - B) Cystic fibrosis
  - C) Idiopathic pulmonary fibrosis
  - D) Nitrofurantoin exposure
  - E) Sarcoidosis
142. The mother of a 6-month-old infant is concerned that her child’s feet are “deformed.” On examination the heel bisector line is between the third and fourth digits on the right foot and on the third digit on the left foot. You attempt to flex the feet, and both appear to be rigid.

Which one of the following would you recommend as a corrective intervention?

- A) Night splints
- B) Adjustable orthotic shoes
- C) Braces
- D) Physical therapy
- E) Surgical correction

143. You admit a 68-year-old female with an acute stroke to the hospital. She has no other acute cardiovascular conditions. CT rules out a hemorrhagic event. You have determined that the patient is not a candidate for reperfusion therapy with alteplase or thrombectomy.

You advise the nursing staff that you will be initiating antihypertensive therapy if the patient's blood pressure rises above a threshold of

- A) 120/80 mm Hg
- B) 140/90 mm Hg
- C) 160/100 mm Hg
- D) 180/110 mm Hg
- E) 220/120 mm Hg

144. A patient begins to cry when you tell her that the mammogram she had yesterday shows an abnormality requiring further imaging. The most appropriate response at this time is to

- A) tell her there is no need to cry
- B) quickly reassure her that this is most likely benign
- C) reassure her that most breast cancers have a long survival rate
- D) wait to specifically address her emotional response until after you have given her more complete information
- E) stop giving information and address her apparent sadness prior to continuing

145. Which one of the following is an indication for a radionuclide thyroid uptake scan for a patient with a single thyroid nodule confirmed by ultrasonography?

- A) The presence of antithyroid antibodies
- B) A low TSH level
- C) An elevated TSH level
- D) A normal TSH level and a tender nodule
- E) The presence of the thyroid nodule regardless of other findings

146. A 15-year-old female is brought to your office by her parents for evaluation because they are concerned about her restrictive eating patterns and weight loss. The patient is unconcerned about these issues and says that she feels well and does not need any evaluation. Her parents tell you that for the past 6 months she has had an increasingly restricted diet to the point that she now drinks only water and eats only vegetables and roasted chicken or turkey. They report that she looks much thinner now than she did 6 months ago, but they are uncertain how much weight she has lost. She says that she does not feel depressed or anxious and she is doing well in school.

On examination she has a height of 163 cm (64 in) and a weight of 43 kg (95 lb), with a BMI of 16 kg/m<sup>2</sup>. She has a pulse rate of 52 beats/min and a blood pressure of 102/68 mm Hg while seated and 84/58 mm Hg while standing. Evaluation of her teeth shows significant erosion of the enamel.

When considering the psychotherapy aspect of care for this patient, which one of the following is preferred for treatment of her condition?

- A) Cognitive-behavioral therapy
  - B) Dialectical behavioral therapy
  - C) Family therapy
  - D) Interpersonal therapy
  - E) Psychodynamic therapy
147. According to the Ottawa knee rule, a radiograph would be indicated for a patient presenting with an acute knee injury if the examination reveals tenderness to palpation over the
- A) fibular head
  - B) lateral joint line
  - C) medial joint line
  - D) tibial tubercle
  - E) upper medial aspect of the tibia
148. In patients diagnosed with COPD, testing should be considered for which one of the following underlying conditions?
- A)  $\alpha_1$ -Antitrypsin deficiency
  - B) Cystic fibrosis
  - C) Hemochromatosis
  - D) Williams syndrome
  - E) Wilson's disease

149. A 4-year-old male is brought to your office by his mother because of a 2-day history of watery diarrhea and vomiting and you diagnose acute gastroenteritis. On examination his mucous membranes are sticky and he has decreased tear production, but his overall appearance is normal and his eyes are not sunken. Using the Clinical Dehydration Scale, you estimate that he has mild (3%–6%) dehydration.

Which one of the following should you recommend?

- A) Water as tolerated
  - B) Half-strength apple juice followed by preferred fluids
  - C) The bananas, rice, applesauce, and toast (BRAT) diet
  - D) Intravenous fluids
  - E) Metoclopramide (Reglan)
150. A 50-year-old male has an acute upper respiratory infection and cough that has improved but has not resolved completely. He presents to your office today with a 2-day history of chest pain that began gradually. The pain is worse when he is supine, takes deep breaths, or coughs, and he says the pain is relieved when he leans forward while sitting. He is afebrile and his vital signs are normal. An EKG confirms your impression of acute pericarditis, a troponin level is normal, and he does not appear acutely ill. You treat him as an outpatient with ibuprofen, 600 mg three times daily, and omeprazole (Prilosec) for gastrointestinal protection.

The patient returns for follow-up 7 days later and tells you that the pain is somewhat improved but still present. He remains afebrile and his other vital signs are normal. On examination he still has a pericardial friction rub but no gallops or murmurs, and his lungs are clear.

Which one of the following would be most appropriate at this time?

- A) Continue his current medications and add colchicine (Colcrys)
  - B) Continue his current medications and add prednisone
  - C) Discontinue his current medications and start aspirin
  - D) Discontinue his current medications and start indomethacin
  - E) Admit him to the hospital and consult a cardiologist
151. An 18-year-old female comes to the urgent care clinic because of worsening nausea and vomiting, itching, and a dry cough that began about 30 minutes after she ate lunch at a nearby restaurant. She tells you that she did not experience any choking while eating her lunch, and she has not had any dysphagia, rash, or diarrhea. She takes no medications, and her past medical history is significant only for a severe nut allergy. She says that she was feeling well before today. An examination is notable only for a blood pressure of 88/60 mm Hg, mildly labored breathing, and bilateral expiratory wheezes.

At this point you would administer

- A) albuterol (Proventil, Ventolin)
- B) diphenhydramine (Benadryl)
- C) epinephrine
- D) hydroxyzine (Vistaril)
- E) methylprednisolone (Medrol)

152. A premenopausal 48-year-old female comes to your office because of a 3-month history of increased frequency and volume of vaginal bleeding. She typically menstruates every 24 days but now has bleeding every 10–14 days and notes an increased volume of blood as well. She feels well otherwise. Her cervical cancer screening is current. A bimanual examination reveals blood at the cervical os. Otherwise the cervix appears normal, the uterus is normal to palpation, and there are no adnexal masses.

Which one of the following should be the next step in the evaluation?

- A) Reassurance that irregular menses are common in the perimenopausal period
  - B) HPV testing
  - C) CT of the pelvis with and without contrast
  - D) An endometrial biopsy
153. An 18-month-old female develops immune thrombocytopenic purpura following MMR administration in your clinic. She requires hospitalization and extensive treatment. The child does not have any health insurance coverage.

The child's family could be eligible for compensation by the

- A) clinic's malpractice insurance
  - B) vaccine manufacturer's liability coverage
  - C) Countermeasures Injury Compensation Program
  - D) National Vaccine Injury Compensation Program
154. A 55-year-old female presents with swelling and some redness in the area of her right ankle that had a gradual onset over the past week. She has not had any injury, fever, or other signs of systemic illness and has no pain. Her past medical history is significant for type 2 diabetes with polyneuropathy that is moderately well controlled, hypertension, hyperlipidemia, and a BMI of 35 kg/m<sup>2</sup>.

On examination her right ankle and foot are slightly larger than the left, exhibit faint erythema, and feel slightly warmer than the left. No pain is noted with palpation, and her ankle ligaments appear to be intact. Pedal pulses are 2+ bilaterally and she has no calf pain or swelling.

Which one of the following would be the most appropriate next step?

- A) Reassure her that the lack of pain indicates the absence of a serious disease process
- B) Prescribe antibiotics for presumed cellulitis
- C) Recommend compression stockings, leg elevation, and monitoring
- D) Provide an ankle stabilizing brace
- E) Obtain bilateral weight-bearing foot radiographs

155. The American Thoracic Society/Infectious Diseases Society of America guidelines recommend which one of the following for the diagnosis and initial management of non-severe community-acquired pneumonia in adults?

- A) Use of a validated clinical prediction rule to determine the need for hospitalization
- B) Urine antigen testing for *Legionella*
- C) Blood and sputum cultures to guide therapy
- D) Procalcitonin to determine the need for antibacterial therapy
- E) Coverage for methicillin-resistant *Staphylococcus aureus* (MRSA)

156. You diagnose nonvalvular atrial fibrillation in a 54-year-old male. His CHA<sub>2</sub>DS<sub>2</sub>-VASc score is 2.

Which one of the following should you recommend as first-line therapy for stroke prevention?

- A) No antithrombotic therapy
- B) Aspirin
- C) A direct oral anticoagulant
- D) Low molecular weight heparin
- E) A vitamin K antagonist

157. A 1-month-old infant is brought to your office by her parents for routine follow-up. The infant was born at 35 weeks and 5 days gestation by normal vaginal delivery after induction of labor for maternal preeclampsia with severe features. The infant was discharged with the mother on the third day of life. There were no additional complications noted. Today the parents report exclusive breastfeeding and tell you the infant spits up after longer feedings. Voiding and stooling are as expected and the infant's development is normal. The weight at birth was at the 20th percentile, and today's weight is at the 25th percentile.

Which one of the following would be the most appropriate intervention at this time?

- A) Caloric supplementation in addition to breastfeeding
- B) Iron supplementation
- C) Vitamin E supplementation
- D) Referral for early intervention

158. A 34-year-old male began a sexual relationship with a woman 3 months ago and the relationship ended on friendly terms last week. He received a call yesterday from the woman, who said she had developed a rash that resulted in a diagnosis of syphilis and that he should be evaluated and treated if appropriate. He has no symptoms and a serologic test for syphilis is negative. He has no known drug allergies.

Which one of the following would be most appropriate at this time?

- A) Daily self-inspection of the penis to identify a chancre
- B) Observation with a repeat serologic test for syphilis in 6 weeks
- C) Azithromycin (Zithromax), 2 g orally as a single dose
- D) Penicillin G benzathine (Bicillin L-A), 2.4 million units intramuscularly as a single dose
- E) Penicillin G benzathine, 2.4 million units intramuscularly once weekly for 3 weeks

159. An 85-year-old male with hypertension and coronary artery disease comes to your office for a routine wellness visit. He is accompanied by his wife, who notes that the patient's memory has been worsening over the last few years. His current medications include carvedilol (Coreg), losartan (Cozaar), hydrochlorothiazide, and aspirin.

A brief screening test is positive for cognitive impairment. The Saint Louis University Mental Status (SLUMS) examination places the patient in the dementia category. You order further testing, including a TSH level, a CBC, a comprehensive metabolic panel, and a vitamin B<sub>12</sub> level.

Which one of the following should also be included in the workup?

- A) The Geriatric Depression Scale
  - B) Apolipoprotein E epsilon 4 allele testing
  - C) An EEG
  - D) A PET scan
  - E) Cerebrospinal fluid analysis
160. A 66-year-old male presents to your office with a 1-week history of dyspnea with minimal exertion but no chest pain. He has had mild hemoptysis. An examination reveals a pulse rate of 100 beats/min but no other remarkable findings. A chest radiograph, CBC, and metabolic panel are normal, but his D-dimer level is elevated at 750 ng/mL (N < 500).

Which one of the following would be the next step in the evaluation?

- A) A BNP level
  - B) CT pulmonary angiography
  - C) An EKG
  - D) Pulmonary arteriography
  - E) A ventilation-perfusion scan
161. An 80-year-old male is considering a cardiac procedure. As part of the evaluation for the procedure he is found to meet the criteria for being at risk of frailty (prefrail).

Which one of the following would be the most effective management of this patient's prefrail status?

- A) Nutritional supplementation
- B) Vitamin D supplementation
- C) Testosterone supplementation
- D) A physical activity program
- E) Cognitive-behavioral therapy

162. You see a 55-year-old female for preoperative clearance prior to a cholecystectomy. When you examine the patient she asks you to also look at the lesion on her foot (shown below).

Which one of the following is the most likely etiology of the lesion?

- A) Arterial
  - B) Venous
  - C) Infectious
  - D) Neuropathic
  - E) Pressure
163. A 50-year-old male with newly diagnosed type 2 diabetes asks how to reduce his risk of diabetic retinopathy progression. You tell him that in addition to maintaining good glycemic control, the risk can be reduced by

- A) corticosteroid eye drops
- B) an ACE inhibitor
- C) aspirin therapy
- D) blood pressure control
- E) lipid management

164. A 48-year-old runner presents with anterior knee pain. He says that the pain developed insidiously and is worse at the beginning of a run and immediately following a run. There is no history of injury. An examination suggests patellar tendinopathy.

Which one of the following treatment modalities has the best evidence of long-term effectiveness in improving this condition?

- A) NSAIDs
  - B) Eccentric quadriceps exercises
  - C) Corticosteroid injection of the infrapatellar bursa
  - D) Injection of the tendon with a sclerosing agent
  - E) Surgical excision of the tendon
165. Which one of the following would be most important for reducing the risk of recurrence after a single mild episode of diverticulitis?

- A) Increasing dietary fiber
- B) Permanently eliminating nuts, seeds, and corn from the diet
- C) Treating the initial episode with appropriate broad-spectrum antibiotics
- D) CT imaging early in the episode to detect complications
- E) Colonoscopy 4–6 weeks after the episode has resolved





**Item #162**

166. A 52-year-old female with no history of cigarette smoking is admitted to the hospital because of chest pain and shortness of breath. After an extensive evaluation you make a diagnosis of Takotsubo syndrome.

Findings are most likely to be normal on which one of the following with this diagnosis?

- A) A CK-MB level
- B) A troponin level
- C) An EKG
- D) Echocardiography
- E) Coronary angiography

167. The U.S. Preventive Services Task Force currently recommends hepatitis C screening for

- A) high-risk adults only, regardless of age
- B) only high-risk adults born between 1945 and 1965
- C) adults born between 1945 and 1965 regardless of risk, and other adults only if they are at high risk
- D) adults born between 1945 and 1980 regardless of risk, and other adults only if they are at high risk
- E) all adults < 80 years of age, regardless of risk

168. You receive a call from the home health nurse who is caring for a bedridden 57-year-old male with progressive multiple sclerosis. She is concerned that he has a weak cough reflex and may not be swallowing safely. She has not witnessed an aspiration event. He was hospitalized for pneumonia 4 months ago.

While awaiting the results of a full swallow evaluation, which one of the following is the most appropriate intervention to prevent recurrent pneumonia in this patient?

- A) The use of chlorhexidine mouthwashes
- B) A mechanical soft diet with thickened liquids
- C) Swallowing exercises
- D) Antibiotic therapy for 24 hours
- E) Placement of a nasogastric tube

169. Which one of the following is the most common cause of koilonychia (spoon-shaped nails)?

- A) Chronic pulmonary disease
- B) Hyperthyroidism
- C) Iron deficiency anemia
- D) Onychomycosis
- E) Psoriasis

170. A 22-year-old gravida 1 para 0 was recently diagnosed with gestational diabetes. Her fasting blood glucose levels have consistently been 120–130 mg/dL since she began following nutrition and exercise recommendations.

Based on guidelines from the American Diabetes Association and the American College of Obstetricians and Gynecologists, which one of the following would be preferred at this point?

- A) No change in management
- B) Loosening the calorie restrictions
- C) Adding glyburide
- D) Adding insulin
- E) Adding metformin (Glucophage)

171. An otherwise healthy 72-year-old male presents with a 4-week history of catching and triggering of his right middle finger. When he awakens in the morning the finger is locked in flexion at the proximal interphalangeal joint and he has to manually extend the finger. He enjoys playing golf and painting, both of which are compromised by the triggering of his finger. He has not had any pain or numbness.

Which one of the following would you tell him regarding his treatment options for this condition?

- A) Less than 15% of cases spontaneously resolve by 1 year
- B) Splinting of the affected finger can result in complete resolution
- C) NSAID injections have been found to be more effective than corticosteroid injections
- D) Surgical release is the most cost-effective treatment

172. A 62-year-old male with hypertension and metabolic syndrome sees you for follow-up. A fasting triglyceride level is 300 mg/dL. You address lifestyle and other potential causes of his elevated triglycerides, including his current medications.

If included in his current regimen, which one of the following hypertension medications would be most likely to contribute to his hypertriglyceridemia?

- A) Amlodipine (Norvasc)
- B) Diltiazem (Cardizem)
- C) Lisinopril (Prinivil, Zestril)
- D) Metoprolol

173. A 2-year-old male with a barking cough is brought to the urgent care clinic by his parents. He is noted to have stridor when agitated and mild retractions. He has a normal level of consciousness, good air entry, and no evidence of cyanosis.

Which one of the following treatment modalities would be most appropriate?

- A) Dexamethasone
- B) Heliox
- C) Humidified air inhalation
- D) Nebulized epinephrine
- E) Oxygen

174. A 29-year-old male tells you that several years ago he was physically assaulted while walking home from work. Since the assault he has experienced insomnia, anhedonia, irritability, and vivid flashbacks and intrusive thoughts about the assault.

Using a screening tool and structured interview you make a diagnosis and discuss treatment. Which one of the following would be the best evidence-based recommendation for initial treatment?

- A) Alprazolam (Xanax)
- B) Clonazepam (Klonopin)
- C) Escitalopram (Lexapro)
- D) Dialectical behavioral therapy
- E) Individual trauma-focused psychotherapy

175. A sexually active 45-year-old female who has been using oral contraceptives for years without experiencing any problems asks how much longer she should continue contraception. She is happy with her current low-dose estrogen combined oral contraceptive and would like to continue this if possible. She asks if the health risks are high enough to warrant a change to another option. She does not smoke and is in excellent health.

Which one of the following would be most appropriate for this patient?

- A) Continue her current oral contraceptive
- B) Discontinue contraception
- C) Obtain FSH and LH levels today and discontinue contraception only if the results confirm infertility
- D) Replace the oral contraceptive with a barrier method

176. A 42-year-old female presents with a several-month history of fatigue, arthralgias in her knees and hips, myalgias, hair loss, and a recent episode of gross hematuria diagnosed at an urgent care center as a urinary tract infection. She has no urinary tract symptoms at this time. A friend of hers who had similar symptoms for months was recently diagnosed with systemic lupus erythematosus (SLE), and the patient asks whether she might have SLE.

Which one of the following would be most helpful in reassuring her that the likelihood of her having SLE is low?

- A) Absence of the typical malar rash
  - B) Absence of RBC casts on microscopic urinalysis
  - C) A negative serum antinuclear antibody
  - D) Normal levels of complement C3, C4, and CH50
  - E) Joint pain limited to large joints
177. A 14-year-old female is brought to your office after a school screening program identified possible scoliosis. She plays basketball at school and has no history of recent injuries. She is feeling well today and a review of systems is negative. A physical examination reveals an elevated right rib on the forward bend test. Radiography demonstrates a Cobb angle of 15°.

Which one of the following would be most appropriate at this point?

- A) Observation only
  - B) Suspension of sports participation
  - C) Bracing
  - D) Physical therapy
  - E) Surgical evaluation
178. You practice in a community with a significant number of Laotian immigrants. A 53-year-old male comes to your office accompanied by his adult daughter for follow-up of hypertension. His primary language is Lao and he has limited proficiency in English.

According to Title VI of the Civil Rights Act, which one of the following is the correct way to approach this situation?

- A) Continue without an interpreter unless he asks for one
- B) Ask the patient's daughter to interpret
- C) Ask a nurse who speaks Lao to interpret
- D) Offer a trained interpreter
- E) Speak loudly and slowly and give him written instructions

179. A 46-year-old male comes to your office for a routine health maintenance examination. He had elevated AST and ALT levels on previous laboratory testing. He reports consuming only one alcoholic drink twice a month. He does not take any medications, including over-the-counter medications. A physical examination is normal except for a BMI of 32 kg/m<sup>2</sup>. Laboratory testing shows an AST level of 72 U/L (N 10–59) and an ALT level of 96 U/L (N 13–40). A hepatitis panel, serum ferritin level, serum iron level, lipid profile, and fasting glucose level are all within normal limits. Ultrasonography of the right upper quadrant shows fatty infiltration of the liver.

Which one of the following would be the first-line treatment of this condition?

- A) Biguanides such as metformin (Glucophage)
  - B) GLP-1 analogs such as liraglutide (Victoza)
  - C) Thiazolidinediones such as pioglitazone (Actos)
  - D) Weight loss with diet and exercise
  - E) Bariatric surgery
180. A 25-year-old primigravida presents to your office in her second trimester with a 24-hour history of fever, cough, and myalgias. A nasal swab is positive for influenza A. She has a temperature of 38.6°C (101.5°F), a heart rate of 100 beats/min, a respiratory rate of 15/min, a blood pressure of 100/64 mm Hg, and an oxygen saturation of 98% on room air. On examination the patient is warm to the touch with mild cervical lymphadenopathy and moist mucous membranes. Her lungs are clear to auscultation bilaterally without wheezes, crackles, or rhonchi. A cardiovascular examination reveals a regular rate and rhythm without murmurs, rubs, or gallops. An abdominal examination is normal.

Which one of the following would be the medication of choice for this patient?

- A) Baloxavir marboxil (Xofluza)
  - B) Oseltamivir (Tamiflu)
  - C) Peramivir (Rapivab)
  - D) Zanamivir (Relenza)
181. A healthy 50-year-old male with no significant past medical history comes to your office for a health maintenance examination. He does not take any medications and does not smoke cigarettes or drink alcohol. He tells you that a friend who is his age recently had an acute myocardial infarction and he would like testing to help decrease his own risk. On examination he has a BMI of 30 kg/m<sup>2</sup>.

In addition to checking his lipid profile and hemoglobin A<sub>1c</sub>, evidence supports which one of the following to assess his risk of cardiovascular disease?

- A) No further testing
- B) An ankle-brachial index
- C) A high-sensitivity C-reactive protein level
- D) A coronary artery calcium score
- E) A PLAC test for lipoprotein-associated phospholipase A<sub>2</sub> activity

182. A 48-year-old male with a 5-year history of diabetes mellitus comes to your office for a 6-month follow-up. His diabetes is finally under better control. His most recent hemoglobin A<sub>1c</sub> is 7.1% but his urine albumin excretion is 250 mg/24 hr (N < 80), which is confirmed with two different readings. He is currently taking amlodipine (Norvasc), 5 mg daily, for blood pressure control. He previously took lisinopril (Prinivil, Zestril) but discontinued it after developing a bothersome dry cough.

Which one of the following agents would be most appropriate to add to this patient's regimen?

- A) Diltiazem (Cardizem)
- B) Hydralazine
- C) Hydrochlorothiazide
- D) Metoprolol
- E) Olmesartan (Benicar)

183. A 63-year-old male presents for advice on smoking cessation. He was recently hospitalized with acute coronary syndrome and is highly motivated to quit smoking. He says that he has quit several times in the past but never for an extended period of time. He currently smokes 10 cigarettes per day. In addition to behavioral support resources such as 1-800-QUIT-NOW, you decide to prescribe a nicotinic receptor partial agonist.

Which one of the following belongs to this class of medications?

- A) Acamprosate
- B) Bupropion (Wellbutrin SR)
- C) Clonidine (Catapres)
- D) Naltrexone
- E) Varenicline (Chantix)

184. A 44-year-old female sees you for evaluation of frequent, disabling headaches. She describes the headaches as throbbing, usually left-sided, and associated with nausea. Her headaches worsen with sound and movement, and they last for 48 hours nearly every week. She has not had any aura, weakness, numbness, or speech disturbance.

Based on current evidence, which one of the following medications would have the greatest potential for reducing the number of headache days for this patient?

- A) Fluoxetine (Prozac)
- B) Gabapentin (Neurontin)
- C) Lisinopril (Prinivil, Zestril)
- D) Propranolol
- E) Verapamil (Calan)

185. A 62-year-old male is scheduled for CT of the chest with intravenous contrast in the next 48 hours. He has a long-standing history of degenerative joint disease in the right knee, coronary artery disease, and type 2 diabetes. His current medications are low-dose aspirin, metformin (Glucophage), and naproxen.

In addition to discontinuing metformin prior to the procedure, which one of the following would you recommend for prevention of contrast-induced nephropathy?

- A) Discontinue aspirin
- B) Discontinue naproxen
- C) Start acetylcysteine
- D) Start mannitol (Osmitrol)

186. A 34-year-old male sees you via your clinic's electronic portal because of a rash. The rash, which he first noticed 3 days ago, was a large red patch on his upper leg at that time. He uploads an image of the rash (shown below) as it appears today. He started feeling feverish last night with chills, nausea, headache, and fatigue. He lives in Wisconsin and spends much of his free time hiking in the woods near his home. He removed two ticks from his legs last week.

Which one of the following is the most likely cause of his current symptoms?

- A) Anaplasmosis
- B) Babesiosis
- C) Ehrlichiosis
- D) Lyme disease
- E) Tularemia

187. A 65-year-old female is diagnosed with osteoporosis based on a screening DXA scan. After a shared decision-making discussion you decide to initiate treatment with alendronate (Fosamax).

Which one of the following would you recommend for the duration of pharmacologic treatment?

- A) 1 year
- B) 3 years
- C) 5 years
- D) 10 years
- E) Lifelong treatment





**Item #186**

188. A 59-year-old male presents with difficulty breathing during exercise. He says that his symptoms have gradually worsened over the past year and he has had to discontinue his morning walks. He reports mild lower extremity edema and weight gain. He has a blood pressure of 115/79 mm Hg, a heart rate of 88 beats/min, and an oxygen saturation of 92% on room air. A physical examination is notable for mild jugular venous distention and 1+ bilateral lower extremity edema. Examination of the heart reveals a normal rate and rhythm with an S<sub>3</sub> heart sound. The lungs are clear to auscultation. You order a CBC, a comprehensive metabolic panel, an EKG, a chest radiograph, and echocardiography.

While awaiting the results you consider the differential diagnosis. Which one of the following conditions is the most common cause of pulmonary hypertension?

- A) Chronic thromboembolism
  - B) COPD
  - C) Idiopathic pulmonary arterial hypertension
  - D) Left heart disease
  - E) Sleep-disordered breathing
189. A 53-year-old female with diabetes mellitus presents to the emergency department with a 4-day history of nausea and vomiting. Her vital signs include a blood pressure of 142/93 mm Hg, a temperature of 36.5°C (97.7°F), a heart rate of 93 beats/min, a respiratory rate of 18/min, and an oxygen saturation of 98% on room air. A potassium level is 6.8 mEq/L (N 3.5–5.1) and a fingerstick blood glucose level is 120 mg/dL. The patient has chronic kidney disease with a baseline glomerular filtration rate of 32 mL/min/1.73 m<sup>2</sup> and today it is 18 mL/min/1.73 m<sup>2</sup>.

Which one of the following EKG findings would you expect?

- A) Atrial fibrillation
  - B) Diffuse ST-segment elevation
  - C) Peaked P waves
  - D) Peaked T waves
  - E) Sinus tachycardia
190. An 84-year-old female presents with dryness and irritation in her eyes. Her optometrist recently diagnosed her with dry eye.

Which one of the medications in this patient's current regimen is most likely causing her dry eye?

- A) Amitriptyline
- B) Empagliflozin (Jardiance)
- C) Levothyroxine (Synthroid)
- D) Liraglutide (Victoza)
- E) Metformin (Glucophage)

191. You are covering a weekend shift in the local intensive-care unit. When providing care for a very ill adult patient with hypoproliferative thrombocytopenia who is not currently bleeding, prophylactic platelet transfusion should be considered if the platelet count is below a threshold of
- A) 10,000/ $\mu$ L
  - B) 20,000/ $\mu$ L
  - C) 25,000/ $\mu$ L
  - D) 50,000/ $\mu$ L
  - E) 100,000/ $\mu$ L

192. A 15-year-old female is brought to your office for a routine wellness check. Her only concerns are that she has never menstruated and she is not growing as fast as her peers. She is very active and plays volleyball on a travel team. An examination reveals that her height is now at the 25th percentile, although it was at the 90th percentile when she was 8 years old. She has breast buds that do not extend beyond the areola and her pubic hair is fine and sparse. Laboratory findings include a negative pregnancy test and a normal CBC, metabolic panel, TSH level, and prolactin level. She has an estradiol level of 12 pg/mL (N 25–75), an LH level of 40 mIU/mL (N 5–20), and an FSH level of 50 mIU/mL (N 3–20).

The most likely diagnosis is

- A) congenital adrenal hyperplasia
  - B) constitutional delay of puberty
  - C) pituitary adenoma
  - D) polycystic ovary syndrome
  - E) primary ovarian insufficiency
193. A 42-year-old male presents with a 3-month history of epigastric pain, bloating, and occasional vomiting after eating. He has not had any weight loss, blood in the stools, or difficulty swallowing. He does not report any significant acid reflux symptoms.

Which one of the following would be the best management strategy for this patient?

- A) Implement lifestyle changes and follow up in 3 months
- B) Test for *Helicobacter pylori* and treat if positive
- C) Initiate a 2-month trial of proton pump inhibitor therapy
- D) Order esophagogastroduodenoscopy
- E) Order a barium swallow

194. A 56-year-old female with a history of stage III non-small cell lung cancer who is currently receiving radiation treatment and chemotherapy sees you because of a poor appetite and a 4.5-kg (10-lb) weight loss in the past month. She requests medication to improve her appetite and you consider prescribing megestrol (Megace).

Which one of the following is a possible side effect associated with the use of megestrol in this patient?

- A) Hirsutism
- B) Hypoglycemia
- C) Improved libido
- D) Thrombocytopenia
- E) A venous thromboembolic event

195. A 60-year-old male who is a bricklayer presents to your office in Florida with a fever, fatigue, headaches, night sweats, cough, and intermittent dyspnea. He also has myalgias and arthralgias. His symptoms started after he returned from a job in Arizona 2 weeks ago. He does not have any other travel history or sick contacts. His vital signs and a physical examination are unremarkable. A chest radiograph does not show any acute pathology. A CBC shows eosinophilia and his erythrocyte sedimentation rate is mildly elevated.

Which one of the following is the most likely pathogen?

- A) *Aspergillus*
- B) *Blastomyces*
- C) *Coccidioides*
- D) *Cryptococcus*
- E) *Histoplasma*

196. Which one of the following psychoactive medications would create the greatest risk of respiratory depression if used in combination with an opioid?

- A) Amitriptyline
- B) Bupropion (Wellbutrin)
- C) Escitalopram (Lexapro)
- D) Lorazepam (Ativan)
- E) Trazodone

197. A 15-year-old basketball player presents with a 3-week history of bilateral knee pain that is greater in the left knee. The pain increases with jumping, walking down stairs, and kneeling. He has not had any recent injury. He tells you that he has grown more than 5 inches in the past year. A physical examination is notable for tight quadriceps and hamstrings, and tenderness to palpation over the tibial tuberosity bilaterally.

Which one of the following is the most likely diagnosis?

- A) Anterior cruciate ligament tear
- B) Medial meniscus tear
- C) Osgood-Schlatter disease
- D) Patellar sleeve fracture
- E) Patellofemoral pain syndrome

198. A healthy 36-year-old female who is a nonsmoker sees you for a routine well woman examination. She has been sexually active with five partners in the last 2 years. She has never had an abnormal Papanicolaou (Pap) smear. Last year's Pap test with high-risk HPV co-testing was negative. You review her immunization status and note that she received the influenza vaccine last fall.

Which one of the following vaccines that this patient has never previously received would you recommend for her?

- A) Hepatitis A vaccine
- B) HPV vaccine (Gardasil 9)
- C) Meningococcal polysaccharide conjugate vaccine (Menactra)
- D) Pneumococcal polysaccharide vaccine (PPSV23, Pneumovax 23)
- E) Recombinant zoster vaccine (Shingrix)

199. A 50-year-old female sees you for further evaluation after she had elevated blood pressure on two consecutive visits to an urgent care clinic for minor illnesses. She has no history of chest pain, shortness of breath, headache, or changes in vision. She has smoked half a pack of cigarettes daily since the age of 16 and has an allergy to iodine. There is no other significant medical history.

On examination the patient has a blood pressure of 155/92 mm Hg and a heart rate of 80 beats/min. The cardiovascular and pulmonary examinations are otherwise normal. A basic metabolic panel and a TSH level are normal.

In addition to lifestyle changes, which one of the following would be most appropriate as initial pharmacologic therapy for management of this patient's hypertension?

- A) Carvedilol
- B) Furosemide (Lasix)
- C) Hydralazine
- D) Hydrochlorothiazide
- E) Spironolactone (Aldactone)

200. A 36-year-old female sees you for a routine health maintenance visit. She reports worsening hair growth on her chin and abdomen over the last few years. The excessive hair growth first appeared in her late teens and she has been dissatisfied with the cosmetic results of various hair removal methods. She is generally healthy aside from a BMI of 31 kg/m<sup>2</sup>. She does not take any medications, is a nonsmoker, and has had a bilateral tubal ligation. Her menses are regular.

A complete physical examination is consistent with some terminal hairs in the distribution she described and is otherwise unremarkable. Laboratory results are normal, including fasting lipids, a comprehensive metabolic panel, a hemoglobin A<sub>1c</sub>, and a TSH level.

Which one of the following would be the recommended first-line treatment for this patient's condition?

- A) Drospirenone/ethinyl estradiol (Yasmin)
- B) Flutamide
- C) Leuprolide (Eligard)
- D) Metformin (Glucophage)
- E) Spironolactone (Aldactone)

# American Board of Family Medicine



**2021 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.

### Item 1

**ANSWER: A**

Carotid artery disease affects extracranial carotid arteries and is caused by atherosclerosis. This patient is asymptomatic and has no history of an ischemic stroke, neurologic symptoms referable to the carotid arteries such as amaurosis fugax, or TIA. He has risk factors for cardiovascular disease (age, male sex, hyperlipidemia), but the U.S. Preventive Services Task Force recommends against specific screening for asymptomatic carotid artery stenosis (D recommendation), which has a low prevalence in the general adult population. Stroke is a leading cause of disability and death in the United States, but asymptomatic carotid artery stenosis causes a relatively small proportion of strokes. Auscultation of the carotid arteries for bruits has been found to have poor accuracy for detecting carotid stenosis and is not a reasonable screening approach. Appropriate modalities for detecting carotid stenosis include carotid duplex ultrasonography, magnetic resonance angiography, and computed tomography, but these are not recommended for screening asymptomatic patients.

Ref: *Final Recommendation Statement: Screening for Asymptomatic Carotid Artery Stenosis*. US Preventive Services Task Force, 2021.

### Item 2

**ANSWER: B**

This patient has seasonal allergic rhinitis. A joint guideline statement from the American Academy of Allergy, Asthma, and Immunology/American College of Allergy, Asthma, and Immunology Joint Task Force on Practice Parameters recommends that monotherapy with intranasal corticosteroids should be prescribed initially in patients  $\geq 12$  years of age rather than combined treatment with oral antihistamines because data has not shown an additional benefit to adding the antihistamine. Higher patient adherence and tolerance and fewer side effects were seen with the monotherapy regimen. High-quality evidence indicates that intranasal corticosteroids were more effective than leukotriene receptor antagonists. Inhaled corticosteroids and triamcinolone injections are not appropriate first-line options for the treatment of seasonal allergic rhinitis.

Ref: Hauk L: Treatment of seasonal allergic rhinitis: A guideline from the AAAAI/ACAAI Joint Task Force on Practice Parameters. *Am Fam Physician* 2018;97(11):756-757.

### Item 3

**ANSWER: B**

In patients with chronic nonbloody diarrhea, the differential diagnosis includes microscopic (lymphocytic or collagenous) colitis. The mucosa appears normal on colonoscopy but a biopsy will show lymphocytic infiltration of the epithelium. The etiology of this is unknown but there are several risk factors to consider, including older age, female sex, and smoking status. Drugs with a high level of evidence for causing microscopic colitis include NSAIDs, proton pump inhibitors, sertraline, acarbose, aspirin, and ticlopidine.



*Clostridioides (Clostridium) difficile* should be suspected in individuals who have taken antibiotics in the past 3 months. Fecal calprotectin is elevated in inflammatory diarrhea such as Crohn's disease or ulcerative colitis. A stool culture would be indicated if there is suspicion of an infectious bacterial diarrhea such as *Shigella* or *Salmonella*, but these bacteria tend to cause bloody diarrhea. Checking for a parasitic infection should be considered for patients with a history of recent travel or exposure to unpurified water.

Ref: Burgers K, Lindberg B, Bevis ZJ: Chronic diarrhea in adults: Evaluation and differential diagnosis. *Am Fam Physician* 2020;101(8):472-480.

#### Item 4

**ANSWER: C**

Buprenorphine is a partial opioid agonist. In order to reduce the risk of precipitated withdrawal, buprenorphine induction should begin once the patient is exhibiting signs of mild to moderate withdrawal, usually 8–12 hours after the last opioid use. Waiting until a patient goes through full withdrawal increases the chances that the patient will revert back to using opioids.

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

#### Item 5

**ANSWER: A**

This patient has a ganglion cyst, which is common and resolves spontaneously in 50% of cases, and watchful waiting would be most appropriate at this time. Treatment is indicated if the cyst is causing significant symptoms such as pain, numbness, or weakness, or for cosmetic reasons. Aspiration of the lesion is the initial treatment, although recurrence may occur in 85% of cases. Immobilizing the wrist with a splint or brace is sometimes helpful in the short term if the patient is bothered by the symptoms, but immobilization does not provide lasting relief and could cause muscle atrophy. Corticosteroid injections have not shown any benefit. Referral for excision is appropriate if there has been no improvement. Patients should be advised that there is a 10%–15% recurrence rate even after excision.

Ref: Armstrong AD, Hubbard MC (eds): *Essentials of Musculoskeletal Care*, ed 5. American Academy of Orthopaedic Surgeons, 2015, pp 510-516.

## Item 6

**ANSWER: E**

Counseling by a diabetic educator or team of educators for medical nutrition therapy lowers hemoglobin A<sub>1c</sub> by 0.2–0.8 percentage points in patients with type 2 diabetes. While a healthy diabetic diet and regular exercise are important, simply reminding the patient of that fact is not likely to be as successful as comprehensive diabetic education. According to the Society of General Internal Medicine in the Choosing Wisely campaign, patients with type 2 diabetes who are not on insulin therapy should not check their blood glucose level daily. An additional medication will likely decrease the hemoglobin A<sub>1c</sub>, but this patient has expressed a desire to avoid additional medication, is near goal, and is not currently managing her diabetes with adequate lifestyle changes, so it would be appropriate to respect her wishes and pursue proven interventions that do not require medication.

Ref: Lyon C, Fields H, Langner S, DeSanto K: Diabetes education and glycemic control. *Am Fam Physician* 2018;97(4):269-270.

## Item 7

**ANSWER: C**

Food allergy affects 4%–6% of children in the United States. Immunoglobulin E (IgE)–mediated food allergy is the best understood, and symptoms can range from rhinorrhea to anaphylaxis. The two most common allergens are cow’s milk and peanuts. The onset of symptoms is usually within 2 hours of exposure and they resolve within several hours.

The National Institute of Allergy and Infectious Diseases in 2017 recommended that healthy infants without known food allergy or who have mild to moderate eczema may be introduced to peanut-containing foods with other solid foods. If the parents are concerned about a reaction, introduction of peanut-containing foods may be done in the physician’s office. Infants with severe eczema, egg allergy, or both should undergo peanut-specific IgE or skin-prick testing.

While breastfeeding may decrease atopic disease, there is insufficient evidence that it reduces the likelihood of food allergy, and using a soy-based formula will not prevent food allergy. If there is a dog in the home there is less risk of allergy to eggs. Children who are exposed to farm animals or who attend day care are less likely to develop atopic disease.

Ref: Bettcher CM, Rockwell PG, Ravikumar R: Managing food allergy in children: An evidence-based update. *J Fam Pract* 2020;69(7):336-343.

### Item 8

**ANSWER: D**

Angiotensin receptor blockers (ARBs) such as losartan are least likely to cause or exacerbate erectile dysfunction. ARBs may have a favorable effect on erectile dysfunction by inhibiting vasoconstriction activity of angiotensin. Clonidine,  $\alpha$ -blockers, hydrochlorothiazide, and  $\beta$ -blockers are more likely to negatively affect erectile function.

Ref: Viigimaa M, Vlachopoulos C, Lazaridis A, Doumas M: Management of erectile dysfunction in hypertension: Tips and tricks. *World J Cardiol* 2014;6(9):908-915. 2) Rew KT, Heidelbaugh JJ: Erectile dysfunction. *Am Fam Physician* 2016;94(10):820-827.

### Item 9

**ANSWER: B**

Malignant bowel obstruction is a common issue with gastrointestinal cancers. Corticosteroids can help alleviate these symptoms, which is the focus in end-of-life care. Corticosteroids have numerous beneficial effects in these situations, such as central antiemetic, anti-inflammatory, antisecretory, and analgesic effects. Intravenous dexamethasone is generally recommended at a dosage of 4 mg 3–4 times daily for malignant bowel obstruction because it has much greater anti-inflammatory effect than methylprednisolone. Although octreotide is commonly used for this purpose, there is little evidence to support its use. Medical cannabis can be used to treat nausea and vomiting in end-of-life care but is not effective for bowel obstruction. Morphine can be used to treat pain and end-of-life dyspnea, but not nausea and vomiting. The use of polyethylene glycol for a malignant obstruction could worsen the patient's symptoms significantly.

Ref: Feuer DJ, Broadley KE: Corticosteroids for the resolution of malignant bowel obstruction in advanced gynaecological and gastrointestinal cancer. *Cochrane Database Syst Rev* 2000;2000(2):CD001219. 2) Patel A, Garg R: Role of steroids in malignant bowel obstruction. *Palliat Med Hosp Care Open J* 2016;2(2):30-36. 3) Albert RH: End-of-life care: Managing common symptoms. *Am Fam Physician* 2017;95(6):356-361.

### Item 10

**ANSWER: D**

Impetigo may be caused by *Streptococcus pyogenes* or *Staphylococcus aureus*, but bullous impetigo is caused exclusively by *S. aureus*. Oral trimethoprim/sulfamethoxazole is an appropriate treatment for skin infections caused by *S. aureus*, including susceptible cases of methicillin-resistant *S. aureus* (MRSA). Topical mupirocin ointment is not practical in very widespread cases or in cases with large bullae. Neither azithromycin nor penicillin is a preferred treatment for impetigo, due to a high rate of treatment failure. Tetracycline should be avoided in children under 8 years of age due to a propensity to cause permanent staining of the teeth.

Ref: Hartman-Adams H, Banvard C, Juckett G: Impetigo: Diagnosis and treatment. *Am Fam Physician* 2014;90(4):229-235. 2) Dinulos JGH: *Habif's Clinical Dermatology: A Color Guide to Diagnosis and Therapy*, ed 7. Elsevier, 2021, pp 331-339.

## Item 11

**ANSWER: B**

Microscopic hematuria, also known as microhematuria, is defined as  $\geq 3$  RBCs/hpf on microscopy. Dipstick analysis alone is insufficient to diagnose microscopic hematuria, as blood that is seen on dipstick analysis may represent a false-positive result caused by myoglobinuria, hemoglobinuria, dehydration, exercise, menstrual blood, or povidone-iodine, as opposed to true hematuria. Thus, when the presence of blood is suggested by dipstick urinalysis, confirmation with microscopic analysis should be obtained. The current guideline from the American Urological Association (AUA) stratifies further workup for microscopic hematuria based on the patient's overall risk of genitourinary malignancy, rather than automatic referral for cystoscopy and CT urography for all adults  $\geq 35$  years old with microhematuria, as was recommended in the previous AUA guideline. According to the current guideline, further evaluation may include renal ultrasonography, CT urography, and/or cystoscopy, depending on the patient's level of risk. Patients who are at low risk also may be given the option to repeat a urinalysis in 6 months. For this patient the next step would be microscopic urinalysis to determine the presence of hematuria, and, if present, to quantify it. If microscopic urinalysis confirms the presence of hematuria, then CT urography and cystoscopy would be indicated, as his age, male sex, and smoking history place him at increased risk of malignancy. Repeating the dipstick analysis in 3 months would be inappropriate in this situation, as the presence or absence of true microscopic hematuria needs to be clarified because of his high-risk history.

Ref: Barocas D, Boorjian SA, Alvarez RD, et al: Microhematuria: AUA/SUFU guideline. *J Urol* 2020;204(4):778-786.

## Item 12

**ANSWER: B**

While historically the optimal management of premature rupture of membranes between 34 and 36 weeks has been unclear, based on the PPRMT (Preterm Pre-labour Rupture of the Membranes close to Term) trial published in 2015, expectant management appears to be associated with better neonatal outcomes. Expectant management decreases the risk of cesarean delivery, neonatal respiratory distress, mechanical ventilation, time spent in the neonatal intensive-care unit, and time spent in the hospital. Expectant management did increase the risk of maternal antepartum or postpartum hemorrhage and intrapartum fever. No differences were found between immediate delivery and expectant management in the risk of neonatal sepsis, pneumonia, or perinatal or infant mortality.

Ref: Morris JM, Roberts CL, Bowen JR, et al: Immediate delivery compared with expectant management after preterm pre-labour rupture of the membranes close to term (PPROMT trial): A randomised controlled trial. *Lancet* 2016;387(10017):444-452.

### Item 13

**ANSWER: A**

Statins have been associated with fetal anomalies and are contraindicated during pregnancy and not recommended during breastfeeding. With appropriate monitoring, statins may be used in patients with chronic hepatitis C infection, end-stage renal disease, and transaminitis due to nonalcoholic fatty liver disease (including nonalcoholic steatohepatitis). Statins also may be continued in the setting of myositis with a creatine kinase up to 10 times the upper limit of normal, provided that the muscle-related symptoms are tolerable to the patient.

Ref: Gillett RC Jr, Norrell A: Considerations for safe use of statins: Liver enzyme abnormalities and muscle toxicity. *Am Fam Physician* 2011;83(6):711-716. 2) Lipid-lowering drugs. *Med Lett Drugs Ther* 2019;61(1565):17-24.

### Item 14

**ANSWER: A**

This patient has bacterial tracheitis, which includes a high fever, barking cough, respiratory distress, and rapid deterioration. Epiglottitis has an acute onset of dysphagia, drooling, and high fever, along with anxiety and a muffled cough, and typically occurs in children 3–10 years of age. Foreign body aspiration is associated with an acute onset of choking and drooling. A peritonsillar abscess would cause a sore throat, fever, and “hot potato” voice.

Ref: Kuo CY, Parikh SR: Bacterial tracheitis. *Pediatrics in Review* 2014;35(11):497-499. 2) Smith DK, McDermott AJ, Sullivan JF: Croup: Diagnosis and management. *Am Fam Physician* 2018;97(9):575-580.

### Item 15

**ANSWER: A**

The insidious onset of this patient’s pain without known injury and the lack of spontaneous resolution strongly suggest an overuse injury. The differential diagnosis in this case would include Little League shoulder, which is a stress injury to the proximal humeral physis in athletes with open growth plates. Other considerations would include biceps or rotator cuff tendinitis, impingement syndrome, glenohumeral instability, a labral tear, an acromioclavicular sprain, or a bone tumor. Pending radiograph results, the best management strategy is complete rest from throwing activities. Patients with Little League shoulder should rest from all throwing for an average of 3 months. In the absence of an acute injury there is no indication for immobilization, and there is no indication for physical therapy for initial management of this condition.

Ref: Cassas KJ, Cassettari-Wayhs A: Childhood and adolescent sports-related overuse injuries. *Am Fam Physician* 2006;73(6):1014-1022. 2) Aicale R, Tarantino D, Maffulli N: Overuse injuries in sport: A comprehensive overview. *J Orthop Surg Res* 2018;13(1):309.

**Item 16****ANSWER: D**

This patient has suspected appendicitis, and CT of the abdomen and pelvis with intravenous contrast is the preferred initial imaging study. Ultrasonography is preferred in children, but not adults, as the initial study for suspected appendicitis. Plain radiographs, pelvic ultrasonography, and MRI are not indicated for this clinical scenario.

Ref: American College of Radiology Appropriateness Criteria: Right lower quadrant pain–suspected appendicitis. American College of Radiology Committee on Appropriateness Criteria, revised 2018. 2) Ford B, Dore M, Moullet P: Diagnostic imaging: Appropriate and safe use. *Am Fam Physician* 2021;103(1):42-50.

**Item 17****ANSWER: D**

A diagnosis of type 2 diabetes can be based on any of the following test results: a hemoglobin A<sub>1c</sub>  $\geq 6.5\%$ , a fasting plasma glucose level  $\geq 126$  mg/dL, a 2-hour plasma glucose level  $\geq 200$  mg/dL on an oral glucose tolerance test, or a random plasma glucose level  $\geq 200$  mg/dL with classic symptoms of hyperglycemia.

Ref: Pippitt K, Li M, Gurgle HE: Diabetes mellitus: Screening and diagnosis. *Am Fam Physician* 2016;93(2):103-109.

**Item 18****ANSWER: A**

Tumor lysis syndrome is a common complication of chemotherapy in hematologic malignancies, such as acute leukemia. Homeostasis is overwhelmed with phosphorus, potassium, calcium, and uric acid released into the bloodstream due to acute cell lysis. Hyperphosphatemia, hyperkalemia, and hyperuricemia are indicative of tumor lysis syndrome. Calcium levels are decreased due to binding with free phosphorus and a depletion of calcium in the bloodstream. Sodium electrolyte levels are not as likely to be affected.

Ref: Higdon ML, Atkinson CJ, Lawrence KV: Oncologic emergencies: Recognition and initial management. *Am Fam Physician* 2018;97(11):741-748.

**Item 19****ANSWER: C**

The number needed to treat (NNT) is calculated as:  $1/\text{absolute risk reduction (ARR)}$ , where the ARR is expressed as a decimal. If the ARR is 5%, the  $\text{NNT} = 1/0.05 = 20$ . This is a very important aspect of biostatistics that most family physicians use on a daily basis. It describes the number of patients who need to receive an intervention instead of the alternative in order for one additional patient to benefit. The number needed to harm is the number of patients necessary to receive an intervention instead of the alternative in order for one additional patient to experience an adverse event. Pretest probability is the probability of disease in a patient before a test is performed. The relative risk reduction indicates how much the risk or outcome was reduced in the treatment group compared to the control group. The likelihood ratio corresponds to the clinical impression of how well a test rules in or rules out a given disease.

Ref: American Family Physician: EBM glossary. American Academy of Family Physicians, 2021.

**Item 20****ANSWER: E**

Initial general neurovascular assessment of an upper extremity injury includes evaluating for radial pulse and digit movement and sensation. Weakness of the thumb and index finger pincer mechanism is indicative of an ulnar nerve injury. Weakness in the shoulder or upper arm would indicate a potential brachial plexus injury. Symptoms related to the median nerve generally include paresthesia of the thumb, index finger, and long finger. Weakness of supination of the forearm would indicate a potential musculocutaneous nerve injury. Weakness of active wrist extension would indicate a potential radial nerve injury.

Ref: Silver S, Ledford CC, Vogel KJ, Arnold JJ: Peripheral nerve entrapment and injury in the upper extremity. *Am Fam Physician* 2021;103(5):275-285.

**Item 21****ANSWER: A**

Hereditary hemochromatosis is a common inherited disorder of iron metabolism. Iron deposits in the liver may lead to chronic liver disease and hepatocellular cancer. Screening for hereditary hemochromatosis includes serum ferritin levels, a family history, and genetic testing. Chronic renal disease, encephalopathy, myelofibrosis, and Wilson disease (disorder of copper transport) do not result from iron overload.

Ref: Goldman L, Schafer AI (eds): *Goldman-Cecil Medicine*, ed 26. Elsevier, 2020, pp 1388-1392.

## Item 22

**ANSWER: D**

Conduct disorder most commonly occurs during adolescence and childhood. There are multiple criteria, including aggression toward people and animals, theft, starting fires, and truancy. It may be associated with other disorders. Antisocial personality disorder, which is usually diagnosed after age 18, involves a disregard for the rights of others. Symptoms of attention-deficit/hyperactivity disorder (ADHD) include inattention, impulsiveness, and hyperactivity. Avoidant personality disorder is characterized by avoidance of social situations and interactions with others. There is no evidence of substance abuse in this patient's history.

Ref: American Psychiatric Association: *Diagnostic and Statistical Manual of Mental Disorders*, ed 5. American Psychiatric Association, 2013, pp 59-65, 476-480, 672-675. 2) Lillig M: Conduct disorder: Recognition and management. *Am Fam Physician* 2018;98(10):584-592.

## Item 23

**ANSWER: C**

This patient has severe aortic stenosis that is asymptomatic. Watchful waiting is recommended for most asymptomatic patients. In asymptomatic patients with severe aortic stenosis, monitoring with serial echocardiography is recommended every 6–12 months. Antibiotic prophylaxis is not indicated unless the patient has undergone aortic valve replacement or has a history of endocarditis. Transesophageal echocardiography is not indicated in this situation. Aortic valve replacement is indicated to decrease mortality in patients with symptomatic aortic stenosis.

Ref: Grimard BH, Safford RE, Burns EL: Aortic stenosis: Diagnosis and treatment. *Am Fam Physician* 2016;93(5):371-378. 2) Runser LA, Gauer RL, Houser A: Syncope: Evaluation and differential diagnosis. *Am Fam Physician* 2017;95(5):303-312.

## Item 24

**ANSWER: A**

This infant has skin findings that are consistent with atopic dermatitis. The first-line treatment is liberal use of fragrance-free emollients, at least 1–2 times per day. Emollients with a high lipid-to-water ratio are the most effective; ointments have the highest ratios, followed by creams and then lotions. A low-potency topical corticosteroid is an appropriate treatment for more significant flares, but in this case basic and consistent treatment with an emollient has not yet been tried. The use of topical calcineurin inhibitors is not indicated in children <2 years of age. Allergy testing is not recommended for the routine evaluation of atopic dermatitis. A subspecialty referral is not necessary for straightforward atopic dermatitis but is recommended for patients who might be candidates for allergen-specific immunotherapy or systemic immunosuppressive therapy. Subspecialty referrals are also appropriate for patients with a poor response to appropriate first-line treatment, severe or recurrent skin infections, significant psychosocial problems due to atopic dermatitis, an uncertain diagnosis, or uncontrolled facial atopic dermatitis.

Ref: Frazier W, Bhardwaj N: Atopic dermatitis: Diagnosis and treatment. *Am Fam Physician* 2020;101(10):590-598.



### Item 25

**ANSWER: D**

Upper respiratory tract infections are the most common acute illness in the United States. Symptoms are self-limited and can include nasal congestion, rhinorrhea, sore throat, cough, general malaise, and a low-grade fever. According to a Cochrane review of 10 trials without a meta-analysis, antitussives and expectorants are no more effective than placebo for cough. Intranasal ipratropium is the only medication that improves persistent cough related to upper respiratory infection in adults. Intranasal antibiotics, antihistamines, corticosteroids, and saline would not improve this patient's cough.

Ref: DeGeorge KC, Ring DJ, Dalrymple SN: Treatment of the common cold. *Am Fam Physician* 2019;100(5):281-289.

### Item 26

**ANSWER: D**

Celiac disease is a chronic malabsorptive disorder with an estimated worldwide prevalence of 1.4%. The preferred initial diagnostic test includes a serum IgA transglutaminase-2 (TG2) antibody level, which has a 98% sensitivity and 98% specificity for the diagnosis of celiac disease. False-negative serologic results may occur in patients with an IgA deficiency, which includes up to 3% of patients with celiac disease. Therefore, when a diagnosis of celiac disease is strongly suspected despite a negative IgA TG2 antibody test, a total IgA level should be obtained. Diagnostic confirmation for patients with positive serologic testing is accomplished with endoscopic mucosal biopsy.

Dietary elimination of gluten, not an increase in gluten intake, prior to serologic testing may lead to false-negative results. Recent use of medications, including loperamide, would not be expected to interfere with the accuracy of serologic testing for celiac disease. Dermatitis herpetiformis is a widespread pruritic papulovesicular rash that occurs in less than 10% of patients with celiac disease, although is essentially pathognomonic for the condition, as nearly all patients with this rash have evidence of celiac disease on an intestinal biopsy. Iron deficiency anemia often occurs in patients with celiac disease due to poor iron absorption, although the presence of iron deficiency anemia does not decrease the sensitivity of serologic testing.

Ref: Papadakis MA, McPhee SJ, Rabow MW (eds): *Current Medical Diagnosis & Treatment 2022*, ed 61. McGraw-Hill Professional Publishing, 2022, pp 636-639.

### Item 27

**ANSWER: C**

Tuft fractures are the most common type of distal phalanx fracture. They rarely require orthopedic referral but often result in up to 6 months of hyperesthesia, pain, and numbness. Treatment involves splinting the affected digit for 2–4 weeks, followed by range of motion and strengthening exercises. Symptomatic treatment may also be involved, but splinting is needed. Taping digits would likely not provide enough stability for the second digit distal phalanx, which extends beyond the first digit. Patients with distal finger injuries need careful physical examination to evaluate for a nail bed injury, but in this case there is no evidence of nail bed damage or laceration.

Ref: Borchers JR, Best TM: Common finger fractures and dislocations. *Am Fam Physician* 2012;85(8):805-810. 2) Eiff MP, Hatch R: *Fracture Management for Primary Care*, ed 3. Elsevier Saunders, 2018, pp 36-37.

### Item 28

**ANSWER: A**

Subclinical hypothyroidism (SCH) is defined as an elevation in TSH level with a normal free T<sub>4</sub> level. It is relatively common in adults over the age of 65, with a prevalence of 20%. The TRUST (Thyroid Hormone Replacement for Subclinical Hypothyroidism) trial and subsequent meta-analyses of randomized, controlled trials demonstrate that there is no benefit in treating SCH. Symptoms such as muscle strength, fatigue or tiredness, depression, and BMI do not improve with L-thyroxine treatment (SOR A), and up to 60% of cases resolve within 5 years without intervention in older adults.

Appropriate management of an elevated TSH level includes repeat testing in 1–3 months along with a free T<sub>4</sub> level. If SCH is diagnosed, levels should be monitored yearly. Only 2%–4% of patients with SCH develop overt hypothyroidism.

Ref: Ebell MH: Treatment of subclinical hypothyroidism ineffective in older adults. *Am Fam Physician* 2017;96(8):Online. 2) Biondi B, Cappola AR, Cooper DS: Subclinical hypothyroidism: A review. *JAMA* 2019;322(2):153-160. 3) de Montmollin M, Feller M, Beglinger S, et al: L-Thyroxine therapy for older adults with subclinical hypothyroidism and hypothyroid symptoms: Secondary analysis of a randomized trial. *Ann Intern Med* 2020;172(11):709-716.

### Item 29

**ANSWER: B**

The most pressing concern with this patient's presentation is that he is septic. As of 2016, the definition of sepsis has been simplified to life-threatening organ dysfunction caused by a dysregulated host response to infection. This patient demonstrates altered mental status and acute renal injury in the setting of a known infection. Pneumonia is the most common cause of sepsis. His elevated lactate level is an additional marker for sepsis. Emergent fluid resuscitation is the first step in sepsis treatment and should not be delayed. Adjusting the patient's antibiotic therapy and ordering additional tests would not be appropriate at this time.

Ref: Gauer R, Forbes D, Boyer N: Sepsis: Diagnosis and management. *Am Fam Physician* 2020;101(7):409-418.

**Item 30****ANSWER: B**

The management of heart failure with preserved ejection fraction includes treatment with diuretics, including loop diuretics such as furosemide, for relief of symptoms when volume overload is present (SOR B). Studies of other medication classes with proven benefit for heart failure with reduced ejection fraction, including ACE inhibitors,  $\beta$ -blockers, spironolactone, and the angiotensin receptor–neprilysin inhibitor sacubitril/valsartan, have not shown the same effects in the setting of heart failure with preserved ejection fraction. For patients with heart failure with preserved ejection fraction, the use of these other medication classes should be limited to the treatment of other comorbid conditions, such as hypertension, coronary artery disease, atrial fibrillation, or chronic kidney disease.

Ref: Redfield MM: Heart failure with preserved ejection fraction. *N Engl J Med* 2016;375(19):1868-1877. 2) Gazewood JD, Turner PL: Heart failure with preserved ejection fraction: Diagnosis and management. *Am Fam Physician* 2017;96(9):582-588. 3) Solomon SD, McMurray JJV, Anand IS, et al: Angiotensin-neprilysin inhibition in heart failure with preserved ejection fraction. *N Engl J Med* 2019;381(17):1609-1620.

**Item 31****ANSWER: B**

SSRIs such as citalopram increase the risk of upper gastrointestinal (GI) bleeding by 55%, according to meta-analysis studies including more than 1 million subjects (SOR A). A cohort study demonstrated no increased risk for rebleeding, bleeding refractory to endoscopy, or 30-day mortality, so citalopram does not necessarily need to be discontinued and should depend on the indication for treatment. Atorvastatin, lisinopril, hydrochlorothiazide, and metformin are not listed as high-risk medications for upper GI bleeding. Other antihypertensives, such as calcium channel blockers and aldosterone antagonists, have demonstrated an elevated risk. Omeprazole, a proton pump inhibitor, is known to decrease the risk of recurrent GI bleeding (SOR A).

Ref: Masclee GM, Valkhoff VE, Coloma PM, et al: Risk of upper gastrointestinal bleeding from different drug combinations. *Gastroenterology* 2014;147(4):784-792. 2) Wilkins T, Wheeler B, Carpenter M: Upper gastrointestinal bleeding in adults: Evaluation and management. *Am Fam Physician* 2020;101(5):294-300.

**Item 32****ANSWER: D**

Of the choices listed, an adverse effect of medication, specifically lisinopril, is the most likely cause of this patient's persistent cough. ACE inhibitors are among the most common causes of chronic cough, with an estimated incidence of 5%–35% of patients. The onset of an ACE inhibitor–induced cough may occur within hours to months after the first dose. A proper evaluation of patients presenting with a chronic cough, which is defined in adults as a persistent cough lasting >8 weeks, begins with a careful history, with attention to smoking status, environmental exposures, and medication use. Identifying ACE inhibitor use is particularly important for a patient with hypertension and diabetes mellitus presenting with a persistent dry cough. If ACE inhibitor use is identified, consideration should be given to a trial of medication elimination, which is the only way to determine if the medication is the cause. If so, the cough should resolve within days, although resolution may take up to 3 months to occur.

Chronic lung disease, although a common cause of cough, would be less likely in a patient of this age with symptoms only for the past several months, particularly without a smoking history or associated dyspnea. Similarly, the absence of a tobacco history or alarm symptoms such as unintended weight loss or hemoptysis, coupled with a normal chest radiograph, makes malignancy less likely. Infection is also less likely, given the absence of constitutional symptoms coupled with a normal physical examination and recent normal chest imaging. Psychogenic cough is a rare cause of cough in adults and children, and would be much less likely in this situation.

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

### Item 33

**ANSWER: C**

Lumbar spinal stenosis is a common cause of low back pain in older adults, with varying reports of prevalence but at least 10% in most studies. It is the most common reason for lumbar spinal surgery in the United States. Management of this condition is delayed due to the lack of strong evidence for definitively efficacious nonsurgical approaches, and by high rates of major complications with surgical approaches. Focused physical therapy has the best evidence for initial management. Given this patient's cardiac and renal comorbidities, chronic use of oral NSAIDs is likely to cause significant harm. While some oral pain medications may be considered, pregabalin has not been found to be any more effective than placebo. Both orthopedic and neurosurgical subspecialists perform lumbar spinal surgeries across the United States. In this case, there is no indication for urgent or emergent surgical management. Given the high complication rate, elective surgical management should be considered only after more conservative options have been found ineffective.

Ref: Ammendolia C, Stuber KJ, Rok E, et al: Nonoperative treatment for lumbar spinal stenosis with neurogenic claudication. *Cochrane Database Syst Rev* 2013;(8):CD010712. 2) Delitto A, Piva SR, Moore CG, et al: Surgery versus nonsurgical treatment of lumbar spinal stenosis: A randomized trial. *Ann Intern Med* 2015;162(7):465-473. 3) Markman JD, Frazer ME, Rast SA, et al: Double-blind, randomized, controlled, crossover trial of pregabalin for neurogenic claudication. *Neurology* 2015;84(3):265-272. 4) Zaina F, Tomkins-Lane C, Carragee E, Negrini S: Surgical versus non-surgical treatment for lumbar spinal stenosis. *Cochrane Database Syst Rev* 2016;2016(1):CD010264.

### Item 34

**ANSWER: C**

Sleeve gastrectomy is currently the most common bariatric procedure. The most common complication is development of GERD, which occurs in 20% of patients. Since this procedure does not produce a malabsorption component, complications such as cholelithiasis, dumping syndrome, and small bowel obstruction are not as likely as with other available procedures. A postoperative leak develops in <2% of cases.

A sleeve gastrectomy involves removing the majority of the greater curvature of the stomach, which creates a tubular stomach. Roux-en-Y gastric bypass and biliopancreatic diversion with duodenal switch both combine volume restriction and nutrient malabsorption.

Ref: Kim VC, Nepomnyashy D: Obesity: Surgical and device interventions. *FP Essent* 2020;492:30-36.

**Item 35**

**ANSWER: E**

E-cigarette use has become quite popular among youth in the United States, with rates surpassing traditional cigarette use in 2014. Among teens who have never smoked, the odds of cigarette smoking are 3–6 times higher in those who have used e-cigarettes within the last year. Nicotine is highly addictive regardless of the source, and heavy metal toxicants are still present when using e-cigarettes, although less than with traditional cigarettes. E-cigarette use is associated with an increased risk of future marijuana use.

Ref: Klein MD, Sokol NA, Stroud LR: Electronic cigarettes: Common questions and answers. *Am Fam Physician* 2019;100(4):227-235.

**Item 36**

**ANSWER: C**

Sporotrichosis is a skin infection caused by the *Sporothrix schenckii* fungus. Spontaneous resolution of sporotrichosis is rare. Uncomplicated small lesions of cutaneous sporotrichosis sometimes can be treated with the daily application of local heat for several weeks. More involved infections, such as this patient's lymphocutaneous sporotrichosis, require systemic therapy. The initial treatment strategy is oral itraconazole for 3–6 months. Another treatment option is saturated solution of potassium iodide, but the regimen is complicated and poorly tolerated. Intravenous liposomal amphotericin B is required for treatment of pulmonary, meningeal, and disseminated sporotrichosis in immunocompromised patients.

Ref: Mahajan VK: Sporotrichosis: An overview and therapeutic options. *Dermatol Res Pract* 2014;2014:272376. 2) Dinulos JGH: *Habif's Clinical Dermatology: A Color Guide to Diagnosis and Therapy*, ed 7. Elsevier, 2021, 2044-2045.

**Item 37**

**ANSWER: E**

Multiple guidelines recommend screening for proteinuria at least annually for patients with certain risk factors. Urinary protein can be measured through several techniques, including urinalysis, 24-hour urine collection, a spot urine protein/creatinine ratio, or a spot urine albumin/creatinine ratio. A 24-hour urine collection is cumbersome and prone to error or delay. Spot ratios have been shown to correlate and provide a reliable surrogate measurement. The spot albumin/creatinine ratio is able to detect lower levels of proteinuria as compared to the spot protein/creatinine ratio. The albumin/creatinine ratio indicates proteinuria, which is not specific to diabetes mellitus. Both protein/creatinine and albumin/creatinine ratios can be affected by exercise and menstruation.

Ref: Gaitonde DY, Cook DL, Rivera IM: Chronic kidney disease: Detection and evaluation. *Am Fam Physician* 2017;96(12):776-783.

### Item 38

**ANSWER: E**

The history and physical examination in this case are consistent with atrophic glossitis. Routine vitamin B<sub>12</sub> monitoring or supplementation is appropriate for patients who take metformin chronically. A decline in vitamin B<sub>12</sub> levels may be seen as early as 3–4 months after starting metformin. Atrophic glossitis can be associated with several different conditions, but this patient's age and metformin use put her at risk for vitamin B<sub>12</sub> deficiency. This is not a common presentation for thyroid disease, sarcoidosis, autoimmune vasculitis, or carcinoid syndrome, which can sometimes be associated with a niacin deficiency.

Ref: Reamy BV, Derby R, Bunt CW: Common tongue conditions in primary care. *Am Fam Physician* 2010;81(5):627-634. 2) Robinson AN, Loh JSP: Atrophic glossitis. *N Engl J Med* 2019;381(16):1568.

### Item 39

**ANSWER: C**

A hypertensive urgency is defined as a confirmed blood pressure >180/110–120 mm Hg without symptoms or signs of end-organ damage. Patients without symptoms in the setting of severe hypertension rarely have end-organ damage. The most common cause of hypertensive urgency in patients with known hypertension is nonadherence to the use of antihypertensive medications.

When a significantly elevated blood pressure is measured, it should be repeated after 20–30 minutes of quiet rest. Blood pressures should be taken in both arms and a thigh to confirm elevation. One-third of patients with an initially elevated blood pressure will have significantly lower pressure after rest.

Patients who are asymptomatic with persistently elevated blood pressures can be safely treated with oral antihypertensives with close follow-up (SOR C). There is no standard workup for patients with hypertensive urgencies, but common practice includes obtaining a basic metabolic panel, CBC, urinalysis, EKG, and troponin to rule out end-organ damage.

Oral medications to lower blood pressure in a patient with a hypertensive urgency are not indicated unless the patient is symptomatic. Symptoms such as headache or epistaxis warrant acute lowering of blood pressure. Preferred medications include clonidine, labetalol, and captopril, among others. Oral nifedipine is not recommended due to unpredictable blood pressure responses.

Patients with physical or laboratory evidence of end-organ damage should be admitted to the intensive-care unit for intravenous treatment of blood pressure. Without symptoms of end-organ damage there is no need to transport patients to the emergency department, as hypertensive urgencies can be managed with outpatient care.

Ref: Peixoto AJ: Acute severe hypertension. *N Engl J Med* 2019;381(19):1843-1852. 2) Unger T, Borghi C, Charchar F, et al: 2020 International Society of Hypertension global hypertension practice guidelines. *Hypertension* 2020;75(6):1334-1357.

**Item 40****ANSWER: D**

This patient has seasonal affective disorder (SAD) that has recurred and is likely to continue to recur. Bupropion is the only medication beneficial for prevention of SAD. Light therapy and SSRIs are helpful for treating this disorder but do not prevent it. Exercise and cognitive-behavioral therapy are beneficial adjuncts to treatment but would not prevent recurrence.

Ref: Galima SV, Vogel SR, Kowalski AW: Seasonal affective disorder: Common questions and answers. *Am Fam Physician* 2020;102(11):668-672.

**Item 41****ANSWER: D**

The U.S. Preventive Services Task Force and the American College of Chest Physicians support screening for lung cancer with annual low-dose CT in patients 50–80 years of age who have a 20-pack-year smoking history and who currently smoke or have smoked within the past 15 years. There is no evidence to support an annual history and physical examination or annual chest radiography as screening tools for lung cancer.

Ref: Armstrong C: Lung cancer screening recommendations from the ACCP. *Am Fam Physician* 2018;98(11):688-689. 2) Mazzone PJ, Silvestri GA, Patel S, et al: Screening for lung cancer: CHEST guideline and expert panel report. *Chest* 2018;153(4):954-985. 3) *Final Recommendation Statement: Lung Cancer: Screening*. US Preventive Services Task Force, 2021.

**Item 42****ANSWER: C**

This patient most likely has peroneal tendinopathy, which is a degeneration of the peroneal tendon that involves pain or tenderness in the lateral calcaneus below the ankle along the path to the base of the fifth metatarsal. Initial treatment options include activity modification, decreasing pressure to the affected area, anti-inflammatory or analgesic medications, and eccentric exercises. Calcaneal apophysitis, or Sever's disease, is a common growth-related injury that typically affects adolescents between 8 and 12 years of age. Symptoms often present after a growth spurt or starting a new high-impact sport or activity, and common examination findings include tight heel cords and a positive calcaneal squeeze test. A calcaneal stress fracture, which most commonly occurs immediately inferior and posterior to the posterior facet of the subtalar joint, involves pain that intensifies with activity and often worsens to include pain at rest. It typically follows an increase in weight-bearing activity or a switch to running or walking on a hard surface. Plantar fasciitis is characterized by sharp, shooting pain in the arch and medial aspect of the foot that often is worse upon arising and taking the first few steps of the morning. Examination of the foot reveals tenderness at the site and pain with dorsiflexion of the toes. Tarsal tunnel syndrome involves entrapment of the posterior tibial nerve and causes a burning, tingling, or shooting pain and numbness that radiates into the plantar aspect of the foot, often into the toes. The pain associated with tarsal tunnel syndrome typically worsens with activity and is relieved with rest.

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

**Item 43****ANSWER: C**

Exenatide is a GLP-1 receptor agonist that is not associated with hypoglycemia and can also assist with weight loss, which would be helpful in this patient with obesity. All of the other listed medications, including both types of insulin, sulfonylureas, and meglitinides, can be associated with hypoglycemia. Since this patient's hemoglobin A<sub>1c</sub> is only moderately elevated at 8.4%, exenatide is reasonable, although it can be an expensive option. If her hemoglobin A<sub>1c</sub> was severely elevated, insulin would be indicated, with close monitoring for hypoglycemia.

Ref: Steinberg J, Carlson L: Type 2 diabetes therapies: A STEPS approach. *Am Fam Physician* 2019;99(4):237-243.

**Item 44****ANSWER: B**

Polypharmacy, which is defined as regular use of five or more medications, increases the risk of adverse medical outcomes. Patients who take five or more medications can find it difficult to understand and adhere to the complicated regimens. Risk factors for polypharmacy include having multiple medical conditions that are managed by multiple specialist or subspecialist physicians, residing in a long-term care facility, having poorly updated medical records, and using automated refill services. Inappropriate prescribing of drugs that are not discontinued after their usual effective or recommended period is known as *legacy prescribing* and can contribute to inappropriate polypharmacy.

According to the Choosing Wisely campaign, any prescriptions beyond a threshold of five medications should trigger a thorough review of the patient's complete regimen, including over-the-counter medications and dietary supplements, to determine if any of the medications can be discontinued. Tools such as the Beers criteria list and the Medication Appropriateness Index can be used to identify potentially inappropriate medication use, but no single tool or strategy has been determined to be superior. If discontinuation of particular high-risk medications is not possible because of medical conditions, then dose reductions should be considered.

Ref: American Society of Health-System Pharmacists: Five things physicians and patients should question. ABIM Foundation Choosing Wisely campaign, 2017. 2) Halli-Tierney AD, Scarbrough C, Carroll D: Polypharmacy: Evaluating risks and deprescribing. *Am Fam Physician* 2019;100(1):32-38.



#### Item 45

**ANSWER: D**

More than 90% of children can speak three words at 18 months of age and 50%–90% can speak six words. This patient scenario suggests a developmental speech delay. There is nothing in this case to suggest an autism spectrum disorder and the normal emotional relationships are reassuring. While cerebral palsy can be associated with speech and language delay due to spasticity of tongue muscles, the otherwise normal motor examination in this case rules this out. Her ability to follow commands indicates her hearing is likely normal. The child can follow commands and points to several body parts, which makes a receptive language disorder less likely.

Ref: McLaughlin MR: Speech and language delay in children. *Am Fam Physician* 2011;83(10):1183-1188. 2) Hagan JF Jr, Shaw JS, Duncan PM (eds): *Bright Futures: Guidelines for Health Supervision of Infants, Children and Adolescents*, ed 4. American Academy of Pediatrics, 2017.

#### Item 46

**ANSWER: C**

For this 43-year-old patient, there is strong evidence based on Cochrane reviews that the use of probiotics may reduce the risk of both antibiotic-associated diarrhea more generally, and *Clostridioides (Clostridium) difficile* diarrhea specifically, when antibiotics are used (level of evidence A). Evidence is not as strong for their impact in adults over the age of 65. The preponderance of evidence for the effective use of probiotics is with diarrhea-predominant irritable bowel syndrome, and systematic reviews have generally supported their use for this condition. There is little evidence that probiotics decrease the incidence or recurrence of urinary tract infections. Topical, not oral, preparations of probiotics have good evidence for reducing the risk of recurrent bacterial vaginosis.

Ref: Allen SJ, Wareham K, Wang D, et al: Lactobacilli and bifidobacteria in the prevention of antibiotic-associated diarrhoea and *Clostridium difficile* diarrhoea in older inpatients (PLACIDE): A randomised, double-blind, placebo-controlled, multicentre trial. *Lancet* 2013;382(9900):1249-1257. 2) Ford AC, Quigley EM, Lacy BE, et al: Efficacy of prebiotics, probiotics, and synbiotics in irritable bowel syndrome and chronic idiopathic constipation: Systematic review and meta-analysis. *Am J Gastroenterol* 2014 Oct;109(10):1547-1561. 3) Schwenger EM, Tejani AM, Loewen PS: Probiotics for preventing urinary tract infections in adults and children. *Cochrane Database Syst Rev* 2015;(12):CD008772. 4) Goldenberg JZ, Yap C, Lytvyn L, et al: Probiotics for the prevention of *Clostridium difficile*-associated diarrhea in adults and children. *Cochrane Database Syst Rev* 2017;(12):CD006095. 5) Guo Q, Goldenberg JZ, Humphrey C, et al: Probiotics for the prevention of pediatric antibiotic-associated diarrhea. *Cochrane Database Syst Rev* 2019;(4):CD004827.

**Item 47****ANSWER: C**

This patient is over the age of 85 and at higher risk for a motor vehicle crash. He has shown that he has good insight and has made safety changes to his driving. Reinforcing safe driving practices would be appropriate at this time. An assessment of his driving safety, including vision and hearing evaluations, would also be appropriate. His blood pressure is well controlled, so amlodipine should be continued. Physicians can recommend that a patient stop driving, but consideration should be given to the social and emotional implications. This patient does not have any medical concerns that would necessitate a recommendation to stop driving or surrender his license.

Ref: Mishori R, Otubu O: The older driver. *Am Fam Physician* 2020;101(10):625-629.

**Item 48****ANSWER: B**

This patient has peripheral artery disease (PAD) of the right arm. PAD of the upper extremities is characterized by pain with exertion and can cause gangrene and ulceration. It is more common in patients who have had lower extremity occlusive disease. A blood pressure differential of 15 mm Hg between arms suggests stenosis and warrants further testing. Initial testing in symptomatic patients includes arterial duplex ultrasonography of the upper extremities. CT angiography and MR angiography may be appropriate to clarify the diagnosis or plan intervention. Neither radiography nor physical therapy would be appropriate.

Ref: Hennion DR, Siano KA: Diagnosis and treatment of peripheral arterial disease. *Am Fam Physician* 2013;88(5):306-310.  
2) Zipes DP, Libby P, Bonow RO, et al (eds): *Braunwald's Heart Disease: A Textbook of Cardiovascular Medicine*, ed 11. Elsevier, 2019, pp 1328-1335.

**Item 49****ANSWER: A**

This patient has symptoms typical for respiratory syncytial virus (RSV) bronchiolitis. Since the patient shows no signs of distress and is well hydrated, no specific treatment is necessary. Neither testing for RSV nor obtaining a chest radiograph would change management, and therefore would not be indicated. Albuterol is ineffective for the wheezing associated with RSV since the mechanism of wheezing is not due to bronchospasm. Antibiotics are not indicated without evidence of a secondary bacterial infection.

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

**Item 50****ANSWER: A**

This patient has mild inflammatory acne as indicated by her combination of comedones and pustules. She does not have extensive skin involvement and should benefit from the use of a topical agent. Topical retinoids, including adapalene, tretinoin, tazarotene, and trifarotene, are appropriate for the treatment of mild to moderate acne as single agents, although they may be more effective when combined with a topical antibiotic or benzoyl peroxide. Topical antibiotics can lead to bacterial resistance and should not be used as monotherapy. Oral antibiotics are appropriate for the treatment of moderate to severe acne that has failed to respond to topical treatment. Oral isotretinoin is reserved for the treatment of severe nodular acne.

Ref: Drugs for acne. *Med Lett Drugs Ther* 2020;62(1612):188-191.

**Item 51****ANSWER: E**

Nonspecific low back pain is a condition with no distinct etiology to explain the patient's associated symptoms. Physical activity, including core strengthening, physical therapy, or yoga, is an important therapeutic intervention in the treatment of nonspecific low back pain. The Choosing Wisely campaign states that bed rest should not be recommended for low back pain, and lumbar supports or braces should not be prescribed for the long-term treatment or prevention of low back pain. Studies have consistently shown that NSAIDs combined with muscle relaxants have no benefit over NSAIDs alone. Interventions such as shoe insoles have shown little benefit.

Ref: Becker BA, Childress MA: Nonspecific low back pain and return to work. *Am Fam Physician* 2019;100(11):697-703.

**Item 52****ANSWER: A**

This patient's history and the physical examination are concerning for features of self-neglect. At this point in the evaluation, the etiology of this possible self-neglect remains unclear. A formal cognitive evaluation, using the Mini-Cog, the full Mini-Mental State Examination, the Montreal Cognitive Assessment, or a similar tool, is recommended to evaluate for objective findings of impairment that may match the subjective concerns. The primary care clinician is responsible for this initial evaluation, given the patient's presence in the clinic and clear safety concerns. The advisability of immediate referrals to adult protective services or to subspecialists may depend on the findings of this initial evaluation. In addition to a cognitive assessment, the primary care clinician may also consider formal depression screening with a Patient Health Questionnaire-9 (PHQ-9), Geriatric Depression Scale, or similar tool.

Ref: Hoover RM, Polson M: Detecting elder abuse and neglect: Assessment and intervention. *Am Fam Physician* 2014;89(6):453-460. 2) Goldman L, Schafer AI (eds): *Goldman-Cecil Medicine*, ed 26. Elsevier, 2020, p 99-100.

### Item 53

**ANSWER: B**

Common variable immunodeficiency (CVID) is the only immunodeficiency condition listed that can present later in life, while severe combined immunodeficiency, DiGeorge syndrome, and Wiskott-Aldrich syndrome typically present prior to 6 months of age. CVID is a condition of impaired humoral immunity and thus should be considered in a patient this age in the setting of recurrent bacterial infections such as sinusitis or pneumonia. The blunted response to a vaccination challenge implies impaired IgG antibody response, which differentiates CVID from a selective IgA deficiency. Because severe combined immunodeficiency is associated with significant abnormalities of both T-cell and B-cell function, it presents very early in life with multiple severe, opportunistic infections, and failure to thrive. DiGeorge syndrome is associated with multiple other physical abnormalities such as cardiac malformations and dysmorphic facial features. Wiskott-Aldrich syndrome is linked to the X chromosome (primarily affecting males) and associated with eczema and thrombocytopenia.

Ref: Reust CE: Evaluation of primary immunodeficiency disease in children. *Am Fam Physician* 2013;87(11):773-778. 2) Baloh C, Reddy A, Henson M, et al: 30-Year review of pediatric- and adult-onset CVID: Clinical correlates and prognostic indicators. *J Clin Immunol* 2019;39(7):678-687. 3) Ameratunga R, Woon ST: Perspective: Evolving concepts in the diagnosis and understanding of common variable immunodeficiency disorders (CVID). *Clin Rev Allergy Immunol* 2020;59(1):109-121.

### Item 54

**ANSWER: B**

About half of pregnant women experience nausea and vomiting during pregnancy, which increases the risk of dehydration, poor weight gain, and impaired fetal growth. Pregnancy-related nausea and vomiting often begins by 4 weeks estimated gestation and typically resolves by the end of 12 weeks estimated gestation. When treating common causes of nausea and vomiting during pregnancy, lifestyle modifications such as frequent small meals and avoidance of high-protein or fatty foods are considered the safest intervention and first-line therapy. If these conservative measures are not effective, other well established low-risk therapies can be added in a stepwise fashion. These options include vitamin B<sub>6</sub> (pyridoxine), over-the-counter antihistamines such as doxylamine, and natural ginger (<1500 mg daily). In addition, combination doxylamine/pyridoxine is approved by the FDA for the prevention of nausea and vomiting in pregnancy. Prescription antiemetics such as metoclopramide or trimethobenzamide are reserved for severe or refractory cases. Vitamin A, vitamin B<sub>12</sub>, vitamin C, and vitamin E are not appropriate for the treatment of pregnancy-related nausea and vomiting.

Ref: Gregory DS, Wu V, Tuladhar P: The pregnant patient: Managing common acute medical problems. *Am Fam Physician* 2018;98(9):595-602.

**Item 55**

**ANSWER: A**

The U.S. Preventive Services Task Force and the American Academy of Family Physicians concluded that evidence is insufficient for vitamin D testing and for vitamin D supplementation in asymptomatic adults. Vitamin D supplementation does not reduce the risk of cancer, depression, diabetes mellitus, or fractures.

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 56**

**ANSWER: B**

Tight glucose control in patients with type 1 diabetes helps prevent microvascular complications such as cardiovascular disease, neuropathy, nephropathy, and retinopathy. The American Diabetes Association recommends a hemoglobin A<sub>1c</sub> goal of <7.0% for nonpregnant adults. Glycemic targets may be higher in older adults, and in patients with functional impairments, limited life expectancy, or multiple comorbidities.

Ref: Smith A, Harris C: Type 1 diabetes: Management strategies. *Am Fam Physician* 2018;98(3):154-162. 2) American Diabetes Association: 6. Glycemic targets: *Standards of Medical Care in Diabetes—2021. Diabetes Care* 2021;44(Suppl 1):S73-S84.

**Item 57**

**ANSWER: C**

SSRIs such as escitalopram are as safe as placebo in terms of side effects for treatment of the acute phase of major depressive disorder in older adults. Tricyclic antidepressants such as amitriptyline should be avoided in older adults with a history of falls, and other side effects from this drug class are also problematic. SNRIs such as duloxetine and venlafaxine cause more adverse events than SSRIs in older adults, with duloxetine especially associated with an increased risk of falls. Paroxetine should generally be avoided in older patients due to a higher likelihood of adverse effects that include sedation and orthostatic hypotension. Monoamine oxidase inhibitors such as phenelzine are rarely used and have significant side effects and drug interactions.

Ref: Salisbury-Afshar E: Adverse events of pharmacologic treatments of major depression in older adults. *Am Fam Physician* 2020;101(3):179-181.

**Item 58****ANSWER: E**

Patients with labral tears usually present with anterior hip pain and may have catching, popping, or clicking sounds associated with activities such as gymnastics, soccer, dancing, basketball, or hockey. On physical examination the flexion, adduction, and internal rotation (FADIR) test and the flexion, abduction, and external rotation (FABER) test will elicit pain. Although initial imaging may include radiographs of the hip, MRI is often needed for diagnosis. MR arthrography with gadolinium injection into the hip joint has been the standard to diagnose labral tears. Neither CT of the hip nor a bone scan are recommended imaging modalities for suspected labral tears.

Ref: Chamberlain R: Hip pain in adults: Evaluation and differential diagnosis. *Am Fam Physician* 2021;103(2):81-89.

**Item 59****ANSWER: C**

Capacity to make a medical decision requires that a patient understands the risks, benefits, and alternatives to a specific treatment recommendation. If a patient can express an understanding of the medical situation, including the consequences of either proceeding or declining a recommended treatment, and a rational, consistent reason for this, then the patient is typically thought to have capacity to make a medical decision. When the patient makes statements that are inconsistent with the expected clinical course, then capacity should be assessed by a formal process and documented in the medical record. This patient stating consistently that he believes his foot will improve does not reflect the expected clinical course and should trigger a formal assessment for capacity. However, statements that are consistent with the clinical course, such as concerns regarding fears or previous experiences, wanting to consult with his family first, or the patient understanding that he may die if he forgoes the amputation, are not by themselves an indication that he lacks capacity to make a medical decision.

Ref: Barstow C, Shahan B, Roberts M: Evaluating medical decision-making capacity in practice. *Am Fam Physician* 2018;98(1):40-46.

**Item 60****ANSWER: B**

Obstructive sleep apnea (OSA) is the repetitive partial or complete collapse of the upper airway during sleep, resulting in episodic apnea or hypopnea lasting at least 10 seconds. OSA is common and affects 17% of women and 34% of men. Risk factors include increased BMI, male sex, postmenopausal state in women, enlarged upper airway soft tissue, and craniofacial abnormalities. The most common presenting symptom is excessive sleepiness; patients may also present with fatigue and lack of energy. Cough, leg swelling, palpitations, and weight gain are not among the most common presenting symptoms of OSA. OSA increases the incidence of heart failure, type 2 diabetes, hypertension, coronary heart disease, stroke, atrial fibrillation, and death. OSA severity is quantified using the apnea-hypopnea index. The diagnostic test of choice is laboratory-based polysomnography. Treatments include behavioral measures (alcohol avoidance, weight loss, exercise, and not sleeping in the supine position), medical devices (CPAP, oral devices), and surgery.

Ref: Gottlieb DK, Punjabi NM: Diagnosis and management of obstructive sleep apnea: A review. *JAMA* 2020;323(14):1389-1400.

**Item 61****ANSWER: E**

This patient has symptomatic New York Heart Association class II heart failure, and an escalation in therapy is warranted. Both  $\beta$ -blockers and aldosterone antagonists have been shown to reduce mortality in patients with symptomatic heart failure (SOR A). Management of associated cardiovascular disease such as hyperlipidemia and hypertension is important to prevent disease progression, but of the medications listed (aspirin, atorvastatin, furosemide, hydrochlorothiazide, and spironolactone) spironolactone is the best choice to reduce heart failure–related 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 62****ANSWER: B**

Chronic kidney disease (CKD) is one of the most common chronic disease states encountered by family physicians, affecting 15% of the total U.S. adult population, and substantially impacting health care costs as well as morbidity and mortality. In the United States, diabetes mellitus and hypertension are the most common causes. CKD is defined by abnormal kidney structure or function lasting greater than 3 months, with associated implications for health. Diagnostic criteria include a persistent glomerular filtration rate  $< 60 \text{ mL/min/1.73 m}^2$ , albuminuria, urine sediment abnormalities, renal imaging abnormalities, and serum acid-base or electrolyte abnormalities.

Ref: Gaitonde DY, Cook DL, Rivera IM: Chronic kidney disease: Detection and evaluation. *Am Fam Physician* 2017;96(12):776-783. 2) Webster AC, Nagler EV, Morton RL, Masson P: Chronic kidney disease. *Lancet* 2017;389(10075):1238-1252.

**Item 63****ANSWER: A**

Gastroparesis is a complication of diabetes mellitus, and presents with nausea, vomiting, early satiety, bloating, postprandial fullness, and/or upper abdominal pain. Gastric emptying scintigraphy with a solid meal is the first-line study for confirming the diagnosis. Hepatobiliary scintigraphy (HIDA) is used to evaluate biliary dyskinesia and is not indicated in this patient. An upper gastrointestinal radiographic series, abdominal ultrasonography, and CT of the abdomen can help to rule out obstructive pathology, biliary tract disease, and other gastrointestinal conditions but would not confirm the diagnosis. The patient should also undergo esophagogastroduodenoscopy to exclude obstruction.

Ref: Careyva B, Stello B: Diabetes mellitus: Management of gastrointestinal complications. *Am Fam Physician* 2016;94(12):980-986.

**Item 64****ANSWER: A**

The U.S. Preventive Services Task Force (USPSTF) has found adequate evidence that questionnaires and other clinical prediction tools to identify asymptomatic children with elevated blood lead levels are inaccurate. The USPSTF went on to conclude that the current evidence is insufficient to assess the balance of benefits and harms of screening for elevated blood lead levels in asymptomatic children 5 years of age and younger. Although children living in older housing with lead-based paint are at higher risk of elevated blood lead levels than those living in housing built after 1978, the USPSTF does not recommend routine screening in asymptomatic children based on this risk factor.

Ref: Cantor A, Hendrickson R, Blazina I, et al: *Screening for Elevated Blood Lead Levels in Children: A Systematic Review for the U.S. Preventive Services Task Force*. Agency for Healthcare Research and Quality, Evidence Synthesis no 174, 2019. 2) *Final Recommendation Statement: Elevated Blood Lead Levels in Children and Pregnant Women: Screening*. US Preventive Services Task Force, 2019.

**Item 65****ANSWER: A**

SGLT2 inhibitors (canagliflozin, dapagliflozin, empagliflozin, and ertugliflozin) are associated with a higher rate of genitourinary infections, including necrotizing fasciitis of the perineum (Fournier's gangrene). While rare, this is a life-threatening infection associated with this class of medications that is being used more frequently to treat diabetes mellitus. Because of this risk, the FDA issued a Drug Safety Warning in 2018 due to case reports. The drug classes that include exenatide, insulin glargine, pioglitazone, and sitagliptin are not associated with this condition.

Ref: FDA warns about rare occurrences of a serious infection of the genital area with SGLT2 inhibitors for diabetes. Safety Announcement, 2018.



## Item 66

**ANSWER: B**

This patient's presentation is typical for idiopathic pulmonary fibrosis (IPF), a chronic and progressive subtype of fibrotic interstitial lung disease (ILD) with an unknown cause, which affects older men more than other individuals. Many patients who are ultimately diagnosed with ILD initially receive a diagnosis of COPD or heart failure. Some patients experience dyspnea and dry cough up to 5 years before ILD is recognized. Although IPF is associated with a high mortality rate, recent advances have been made in drug therapies that slow the rate of disease progression, so early recognition and diagnosis of this condition in the primary care setting is key to improving patient outcomes.

Nearly all patients with IPF experience chronic exertional dyspnea. Other common symptoms include chronic nonproductive cough and fatigue. Bilateral "Velcro-like" crackles are nearly universal. Other common examination findings include digital clubbing, acrocyanosis, and resting hypoxemia. Chest radiographs are often normal or show nonspecific findings early in the disease course. Common findings later in the disease include bilateral reticular infiltrates in the lower lung zones, hazy opacities, and low inspiratory lung volumes.

Once ILD is suspected, further evaluation is indicated to determine a more specific diagnosis, as management and prognosis differ by type. Of the options listed, only high-resolution chest CT has the potential to provide a specific diagnosis of IPF, which usually has a characteristic pattern of bilateral reticulation and honeycombing in the lung periphery and in the lower lobes termed *usual interstitial pneumonia*. Spirometry usually shows a restrictive pattern, although it may be normal in early disease or with comorbid emphysema. The presence of restrictive physiology is not specific to IPF but is seen more generally with other forms of ILD as well. Polysomnography may identify an associated sleep disorder, such as obstructive sleep apnea, but does not factor into making the diagnosis of IPF. Echocardiography and right heart catheterization may help to identify associated pulmonary hypertension, although neither would provide a specific diagnosis of IPF.

Ref: Lederer DJ, Martinez FJ: Idiopathic pulmonary fibrosis. *N Engl J Med* 2018;378(19):1811-1823. 2) Wijsenbeek M, Cottin V: Spectrum of fibrotic lung diseases. *N Engl J Med* 2020;383(10):958-968.

## Item 67

**ANSWER: C**

Both diabetes mellitus and hypothyroidism have been found to have a prevalence of 25%–50% in patients with adhesive capsulitis, which is also known as frozen shoulder. Consideration should be given to testing for both of these conditions when making the diagnosis of adhesive capsulitis (level of evidence C). Other laboratory tests such as antinuclear antibody, an erythrocyte sedimentation rate, and IgA tissue transglutaminase are not recommended to add support for the diagnosis of adhesive capsulitis. Adhesive capsulitis is a clinical diagnosis and MRI is reserved to look for other sources of pathology, and not routinely recommended. Plain radiography is reasonable to rule out other conditions such as glenohumeral osteoarthritis.

Ref: Ramirez J: Adhesive capsulitis: Diagnosis and management. *Am Fam Physician* 2019;99(5):297-300.

**Item 68****ANSWER: C**

Foreign bodies can be challenging to both detect and remove, especially in younger children. Ultrasonography is good for detecting radiolucent material such as wood or vegetation. MRI can also be used but is more expensive and not as readily available, and may be dangerous if metal is present. There is no radiation exposure with either of these modalities. Plain radiography creates minimal exposure to radiation and can detect radiopaque materials such as glass and metal but cannot detect vegetative materials. Fluoroscopy would be an option to detect radiopaque materials, but not a wooden splinter. CT would not be used for initial evaluation given the cost and high level of radiation exposure. In addition, like plain radiography, CT does not adequately detect radiolucent material.

Ref: Rupert J, Honeycutt JD, Odom MR: Foreign bodies in the skin: Evaluation and management. *Am Fam Physician* 2020;101(12):740-747.

**Item 69****ANSWER: E**

The 2020 American College of Rheumatology guideline for the management of gout generated numerous recommendations, including the management of concurrent medications in patients with gout. In such patients, losartan is the preferred antihypertensive agent when possible (SOR C). Hydrochlorothiazide should typically be changed to another agent, such as losartan, when feasible in patients with gout (SOR C). Both hydrochlorothiazide and losartan are known to have effects on the serum urate concentrations, with hydrochlorothiazide causing an increase and losartan causing a decrease. The American College of Rheumatology guideline does not recommend for or against the use of atenolol, hydralazine, and lisinopril as antihypertensive treatment in patients with gout.

Ref: FitzGerald JD, Dalbeth N, Mikuls T, et al: 2020 American College of Rheumatology guideline for the management of gout. *Arthritis Care Res (Hoboken)* 2020;72(6):744-760.

**Item 70****ANSWER: C**

Family physicians are often required to manage dyspnea and evaluate common office spirometry results. The American Thoracic Society recommends full pulmonary function testing when office spirometry suggests a restrictive pattern, which is the case with this patient's normal FEV<sub>1</sub>/FVC ratio and decreased FVC. Full laboratory pulmonary function testing gives further information about gas exchange and lung volumes, which allows a more definitive diagnosis.

The 6-minute walk test is used to evaluate treatment response for known cardiopulmonary disease. Bronchoprovocation testing helps identify asthma triggered by allergens or exercise when office spirometry is normal. Bronchoscopy is an invasive test that is not indicated at this point in the evaluation. A ventilation-perfusion scan is not appropriate because pulmonary embolus is not strongly suspected.

Ref: Budhwar N, Syed Z: Chronic dyspnea: Diagnosis and evaluation. *Am Fam Physician* 2020;101(9):542-548. 2) Langan RC, Goodbred AJ: Office spirometry: Indications and interpretation. *Am Fam Physician* 2020;101(6):362-368.

**Item 71**

**ANSWER: E**

An open lymph node biopsy is the preferred method for making the diagnosis of lymphoma. Although fine-needle aspiration and core needle biopsy are often part of the initial evaluation of any adenopathy, neither will provide adequate tissue for the diagnosis of lymphoma. A PET-CT scan may be used for staging. A bone scan or CT alone is not part of the usual diagnostic evaluation.

Ref: Lewis WD, Lilly S, Jones KL: Lymphoma: Diagnosis and treatment. *Am Fam Physician* 2020;101(1):34-41.

**Item 72**

**ANSWER: C**

Mindfulness-based meditation is a form of mental training that requires calming of thoughts with the goal of achieving a state of detached observation. Recent clinical recommendations show that aerobic and resistance exercises, yoga, and mindfulness-based meditation interventions are effective therapeutic options for depressive disorder, while both tai chi and qi gong have inconsistent effectiveness as a complementary treatment for depression. Recent systematic reviews of several hundred studies indicated that mindfulness-based training was as effective as cognitive-behavioral therapy, other behavioral therapies, and pharmacologic treatments. There also are no apparent negative effects of mindfulness-based interventions.

Ref: Saeed SA, Cunningham K, Bloch RM: Depression and anxiety disorders: Benefits of exercise, yoga, and meditation. *Am Fam Physician* 2019;99(10):620-627.

**Item 73**

**ANSWER: E**

Immunoassay drug screenings can be performed at the point of care and are relatively inexpensive. Typical immunoassays can detect nonsynthetic opioids such as morphine and codeine, as well as illicit substances such as amphetamines, cannabinoids, cocaine, and phencyclidine. However, these immunoassays do not reliably detect synthetic or semisynthetic opioids such as oxycodone, oxymorphone, methadone, buprenorphine, and fentanyl, as well as many benzodiazepines. Confirmatory testing is needed in situations with an unexpected negative result in order to distinguish a false negative from a true negative.

Ref: Kale N: Urine drug tests: Ordering and interpreting results. *Am Fam Physician* 2019;99(1):33-39.

**Item 74**

**ANSWER: C**

Based on well designed randomized, controlled trials and systematic reviews, the American Academy of Pediatrics recommends the use of isotonic solutions with adequate potassium chloride and dextrose for maintenance intravenous fluids in children. This approach significantly reduces the risk of hyponatremia without increasing other risks such as hypernatremia and acidosis. Hypotonic commercial solutions such as 0.2% sodium chloride and 0.45% sodium chloride do not contain the appropriate sodium concentration, and 3% saline and 5% dextrose in water would not be appropriate for maintenance intravenous fluids in children.

Ref: Costlow L: Maintenance intravenous fluids in children: AAP provides recommendation. *Am Fam Physician* 2019;100(4):251.

**Item 75**

**ANSWER: E**

Treatments with evidence of effectiveness for knee osteoarthritis include exercise, physical therapy, knee taping, and tai chi. Medical treatments should begin with full-strength acetaminophen and topical therapy, then NSAIDs and, selectively, tramadol or other opioids. Lateral wedge insoles, vitamin D supplements, glucosamine and chondroitin supplements, and hyaluronic acid injections are all ineffective. According to the Choosing Wisely campaign from the American Academy of Orthopaedic Surgeons, glucosamine and chondroitin should not be used in knee osteoarthritis and lateral wedge insoles should not be used for medial knee osteoarthritis.

Ref: American Academy of Orthopaedic Surgeons: Don't use lateral wedge insoles to treat patients with symptomatic medial compartment osteoarthritis of the knee. ABIM Foundation Choosing Wisely campaign, 2013. 2) American Academy of Orthopaedic Surgeons: Don't use glucosamine and chondroitin to treat patients with symptomatic osteoarthritis of the knee. ABIM Foundation Choosing Wisely campaign, 2013. 3) Ebell MH: Osteoarthritis: Rapid evidence review. *Am Fam Physician* 2018;97(8):523-526. 4) Lin KW: Treatment of knee osteoarthritis. *Am Fam Physician* 2018;98(9):603-606. 5) Deyle GD, Allen CS, Allison SC, et al: Physical therapy versus glucocorticoid injection for osteoarthritis of the knee. *N Engl J Med* 2020;382(15):1420-1429.

**Item 76**

**ANSWER: B**

SARS-CoV-2 is a respiratory coronavirus that is responsible for COVID-19. Knowledge of the natural history of the viral infection will inform testing strategies and many other aspects of counseling of patients. The incubation period measures the time from exposure to symptom onset. The typical incubation period for COVID-19 is approximately 4–5 days, though it can range from 1–14 days.

Ref: COVID-19: Interim clinical guidance for management of patients with confirmed coronavirus disease (COVID-19). Centers for Disease Control and Prevention, updated 2021.

**Item 77****ANSWER: D**

All patients between 40 and 75 years of age with diabetes mellitus and an LDL-cholesterol level  $\geq 70$  mg/dL should begin taking a moderate-intensity statin. It is not necessary to calculate a 10-year risk for atherosclerotic cardiovascular disease because the results do not alter the recommendation. This patient's hemoglobin A<sub>1c</sub> is  $< 7\%$ , which is acceptable, and she does not need additional hypoglycemic medications. She has no diabetes-specific risk-enhancing conditions such as a long duration of illness, chronic kidney disease, retinopathy, neuropathy, or an ankle-brachial index  $< 0.9$ . Older age and risk-enhancing conditions may require increasing the statin to high-intensity dosages. A DPP-4 inhibitor, an SGLT2 inhibitor, and a low-intensity statin would not be appropriate for this patient at this time.

Ref: Grundy SM, Stone NJ, Bailey AL, et al: 2018 AHA/ACC/AACVPR/AAPA/ABC/ACPM/ADA/AGS/APhA/ASPC/NLA/PCNA guideline on the management of blood cholesterol: A report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *J Am Coll Cardiol* 2019;73(24):e285-e350.

**Item 78****ANSWER: A**

The prevalence of Parkinson's disease increases with age and shows a slight predominance toward males. Bradykinesia is a key diagnostic criterion. Muscular rigidity, resting tremor, and postural instability are other symptoms. Nonmotor symptoms such as depression, anxiety, fatigue, and insomnia are also common. Parkinson's disease is a clinical diagnosis and seldom requires testing. Imaging such as CT, MRI, or EEG can be useful in ruling out other diagnoses but will not reveal findings suggestive of Parkinson's disease. A lumbar puncture is not necessary to confirm Parkinson's disease.

Ref: Young J, Mendoza M: Parkinson's disease: A treatment guide. *J Fam Pract* 2018;67(5):276-286. 2) McPhee SJ, Papadakis MA (eds): *Current Medical Diagnosis and Treatment*, ed 58. McGraw-Hill Education, 2019, pp 1024-1027.

**Item 79****ANSWER: E**

Surgical excision is indicated for the management of larger basal cell carcinomas. Although this patient had a punch biopsy, that is not considered curative and excision with wide margins is indicated. Topical therapy and cryotherapy are reserved for patients who decline surgery or for cases in which surgery is contraindicated. The combination of curettage and electrodesiccation is a management option, but the cosmetic results are not as desirable as with excision.

Ref: Work Group; Invited Reviewers, Kim JYS, et al: Guidelines of care for the management of basal cell carcinoma. *J Am Acad Dermatol* 2018;78(3):540-559.

## Item 80

**ANSWER: B**

The U.S. Preventive Services Task Force (USPSTF) recommends prescribing low-dose aspirin after 12 weeks gestation for asymptomatic women at high risk for preeclampsia. Women at high risk include those with a history of preeclampsia, chronic hypertension, multiple pregnancy, type 1 or 2 diabetes, renal disease, autoimmune disease, or any combination of these. Many women become iron deficient in pregnancy but not all will require additional iron supplementation beyond what is available in the prenatal vitamin. The USPSTF found insufficient evidence to recommend for or against routine iron supplementation for pregnant women. Additional folic acid is recommended for women with increased risk for neural tube defects (NTDs), and while obesity increases the risk for NTD it is not an indication alone for a higher dosage of folic acid than the levels found in prenatal vitamins. In pregnant patients with chronic hypertension, treatment with antihypertensive medications is recommended only when the blood pressure is >150/100 mm Hg, because aggressive blood pressure lowering may result in placental hypoperfusion.

Ref: Zolotor AJ, Carlough MC: Update on prenatal care. *Am Fam Physician* 2014;89(3):199-208. 2) Leeman L, Dresang LT, Fontaine P: Hypertensive disorders of pregnancy. *Am Fam Physician* 2016;93(2):121-127. 3) Riley L, Wertz M, McDowell I: Obesity in pregnancy: Risks and management. *Am Fam Physician* 2018;97(9):559-561. 4) *Final Recommendation Statement: Low-Dose Aspirin Use for the Prevention of Morbidity and Mortality from Preeclampsia: Preventive Medication*. US Preventive Services Task Force, 2021.

## Item 81

**ANSWER: D**

According to the ACCORD (Action to Control Cardiovascular Risk in Diabetes) and ADVANCE (Action in Diabetes and Vascular Disease: Preterax and Diamicron MR Controlled Evaluation) trials, aggressive management of diabetes mellitus to achieve a hemoglobin A<sub>1c</sub> < 6.5% increases the risk of patient harm and does not provide clinical benefit. The American Diabetes Association recommends metformin as first-line therapy, which is supported by the STEPS criteria: safety, tolerability, effectiveness, price, and simplicity. Insulin glargine increases the risk of hypoglycemia, which this patient reports. In addition, it is expensive and more complex to administer insulin compared to an oral medication. Since this patient is on a starting dosage of insulin glargine and her hemoglobin A<sub>1c</sub> is well below 6.5%, she should discontinue insulin glargine and maintain metformin as a first-line choice that is well tolerated.

Ref: Qaseem A, Wilt TJ, Kansagara D, et al: Hemoglobin A<sub>1c</sub> targets for glycemic control with pharmacologic therapy for nonpregnant adults with type 2 diabetes mellitus: A guidance statement update from the American College of Physicians. *Ann Intern Med* 2018;168(8):569-576. 2) Type 2 diabetes mellitus: ACP releases updated guidance statement on A1C targets for pharmacologic glycemic control. *Am Fam Physician* 2018;98(9):613-614. 3) Steinberg J, Carlson L: Type 2 diabetes therapies: A STEPS approach. *Am Fam Physician* 2019;99(4):237-243.

**Item 82****ANSWER: A**

One of the most potentially devastating late complications of joint replacement surgery is infection of the prosthetic joint. Because dental procedures are known to induce transient bacteremia, the use of prophylactic antibiotics prior to dental procedures for patients with prosthetic joints was considered orthopedic dogma for many years. Current evidence to support this practice is limited and antibiotic use is known to increase cost, bacterial resistance, and the risk of adverse drug reactions, and in most cases the risks of antibiotic prophylaxis outweigh the likelihood of benefit. Recent guidelines from the American Dental Association and the American Academy of Orthopaedic Surgeons recommend against the routine use of prophylactic antibiotics for dental procedures in patients with a history of joint replacement, except for situations in which infectious risk is increased, such as immunocompromise or a history of a previous joint infection. Prophylaxis with amoxicillin, clindamycin, or cefazolin would not be appropriate for this patient.

Ref: Sollecito TP, Abt E, Lockhart PB, et al: The use of prophylactic antibiotics prior to dental procedures in patients with prosthetic joints: Evidence-based clinical practice guideline for dental practitioners—A report of the American Dental Association Council on Scientific Affairs. *J Am Dent Assoc* 2015;146(1):11-16.e8. 2) DeFroda SF, Lamin E, Gil JA, et al: Antibiotic prophylaxis for patients with a history of total joint replacement. *J Am Board Fam Med* 2016;29(4):500-507. 3) American Academy of Orthopaedic Surgeons Appropriate Use Criteria for the Management of Patients Undergoing Dental Procedures, 2016.

**Item 83****ANSWER: E**

Opiates are the most effective agents for treating dyspnea and the resultant anxiety in patients with terminal cancer. Higher levels of oxygen are indicated if the patient's oxygen saturation is <92% and with caution in patients with COPD so as not to suppress respiratory drive. Dexamethasone, hyoscyamine, and lorazepam have a frequent role in patients such as this one, but morphine sulfate or a similar fast-acting opiate is the drug of choice (SOR B).

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

**Item 84****ANSWER: B**

For patients with mild asthma, recent evidence has shown that an inhaled corticosteroid (ICS)/long-acting  $\beta$ -agonist (LABA), such as budesonide/formoterol, as needed was as effective at preventing exacerbations as a daily maintenance ICS plus a short-acting  $\beta$ -agonist (SABA) at one-fifth of the total corticosteroid dose. In addition, it was more effective at preventing exacerbations than continued use of a SABA alone as needed. A daily maintenance ICS inhaler plus either a LABA or a leukotriene receptor antagonist are management strategies for persistent asthma.

Ref: Bateman ED, Reddel HK, O'Byrne PM, et al: As-needed budesonide-formoterol versus maintenance budesonide in mild asthma. *N Engl J Med* 2018;378(20):1877-1887. 2) Beasley R, Holliday M, Reddel HK, et al: Controlled trial of budesonide-formoterol as needed for mild asthma. *N Engl J Med* 2019;380(21):2020-2030. 3) Grad R, Ebell MH: Top POEMS of 2018 consistent with the principles of the Choosing Wisely campaign. *Am Fam Physician* 2019;100(5):290-294.

### Item 85

**ANSWER: D**

In adult patients with stable coronary artery disease, continued control of blood pressure and cholesterol is paramount. Based on American College of Cardiology/American Heart Association guidelines, it would be reasonable for this patient to stop dual antiplatelet therapy at this time by discontinuing clopidogrel. Aspirin should be continued and is the most cost-effective option for antiplatelet therapy. This patient's LDL-cholesterol level is at goal, so atorvastatin should be continued. He has reached his blood pressure goal of <130/80 mm Hg and has no orthostatic symptoms, so his current blood pressure medication regimen should be continued.

Ref: Randel A: AHA/ACC/ASH release guideline on the treatment of hypertension and CAD. *Am Fam Physician* 2015;92(11):1023-1030. 2) Capodanno D, Alfonso F, Levine GN, et al: ACC/AHA versus ESC guidelines on dual antiplatelet therapy: JACC guideline comparison. *J Am Coll Cardiol* 2018;72(23 Pt A):2915-2931. 3) Grundy SM, Stone NJ, Bailey AL, et al: 2018 AHA/ACC/AACVPR/AAPA/ABC/ACPM/ADA/AGS/APhA/ASPC/NLA/PCNA guideline on the management of blood cholesterol: A report of the American College of Cardiology/American Heart Association Task Force on clinical practice guidelines. *Circulation* 2019;139(25):e1082-e1143.

### Item 86

**ANSWER: C**

This patient presents with classic biliary symptoms and normal right upper quadrant ultrasonography, liver enzymes, and pancreatic enzymes. Abdominal ultrasonography was negative for gallstones. The next most appropriate test is hepatobiliary scintigraphy, also known as a hepatobiliary iminodiacetic acid (HIDA) scan. While a normal HIDA scan does not exclude a diagnosis of functional gallbladder disease (also referred to as acalculous cholecystitis, biliary dyskinesia, and biliary dysmotility), an abnormal study identifies patients for whom cholecystectomy is strongly recommended. Plain radiography of the abdomen and CT of the abdomen are helpful to evaluate for other etiologies of abdominal pain but are not the most appropriate next step for a patient with classic biliary symptoms and a normal laboratory workup. Magnetic resonance cholangiopancreatography (MRCP) is reserved for suspected choledocholithiasis. Endoscopic retrograde cholangiopancreatography (ERCP) is an invasive test also used for choledocholithiasis and in conjunction with sphincterotomy and stone extraction.

Ref: Croteau DI: Functional gallbladder disease: An increasingly common diagnosis. *Am Fam Physician* 2014;89(10):779-784. 2) Abraham S, Rivero HG, Erikh IV, et al: Surgical and nonsurgical management of gallstones. *Am Fam Physician* 2014;89(10):795-802. 3) Townsend CM Jr, Beauchamp RD, Evers BM, Mattox KL: *Sabiston Textbook of Surgery: The Biological Basis of Modern Surgical Practice*, ed 20. Elsevier, 2017, p 1488.



**Item 87****ANSWER: C**

The American Academy of Pediatrics (AAP) recommends formal screening for maternal depression with the Edinburgh Postnatal Depression Scale or the Patient Health Questionnaire–2 (PHQ-2) at the 1-, 2-, 4-, and 6-month well child visits. The AAP recommends screening for autism at 18 months, but the U.S. Preventive Services Task Force (USPSTF) finds insufficient evidence to recommend screening unless there are parental concerns. The AAP recommends screening for iron deficiency at 12 months, but the USPSTF finds insufficient evidence for screening at this time. Otoacoustic emissions (OAE) testing is performed during the newborn screening and is not recommended at 6 months of age.

Ref: Turner K: Well-child visits for infants and young children. *Am Fam Physician* 2018;98(6):347-353.

**Item 88****ANSWER: E**

This patient presents with a symptomatic fibroid. Although she does not express a desire to maintain fertility, she prefers uterine preservation. The Agency for Healthcare Research and Quality Effective Health Care Program review found consistent evidence that uterine artery embolization and occlusion is effective for reducing fibroid size, with lasting effects up to 5 years and moderate evidence for reducing bleeding and improving quality of life. Expectant management is an appropriate option only for patients who have asymptomatic fibroids. GnRH agonists are effective for providing symptom relief and reducing fibroid size, but their use results in a hypoestrogenized state and should not be continued long term for a sustained effect in premenopausal women. Treatment with a selective estrogen receptor modulator such as raloxifene does not affect fibroid size or bleeding patterns. There is limited data regarding the efficacy of a levonorgestrel-releasing IUD for the treatment of uterine fibroids.

Ref: De La Cruz MS, Buchanan EM: Uterine fibroids: Diagnosis and treatment. *Am Fam Physician* 2017;95(2):100-107. 2) Rogers TS, Bieck AM: Management of uterine fibroids. *Am Fam Physician* 2019;99(5):330-333.

**Item 89****ANSWER: D**

Serotonin syndrome is a potentially life-threatening condition caused by excessive serotonergic activity, and certain medications are more likely to precipitate it. Early recognition of symptoms is important, as most cases can be managed on an outpatient basis with discontinuation of the precipitating medication and supportive care. The Hunter Serotonin Toxicity Criteria can be used to diagnose serotonin syndrome (SOR C). This patient has serotonin syndrome based on her use of both sertraline and tramadol and meeting the Hunter criteria of hyperthermia, clonus, tremor, and hyperreflexia. This patient does not have findings on the neurologic examination that would make acute cerebral infarction likely. Meningitis and sepsis syndrome are less likely with a normal CBC.

Ref: Ables AZ, Nagubilli R: Prevention, recognition, and management of serotonin syndrome. *Am Fam Physician* 2010;81(9):1139-1142. 2) Foong AL, Grindrod KA, Patel T, Kellar J: Demystifying serotonin syndrome (or serotonin toxicity). *Can Fam Physician* 2018;64(10):720-727.

**Item 90****ANSWER: A**

Guidelines from the American College of Radiology state that imaging in children and adolescents with back pain can be delayed unless there are abnormal neurologic findings, pain that awakens the patient at night, or pain that radiates or persists for more than 4 weeks. Imaging would not be recommended at this time if the patient has pain that is localized to the midthoracic spine, pain that is increased with flexion, intermittent pain that has persisted for 2 weeks, or a recent history of an upper respiratory infection.

Ref: Achar S, Yamanaka J: Back pain in children and adolescents. *Am Fam Physician* 2020;102(1):19-28.

**Item 91****ANSWER: B**

The U.S. Preventive Services Task Force (USPSTF) concluded with moderate certainty that there is a moderate net benefit for screening for abdominal aortic aneurysm (AAA) in 65- to 75-year-old men who have ever smoked (defined as >100 lifetime cigarettes). There is insufficient evidence that screening women who have ever smoked is beneficial, and the USPSTF recommends against screening in women without a smoking history because the harms outweigh the benefits. The primary method of screening for AAA is conventional abdominal duplex ultrasonography, which is noninvasive, has high sensitivity and specificity, and does not expose patients to radiation.

Ref: *Final Recommendation Statement: Abdominal Aortic Aneurysm: Screening*. US Preventive Services Task Force, 2019.

**Item 92****ANSWER: D**

Delusion of infestation is a strong belief by the patient that he or she is afflicted with an insect infestation or an infection by a microorganism. Before making this diagnosis organic causes must be ruled out, including withdrawal from illicit drugs or alcohol. The majority of patients with this condition are female and are either retired or disabled. They have often seen multiple providers and have been told this problem is “in your head.” Management can be difficult, but it is important to thoroughly investigate during the initial visit, including examining samples that the patient presents. Subsequent visits should be supportive, allowing time for the patient to have any concerns addressed. Often the patient will respond to atypical antipsychotic medications such as risperidone or olanzapine.

Cholestyramine is used to treat cholestatic jaundice. Hydroxyzine can be used for itching, particularly from urticaria, but can cause sedation in the elderly. Ivermectin is an option to treat scabies. Prednisone would be appropriate for allergic reactions or inflammatory dermatitis problems.

Ref: Russell M, Zare M: How to assess and relieve that perplexing rashless itch. *J Fam Pract* 2020;69(9):430-437. 2) Dinulos JGH: *Habif's Clinical Dermatology: A Color Guide to Diagnosis and Therapy*, ed 7. Elsevier, 2021, pp 90-120.

### Item 93

**ANSWER: A**

The American Thoracic Society, Infectious Diseases Society of America, and CDC recommend testing for tuberculosis with an interferon-gamma release assay (IGRA) rather than a tuberculin skin test (TST) in individuals > 5 years of age who have received the bacillus Calmette-Guérin (BCG) vaccine. Since BCG immunization will not cause false positives with an IGRA but does with a TST, an IGRA is preferred. IGRA also would be ideal when the likelihood of the patient returning for follow-up is low. In this case, the patient has received the BCG vaccine and she is new to the office and may not return since there is not an established primary care provider relationship, so a TST requiring a 48- to 72-hour follow-up visit may not be a reliable testing method. Performing a nucleic acid amplification test or obtaining acid-fast bacilli specimens would be premature as there is no indication of active tuberculosis infection at this time. Ordering a chest radiograph for an asymptomatic child without a positive test is also premature and exposes the child to unnecessary radiation.

Ref: Hauk L: Tuberculosis: Guidelines for diagnosis from the ATS, IDSA, and CDC. *Am Fam Physician* 2018;97(1):56-58.

### Item 94

**ANSWER: B**

Episodic vertigo, hearing loss, and tinnitus are the classic triad of Meniere's disease. While nausea, vomiting, and headaches may coexist with the classic triad, these symptoms are not used to diagnosis the disease. Meniere's disease is relatively rare, with an incidence of 0.1%, and typically presents in patients between 30 and 60 years of age. Both the etiology and treatment of Meniere's disease remain unclear. Benign paroxysmal positional vertigo (BPPV) is quite common, with a lifetime prevalence of 2.4%. BPPV is marked by brief episodes of vertigo precipitated by head movement, and is not associated with tinnitus or hearing loss. Multiple sclerosis can present with symptoms similar to Meniere's disease but this would be an unusual presentation. Multiple sclerosis more commonly presents with sensory anomalies in the extremities, visual disturbance, and weakness. Vestibular migraines are relatively common, affecting approximately 1% of the general population, and present with many of the same symptoms as Meniere's disease, but they are not associated with tinnitus. Headache may precede or follow vertiginous symptoms and may be accompanied by phonophobia, photophobia, and visual auras. Vestibular schwannoma is quite rare, occurring in 1 in 100,000 patient-years with a peak age at diagnosis of 50. Patients with vestibular schwannoma typically present with gradual asymmetric hearing loss, but they can have tinnitus and vertigo as well.

Ref: Wright T: Menière's disease. *BMJ Clin Evid* 2015;2015:0505. 2) Dieterich M, Obermann M, Celebisoy N: Vestibular migraine: The most frequent entity of episodic vertigo. *J Neurol* 2016;263(Suppl 1):S82-S89.

**Item 95****ANSWER: B**

During well child visits, family physicians commonly counsel parents on the current recommendations for car safety restraints. Accidental injury is the number one cause of death in children over the age of 1. Motor vehicle violence is the most common cause of fatal injuries in this age group, accounting for about half of deaths. Children 4–8 years of age may be appropriately restrained in a car seat or booster seat, with a booster recommended when the child outgrows the forward-facing limit of the convertible or combination car seat. This child may still fit many car seats, though she is too large for rear-facing seats. Children can generally be safely restrained without a booster seat when their height reaches around 145 cm (57 in), though this lower limit can vary based on the specific vehicle. All children who ride in motorized vehicles should be restrained in the back seat until at least age 13 (SOR C).

Ref: DeGeorge KC, Neltner CE, Neltner BT: Prevention of unintentional childhood injury. *Am Fam Physician* 2020;102(7):411-417.

**Item 96****ANSWER: A**

Although use of chronic indwelling urethral catheters should be avoided whenever possible, there are still some patients that will require one. Prevention of catheter-associated urinary tract infections (CAUTIs) is important. The most important measure to prevent CAUTIs is routine cleaning of the meatal surface with soap and water while bathing or showering. Use of specific periurethral antiseptics or instillation of antiseptics into the drainage bag does not reduce rates of CAUTI. Daily oral antibiotics are not indicated to prevent CAUTIs. Catheters and drainage bags should only be changed when clinically indicated, such as when there is an infection or obstruction.

Ref: Infection control: Catheter-associated urinary tract infections (CAUTI): III. Proper techniques for urinary catheter maintenance. Centers for Disease Control and Prevention, reviewed 2015. 2) Goldman L, Schafer AI (eds): *Goldman-Cecil Medicine*, ed 26. Elsevier, 2020, p 1840.

**Item 97****ANSWER: C**

Decisions regarding the management of burn wounds depend on first identifying the depth of the burn. Superficial burns are red, painful, and blanching, and they do not blister. Superficial partial-thickness burns blister and blanch with pressure. Deep partial-thickness burns blister, but do not blanch with pressure. Full-thickness burns extend through the entire dermis and into the underlying tissues, and they are dry and leathery. Patients with deep partial-thickness or full-thickness burns should be evaluated by a burn specialist.

Ref: Lanham JS, Nelson NK, Hendren B, Jordan TS: Outpatient burn care: Prevention and treatment. *Am Fam Physician* 2020;101(8):463-470.

## Item 98

**ANSWER: B**

Incidentally found adrenal masses are very common, occurring in 3%–7% of adults. The majority of these masses are benign nonfunctioning adenomas, although some are primary and functioning adrenal tumors such as pheochromocytoma and adenomas that secrete aldosterone and cortisol. Metastatic lesions are associated with bronchogenic carcinomas, renal cell carcinomas, and melanomas. Most masses measuring 1–4 cm are benign and can be monitored for growth changes with radiographs. Hormonal evaluation should be considered in patients who have a history or physical findings that would suggest a hyperfunctioning adrenal adenoma, such as hypertension. A concurrent condition of renal cell carcinoma would suggest a metastatic lesion rather than a hyperfunctioning lesion. Hyperlipidemia, rheumatoid arthritis, and type 2 diabetes are not associated with excessive adrenal function.

Ref: Hitzeman N, Cotton E: Incidentalomas: Initial management. *Am Fam Physician* 2014;90(11):784-789. 2) Mayo-Smith WW, Song JH, Boland GL, et al: Management of incidental adrenal masses: A white paper of the ACR Incidental Findings Committee. *J Am Coll Radiol* 2017;14(8):1038-1044.

## Item 99

**ANSWER: A**

Identification and management of hypertension is critically important given the global burden of heart disease. Family physicians should be familiar with the various guidelines related to hypertension. Of the options listed, ambulatory blood pressure monitoring should be used to confirm the diagnosis of hypertension and screen for potential “white coat” hypertension, given the single elevated reading in this new patient. Patients who are overweight or obese should generally receive counseling regarding weight loss as treatment of hypertension, but this would not be appropriate for this patient who has a normal BMI. Antihypertensive pharmacotherapy should not be initiated based on a single, mildly elevated reading, and initial pharmacotherapy, when indicated, should be in the form of a thiazide-type diuretic, calcium channel blocker, or ACE inhibitor. Dietary modifications, increased physical activity, and reduction of alcohol use all have an effect on blood pressure and would also be appropriate steps in management.

Ref: 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* 2018;71(19):e127-e248. 2) Smith DK, Lennon RP, Carlsgaard PB: Managing hypertension using combination therapy. *Am Fam Physician* 2020;101(6):341-349.

### Item 100

**ANSWER: B**

Parents and legal guardians of pediatric patients should be provided information on the benefits and risks of vaccination in clear and culturally sensitive language. Some parents express concerns about the need for, or safety of, certain vaccines. Some refuse certain vaccines, or all vaccines, for personal or religious reasons. One of the most important strategies is to build trust with the parents or legal guardians. Strategies to build trust include seeking to understand the specific concerns or factors leading to refusal and providing balanced, factual information in response. A strong recommendation from a health care provider is the single most important factor in determining whether someone gets vaccinated. Parental refusal of one or more vaccines does not ensure future refusal. The American Academy of Pediatrics does not recommend excluding patients from the practice if their parents or guardians refuse or question vaccination.

Ref: Talking with parents about vaccines for infants. Centers for Disease Control and Prevention, reviewed 2018. 2) Vaccine administration: Educate the parent and patient. Centers for Disease Control and Prevention, reviewed 2019. 3) Vaccine recommendations and guidelines of the ACIP: Preventing and managing adverse reactions. Centers for Disease Control and Prevention, reviewed 2021.

### Item 101

**ANSWER: C**

Community-acquired pneumonia (CAP) is an infection of the lung parenchyma that is not acquired in a hospital, long-term care facility, or other health care setting, and it is a significant cause of morbidity and mortality in adults. This patient has CAP in the presence of a significant comorbidity (diabetes mellitus). After CAP is diagnosed the first decision to make is whether hospitalization is needed. In all patients with CAP, mortality and severity prediction scores should be used to determine inpatient versus outpatient care (SOR A). This patient has a CURB-65 score of 1 (age  $\geq 65$  years), so she can be treated as an outpatient.

For outpatients with comorbidities, amoxicillin/clavulanate is a possible treatment option, but it should be paired with a macrolide. Macrolides such as azithromycin are the treatment of choice for previously healthy outpatients with no history of antibiotic use within the past 3 months. Azithromycin monotherapy, amoxicillin plus metronidazole, azithromycin plus levofloxacin, or clindamycin plus doxycycline would not be appropriate treatment strategies for this patient with a significant comorbidity.

Ref: Metlay JP, Waterer GW, Long AC, et al: Diagnosis and treatment of adults with community-acquired pneumonia. An official clinical practice guideline of the American Thoracic Society and Infectious Diseases Society of America. *Am J Respir Crit Care Med* 2019;200(7):e45-e67.

### Item 102

**ANSWER: C**

This patient has a compression fracture of the distal radius, also known as a buckle fracture. There is no cortical disruption and these are inherently stable fractures. Radiography or ultrasonography may be used as the initial imaging study if a buckle fracture is suspected. Treatment consists of short arm immobilization, which is most easily performed with a removable splint or wrist brace. The Choosing Wisely campaign states that these fractures do not require repeat imaging if there is no longer any tenderness or pain with palpation after 4 weeks of splinting, and the patient can return to full activity as tolerated. These fractures do not require referral to an orthopedist and can be managed in the office.

Ref: American Academy of Pediatrics section on Orthopaedics and the Pediatric Orthopaedic Society of North America: Do not order follow-up X-rays for buckle (or torus) fractures if they are no longer tender or painful. Choosing Wisely campaign, 2018. 2) Patel DS, Statuta SM, Ahmed N: Common fractures of the radius and ulna. *Am Fam Physician* 2021;103(6):345-354.

### Item 103

**ANSWER: C**

Although up to 84% of term newborns experience neonatal jaundice, severe hyperbilirubinemia (total serum bilirubin level > 20 mg/dL) occurs in < 2% of term infants. Prompt identification and management of severe hyperbilirubinemia is critical due to the risk of neurologic injury from untreated bilirubin toxicity. Acute bilirubin encephalopathy develops in 1 in 10,000 infants, and kernicterus (chronic bilirubin encephalopathy) occurs in 1 in 100,000 infants and can lead to permanent neurodevelopmental delay.

Neonates at high risk of bilirubin toxicity are treated with phototherapy to decrease bilirubin levels through the breakdown of unconjugated bilirubin into byproducts that are excreted into stool and urine. In infants at even higher risk, exchange transfusion may be indicated. Treatment guidelines published by the American Academy of Pediatrics stratify infants according to risk. Risk factors for toxicity include earlier gestational age at birth, hemolysis, sepsis, acidosis, G6PD deficiency, lethargy, asphyxia, temperature instability, acidosis, and hypoalbuminemia.

Of the options listed, hemolysis, which is associated with a positive direct antibody titer (Coombs test), is the most significant risk factor for developing acute bilirubin encephalopathy, and therefore impacts the treatment threshold for initiation of phototherapy. While East Asian race, exclusive breastfeeding, and a sibling with a history of neonatal jaundice are risk factors for severe hyperbilirubinemia, they do not impact the phototherapy treatment threshold. Similarly, untreated maternal group B *Streptococcus* colonization may increase an infant's risk of developing neonatal sepsis, although it is not a direct risk factor for bilirubin encephalopathy.

Ref: American Academy of Pediatrics Subcommittee on Hyperbilirubinemia: Management of hyperbilirubinemia in the newborn infant 35 or more weeks of gestation. *Pediatrics* 2004;114(1):297-316. 2) Lauer BJ, Spector ND: Hyperbilirubinemia in the newborn. *Pediatr Rev* 2011;32(8):341-349. 3) Muchowski KE: Evaluation and treatment of neonatal hyperbilirubinemia. *Am Fam Physician* 2014;89(11):873-878. 4) Kliegman RM, St Geme JW III, Blum NJ, et al (eds): *Nelson Textbook of Pediatrics*, ed 21. Elsevier Saunders, 2020, pp 912.

**Item 104****ANSWER: D**

Fibrates reduce the likelihood and recurrence of pancreatitis due to severe hypertriglyceridemia when triglyceride levels are  $\geq 500$  mg/dL, measured in a fasting or nonfasting state (SOR A). This patient's risk of atherosclerotic cardiovascular disease is  $< 7.5\%$  and his LDL-cholesterol level is within normal range, so initiating a statin or ezetimibe is not indicated. Colesevelam may be used to reduce LDL-cholesterol and glucose levels but is not considered a first-line treatment. Omega-3-acid ethyl esters will reduce the triglyceride levels but this patient has severe hypertriglyceridemia, so fibrate therapy is recommended to prevent recurrent pancreatitis.

Ref: Raza Z, Mulki AK, Garufi LC, Greenberg GM: Hypertriglyceridemia: A strategic approach. *J Fam Pract* 2020;69(4):180-187.

**Item 105****ANSWER: D**

The U.S. Preventive Services Task Force (USPSTF) recommends counseling interventions to prevent perinatal depression in patients who are at risk. This patient has risk factors for perinatal depression, including young age, single motherhood, and a history of depression. Other risk factors include low socioeconomic status and depressive symptoms. The USPSTF found that the benefits of counseling interventions outweigh the harms. The USPSTF could not find evidence that exercise, amitriptyline, or sertraline were beneficial.

Ref: *Final Recommendation Statement: Perinatal Depression: Preventive Interventions*. US Preventive Services Task Force, 2019. 2) US Preventive Services Task Force: Interventions to prevent perinatal depression: US Preventive Services Task Force Recommendation Statement. *JAMA* 2019;321(6):580-587.

**Item 106****ANSWER: B**

Antiretroviral therapy (ART) should be prescribed at the time of diagnosis of HIV infection unless the patient has expressed a desire to not initiate treatment. ART should not be delayed until the CD4 cell count drops to a predetermined level or until an AIDS-defining illness occurs. It is recommended to initiate prophylaxis for *Pneumocystis* pneumonia when the CD4 cell count drops below 200 cells/ $\mu$ L.

Ref: Croke L: HIV prevention and treatment with ART: International Antiviral Society updates recommendations. *Am Fam Physician* 2019;99(6):395-396.



### Item 107

**ANSWER: C**

This patient presents with typical symptoms of digitalis toxicity, which is common in elderly patients and may occur when the serum level is in the suggested therapeutic range. When drug toxicity is suspected the first step in management would be to discontinue or reduce the dosage of the suspected agent. In this case the addition of verapamil will increase the serum level of digoxin, which will reach a new steady-state level in several days. Therefore, the side effects may not occur for several days while the level is increasing. Because this patient has a good response to verapamil, it is not advisable to stop it, as the digitalis toxicity should be reversed by a dosage reduction. A therapeutic trial of an H<sub>2</sub>-blocker, an upper gastrointestinal contrast study, or imaging to look for a central nervous system abnormality would not be appropriate at this time.

Ref: Yang EH, Shah S, Criley JM: Digitalis toxicity: A fading but crucial complication to recognize. *Am J Med* 2012;125(4):337-343. 2) Tintinalli JE, Stapczynski JS, Ma OJ, et al (eds): *Tintinalli's Emergency Medicine: A Comprehensive Study Guide*, ed 8. McGraw-Hill, 2016, pp 1284-1287. 3) Zipes DP, Libby P, Bonow RO, et al (eds): *Braunwald's Heart Disease: A Textbook of Cardiovascular Medicine*, ed 11. Elsevier, 2019, p 522.

### Item 108

**ANSWER: C**

In addition to the presence of relevant factors and chronic respiratory symptoms, a postbronchodilator FEV<sub>1</sub>/FVC ratio <0.70 is required for the diagnosis of COPD. COPD is classified as mild (FEV<sub>1</sub> >80% of predicted), moderate (FEV<sub>1</sub> 50%–79% of predicted), severe (FEV<sub>1</sub> 30%–49% of predicted), or very severe (FEV<sub>1</sub> <30% of predicted). Further pulmonary function testing may support the diagnosis, but it is not required. For instance, a high total lung capacity indicating hyperinflation, a high residual volume indicating air trapping, and a low diffusing capacity for carbon monoxide indicating impaired gas exchange all suggest emphysema.

Ref: Labaki WW, Rosenberg SR: Chronic obstructive pulmonary disease. *Ann Intern Med* 2020;173(3):ITC17-ITC32.

### Item 109

**ANSWER: A**

In 2020 the American College of Physicians and the American Academy of Family Physicians published a guideline regarding the treatment of acute pain from musculoskeletal injuries (non-low back related). This systematic review found good evidence to support the recommendation that topical NSAIDs be used as first-line therapy to reduce pain and improve physical function. Topical NSAIDs were the only intervention that improved multiple outcomes and were not associated with a statistically significant increase in the risk for adverse events. Oral NSAIDs and acetaminophen were recommended as second-line therapies, as they were found to be effective for pain relief but were associated with an increased risk for adverse events. Topical menthol gel was not found to be effective as monotherapy but may be considered when combined with a topical NSAID. The guideline specifically recommends avoidance of opioids, including tramadol, noting a prevalence of 6% for prolonged opioid use resulting from an initial prescription. Nonpharmacologic approaches with evidence of benefit include specific acupressure and use of a transcutaneous electrical nerve stimulation (TENS) unit.

Ref: Qaseem A, McLean RM, O’Gurek D, et al: Nonpharmacologic and pharmacologic management of acute pain from non–low back, musculoskeletal injuries in adults: A clinical guideline from the American College of Physicians and American Academy of Family Physicians. *Ann Intern Med* 2020 Nov 3;173(9):739-748.

**Item 110**

**ANSWER: C**

Using the Jones criteria for diagnosis, this patient has acute rheumatic fever, with two major criteria (carditis and polyarthritits) and two minor criteria (fever and positive erythrocyte sedimentation rate). NSAIDs such as naproxen can provide significant relief and should be administered as soon as acute rheumatic fever is diagnosed (SOR B). Hydroxychloroquine is not FDA approved for the treatment of acute rheumatic fever and would not be appropriate. Treatment with corticosteroids, intravenous immunoglobulins, and plasmapheresis is not considered appropriate for acute rheumatic fever but may be indicated for management of pediatric autoimmune neuropsychiatric disorders associated with streptococcal infections (PANDAS).

Ref: Maness DL, Martin M, Mitchell G: Poststreptococcal illness: Recognition and management. *Am Fam Physician* 2018;97(8):517-522.

**Item 111**

**ANSWER: B**

Dermatitis herpetiformis is an immunologic response to ingested gluten and is pathognomonic for celiac disease. It may be the only presenting symptom of celiac disease, so there should be a high index of suspicion in patients presenting with a rash consistent with dermatitis herpetiformis. The papulovesicular rash is extremely pruritic and found on extensor surfaces such as elbows and knees, as well as the buttocks and scalp. It is more common in men than in women. The preferred initial diagnostic test includes a serum IgA transglutaminase-2 (TG2) antibody level, which has a 98% sensitivity and 98% specificity for the diagnosis of celiac disease. When celiac disease is strongly suspected despite a negative IgA TG2 antibody test, a total IgA level should be obtained. Diagnostic confirmation for patients with positive serologic testing is accomplished with an endoscopic mucosal biopsy. Dermatitis herpetiformis is not associated with food allergy, HIV, immunodeficiency, or internal malignancy.

Ref: Frazier W, Bhardwaj N: Atopic dermatitis: Diagnosis and treatment. *Am Fam Physician* 2020;101(10):590-598.

**Item 112**

**ANSWER: A**

Women experience subjective cognitive difficulties during their menopausal transition. This may include retrieving numbers or words, losing one’s train of thought, forgetting appointments, and forgetting the purpose of behavior such as entering a room. Clinical studies of these women showed intact cognitive test performance. The treatment consists of patient education and reassurance, since studies have shown that 62% of women report subjective cognitive problems during their menopausal transition. Imaging and referral to a neurologist are not indicated, and there are no trials that support the use of hormone therapy.

Ref: Greendale GA, Karlamangla AS, Maki PM: The menopause transition and cognition. *JAMA* 2020;323(15):1495-1496.

**Item 113****ANSWER: A**

Trigeminal neuralgia is a clinically diagnosed condition that is characterized by brief, sudden, unilateral pain in the distribution of one of the three branches of the trigeminal nerve. The pain, which is often triggered by minimal stimulus, is paroxysmal with episodes of remission that can last for months. First-line treatment for the condition is carbamazepine or oxcarbazepine (SOR C). Other suggested treatments include lamotrigine, baclofen, and surgical treatments, including microvascular decompression. There is a paucity of good evidence for treatments other than carbamazepine.

Valacyclovir would be an appropriate treatment for herpes zoster, which can also cause unilateral electrical shock-like pain in the face. However, patients with herpes zoster typically would have developed the characteristic lesions by 10 days. In addition, the pain is rarely paroxysmal in nature with herpes zoster. Short-term corticosteroids are not recommended for trigeminal neuralgia and there is minimal evidence of their effectiveness for herpes zoster. Sumatriptan is an appropriate treatment for migraines that are also unilateral but are associated with photophobia, phonophobia, nausea, and persistent severe pain.

High-flow oxygen is used to relieve cluster headaches that occur in the orbital, temporal, or supraorbital areas and persist for 15–180 minutes. Cluster headaches are accompanied by tearing and nasal discharge.

Ref: Zakrzewska JM, Linskey ME: Trigeminal neuralgia. *Am Fam Physician* 2016;94(2):133-135. 2) Maarbjerg S, Di Stefano G, Bendtsen L, Cruccu G: Trigeminal neuralgia—diagnosis and treatment. *Cephalalgia* 2017;37(7):648-657. 3) Cruccu G, Di Stefano G, Truini A: Trigeminal neuralgia. *N Engl J Med* 2020;383(8):754-762.

**Item 114****ANSWER: A**

Approximately 1%–2% of adults will have subclinical hyperthyroidism with a low TSH level and normal T<sub>3</sub> and T<sub>4</sub> levels. The American Thyroid Association recommends observation for asymptomatic patients with mildly low TSH (0.1–0.4 μU/mL), so further evaluation is not indicated in this patient.

A thyroglobulin level might be helpful in differentiating exogenous thyroid intake from thyroiditis but would not be appropriate in this case. Further evaluation including thyroid antibody studies and a thyroid uptake scan with radioactive iodine should be considered in older patients (> 65 years), those with very low TSH (<0.1 μU/mL), and those with comorbidities. Thyroid ultrasonography is not indicated for abnormal thyroid function tests in asymptomatic patients with normal examinations.

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

### Item 115

**ANSWER: E**

Child abuse is a common problem that often goes unrecognized until serious injury or death occurs. As many as 20% of child homicide victims have contact with a healthcare provider within a month of their death; thus, family physicians are ideally positioned to identify and intervene in suspected cases of child abuse. Furthermore, physicians are mandatory reporters of suspected child abuse and neglect to the appropriate child protective service and/or law enforcement agency, according to the provisions and procedures of their state of practice. Any bruising in a nonmobile infant, particularly under 4 months of age, warrants further evaluation for physical child abuse (SOR C).

For the 2-month-old in this case, the presence of bruising on the arm and thigh should raise concern and prompt immediate referral for a child abuse investigation. For children under 2 years of age with suspected abuse, skeletal survey imaging is also recommended (SOR C). While it is important to obtain the history from the child's mother in a nonaccusatory manner, simply reassuring her that extremity bruising is common in children of this age group would not be appropriate because this is not true. Helpful laboratory tests in this case may include a CBC and platelet count, a metabolic panel, and coagulation studies. Serum vitamin D and vitamin K levels would be unlikely to provide useful information. In cases of suspected abdominal trauma, abdominal CT is the preferred imaging modality rather than ultrasonography. In this case, abdominal injury is not suggested by the history or physical examination.

Ref: Kodner C, Wetherton A: Diagnosis and management of physical abuse in children. *Am Fam Physician* 2013;88(10):669-675. 2) Glick JC, Lorand MA, Bilka KR: Physical abuse of children. *Pediatr Rev* 2016;37(4):146-156.

### Item 116

**ANSWER: A**

Rheumatoid arthritis (RA) affects about 1% of people over their lifetime, with women being affected more often than men. RA can be diagnosed after considering the patient's medical history and physical examination and the results of serology and acute phase reactant tests. Some of these tests are often elevated in patients without RA, so family physicians need to know how to interpret positive laboratory results. This patient's history and the physical examination support a possible diagnosis of RA. Anti-citrullinated protein antibody is >95% specific for RA when significantly elevated. Acute phase reactants are very nonspecific and may be positive due to infection, other autoimmune conditions, age, or obesity. Leukocyte counts may be elevated because of infection, cancer, smoking, and other conditions. Rheumatoid factor is also nonspecific for RA and may be positive due to cancer, infection, and other autoimmune conditions.

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

### Item 117

**ANSWER: C**

COPD is currently the third leading cause of death in the United States and is commonly treated by primary care providers. In patients on monotherapy with a long-acting bronchodilator such as a long-acting muscarinic agonist (LAMA) or long-acting  $\beta$ -agonist (LABA) who have continued dyspnea, the Global Initiative for Chronic Obstructive Lung Disease (GOLD) guidelines recommend escalating therapy to two bronchodilators. This patient has persistent dyspnea and is being treated with a single agent, a LAMA, so his regimen needs to be escalated to include a LABA such as salmeterol. Once the symptoms are stabilized, treatment can be de-escalated to a single agent. For patients with frequent COPD exacerbations or with a diagnosis of asthma and COPD, the guidelines recommend adding an inhaled corticosteroid (ICS) such as fluticasone to a LABA, LAMA, or both. Triple therapy with a LABA, a LAMA, and an ICS is not indicated at this time as the patient has not yet been treated with a combination of a LAMA and LABA and has not had any recent exacerbations. The addition of azithromycin may be considered in patients who are already on triple therapy with a LABA, a LAMA, and an ICS and still having exacerbations. Monotherapy with an ICS is not indicated in COPD and has been shown to increase the risk of developing pneumonia.

Ref: Gentry S, Gentry B: Chronic obstructive pulmonary disease: Diagnosis and management. *Am Fam Physician* 2017;95(7):433-441. 2) Global Strategy for the Diagnosis, Management, and Prevention of Chronic Obstructive Pulmonary Disease. Global Initiative for Chronic Obstructive Lung Disease, 2019. 3) Nici L, Mammen MJ, Charbek E, et al: Pharmacologic management of chronic obstructive pulmonary disease. An official American Thoracic Society clinical practice guideline. *Am J Respir Crit Care Med* 2020;201(9):e56-e69.

### Item 118

**ANSWER: C**

Alcohol use causes preventable morbidity and mortality in the United States. Alcohol use disorder (AUD) affects approximately 9% of men in the United States. Family physicians should be familiar with evidence-based interventions to treat this disorder. Naltrexone has been shown to decrease heavy drinking, daily drinking, and the amount of alcohol consumed (SOR A). A 2018 Cochrane review did not support the use of baclofen for AUD. Evidence does not support the use of disulfiram for AUD but it may be offered in selected circumstances, particularly when patients do not tolerate other options and their goal is abstinence. There is limited evidence on the use of pregabalin for AUD but the available data does not support its use. Antidepressants are not effective for AUD unless there is a coexisting mental health disorder such as depression.

Ref: Pani PP, Trogu E, Pacini M, Maremmani I: Anticonvulsants for alcohol dependence. *Cochrane Database Syst Rev* 2014;(2):CD008544. 2) US Department of Health & Human Services: Pharmacotherapy for adults with alcohol use disorder (AUD) in outpatient settings. Agency for Healthcare Research and Quality, 2016. 3) Winslow BT, Onysko M, Hebert M: Medications for alcohol use disorder. *Am Fam Physician* 2016;93(6):457-465. 4) Minozzi S, Saulle R, Rösner S: Baclofen for alcohol use disorder. *Cochrane Database Syst Rev* 2018;11(11):CD012557. 5) American Psychiatric Association: The American Psychiatric Association Practice Guideline for the Pharmacological Treatment of Patients with Alcohol Use Disorder: Guideline Statement Summary. American Psychiatric Association Publishing, 2018.

### Item 119

**ANSWER: B**

Syncope is generally classified into three broad categories: cardiac, neurally mediated, and orthostatic hypotension. The history of an abrupt unprovoked episode of syncope in this patient suggests a cardiac source. The most frequent cause of cardiac-associated syncope is an arrhythmia. The fact that this patient's syncope occurred during exercise (walking) also suggests an arrhythmia.

A clinical history suggestive of arrhythmia places the patient in a higher risk stratification. An EKG should be performed. Continuous cardiac monitoring correlates symptoms with cardiac rhythm. Options for monitoring include a Holter monitor for up to 72 hours, an external cardiac event monitor or loop recorder for up to 4–6 weeks, and an implantable loop recorder for up to 3 years. The more prolonged monitoring increases the chances of confirming the diagnosis.

Orthostatic blood pressure measurements should be performed in all patients presenting with syncope, but this patient's symptom pattern is not consistent with orthostatic hypotension.

Recommendations from the Choosing Wisely campaign regarding syncope include the following:

- The American College of Emergency Physicians does not recommend imaging of the brain if there is no history of significant trauma and a neurologic examination is normal.
- The American College of Physicians does not recommend imaging of the brain for simple syncope in the setting of a normal neurologic examination.
- The American Academy of Neurology does not recommend imaging of the carotid arteries for simple syncope without other neurologic symptoms.

Ref: Runser LA, Gauer RL, Houser A: Syncope: Evaluation and differential diagnosis. *Am Fam Physician* 2017;95(5):303-312.

### Item 120

**ANSWER: E**

This patient has several risk factors for a significant problem such as esophageal cancer, including age over 50, weight loss, and progressive symptoms. Esophagogastroduodenoscopy (EGD) is needed without delay. This approach would allow biopsy of any lesions seen and therapeutic dilatation if a benign-appearing stricture is noted. Biopsies are also needed to diagnose eosinophilic esophagitis. If the EGD does not identify a problem, further workup should then proceed. CT may identify a source of extrinsic pressure. Barium esophagography may detect mild narrowing or esophageal webs missed on EGD. Esophageal motility disorders may be diagnosed with esophageal manometry. Waiting 8 weeks to see if his symptoms improve with regular use of a proton pump inhibitor would not be appropriate in this patient with symptoms that are worrisome for esophageal cancer.

Ref: Wilkinson JM, Codipilly DC, Wilfahrt RP: Dysphagia: Evaluation and collaborative management. *Am Fam Physician* 2021;103(2):97-106.

**Item 121****ANSWER: B**

Hand-foot-and-mouth disease is a viral illness caused by human enteroviruses and coxsackie viruses that presents in the spring to the fall, generally in children < 10 years of age. It is characterized by a low-grade fever, uncomfortable oral lesions, and a papular to vesicular rash on the hands and soles of the feet. Hydration and pain control with acetaminophen or ibuprofen are the mainstays of treatment. Erythema multiforme is characterized by target lesions on the trunk, face, and limbs, as well as vesicular lesions that can affect oral, genital, and ocular mucosa. It is most common in young adults 20–40 years of age and is slightly more predominant in males. Herpetic gingivostomatitis can be associated with fever, decreased appetite, and oral vesicles that can be found on the lips, palate, tongue, and gums, but not on the palms of the hands or soles of the feet. Oral candidiasis is characterized by a white film that could be scraped off and generally is not associated with a fever. Varicella causes a very pruritic vesicular rash that starts on the face and trunk and then spreads to the remainder of the body. Children are routinely vaccinated against varicella, making it an unlikely diagnosis in this patient who is up to date on all age-appropriate recommended immunizations.

Ref: Saguil A, Kane SF, Lauters R, Mercado MG: Hand-foot-and-mouth disease: Rapid evidence review. *Am Fam Physician* 2019;100(7):408-414.

**Item 122****ANSWER: A**

This patient most likely has an Achilles tendon rupture based on the history and examination, with pain localized to the posterior leg 2–6 cm above the calcaneus. The Thompson test is positive when there is no plantar flexion of the foot with squeezing the calf, due to a disruption of the Achilles tendon. Plantar fasciitis typically involves heel pain that is worse with the first steps after a period of non-weight bearing and then improves with ambulation. Typically there is tenderness on the plantar surface of the foot along the plantar fascia. A proximal fifth metatarsal fracture would present with foot pain and a limp and there is typically point tenderness over the fracture site. A stress fracture may cause pain on palpation and a limp, but the Thompson test would be negative. A syndesmosis injury typically involves ankle pain, swelling, and instability. Pain is elicited at the site of the syndesmosis on the squeeze test, and external rotation of the foot and ankle typically reproduces the pain.

Ref: Roman A, Van Lancker HP: Painful foot or ankle? Don't overlook these 5 injuries. *J Fam Pract* 2020;69(5):228-236.

### Item 123

**ANSWER: A**

Patients with acute bacterial sinusitis who do not improve while taking the usual dose of amoxicillin, who have recently been treated with an antimicrobial (within the past 90 days), who have an illness that is moderate or more severe, or who attend day care should be treated with high-dose amoxicillin/clavulanate in two divided doses. Alternate therapies include cefdinir, cefuroxime, or cefpodoxime. A single dose of ceftriaxone, 50 mg/kg daily, either intravenously or intramuscularly, can be used in children who are vomiting. Once there is clinical improvement, usually within about 24 hours, an oral antibiotic can be started. Cephalexin is not recommended for treating acute bacterial sinusitis because of inadequate antimicrobial coverage of the major organisms. Clarithromycin is not recommended as empiric therapy because of high rates of resistance in *Streptococcus pneumoniae*. The use of doxycycline is not appropriate in children. Levofloxacin would be appropriate if the patient had a history of type I hypersensitivity to penicillin.

Ref: DeMuri GP, Wald ER: Acute bacterial sinusitis in children. *N Engl J Med* 2012;367(12):1128-1134. 2) Chow AW, Benninger MS, Brook I, et al: IDSA clinical practice guideline for acute bacterial rhinosinusitis in children and adults. *Clin Infect Dis* 2012;54(8):e72-e112. 3) Kliegman RM, St Geme JW III, Blum NJ, et al (eds): *Nelson Textbook of Pediatrics*, ed 21. Elsevier Saunders, 2020, pp 2188-2191.

### Item 124

**ANSWER: E**

This patient presents with risk factors for coronary artery disease, including male sex and activity-related chest pain. He also has a new left bundle branch block, which necessitates a trip to the emergency department for urgent evaluation. If there were no EKG changes the patient would be at moderate risk for acute coronary syndrome, and further evaluation with an exercise stress test, stress echocardiography, or coronary CT angiography would be indicated. Referral to a cardiologist would lead to further delay and would not be appropriate.

Ref: McConaghy JR, Sharma M, Patel H: Acute chest pain in adults: Outpatient evaluation. *Am Fam Physician* 2020;102(12):721-727.

### Item 125

**ANSWER: B**

There are many circumstances in which a minor may present to an emergency department (ED) for evaluation and treatment without a parent or guardian. Federal law requires that the ED medical providers complete the initial medical screening and evaluation of minors even if parental consent cannot be obtained. In addition, treatment of emergencies is required, even without parental consent. This should all be done while working diligently to obtain consent from a parent, family member, or legal guardian. The medical providers should also explain everything to the minor in terms that the patient can understand.

Ref: Benjamin L, Ishimine P, Joseph M, Mehta S: Evaluation and treatment of minors. *Ann Emerg Med* 2018;71(2):225-232.



**Item 126****ANSWER: C**

Calcium stones, composed of either calcium oxalate and/or phosphate, account for up to 90% of all stones in adults in developed countries. Increasing fluid intake to 2.5–3 L/day is the most important lifestyle modification to prevent recurrent kidney stones. A diet rich in fiber and vegetables with normal calcium content (1–1.2 g/day), limited sodium intake (4–5 g/day), and limited animal protein intake (0.8–1 g/kg/day) is strongly encouraged. Reduction of BMI by dietary modification and increased exercise is also recommended. Citrate supplementation with potassium citrate is recommended for preventing calcium stones that recur despite lifestyle modifications. Thiazide diuretics in higher dosages, such as 50 mg daily of hydrochlorothiazide, have also been shown to be effective in preventing calcium stone formation. Allopurinol is also an effective option. Elimination of all calcium from the diet, such as a low- to very-low-calcium diet, is discouraged as it not only increases stone formation but may also result in bone demineralization. Furosemide increases urinary calcium excretion and would increase the likelihood of calcium stone formation. Probenecid is not recommended in patients with uric acid stones, as it is a uricosuric agent.

Ref: Fontenelle LF, Sarti TD: Kidney stones: Treatment and prevention. *Am Fam Physician* 2019;99(8):490-496.

**Item 127****ANSWER: B**

Primary care physicians should ensure that their patients who have undergone treatment for breast cancer follow the recommendations of their oncologist, as well as receive a history evaluation and health maintenance examination every 3–6 months for 3 years, every 6–12 months for 2 more years, and then on an annual basis. For ongoing surveillance only annual mammography is recommended (SOR A), which is bilateral in breast-conserving therapy and unilateral following a mastectomy. Other surveillance testing such as radionuclide bone scans, PET scans, and biomarkers should not be performed in asymptomatic patients who received curative treatment.

Ref: Zoberi K, Tucker J: Primary care of breast cancer survivors. *Am Fam Physician* 2019;99(6):370-375.

## Item 128

ANSWER: C

*Transgender* describes persons whose experienced or expressed gender differs from their sex assigned at birth. In the United States approximately 150,000 youth and 1.4 million adults identify as transgender, though many believe these numbers underestimate the actual prevalence. Transgender men who take testosterone may experience increased muscle mass and decreased fat mass, male pattern baldness, increased sexual desire, clitoromegaly, decreased fertility, deepening of the voice, cessation of menses, acne, and a significant increase in body hair, particularly on the face, chest, and abdomen. Risks of testosterone therapy include more atherogenic lipid profiles, an increase in blood pressure, and erythrocytosis (rather than anemia). Severe liver dysfunction is unusual at therapeutic dosages but is a concern at dosages above the recommended therapeutic range. Testosterone therapy has not been associated with cervical cancer, kidney disease, or venous thromboembolism (VTE). Estrogen-based therapies for male-to-female transgender patients do carry an increased risk for VTE. It is not clear whether increased blood pressure and dyslipidemia in these patients translates into an increase in cardiovascular events. Even so, when identified, treatment such as antihypertensive drugs and statins to address these risk factors is recommended as for any other patient.

Ref: Hembree WC, Cohen-Kettenis PT, Gooren L, et al: Endocrine treatment of gender-dysphoric/gender-incongruent persons: An Endocrine Society clinical practice guideline. *J Clin Endocrinol Metab* 2017;102(11):3869-3903. 2) Lapinski J, Covas T, Perkins JM, et al: Best practices in transgender health: A clinician's guide. *Prim Care* 2018;45(4):687-703. 3) Klein DA, Paradise SL, Goodwin ET: Caring for transgender and gender-diverse persons: What clinicians should know. *Am Fam Physician* 2018;98(11):645-653.

## Item 129

ANSWER: D

An underlying bipolar disorder is often overlooked in patients presenting with anxiety and/or depressive symptoms. One-fourth of patients presenting with depression or anxiety have been diagnosed with a bipolar disorder. Children of parents with bipolar disorders have a 4%–15% risk of being affected compared to <2% of patients without a family history. Symptoms of diminished interest in activities, fatigue or loss of energy, feelings of worthlessness or inappropriate guilt, and psychomotor retardation are all classic symptoms of a major depressive disorder and by themselves do not raise suspicion of a bipolar disorder.

Ref: American Psychiatric Association: Practice guideline for the treatment of patients with bipolar disorder (revision). *Am J Psychiatry* 2002;159(4 Suppl):1-50. 2) American Psychiatric Association: *Diagnostic and Statistical Manual of Mental Disorders*, ed 5. American Psychiatric Association, 2013, pp 123-127. 3) Yatham LN, Kennedy SH, Parikh SV, et al: Canadian Network for Mood and Anxiety Treatments (CANMAT) and International Society for Bipolar Disorders (ISBD) 2018 guidelines for the management of patients with bipolar disorder. *Bipolar Disord* 2018;20(2):97-170.

**Item 130****ANSWER: D**

Excess thyroid hormone intake would cause a low TSH level with a high free T<sub>4</sub> level. Other possibilities include an hCG-secreting tumor and the thyrotoxic phase of subacute thyroiditis. An elevated TSH level would be seen with thyroid-hormone resistance or a thyrotropin-secreting pituitary tumor. Graves disease causes a homogeneous increased thyroid uptake on radionuclide scanning, whereas a hot nodule would be expected with toxic nodular goiter.

Ref: Smith TJ, Hegedüs L: Graves' disease. *N Engl J Med* 2016;375(16):1552-1565.

**Item 131****ANSWER: B**

Hallux rigidus affects as many as 50% of women and 40% of men by the age of 70. It is usually due to osteoarthritis of the metatarsophalangeal (MTP) joint and presents as decreased range of motion, swelling, and pain. With progression of the condition, flare-ups become more frequent and more severe, and it can be mistaken for gout. Initial treatment is restriction of motion across the MTP joint. A stiffening shoe insert does relieve pain and most patients see improvement without surgery. Custom orthotics, rigid inserts, or hard-soled shoes are options that are more effective than NSAIDs. Corticosteroid injections, preferably administered with ultrasound guidance, and surgery are reserved for those who fail to respond to more conservative measures. Stretching and strengthening exercises are recommended for plantar fasciitis more so than for hallux rigidus.

Ref: Becker BA, Childress MA: Common foot problems: Over-the-counter treatments and home care. *Am Fam Physician* 2018;98(5):298-303.

**Item 132****ANSWER: C**

Pediatric type 1 diabetes is recognized as a high-risk condition for the future development of cardiovascular disease. Current guidelines recommend initiating a statin, in addition to education regarding a healthy diet and physical activity, for pediatric patients in this high-risk category with an LDL-cholesterol level > 100 mg/dL. Statins such as atorvastatin are recommended for first-line treatment according to multiple studies that demonstrate their efficacy and benefits in reduction of cardiovascular morbidity and mortality, along with long-term studies demonstrating their safety. Fish oil supplements, ezetimibe, and gemfibrozil would not be appropriate recommendations for this patient at this time.

Ref: Daniels SR, Benuck I, Christakis DA, et al: Expert Panel on Integrated Guidelines for Cardiovascular Health and Risk Reduction in Children and Adolescents: Full report. US Department of Health and Human Services, National Heart Lung and Blood Institute, 2012. 2) Kusters DM, Avis HJ, de Groot E, et al: Ten-year follow-up after initiation of statin therapy in children with familial hypercholesterolemia. *JAMA* 2014;312(10):1055-1057. 3) de Ferranti SD, Steinberger J, Ameduri R, et al: Cardiovascular risk reduction in high-risk pediatric patients: A scientific statement from the American Heart Association. *Circulation* 2019;139(13):e603-e634.

**Item 133****ANSWER: D**

The leading cause of mortality among people aged 45–64 years is malignancy. The U.S. Preventive Services Task Force generally recommends a focus on cancer screening in this age group. Accidents are the third most common cause of mortality in people 45–64 years of age, but they are the leading cause of mortality among people 15–44 years of age, and preventive recommendations reflect interventions to prevent accidents. Diabetes mellitus is the sixth most common cause of mortality in people 45–54 years of age, and the fifth most common cause in people 55–64 years of age. Heart disease is the second most common cause of mortality in people 45–64 years of age, but it is the leading cause of mortality in people 65 years of age and older. Suicide is the fourth most common cause of mortality in adults 45–54 years of age, and the eighth most common cause in adults 55–64 years of age.

Ref: National Vital Statistics System: Deaths, percent total deaths, and death rates for the 15 leading causes of death in 10-year age groups, by race and sex: United States, 2015-2017. National Center for Health Statistics, reviewed 2017.

**Item 134****ANSWER: C**

Acute respiratory distress syndrome (ARDS) will often present similarly to pneumonia and heart failure with dyspnea, hypoxemia, and tachypnea. ARDS typically does not respond to supplemental oxygen or diuretic therapy. Patients decompensate quickly and usually require mechanical ventilation. Chest radiographic findings include bilateral airspace opacities but not a localized infiltrate as with pneumonia, venous congestion or cardiac enlargement as with heart failure, or a flattened diaphragm (associated with COPD).

Ref: Saguil A, Fargo MV: Acute respiratory distress syndrome: Diagnosis and management. *Am Fam Physician* 2020;101(12):730-738.

**Item 135****ANSWER: E**

This patient's laboratory studies are consistent with a past natural hepatitis B virus (HBV) infection and she is now immune. If she had never been infected her anti-HBc and anti-HBs would both be negative. If she had an acute infection the HBsAg, anti-HBc IgM, and HBV nucleic acid test (NAT) would have all been positive along with the total anti-HBc. If she had a chronic infection the HBsAg and HBV NAT would be positive in addition to the total anti-HBc. Furthermore, the anti-HBs would be negative in both acute and chronic infection since its presence is associated with recovery from infection. If her anti-HBc screening test were a false positive the anti-HBs would be negative.

Ref: Wilkins T, Sams R, Carpenter M: Hepatitis B: Screening, prevention, diagnosis, and treatment. *Am Fam Physician* 2019;99(5):314-323. 2) Interpretation of hepatitis B serologic test results. Centers for Disease Control and Prevention, reviewed 2019. 3) Infectious disease, HLA, and ABO donor qualification testing. The American National Red Cross.

**Item 136**

**ANSWER: B**

All newborns should have a bilateral hearing screen completed before hospital discharge. For infants that fail the initial hearing screen in one or both ears, a repeat bilateral audiology evaluation should be performed before 3 months of age to ensure early identification of hearing loss and therefore maximize speech perception and development.

Ref: Hearing loss in children: Screening and diagnosis of hearing loss. Centers for Disease Control and Prevention, reviewed 2020.

**Item 137**

**ANSWER: A**

A Cochrane review reports good evidence that salicylic acid is effective for the treatment of plantar warts. *Candida* injections may be indicated for warts that are difficult to treat, but they are not considered first-line treatments. The application of duct tape has not been shown to be more effective than placebo. Manual paring and extraction of plantar warts carries a greater risk for complications and is not necessary for these flat, minimally bothersome warts. Laser treatment may be effective, but the cost is not justified as an initial therapy in this simple case.

Ref: Bacelieri R, Johnson SM: Cutaneous warts: An evidence-based approach to therapy. *Am Fam Physician* 2005;72(4):647-652. 2) Mulhem E, Pinelis S: Treatment of nongenital cutaneous warts. *Am Fam Physician* 2011;84(3):288-293. 3) Becker BA, Childress MA: Common foot problems: Over-the-counter treatments and home care. *Am Fam Physician* 2018;98(5):298-303.

**Item 138**

**ANSWER: B**

Cytokine storm or cytokine release syndrome is caused by the release of cytokines and is characterized by fever, tachypnea, headache, tachycardia, hypotension, rash, and/or hypoxia. Cytokine storm can be triggered by certain therapies, pathogens, cancers, autoimmune conditions, and monogenic disorders. The normal inflammatory response involves recognition of a pathogen or injury, activation of a proportional response, and a return to homeostasis. However, cytokine storm involves immune dysregulation and immune-cell hyperactivation in which an overabundance of cytokines can cause collateral damage that may be worse than the benefit from the immune response itself. It is not considered a normal physiologic response, and it does not involve histamine release or anaphylaxis. Immune-cell hyperactivation rather than immunodeficiency is involved in cytokine storm. However, it is important to be aware of concurrent immunodeficiency since treatment for the immune hyperactivity can place patients at risk for secondary infections and illness. Serum sickness is associated with delayed hypersensitivity to foreign proteins from animal serums and is not involved in the pathophysiology of cytokine storm.

Ref: Common Terminology Criteria for Adverse Events (CTCAE), version 5.0. US Department of Health and Human Services, 2017. 2) Fajgenbaum DC, June CH: Cytokine storm. *N Engl J Med* 2020;383(23):2255-2273.

**Item 139****ANSWER: B**

After confirming low testosterone with two morning laboratory tests, the next step is to attempt to determine the cause of the low testosterone. Checking LH and FSH levels is recommended to evaluate for primary hypogonadism. If primary hypogonadism is present, chromosomal studies should be considered. Before initiating testosterone therapy, checking the patient's PSA level and performing a digital rectal examination are recommended, but in this case the initial workup is not yet complete. It is crucial to discuss the risks and benefits of treatment, and as with all medications, it is recommended to start with the lowest dose needed. However, starting treatment in this case is premature. Evidence for testosterone replacement therapy is not as robust as desired and it does carry risks, but as long as there are no contraindications it can be initiated after a discussion of the risks and benefits.

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

**Item 140****ANSWER: E**

Thoracic outlet syndrome can be differentiated into neurogenic, venous, or arterial, with neurogenic being the most common, constituting more than 95% of cases. This patient has venous thoracic outlet syndrome, which is the second most common, occurring in about 3% of cases. Swelling of the arm with associated pain strongly suggests obstruction of the subclavian vein. Paresthesias in the fingers and hand are common, likely due to swelling rather than nerve compression at the thoracic outlet. Venous thoracic outlet syndrome is easily identified by swelling, cyanosis, and distention of superficial veins in the arm. Due to the exceptionally high risk of developing a venous thrombosis, patients should undergo diagnostic evaluation with upper extremity venous duplex ultrasonography. False negatives are common in patients without a thrombus and in such cases the patient may benefit from evaluation with either contrast-enhanced upper extremity CT or magnetic resonance venography. If a thrombosis is present anticoagulation should be started immediately and catheterization of the vein should be performed with thrombolysis with or without balloon angioplasty. Ultimately the patient will require surgical decompression.

Ref: Sanders RJ, Hammond SL, Rao NM: Thoracic outlet syndrome: A review. *Neurologist* 2008;14(6):365-373. 2) Cook JR, Thompson RW: Evaluation and management of venous thoracic outlet syndrome. *Thorac Surg Clin* 2021;31(1):27-44.

**Item 141****ANSWER: B**

Office spirometry can be very helpful in the development of a differential diagnosis. The differential can be narrowed with the use of office spirometry, as many conditions create either an obstructive or restrictive pattern. Of the options listed, only cystic fibrosis can cause an obstructive pattern. Other causes of an obstructive pattern include asthma, COPD,  $\alpha_1$ -antitrypsin deficiency, and bronchiectasis, among others. Common diseases or conditions causing restrictive patterns include adverse reactions to nitrofurantoin, methotrexate, and amiodarone. Chest wall conditions such as kyphosis, scoliosis, and morbid obesity can also cause restrictive patterns. Interstitial lung disease, including idiopathic pulmonary fibrosis, sarcoidosis, and asbestosis, also causes a restrictive pattern (SOR A).

Ref: Langan RC, Goodbred AJ: Office spirometry: Indications and interpretation. *Am Fam Physician* 2020;101(6):362-368.

**Item 142****ANSWER: B**

Adjustable orthotic shoes in infants who are not yet walking can be effective for the treatment of metatarsus adductus (SOR B). These orthotics can be adjusted to apply an abduction force on the forefoot while maintaining the heel in a neutral position. Night splints, braces, and physical therapy are not indicated or proven to correct this deformity. Surgery has high complication rates and is rarely indicated to treat metatarsus adductus.

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

**Item 143****ANSWER: E**

Because patients with an acute ischemic stroke may require the increased perfusion pressure to limit ischemia, antihypertensive therapy should not be given during the first 48–72 hours as long as they are not candidates for, or recipients of, reperfusion therapy with alteplase or thrombectomy; do not have a comorbid condition requiring acute blood pressure lowering; and do not have a blood pressure > 220/120 mm Hg.

Ref: Powers WJ, Rabinstein AA, Ackerson T, et al: Guidelines for the early management of patients with acute ischemic stroke: 2019 Update to the 2018 guidelines for the early management of acute ischemic stroke: A guideline for healthcare professionals from the American Heart Association/American Stroke Association. *Stroke* 2019;50(12):e344-e418.

**Item 144****ANSWER: E**

Delivering life-altering news is a difficult but common task for family physicians, who should respect the patient's individual preferences for receiving bad news and allow adequate time to deliver the information in a private setting with limited interruptions. The physician should accept the patient's response and acknowledge it at that time, most appropriately with a statement that shows empathy for the emotion. This should be done prior to attempting to immediately reassure her about the prognosis or giving more information. Although telling the patient there is no need to cry may seem reassuring, it is not acknowledging and accepting her response of crying or sadness.

Ref: Berkey FJ, Wiedemer JP, Vithalani ND: Delivering bad or life-altering news. *Am Fam Physician* 2018;98(2):99-104.

**Item 145****ANSWER: B**

In all patients found to have a thyroid nodule, the first steps in evaluation should be measuring the TSH level and performing thyroid ultrasonography. If the TSH level is low, then a radionuclide scan is indicated. If the scan indicates hyperfunctioning of the nodule, then fine-needle aspiration is not necessary and radioactive iodine ablation is generally the treatment of choice. With normal to high TSH levels, the need for a biopsy and for follow-up surveillance depends on the findings on ultrasonography. Measuring antithyroid antibodies in a patient with a thyroid nodule is not part of the routine workup.

Ref: Kant R, Davis A, Verma V: Thyroid nodules: Advances in evaluation and management. *Am Fam Physician* 2020;102(5):298-304.

**Item 146****ANSWER: C**

This patient has anorexia nervosa, likely a combination of the restrictive subtype and the binge-eating and purging subtype, given the dental findings on examination. This condition is difficult to treat and carries significant risk of mortality, with an estimated aggregate mortality of 5.6% per decade. Coexisting psychiatric conditions are common, with major depression, anxiety disorders, obsessive-compulsive disorder, and trauma-related disorders predominating. Medical complications include disorders of the esophagus and stomach related to repeated vomiting; cardiovascular conditions associated with bradycardia, orthostatic hypotension, and arrhythmias; renal disease due to chronic dehydration and electrolyte abnormalities; and osteoporosis and bone marrow abnormalities. Treatment may be provided in inpatient or outpatient settings, depending on the severity of disease. Psychotherapy is the foundation of treatment and parental involvement is key for children and adolescents. Parents or guardians typically have a high level of distress around their child's condition and family therapy helps provide consistent support for treatment goals set by the care team. Other types of one-on-one therapy may be appropriate to augment family therapy and for adolescents with specific comorbidities. Psychotropic drugs have not been consistently and clearly shown to add benefit to psychotherapy, although they are often prescribed.



Ref: Resmark G, Herpertz S, Herpertz-Dahlmann B, Zeeck A: Treatment of anorexia nervosa—New evidence-based guidelines. *J Clin Med* 2019;8(2):153. 2) Mitchell JE, Peterson CB: Anorexia nervosa. *N Engl J Med* 2020;382(14):1343-1351.

#### Item 147

**ANSWER: A**

Because of the low prevalence and diagnostic yield for clinically significant fractures in patients with acute knee injuries, radiographs should be limited to patients who meet specific evidence-based criteria. The Ottawa knee rule is a validated tool that decreases unnecessary radiographs in patients with an acutely injured knee. Criteria for imaging according to the Ottawa knee rule include any of the following: age >55, isolated tenderness of the patella, tenderness of the fibular head, inability to flex the knee to 90°, and inability to bear weight for four steps both immediately after the injury and at the time of the examination. In the absence of these findings patients are highly unlikely to have a clinically significant fracture. Pain over the lateral or medial joint line is more likely to result from meniscal derangements or a sprain or rupture of a collateral ligament. Pain over the tibial tubercle is more typical of Osgood-Schlatter disease (tibial apophysitis). Pain over the upper medial aspect of the tibia suggests pes anserine bursitis.

Ref: Bachmann LM, Haberzeth S, Steurer J, ter Riet G: The accuracy of the Ottawa knee rule to rule out knee fractures: A systematic review. *Ann Intern Med* 2004;140(2):121-124. 2) Bunt CW, Jonas CE, Chang JG: Knee pain in adults and adolescents: The initial evaluation. *Am Fam Physician* 2018;98(9):576-585.

#### Item 148

**ANSWER: A**

Clinicians should consider measuring the  $\alpha_1$ -antitrypsin level in all symptomatic COPD patients with fixed airflow obstruction, particularly with a COPD onset as early as the fifth decade of life; a family history of  $\alpha_1$ -antitrypsin deficiency; and emphysema, bronchiectasis, liver disease, or panniculitis in the absence of a recognized risk factor. Identifying this condition is particularly important because current smokers should be urged to quit, given that they are at high risk for accelerated lung function decline, and also to consider intravenous pooled human  $\alpha_1$ -antitrypsin, which has been shown to reduce declines in lung function and lung density measured on chest CT. In this patient, testing for cystic fibrosis, hemochromatosis, Williams syndrome, or Wilson's disease would not be indicated.

Ref: Labaki WW, Rosenberg SR: Chronic obstructive pulmonary disease. *Ann Intern Med* 2020;173(3):ITC17-ITC32.

**Item 149****ANSWER: B**

An oral rehydration solution is the treatment of choice for mild dehydration in children with acute gastroenteritis. However, prescribing a formal oral rehydration solution is not necessary. A randomized, controlled trial has shown that initial rehydration with diluted apple juice followed by preferred fluids resulted in fewer treatment failures than use of a formal electrolyte solution. This is likely due to the increased likelihood that children will drink preferred fluids due to better taste, tolerability, and ease of administration. Therefore, in high-income countries, this should be the recommended initial treatment for mild dehydration due to gastroenteritis. Intravenous fluids should be reserved for cases of moderate to severe dehydration. Metoclopramide is not recommended because of potential adverse effects.

Ref: Freedman SB, Willan AR, Boutis K, Schuh S: Effect of dilute apple juice and preferred fluids vs electrolyte maintenance solution on treatment failure among children with mild gastroenteritis: A randomized clinical trial. *JAMA* 2016;315(18):1966-1974. 2) Hartman S, Brown E, Loomis E, Russell HA: Gastroenteritis in children. *Am Fam Physician* 2019;99(3):159-165.

**Item 150****ANSWER: A**

In a patient with acute pericarditis, after determining that the patient is not at high risk for complications, does not have acute myocardial injury, and is an appropriate candidate for outpatient treatment, there are several options for treatment. Any of the NSAIDs alone are effective in many patients, but some patients do not respond sufficiently, so the addition of colchicine would be the treatment of choice. Colchicine alone is also an appropriate initial treatment, but in case of insufficient response to NSAIDs, the combination is the most effective treatment. Corticosteroids are best reserved for pericarditis related to a connective tissue disease, but they are not recommended in viral or idiopathic pericarditis or in pericarditis in patients with post-acute myocardial infarction pericarditis. Consultation with a cardiologist would be recommended for patients with pericarditis that is severe, is refractory to treatment, or has an unclear etiology.

Ref: Snyder MJ, Bepko J, White M: Acute pericarditis: Diagnosis and management. *Am Fam Physician* 2014;89(7):553-560. 2) Zipes DP, Libby P, Bonow RO, et al (eds): *Braunwald's Heart Disease: A Textbook of Cardiovascular Medicine*, ed 11. Elsevier, 2019, p 1663-1667.

**Item 151****ANSWER: C**

Most anaphylactic reactions occur outside of the hospital setting, and early treatment decreases both hospitalizations and mortality. This patient presents with respiratory, dermatologic, cardiovascular, and gastrointestinal symptoms, which are common in anaphylaxis. Tree nut and peanut allergies are risk factors for severe reactions. Early treatment with intramuscular epinephrine and attention to airway, breathing, and circulation are the first steps for treatment. Adjunct medications can be considered after epinephrine, but antihistamines have an onset of action of  $\geq 1$  hour and corticosteroids have an onset of action of 6 hours. Albuterol may be considered as an adjunct but its use does not address the urgent need to resolve anaphylaxis symptoms first.

Ref: Pflipsen MC, Vega Colon KM: Anaphylaxis recognition and management. *Am Fam Physician* 2020;102(6):355-362.

**Item 152****ANSWER: D**

This patient has abnormal uterine bleeding characterized by an increased frequency and volume of vaginal bleeding. Due to the increased risk of endometrial cancer, current guidelines recommend that all women  $>45$  years of age presenting with abnormal uterine bleeding undergo endometrial sampling. Irregular menses can occur during the perimenopausal period but this patient's increased frequency and volume of vaginal bleeding combined with her age warrant further evaluation. In a patient with an up-to-date Papanicolaou smear and normal-appearing cervix, HPV testing would have no role in the evaluation. Transvaginal ultrasonography is recommended if a bimanual examination is abnormal or if symptoms persist despite treatment. CT is rarely indicated if imaging is necessary, because transvaginal ultrasonography is preferred.

Ref: Practice Bulletin No. 149: Endometrial cancer. *Obstet Gynecol* 2015;125(4):1006-1026. 2) Wouk N, Helton M: Abnormal uterine bleeding in premenopausal women. *Am Fam Physician* 2019;99(7):435-443. 3) NICE guideline [NG88]: Heavy menstrual bleeding: Assessment and management. Clinical Guideline (CG44). National Institute for Health and Care Excellence, updated 2020.

**Item 153****ANSWER: D**

Common reactions to vaccines are typically mild and include pain or swelling at the injection site, fever, drowsiness, and rash. Serious adverse reactions to vaccines are less common, and in some cases are rare, but can include serious allergic reaction to a vaccine ingredient, febrile seizure, immune thrombocytopenic purpura, and intussusception. The National Childhood Vaccine Injury Act of 1986 established the no-fault National Vaccine Injury Compensation Program for patients and families who were injured by recommended vaccines. This law requires documentation of the manufacturer and lot number of the administered vaccine. Physicians also must document that they have provided their patients with current vaccine information statements. The program is funded by an excise tax on vaccines. Compensation for vaccine injury is not available from the clinic's malpractice insurance or the vaccine manufacturer's liability coverage.

The Countermeasures Injury Compensation Program is a federal program created to provide compensation for patients who are injured or die from the administration of a countermeasure for a declared epidemic, pandemic, or national security threat. This provides coverage for emergency-use authorizations for medications and vaccines used to prevent or treat conditions such as COVID-19, Zika virus, Ebola virus, anthrax, acute radiation syndrome, and smallpox. It does not provide coverage for side effects or complications from Advisory Committee on Immunization Practices–approved routine vaccinations.

Ref: Spencer JP, Trondsen Pawlowski RH, Thomas S: Vaccine adverse events: Separating myth from reality. *Am Fam Physician* 2017;95(12):786-793. 2) Countermeasures Injury Compensation Program (CICP). Health Resources & Services Administration, reviewed 2020.

#### Item 154

**ANSWER: E**

Acute Charcot neuropathy is a commonly missed diagnosis, and the diagnosis is delayed in up to 25% of cases. The diagnosis should be considered in patients over age 40 with neuropathy and obesity who present with unilateral foot swelling. There may be associated erythema and warmth, and pain may be absent. In a patient with suspected acute Charcot neuropathy, bilateral weight-bearing radiographs are recommended to detect fractures of the midfoot. Acute Charcot neuropathy is frequently painless, and its consequences can be severe, so it would be inappropriate to counsel a patient that lack of pain means the absence of serious disease. Charcot neuropathy is commonly misdiagnosed as cellulitis. In this patient's presentation, cellulitis is not a clear diagnosis, and Charcot neuropathy needs to be considered before initiating treatment for cellulitis. Compression stockings and leg elevation are appropriate for peripheral edema when other causes of edema have been evaluated and addressed, but in this case the swelling is lower on the leg than what compression stockings would usually treat, and further evaluation is required prior to treatment. There is no evidence for ankle sprain or instability in this patient, so an ankle brace would not be appropriate.

Ref: Marmolejo VS, Arnold JF, Ponticello M, Anderson CA: Charcot foot: Clinical clues, diagnostic strategies, and treatment principles. *Am Fam Physician* 2018;97(9):594-599.

#### Item 155

**ANSWER: A**

The American Thoracic Society (ATS) and the Infectious Diseases Society of America (IDSA) guideline recommends use of a validated clinical prediction rule, preferably the Pneumonia Severity Index (PSI), to determine the need for hospitalization in adults diagnosed with community-acquired pneumonia (CAP) (strong recommendation). The yield of blood cultures is around 2% (outpatients) to 9% (inpatients) in adults with non-severe CAP. A sputum culture and a Gram stain of respiratory secretions are recommended in patients classified as having severe CAP, or in those with strong risk factors for methicillin-resistant *Staphylococcus aureus* (MRSA) or *Pseudomonas aeruginosa*. Randomized trials have failed to show a benefit for urinary antigen testing for *Streptococcus pneumoniae* and *Legionella*. ATS/IDSA guidelines recommend empiric antibiotic therapy for adults with clinically suspected and radiographically confirmed CAP regardless of the initial serum procalcitonin level (strong recommendation). Coverage for MRSA is not recommended in patients without risk factors for MRSA pneumonia.

Ref: Kaysin A, Viera AJ: Community-acquired pneumonia in adults: Diagnosis and management. *Am Fam Physician* 2016;94(9):698-706. 2) Metlay JP, Waterer GW, Long AC, et al: Diagnosis and treatment of adults with community-acquired pneumonia. An official clinical practice guideline of the American Thoracic Society and Infectious Diseases Society of America. *Am J Respir Crit Care Med* 2019;200(7):e45-e67.

### Item 156

**ANSWER: C**

Direct oral anticoagulants such as apixaban, betrixaban, dabigatran, edoxaban, and rivaroxaban are first-line agents for prevention of stroke in patients with nonvalvular atrial fibrillation with a CHA<sub>2</sub>DS<sub>2</sub>-VASc score  $\geq 2$  in men or  $\geq 3$  in women. For patients with atrial fibrillation without valvular heart disease, forgoing antithrombotic therapy is only appropriate in patients with a CHA<sub>2</sub>DS<sub>2</sub>-VASc score of 0 in men and 1 in women. Aspirin should not be considered a substitute for anticoagulation but may be suggested for patients with an unprovoked deep vein thrombosis or pulmonary embolism who do not wish to receive lifelong anticoagulation. Low molecular weight heparin is recommended as the anticoagulant of choice in patients with cancer and venous thromboembolism, although direct anticoagulants may be appropriate in some situations. If a patient has moderate to severe mitral stenosis or a mechanical valve, then vitamin K antagonists are the preferred agent.

Ref: Lip GYH, Banerjee A, Boriani G, et al: Antithrombotic therapy for atrial fibrillation: CHEST guideline and expert panel report. *Chest* 2018;154(5):1121-1201. 2) Wigle P, Hein B, Bernheisel CR: Anticoagulation: Updated guidelines for outpatient management. *Am Fam Physician* 2019;100(7):426-434.

### Item 157

**ANSWER: B**

In 2018, 1 in 10 infants born in the United States were preterm, with significant racial and ethnic differences noted. Breastfed infants born before 37 weeks gestation should receive iron supplementation at 2 mg/kg/day after 1 month of life. This infant does have some physiologic reflux but since this infant appears asymptomatic, the parents should be counseled on behavioral techniques to reduce spitting up, as there is no clear long-term benefit to antireflux medication. This infant's growth and development are normal so there is no indication for caloric fortification of breast milk, which is more appropriate for small-for-gestational-age infants or those born below the 10th percentile. There is no specific recommendation for micronutrient supplementation other than iron and vitamin D, so there is no indication to initiate vitamin E supplementation. This child should be screened for developmental delay at each office visit, but there is currently no evidence of delay so referral to early intervention is not indicated.

Ref: Engle WA, Tomashek KM, Wallman C; Committee on Fetus and Newborn, American Academy of Pediatrics: "Late-preterm" infants: A population at risk. *Pediatrics* 2007;120(6):1390-1401. 2) Baker RD, Greer FR; Committee on Nutrition American Academy of Pediatrics: Diagnosis and prevention of iron deficiency and iron-deficiency anemia in infants and young children (0-3 years of age). *Pediatrics* 2010;126(5):1040-1050. 3) Gauer RL, Burket J, Horowitz E: Common questions about outpatient care of premature infants. *Am Fam Physician* 2014;90(4):244-251. 4) Wang M: Iron deficiency and other types of anemia in infants and children. *Am Fam Physician* 2016;93(4):270-278. 5) Reproductive health: Preterm birth. Centers for Disease Control and Prevention, reviewed 2020.

**Item 158****ANSWER: D**

The evidence suggests that this patient did not have syphilis prior to this lone contact and a diagnosis of syphilis cannot be confirmed by examination or testing at this point. He should be treated presumptively for early syphilis, even though the serologic test result is negative, because he had sexual contact within the past 90 days with a person who was diagnosed with secondary syphilis. The same is true for individuals exposed to sex partners diagnosed with primary or early latent syphilis during the same time period. When the contact occurred more than 90 days before confirmation of a negative serologic test result, no treatment is necessary.

The recommended treatment for individuals such as this patient and for those with primary or secondary syphilis is a single dose of penicillin G benzathine, 2.4 million units. For patients with a penicillin allergy, oral treatment with doxycycline, 100 mg twice daily; tetracycline, 500 mg four times daily; or azithromycin, 2 g as a single dose, has been effective as an alternate treatment option but should only be used when penicillin is contraindicated and should be followed by close monitoring of serologic tests.

Ref: Workowski KA, Bachmann LH, Chan PA, et al: Sexually transmitted infections treatment guidelines, 2021. *MMWR Recomm Rep* 2021;70(4):39-42.

**Item 159****ANSWER: A**

Depression in the elderly can cause symptoms similar to those of dementia. Also, many patients with dementia concurrently have depression. It is recommended that depression be treated first if found (SOR C). If cognitive symptoms improve with depression treatment, pseudodementia is diagnosed.

The recommended workup for dementia includes a TSH level, a CBC, a comprehensive metabolic panel, and a vitamin B<sub>12</sub> level; depression screening; and noncontrast MRI of the brain. MRI of the brain is recommended to rule out stroke, mass, or hydrocephalus. If MRI cannot be performed, then CT is indicated.

Testing for the apolipoprotein E epsilon 4 allele is not a diagnostic test for Alzheimer's dementia. It can be ordered for children of affected individuals to assess risk of developing the disease. An EEG would be useful if the patient also experienced seizures, but it is not routinely indicated. A PET scan is not appropriate in the evaluation for dementia. Cerebrospinal fluid (CSF) testing is indicated for patients with rapidly progressive symptoms of dementia. Testing for infection and prior disease can be accomplished through CSF analysis.

Ref: Falk N, Cole A, Meredith TJ: Evaluation of suspected dementia. *Am Fam Physician* 2018;97(6):398-405.

### Item 160

**ANSWER: B**

Pulmonary embolus is reliably diagnosed with CT pulmonary angiography (CTA), but there is now a simple diagnostic algorithm to reduce the reliance on CTA. The simplified recommendations for ordering CTA are a D-dimer  $\geq 1000$  ng/mL, or a D-dimer that is  $> 500$  ng/mL and hemoptysis, signs of deep vein thrombosis, or a suspicion that pulmonary embolism is the most likely diagnosis.

A BNP level would be useful in detecting heart failure, and an EKG would be more helpful if ischemic heart disease were suspected. Pulmonary arteriography is invasive and carries a higher risk. A ventilation-perfusion scan has less risk but is not as accurate.

Ref: van der Hulle T, Cheung WY, Kooij S, et al: Simplified diagnostic management of suspected pulmonary embolism (the YEARS study): A prospective, multicentre, cohort study. *Lancet* 2017;390(10091):289-297. 2) Slattengren AH, Prasad S, Bury C, et al: PURL: A better approach to the diagnosis of PE. *J Fam Pract* 2019;68(6):286, 287, 295.

### Item 161

**ANSWER: D**

Adults who are diagnosed as either prefrail or frail should be considered for a multicomponent physical activity program. This strategy is graded as a strong recommendation with moderate certainty of evidence by the International Conference on Frailty and Sarcopenia Research (ICFSR).

Frailty is an important geriatric syndrome representing a state of increased vulnerability to adverse health outcomes. Current assessment criteria divide patients into not-frail, prefrail (at risk of frailty), and frail. It is important for clinicians to understand that this is not simply the aging process. It is a dynamic process in which a patient can transition between levels, worsening, improving, or maintaining the current state.

Nutritional or protein supplementation may be considered in conjunction with the physical activity program. This is a conditional grade recommendation with a low certainty of evidence according to the ICFSR. Vitamin D supplementation in the absence of a documented deficiency, hormone therapy, and cognitive-behavioral or problem-solving therapy are not recommended for frailty by the ICFSR.

Ref: Allison R 2nd, Assadzandi S, Adelman M: Frailty: Evaluation and management. *Am Fam Physician* 2021;103(4):219-226.

### Item 162

**ANSWER: D**

The likely etiology of this patient's lesion is neuropathy, most likely due to poorly controlled diabetes mellitus. Peripheral neuropathy can predispose patients to abnormal gait patterns and/or unrecognized trauma. These deep ulcers usually present over a bony prominence and are surrounded by a callus (SOR A).

Ulcers of arterial origin are due to tissue ischemia and are most typically deep but on the anterior leg, distal dorsal foot, and toes, and have a dry, fibrous base with poor granulation tissue. Tendons can be exposed. Venous ulcers are due to venous hypertension and chronic venous insufficiency. These ulcers are shallow and exudative with good granulation tissue in the base. Common locations are over bony prominences such as the medial malleolus. Infectious lesions would typically have erythema and extensive exudation. Pressure ulcers occur on areas of high pressure in patients with limited mobility, especially on the sacrum, heels, and hips.

Ref: Bonkemeyer Millan S, Gan R, Townsend PE: Venous ulcers: Diagnosis and treatment. *Am Fam Physician* 2019;100(5):298-305.

### **Item 163**

**ANSWER: D**

The risk of diabetic retinopathy progression can be modified by good glycemic control, maintaining a hemoglobin A<sub>1c</sub> <7%, maintaining a blood pressure <140/90 mm Hg, and undergoing periodic eye examinations. Corticosteroid eye drops are not appropriate to reduce the risk of diabetic retinopathy. ACE inhibitors are used to help prevent nephropathy. Aspirin therapy and lipid management have no effect on the progression of diabetic retinopathy.

Ref: Farford B: Diabetic retinopathy: The FP's role in preserving vision. *J Fam Pract* 2020;69(3):120-126.

### **Item 164**

**ANSWER: B**

Patellar tendinopathy may persist for years and may be refractory to treatment. Eccentric quadriceps-strengthening exercises have the best evidence for long-term improvement of the condition. NSAIDs provide only temporary pain relief and do not improve the condition. Corticosteroid injections may predispose tendons in weight-bearing joints such as the patellar tendon to rupturing, so they should be used sparingly for short-term pain relief only. Injection of the tendon with sclerosing agents may also provide pain relief but there is no high-quality evidence of long-term effectiveness in improving this condition. Surgical treatment combined with rehabilitation was found in one study to be inferior to eccentric exercises alone.

Ref: Arnold MJ, Moody AL: Common running injuries: Evaluation and management. *Am Fam Physician* 2018;97(8):510-516.

### **Item 165**

**ANSWER: A**

Risk factors for diverticulitis include low dietary fiber, a sedentary lifestyle, obesity, and smoking. Avoidance of nuts, seeds, and corn has not been shown to decrease risk for diverticular disease, including diverticulitis. While treatment of the initial episode with broad-spectrum antibiotics, early CT imaging to detect complications, and colonoscopy 4–6 weeks after the resolution of the episode may be appropriate depending on the circumstances, they do not reduce recurrence rates.



Ref: Wilkins T, Embry K, George R: Diagnosis and management of acute diverticulitis. *Am Fam Physician* 2013;87(9):612-620.  
2) Swanson SM, Strate LL: In the clinic: Acute colonic diverticulitis. *Ann Intern Med* 2018;168(9):ITC65-ITC-80.

### Item 166

**ANSWER: E**

Takotsubo syndrome (acute stress-induced cardiomyopathy) is characterized by transient wall motion abnormalities on echocardiography, usually following an emotionally triggering event. Although coronary artery disease may be present, and the two diagnoses may be seen together, the International Takotsubo Registry reports coronary artery disease in only about 15%, so coronary angiography is more likely to be normal than the other listed diagnostic tests. Cardiac biomarkers such as CK-MB and troponin are usually elevated, but to a lesser degree than with an acute myocardial infarction. An abnormal EKG is found in >95% of patients with Takotsubo syndrome.

Ref: Rodríguez M, Rzechorzek W, Herzog E, Lüscher TF: Misconceptions and facts about Takotsubo syndrome. *Am J Med* 2019;132(1):25-31.

### Item 167

**ANSWER: E**

The U.S. Preventive Services Task Force currently recommends that all asymptomatic adults, including pregnant women, between the ages of 18 and 79 without known liver disease should be screened for hepatitis C virus (B recommendation). Others at high risk, including anyone with past or current injection drug use, should also be screened for hepatitis C virus. The prior recommendation was to screen adults born between 1945 and 1965, as well as any other persons at high risk.

Ref: *Final Recommendation Statement: Hepatitis C Virus Infection in Adolescents and Adults: Screening*. US Preventive Services Task Force, 2020.

### Item 168

**ANSWER: B**

This patient is at risk for aspiration pneumonia due to his neurologic disease and impaired cough reflex. A swallow evaluation is appropriate. A mechanical soft diet with thickened liquids is recommended rather than pureed foods and thin liquids. Addressing oral hygiene has shown no clear benefit, and the use of chlorhexidine mouthwashes is controversial due to the risk of toxicity if aspirated. The effect of swallowing exercises requires more study at this time. Prophylactic antibiotic therapy can be considered in comatose patients following emergency intubation but is not appropriate in this scenario. Antibiotic therapy is appropriate for signs and symptoms of aspiration pneumonia with or without chest radiograph findings and depending on illness severity. The effect of nasogastric tube placement in preventing aspiration is unclear.

Ref: Mandell LA, Niederman MS: Aspiration pneumonia. *N Engl J Med* 2019;380(7):651-663.

**Item 169**

**ANSWER: C**

Iron deficiency anemia is the most common cause of koilonychia, which is also known as spoon nail because it appears as a central depression in the nail that curves outward away from the nailbed, giving the nail the appearance of a spoon. If iron deficiency anemia is the cause of koilonychia, the nail will return to a normal appearance when the anemia is corrected. Chronic pulmonary disease is associated with clubbing of the nails. Hyperthyroidism can result in onycholysis and brown discoloration of the nail plate. Onychomycosis causes onycholysis, hyperkeratosis, and yellow streaks. Psoriasis typically causes pitted nails, although patients can also have some hyperkeratosis and onycholysis.

Ref: Fawcett RS, Linford S, Stulberg DL: Nail abnormalities: Clues to systemic disease. *Am Fam Physician* 2004;69(6):1417-1424. 2) Danoff R, Todd J: Digital clues. *Am Fam Physician* 2018;97(7):465-466.

**Item 170**

**ANSWER: D**

Pharmacologic treatment should be initiated in patients with gestational diabetes mellitus (GDM) when nutrition and exercise therapy are not adequate to meet goals. Accepted goals are fasting blood glucose levels <95 mg/dL, 1-hour postprandial glucose levels <140 mg/dL, and 2-hour glucose levels <120 mg/dL. Although oral antidiabetic medications are being used more frequently in GDM, insulin is the preferred treatment recommended by the American Diabetes Association and the American College of Obstetricians and Gynecologists. Oral medication may be initiated in patients who refuse insulin or are unable to comply with insulin management. This recommendation is made predominantly because metformin has not shown superiority and there is a lack of long-term outcome studies in the offspring exposed to metformin. Glyburide has not shown outcomes equivalent to those of metformin or insulin.

Ref: ACOG Practice Bulletin No. 190: Gestational diabetes mellitus. *Obstet Gynecol* 2018;131(2):e49-e64. 2) American Diabetes Association: 14. Management of diabetes in pregnancy: *Standards of Medical Care in Diabetes-2021 Diabetes Care* 2021;44(Suppl 1):S200-S210.

**Item 171**

**ANSWER: B**

This patient presents with trigger finger, which has a lifetime prevalence of 2%–3% in the adult population, with higher prevalence rates in patients with diabetes mellitus. There are several options for conservative treatment that are appropriate prior to consideration of surgical release. Splinting, which is a first-line treatment, has been shown to be effective. Single-joint orthoses at either the metacarpophalangeal or the proximal interphalangeal joint can be effective (SOR B). The duration of splinting can range from 6 weeks to 3 months.

A retrospective case series analysis of trigger finger managed by observation only found that trigger finger resolved spontaneously in 52% of patients, with the majority resolving within 1 year. Corticosteroid injections are generally effective but efficacy depends on the severity of the condition and on the number of fingers involved. They are more effective than NSAID injections (SOR B). Surgical release is considered the most effective treatment but not the most cost-effective. A series of three corticosteroid injections could result in savings of up to \$72,000 in one study.

Ref: David M, Rangaraju M, Raine A: Acquired triggering of the fingers and thumb in adults. *BMJ* 2017;359:j5285. 2) Gil JA, Hresko AM, Weiss AC: Current concepts in the management of trigger finger in adults. *J Am Acad Orthop Surg* 2020;28(15):e642-e650.

### Item 172

**ANSWER: D**

Several medications can be secondary causes of hypertriglyceridemia, including  $\beta$ -blockers, with the exception of carvedilol. Others include oral estrogens, glucocorticoids, bile acid sequestrants, protease inhibitors, retinoic acid, anabolic steroids, sirolimus, raloxifene, tamoxifen, and thiazides. Calcium channel blockers, ACE inhibitors, and angiotensin receptor blockers are not associated with hypertriglyceridemia.

Ref: Grundy SM, Stone NJ, Bailey AL, et al: 2018 AHA/ACC/AACVPR/AAPA/ABC/ACPM/ADA/AGS/APhA/ASPC/NLA/PCNA guideline on the management of blood cholesterol: A report of the American College of Cardiology/American Heart Association Task Force on clinical practice guidelines. *Circulation* 2019;139(25):e1082-e1143. 2) Oh RC, Trivette ET, Westerfield KL: Management of hypertriglyceridemia: Common questions and answers. *Am Fam Physician* 2020;102(6):347-354.

### Item 173

**ANSWER: A**

Based on the Westley Croup Score, this patient has mild croup. Corticosteroids should be used in the treatment of croup regardless of the degree of severity. Dexamethasone is preferred because it can be given in a single dose and administered either orally, parentally, or intravenously. Heliox is a helium and oxygen mixture that theoretically decreases airflow resistance but there is no clear evidence to support its use at this time. Humidified air inhalation has not been shown to have a clinical benefit in terms of croup scores or hospital admissions. Nebulized epinephrine should be reserved for patients with moderate to severe croup. Oxygen should be administered if there are signs of hypoxemia or severe respiratory distress.

Ref: Johnson DW: Croup. *BMJ Clin Evid* 2014;2014:0321. 2) Smith DK, McDermott AJ, Sullivan JF: Croup: Diagnosis and management. *Am Fam Physician* 2018;97(9):575-580.

**Item 174****ANSWER: E**

Posttraumatic stress disorder (PTSD) is regularly seen in primary care practices, with estimated incidences of 8%–20% in the general population. Expert guidelines recommend screening adults at risk of PTSD, such as this patient who was exposed to a traumatic event, with standardized screening tools and then using a structured interview tool if the screen is positive. Once the diagnosis is established, individual trauma-focused psychotherapy is the intervention that demonstrates the most significant benefit. Pharmacotherapy may be used if psychotherapy is not effective or available. Recommended options include fluoxetine, paroxetine, venlafaxine, or sertraline. Benzodiazepines and escitalopram are not recommended in the treatment of PTSD. Dialectical behavioral therapy is used in the treatment of borderline personality disorder.

Ref: Saguil A: Psychological and pharmacologic treatments for adults with PTSD. *Am Fam Physician* 2019;99(9):577-583.

**Item 175****ANSWER: A**

The defined age at which a woman loses natural fertility is not known. The median age for menopause in the United States is approximately 51 years of age, but it can normally occur anytime between 40 and 60 years of age. The American College of Obstetricians and Gynecologists and the North American Menopause Society both currently recommend that women continue contraceptive use until menopause or age 50–55 years. For women on hormonal contraception no current laboratory test can confirm the menopausal state. Natural pregnancy is uncommon for women over 44 years of age, but the risks associated with pregnancy beyond that age may exceed the risks associated with use of combined oral contraceptives (COCs) in women who do not have certain chronic conditions. For this group, increased risks for developing breast cancer in women over 40 years of age and stroke for women over 45 years of age who continue to use COCs has been shown to be nonsignificant in recent studies (level of evidence 2). It is not clear that the increased risk for myocardial infarction or thromboembolism associated with the use of COCs is any higher above baseline for women over the age of 45 years than for younger women.

Ref: Curtis KM, Jatlaoui TC, Tepper NK, et al: US selected practice recommendations for contraceptive use, 2016. *MMWR Recomm Rep* 2016;65(4):1-66.

**Item 176****ANSWER: C**

The diagnosis of systemic lupus erythematosus (SLE) can be difficult and is often not established for months or even years, due to the significant overlap of symptoms with many other conditions. The American College of Rheumatology has established 11 diagnostic criteria, at least 4 of which must be met over time, to establish a diagnosis of SLE. The vast majority (>95%) of patients with SLE have a positive antinuclear antibody (ANA) test, thus it is sensitive as an initial test in a patient for whom there is clinical suspicion for SLE. However, testing for other immunologic subgroup ANA markers should be performed in a patient with a positive ANA. If one or more of those are positive, then the likelihood of SLE is higher. The majority of patients with a positive ANA do not have SLE but a negative ANA is very unlikely in a patient who has SLE.

The typical malar rash of SLE is one of the 11 clinical criteria but is only present in approximately 30% of patients with SLE. Up to 80% of patients may have some form of cutaneous involvement over the course of the disease but hair loss is not specifically a feature of SLE. Other potentially helpful but nonspecific findings in SLE include proteinuria and RBC cellular casts, both of which are indicators of nephritis, but their absence does not rule it out. The subgroup markers (anti-dsDNA, anti-SmDNA, complement C3, C4, CH50) should only be obtained in patients suspected of having SLE who have a positive ANA. Myalgias or arthralgias and synovitis in two or more joints (not limited to large or small joints) is another one of the clinical diagnostic criteria.

Ref: Lam NC, Ghetu MV, Bieniek ML: Systemic lupus erythematosus: Primary care approach to diagnosis and management. *Am Fam Physician* 2016;94(4):284-294.

**Item 177****ANSWER: A**

Despite a lack of consensus between major health care organizations on the benefit of screening for scoliosis, more than half of states require or recommend school-based screening programs. Adolescent idiopathic scoliosis is generally defined as a lateral curvature of the spine or Cobb angle  $\geq 10^\circ$ . Cases with a Cobb angle  $< 20^\circ$  can generally be managed with observation. In this asymptomatic patient there would be no reason to suspend sports participation. Moreover, suspension of sports activity may worsen or contribute to psychological distress experienced by those with this disorder. In a U.S. Preventive Services Task Force evidence report and systematic review, bracing did decrease progression of the Cobb angle but it did not improve patient-oriented outcomes and did have associated harms. Physical therapy does not have consistent evidence of benefit. Therefore, bracing and physical therapy should be reserved for more severe cases. Surgical evaluation is reserved for severe cases or those with a Cobb angle  $\geq 40^\circ$ .

Ref: *Final Recommendation Statement: Adolescent Idiopathic Scoliosis: Screening*. US Preventive Services Task Force, 2018. 2) Dunn J, Henrikson NB, Morrison CC, et al: Screening for adolescent idiopathic scoliosis: Evidence report and systematic review for the US Preventive Services Task Force. *JAMA* 2018;319(2):173-187. 3) Kuznia AL, Hernandez AK, Lee LU: Adolescent idiopathic scoliosis: Common questions and answers. *Am Fam Physician* 2020;101(1):19-23.

### Item 178

**ANSWER: D**

Using trained, qualified interpreters for patients with limited English proficiency leads to fewer hospitalizations, less reliance on testing, a higher likelihood of making the correct diagnosis and providing appropriate treatment, and better patient understanding of conditions and therapies. Title VI of the Civil Rights Act requires offering interpreter services for all patients with limited English proficiency. Although the patient may request that a family member or an office staff member interpret, there are many difficulties in using untrained interpreters, including a lack of understanding of medical terminology, concerns about confidentiality, and unconscious editing by the interpreter regarding what the patient has said. Additionally, the patient may be reluctant to divulge sensitive or potentially embarrassing information to a friend or family member. When using a trained medical interpreter, the physician should speak directly to the patient using short sentences and a normal tone of voice.

Ref: Juckett G, Unger K: Appropriate use of medical interpreters. *Am Fam Physician* 2014;90(7):476-480. 2) Jacobs B, Ryan AM, Henrichs KS, Weiss BD: Medical interpreters in outpatient practice. *Ann Fam Med* 2018;16(1):70-76.

### Item 179

**ANSWER: D**

This patient has nonalcoholic fatty liver disease (NAFLD) based on his elevated liver enzymes and ultrasonography of his liver. Obesity is a risk factor for NAFLD, and the primary treatment of NAFLD is weight loss with diet and exercise. Biguanides are not a treatment option for NAFLD as trials have shown that metformin does not improve liver histology in NAFLD. GLP-1 analogues, thiazolidinediones, vitamin E supplementation, and bariatric surgery are helpful for some patients but do not have enough evidence to support their use as primary treatment options.

Ref: Westfall EC, Jeske R, Bader AR: Nonalcoholic fatty liver disease: Common questions and answers on diagnosis and management. *Am Fam Physician* 2020;105(9):603-612.

### Item 180

**ANSWER: B**

Antiviral medications are recommended for the treatment of influenza only within 48 hours of symptom onset (SOR A). However, in high-risk patient populations and in severe cases of disease, antivirals should be provided regardless of the duration of symptoms (SOR B). According to the CDC, oseltamivir remains the drug of choice for the treatment of influenza during pregnancy because it has good safety data. Baloxavir marboxil is indicated for patients > 12 years of age but should be avoided during pregnancy. There is less safety data for peramivir and zanamivir.

Ref: Cayley WE Jr: Vaccines for preventing influenza in healthy children, healthy adults, and older adults. *Am Fam Physician* 2019;100(3):143-146. 2) Armstrong C: Influenza vaccination: Updated recommendations from ACIP. *Am Fam Physician* 2019;100(8):505-507. 3) Gaitonde DY, Moore FC, Morgan MK: Influenza: Diagnosis and treatment. *Am Fam Physician* 2019;100(12):751-758. 4) Erlich DR: Baloxavir marboxil (Xofluza) for influenza. *Am Fam Physician* 2019;100(12):776-777. 5) Influenza (flu): Recommendations for obstetric health care providers related to use of antiviral medications in the treatment and prevention of influenza. Centers for Disease Control and Prevention, reviewed 2020.

**Item 181****ANSWER: A**

The U.S. Preventive Services Task Force recently concluded that there is insufficient evidence to assess the risk-benefit ratio of screening asymptomatic adults for cardiovascular disease risk by checking an ankle-brachial index, a high-sensitivity C-reactive protein level, or a coronary artery calcium score. The PLAC test is used to measure lipoprotein-associated phospholipase A<sub>2</sub> (Lp-PLA<sub>2</sub>), an enzyme that breaks down oxidized LDL in the vascular wall. High levels of Lp-PLA<sub>2</sub> are thought to promote atherosclerotic plaque formation. Analysis of studies concluded that Lp-PLA<sub>2</sub> activity does not add significant information to the standard evaluation of cardiovascular risk.

Ref: Risk assessment for cardiovascular disease with nontraditional risk factors: Recommendation statement. *Am Fam Physician* 2019;99(2):online. 2) Mills J, Thomas A: Risk assessment for cardiovascular disease with nontraditional risk factors. *Am Fam Physician* 2019;99(2):123-124. 3) Chang JG: PLAC test for Lp-PLA<sub>2</sub> activity to predict coronary heart disease. *Am Fam Physician* 2020;101(1):44-46.

**Item 182****ANSWER: E**

This patient has diabetic kidney disease and hypertension. He is unable to tolerate ACE inhibitors, so he should begin taking an angiotensin receptor blocker (ARB). Of the options listed, olmesartan is the only ARB.

Ref: McGrath K, Edi R: Diabetic kidney disease: Diagnosis, treatment, and prevention. *Am Fam Physician* 2019;99(12):751-759.

**Item 183****ANSWER: E**

Varenicline, an  $\alpha_4\text{-}\beta_2$  nicotinic receptor partial agonist, works to reduce nicotine withdrawal by activating the nicotine receptor and producing about 50% of the effect of nicotine. It also prevents tobacco smoke nicotine from binding to the receptor. Acamprosate is a gamma-aminobutyric acid (GABA) agonist and glutamate antagonist that is effective for the treatment of alcohol use disorder. Bupropion is a norepinephrine-dopamine reuptake inhibitor that reduces nicotine withdrawal and the reward from tobacco smoking. Clonidine is an  $\alpha_2$ -adrenergic agonist, and it has been shown to assist with smoking cessation but is not FDA approved for this purpose. Naltrexone is a pure opioid receptor antagonist that is effective for the treatment of alcohol use disorder and opioid use disorder.

Ref: Barua RS, Rigotti NA, Benowitz NL, et al: 2018 ACC expert consensus decision pathway on tobacco cessation treatment: A report of the American College of Cardiology Task Force on Clinical Expert Consensus Documents. *J Am Coll Cardiol* 2018;72(25):3332-3365.

**Item 184****ANSWER: D**

According to the International Classification of Headache Disorders, this patient meets criteria for the diagnosis of migraine without aura. Many medications have been studied for the prevention of migraine. Divalproex, topiramate, metoprolol, propranolol, and timolol have been shown to be effective for migraine prevention by consistent, good-quality evidence. One of these medications should be offered as first-line treatment. Studies of fluoxetine have demonstrated inconsistent results. Gabapentin has been evaluated in six randomized, controlled trials with mixed results. Three studies have been conducted with ACE inhibitors and angiotensin receptor blockers for migraine prevention, with just one study showing some benefit. Verapamil has previously been considered effective, but on reevaluation of previous studies, the supporting data for verapamil is insufficient to prove efficacy.

Ref: Ha H, Gonzalez A: Migraine headache prophylaxis. *Am Fam Physician* 2019;99(1):17-24.

**Item 185****ANSWER: B**

In order to prevent contrast-induced nephropathy, NSAIDs such as naproxen should be withheld for 24–48 hours prior to a procedure involving venous or arterial administration of radiocontrast material. Avoidance of volume depletion and other nephrotoxic agents is also recommended. Aspirin in low doses (up to 325 mg) does not impact renal function and therefore does not play a role in the development of contrast-induced nephropathy. Administration of acetylcysteine or mannitol has not been shown to reduce the incidence of contrast-induced nephropathy. Pre- and postprocedural hydration with normal saline is recommended in patients at high risk for developing contrast-induced nephropathy, such as those with underlying chronic kidney disease, heart failure, proteinuria, sepsis, hypovolemia, or hypotension. Metformin does not cause contrast-induced nephropathy but should be withheld due to the potential, mostly theoretical, risk of developing lactic acidosis, especially if contrast-induced nephropathy were to develop (SOR B).

Ref: Lewington A, MacTier R, Hoefield R, et al: Prevention of contrast induced acute kidney injury (CI-AKI) in adult patients. The Renal Association, 2013. 2) Weisbord SD, Gallagher M, Jneid H, et al: Outcomes after angiography with sodium bicarbonate and acetylcysteine. *N Engl J Med* 2018;378(7):603-614.



**Item 186****ANSWER: D**

This patient has findings consistent with early localized Lyme disease, notably influenza-like symptoms and an erythema migrans (EM) rash with its typical bull's-eye or target-like appearance. It is the most common tickborne disease in the United States, and it is most prevalent in states in the New England, mid-Atlantic, and upper Midwest regions. It is caused by the *Borrelia burgdorferi* bacteria, which is transmitted by the deer tick (*Ixodes scapularis* or *Ixodes pacificus*). Lyme disease can be diagnosed based on clinical criteria for patients in an endemic area who have a possible exposure. Serology is not required to make the diagnosis. The preferred treatment is doxycycline, 100 mg twice daily for 14 days, with alternatives available for children and pregnant women. Anaplasmosis, babesiosis, ehrlichiosis, and tularemia all may be spread by ticks and cause an influenza-like illness, but none of these conditions cause EM.

Ref: Pace EJ, O'Reilly M: Tickborne diseases: Diagnosis and management. *Am Fam Physician* 2020;101(9):530-540.

**Item 187****ANSWER: C**

Alendronate decreases the risk of osteoporosis-related hip and vertebral fractures in postmenopausal women. The risk for atypical subtrochanteric fractures increases significantly with duration of treatment. The American College of Physicians evidence-based guideline recommends a maximum treatment duration of 5 years with alendronate. Continuation of treatment beyond 5 years should be reassessed at that point and determined based upon an individualized discussion of risks and benefits.

Ref: Qaseem A, Forcica MA, McLean RM, Denberg TD: Treatment of low bone density or osteoporosis to prevent fractures in men and women: A clinical practice guideline update from the American College of Physicians. *Ann Intern Med* 2017;166(11):818-839. 2) Hauk L: Treatment of low BMD and osteoporosis to prevent fractures: Updated guideline from the ACP. *Am Fam Physician* 2018;97(5):352-353.

**Item 188****ANSWER: D**

This patient has signs and symptoms of pulmonary hypertension. Diagnostic tests, particularly echocardiography, can confirm this diagnosis. It is important to determine the etiology since addressing the underlying condition is the preferred treatment for most cases of non-severe pulmonary hypertension. Left heart disease, including both preserved and reduced systolic function, is the most common cause of pulmonary hypertension, while chronic thromboembolism, COPD, and sleep-disordered breathing are other possible but less common causes. Idiopathic pulmonary arterial hypertension is a rare cause.

Ref: Rich JD, Rich S: Clinical diagnosis of pulmonary hypertension. *Circulation* 2014;130(20):1820-1830. 2) Rakel RE, Rakel DP (eds): *Textbook of Family Medicine*, ed 9. Elsevier Saunders, 2016, p 264.

**Item 189****ANSWER: D**

Acute EKG changes may be noted in the setting of hyperkalemia. These changes should trigger prompt treatment of the electrolyte abnormality, but it should be noted that they are nonspecific in nature and treatment should not be solely based on these findings. EKG changes noted with hyperkalemia include peaked T waves, flattened P waves, PR prolongation, a widened QRS complex, sine waves, sinus bradycardia, ventricular tachycardia, ventricular fibrillation, and asystole. Treatment includes intravenous calcium chloride 10% solution, 10 mL (level of evidence C). Atrial fibrillation, diffuse ST-segment elevation, peaked P waves, and sinus tachycardia would not be expected EKG changes in a patient with hyperkalemia.

Ref: Viera AJ, Wouk N: Potassium disorders: Hypokalemia and hyperkalemia. *Am Fam Physician* 2015;92(6):487-495.

**Item 190****ANSWER: A**

Many systemic drugs have been reported to trigger dry eye, including diuretic agents,  $\beta$ -blockers, other antihypertensive agents such as candesartan, antihistamines, decongestants, medications for Parkinson's disease, antidepressant agents such as amitriptyline, anxiolytic agents, antispasmodic agents, anticonvulsant agents, gastric protection agents, oral contraceptives, and some herbal supplements. Empagliflozin, levothyroxine, liraglutide, and metformin are not associated with dry eye.

Ref: Clayton JA: Dry eye. *N Engl J Med* 2018;378(23):2212-2223.

**Item 191****ANSWER: A**

The threshold for transfusing platelets to prevent spontaneous bleeding in the setting of hypoproliferative thrombocytopenia in most adults is  $<10,000/\mu\text{L}$  (SOR A). A platelet count  $<20,000/\mu\text{L}$  is the threshold for use of elective central venous catheter placement. For elective diagnostic lumbar puncture, major elective non-neuraxial surgery, and interventional procedures, the threshold is a platelet count  $<50,000/\mu\text{L}$ . For neuraxial surgery a threshold  $<100,000/\mu\text{L}$  is recommended.

Ref: Raval JS: Blood product transfusion in adults: Indications, adverse reactions, and modifications. *Am Fam Physician* 2020;102(1):30-38.

### Item 192

**ANSWER: E**

Primary amenorrhea is the lifelong absence of menses. If menarche has not occurred by age 15, or no menses have occurred 3 years after the development of breast buds, an evaluation is recommended. The patient's history should include a review of eating and exercise habits, sexual activity, changes in body weight, perfectionistic tendencies, substance abuse, chronic illness, and timing of breast and pubic hair development. A family history of late growth spurts or late menses may indicate constitutional delay, which manifests as short stature that continues on the same percentile until puberty, when there is a delayed growth spurt to achieve normal height.

A physical examination should note trends in height, weight, and BMI. An evaluation should be performed to look for signs of virilization, which would indicate androgen excess found in congenital adrenal hyperplasia, polycystic ovary syndrome, Cushing syndrome, or adrenal tumors.

Laboratory testing is usually initiated with a pregnancy test and prolactin, LH, FSH, and TSH levels. Primary ovarian insufficiency is associated with low estradiol levels and high levels of LH and FSH. Generally, the LH/FSH ratio is  $< 1$ . Patients with congenital adrenal hyperplasia will have low estrogen, LH, and FSH levels. Virilization is generally noted in congenital adrenal hyperplasia, and a 17-hydroxyprogesterone level should be obtained to assess for this condition. Functional hypothalamic amenorrhea will also cause low levels of LH, FSH, and TSH. While polycystic ovary syndrome is associated with low estrogen, LH, and FSH levels, prolactin may be elevated. A pituitary adenoma will cause the prolactin level to be elevated.

Ref: Klein DA, Paradise SL, Reeder RM: Amenorrhea: A systematic approach to diagnosis and management. *Am Fam Physician* 2019;100(1):39-48.

### Item 193

**ANSWER: B**

This patient presents with dyspepsia but does not have any alarm symptoms such as weight loss, blood in the stools, or difficulty swallowing. An important cause of dyspepsia is gastric infection with *Helicobacter pylori*. In patients younger than 55 years of age with no alarm symptoms, a test-and-treat strategy is effective and safe, with esophagogastroduodenoscopy reserved for patients not meeting these criteria (SOR A). Lifestyle interventions and proton pump inhibitor therapy are more effective for GERD. A barium swallow would not be appropriate for this patient at this time.

Ref: Fashner J, Gitu AC: Diagnosis and treatment of peptic ulcer disease and *H. pylori* infection. *Am Fam Physician* 2015;91(4):236-242. 2) Randel A: *H. pylori* infection: ACG updates treatment recommendations. *Am Fam Physician* 2018;97(2):135-137. 3) Mounsey A, Barzin A, Rietz A: Functional dyspepsia: Evaluation and management. *Am Fam Physician* 2020;101(2):84-88.

**Item 194****ANSWER: E**

Megestrol increases the risk of venous thromboembolic events in patients with cancer who are receiving chemotherapy (SOR C). Megestrol can also cause adrenal suppression, diabetes mellitus, and cardiomyopathy, and it is associated with alopecia, hyperglycemia, decreased libido, and sexual dysfunction. Megestrol is not associated with hirsutism, hypoglycemia, improved libido, or thrombocytopenia.

Ref: Wong M, Sisay M, Neher JO, Safranek S: Megestrol for palliative care in patients with cancer. *Am Fam Physician* 2020;101(9):online. 2) Megestrol acetate: Drug summary. Prescribers' Digital Reference website.

**Item 195****ANSWER: C**

Inhaling airborne spores of the fungus *Coccidioides immitis* or *Coccidioides posadasii* causes primary pulmonary coccidioidomycosis (valley fever). Traveling to or residing in areas endemic for *Coccidioides* is required for the diagnosis, since no zoonotic contagion or person-to-person contagion occurs. *Coccidioides* has been identified as the cause of 17%–29% of all cases of community-acquired pneumonia in endemic areas. This patient traveled to an endemic area and engaged in dusty outdoor activities, which puts him at a higher risk for infection, and he presents with common symptoms of primary pulmonary coccidioidomycosis. A chest radiograph often appears normal on the initial evaluation. Eosinophilia should raise suspicion for coccidioidomycosis but laboratory detection of *Coccidioides* is required for a definitive diagnosis. In symptomatic patients who have a clinically significant disease or an elevated risk of dissemination, antifungals are recommended for treatment. Although *Aspergillus*, *Blastomyces*, *Cryptococcus*, and *Histoplasma* may cause similar symptoms, the test findings and travel history make *Coccidioides* the most likely pathogen in this case.

Ref: Herrick KR, Trondle ME, Febles TT: Coccidioidomycosis (valley fever) in primary care. *Am Fam Physician* 2020;101(4):221-228.

**Item 196****ANSWER: D**

The FDA has issued a safety communication about combining benzodiazepines with either opioids or cough medications. The FDA expressed its strongest warning due to the risk of central nervous system (CNS) depression and respiratory depression. Also, the 2016 CDC guideline for prescribing opioids for chronic pain recommended specifically that clinicians should avoid prescribing opioid pain medication and benzodiazepines concurrently whenever possible.

While caution should be exercised with all medication combinations, there has not been a specific FDA warning about the risks of combining opioids with amitriptyline, bupropion, escitalopram, or trazodone. Antipsychotics, barbiturates, benzodiazepines, hypnotics, muscle relaxants, and opioid analgesics are associated with an increased risk of CNS depression.

Ref: Dowell D, Haegerich TM, Chou R: CDC guideline for prescribing opioids for chronic pain—United States, 2016. *JAMA* 2016;315(15):1624-1645. 2) FDA requires strong warnings for opioid analgesics, prescription opioid cough products, and benzodiazepine labeling related to serious risks and death from combined use. FDA News Release, 2016. 3) Carpenter M, Berry H, Pelletier AL: Clinically relevant drug-drug interactions in primary care. *Am Fam Physician* 2019;99(9):558-564.

### Item 197

**ANSWER: C**

Apophysitis is a traction injury at the bony site of the tendon attachment. It most often occurs in children or adolescents who are rapidly growing. Rapid growth results in bone lengthening, which occurs more rapidly than lengthening of the associated muscle and tendons. Osgood-Schlatter disease is one type of apophysitis affecting the patellar tendon attachment at the proximal tibia. Anterior cruciate ligament tears will present with joint laxity and meniscal tears with joint line tenderness. Anterior cruciate ligament and medial meniscus tears are usually associated with trauma, especially in younger patients. A patellar sleeve fracture results from a similar type of apophysitis (Larsen-Johansson disease), which affects the patellar tendon attachment at the lower pole of the patella. It most often occurs in athletic children between the ages of 10 and 12. Patellofemoral pain syndrome may present with a similar history, but the pain is generally felt under the patella and localized tenderness over the tibial tuberosity is not present.

Ref: Achar S, Yamanaka J: Apophysitis and osteochondrosis: Common causes of pain in growing bones. *Am Fam Physician* 2019;99(10):610-618.

### Item 198

**ANSWER: B**

The only vaccine indicated for this patient would be the HPV vaccine, which the CDC recommends as a routine vaccination for all patients starting at 11 or 12 years of age through 26 years of age but can also be considered in adults 27–45 years of age who have not previously received the vaccine and are most likely to benefit. Routine vaccination for hepatitis A is recommended only for patients who are at high risk of hepatitis A infection, but that is not the case with this patient. Meningococcal polysaccharide conjugate vaccine is not routinely recommended for patients  $\geq 24$  years of age. The CDC recommends pneumococcal polysaccharide vaccine (PPSV23) for all adults  $\geq 65$  years of age, but also for those  $\geq 2$  years of age at high risk of disease, including patients who smoke. However, this patient does not have any high-risk conditions and is not a smoker, so PPSV23 would not be appropriate. The recombinant zoster vaccine is approved for adults  $\geq 50$  years of age.

Ref: Vaughn JA, Miller RA: Update on immunizations in adults. *Am Fam Physician* 2011;84(9):1015-1020. 2) Table 1. Recommended adult immunization schedule for ages 19 years or older, United States, 2021. Centers for Disease Control and Prevention, reviewed 2021.

### Item 199

**ANSWER: D**

According to the JNC 8 panel, the goal for treatment of hypertension in a patient < 60 years of age should be a blood pressure < 140/90 mm Hg. This patient has had multiple blood pressure readings higher than the threshold, which warrants treatment. Appropriate initial treatment of hypertension should include a thiazide-type diuretic, calcium channel blocker, ACE inhibitor, or angiotensin receptor blocker. A  $\beta$ -blocker such as carvedilol, a diuretic such as furosemide, a vasodilator such as hydralazine, or an aldosterone receptor antagonist such as spironolactone would not be an appropriate first-line treatment of hypertension in this patient.

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 200

**ANSWER: A**

Hirsutism affects 5%–15% of women and can adversely affect quality of life. It is caused by increased androgen production. Most cases are caused by benign conditions. Polycystic ovary syndrome (PCOS) accounts for 70% of cases with another 25% attributable to idiopathic hyperandrogenism and idiopathic hirsutism. First-line therapy for hirsutism in women who do not desire pregnancy and for whom cosmetic treatments are not effective is combined oral contraceptives (SOR B), which decrease androgen production in the ovaries by decreasing LH levels.

Flutamide is an antiandrogen treatment that has been found to be effective but should be avoided due to potential hepatotoxicity. Leuprolide can be used in patients who do not respond to combined oral contraceptives and antiandrogen treatments. However, there are serious side effects with its use, including bone loss and hypoestrogenism. Metformin is not effective for the treatment of hirsutism (SOR B). While this patient likely has PCOS, the anti-insulin medications will not affect excess hair growth. Antiandrogen treatments such as spironolactone and finasteride are second-line therapies that can be added to the combined oral contraceptives if there is no improvement after the first 6 months (SOR A).

Ref: van Zuuren EJ, Fedorowicz Z: Interventions for hirsutism excluding laser and photoepilation therapy alone: Abridged Cochrane systematic review including GRADE assessments. *Br J Dermatol* 2016;175(1):45-61. 2) Matheson E, Bain J: Hirsutism in women. *Am Fam Physician* 2019;100(3):168-175.