American Board of Family Medicine

IN-TRAINING EXAMINATION

1. A 45-year-old female presents to the emergency department with a 1-week history of facial swelling and progressive dyspnea with exertion. She was diagnosed 1 week ago with non-Hodgkin lymphoma but her medical history is otherwise unremarkable. A chest radiograph is shown below.

After hospital admission, which one of the following would be the most appropriate urgent next step in the management of this condition?

A) Intravenous antibiotics
B) Echocardiography
C) Plasmapheresis
D) Bronchoscopy
E) Radiation

2. A 22-year-old male presents for follow-up of moderate persistent asthma. After discussing his treatment options, you decide to use a single maintenance and reliever therapy (SMART) approach.

Which one of the following daily inhaled therapies is appropriate to prescribe in this setting?

A) Budesonide (Pulmicort)
B) Budesonide/formoterol (Symbicort)
C) Fluticasone/salmeterol (Advair Diskus)
D) Fluticasone/vilanterol (Breo Ellipta)
E) Tiotropium/olodaterol (Stiolto Respimat)

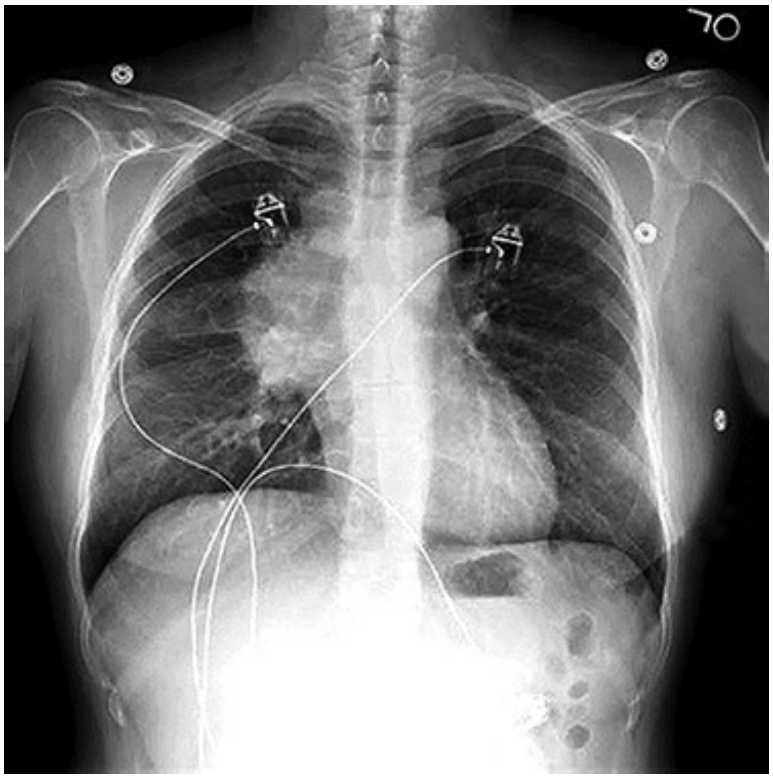
3. Which one of the following is an indication for long-term, rather than short-term, proton pump inhibitor therapy?

A) The eradication of *Helicobacter pylori*
B) Gastroprotection in users of high-dose NSAIDs at high risk for gastrointestinal bleeding
C) The prevention of rebleeding from a Mallory-Weiss tear
D) The prevention of ulcers after band ligation of esophageal varices
E) The treatment of an NSAID-related gastric ulcer

4. An 85-year-old male presents for an annual Medicare examination. His wife tells you that he has been repeating himself in conversations, buying the same item multiple times, and taking longer to complete routine tasks such as balancing the checkbook. He recalls 1 out of 3 items on the Mini-Cognitive Assessment Instrument (Mini-Cog) and is unable to draw a clock. A depression screening is negative.

Which one of the following is the greatest risk factor for this patient's condition?

A) Advanced age
B) Atrial fibrillation
C) Diabetes mellitus
D) A history of head trauma
E) Smoking



Item #1

5. Which one of the following would be the most appropriate initial pharmacotherapy for a temporomandibular disorder in an otherwise healthy 54-year-old male?

A) Amitriptyline, 25 mg at bedtime
B) Gabapentin (Neurontin), 300 mg daily
C) Naproxen, 500 mg twice daily
D) Tramadol, 50 mg every 6 hours
E) Corticosteroid injection into the temporomandibular joint

6. A 33-year-old female presents to your office concerned about feeling fatigued for the past few months. She says that she feels cold often, has intermittent joint discomfort, and has gained 5 lb. She has not experienced any pain or problems swallowing. She gave birth to her youngest child almost 3 years ago, and she recently started an oral contraceptive. She has not had any recent illnesses. Her family history is significant for rheumatoid arthritis.

A physical examination reveals a mild goiter but is otherwise unremarkable. Her vital signs are stable. A CBC and comprehensive metabolic panel are normal. A TSH level is 6.48 μU/mL (N 0.4–4.5) and a thyroid peroxidase antibody level is 378 IU/mL (N <34). A free T_4 level is normal.

Which one of the following is the most likely diagnosis for this patient?

A) Drug-induced thyroiditis
B) Hashimoto thyroiditis
C) Postpartum thyroiditis
D) Subacute thyroiditis

7. A first-time mother brings her 12-month-old to your office for a well child check. She and the child's father are both your patients as well. Upon routine screening for anemia, you discover the infant has microcytic anemia with elevated red cell distribution width. You ask the parent about the child's diet. She looks down at the floor, exhibiting poor eye contact and a flat affect, and responds that she does not shop or cook often. She says the child is happy when eating just applesauce and milk. The mother reports that she has been unmotivated and crying frequently.

In addition to checking the child's lead level and starting iron supplementation, which one of the following would be the most important next step to help this dyad?

A) Providing reassurance and validation for the mother
B) Educating the mother about nutrition and the importance of iron-rich foods for the child
C) Notifying the child's father
D) Evaluating and treating the mother for postpartum depression
E) Referring the mother to a psychiatrist

8. A 52-year-old male presents to your office for a routine annual health maintenance examination. He has a past medical history of hypertension and well-controlled type 2 diabetes with a hemoglobin A_{1c} of 6.6%. He is also a chronic tobacco smoker. He requests screening for testicular cancer because his close friend recently died from the disease. Other than colon cancer in his adoptive father, there is no known family history of cancer.

Which one of the following is indicated for testicular cancer screening for this patient?

A) No screening
B) An α-fetoprotein level
C) Scrotal ultrasonography now
D) Scrotal ultrasonography at age 55
E) CT of the abdomen and pelvis at age 55

9. An 82-year-old female in your palliative care service who has stage 4 breast cancer is experiencing frequent episodes of delirium. Her pain is well controlled on long-acting oral opioid therapy. Additionally, no other reversible causes of delirium are noted. Her delirium is not responding to conservative measures, and her family asks if there are any medications that can effectively manage her symptoms.

Which one of the following should you recommend?

A) Alprazolam (Xanax)
B) Diazepam (Valium)
C) Melatonin
D) Risperidone (Risperdal)

10. A Black female presents with multiple insect bites on her arms and legs. This patient is at risk for developing which one of the following conditions?

A) Acanthosis nigricans
B) Acne keloidalis nuchae
C) Dermatosis papulosa nigra
D) Melasma
E) Postinflammatory hyperpigmentation

11. You are co-managing a 59-year-old female with stage 3b chronic kidney disease (CKD) and secondary hyperparathyroidism resulting in osteoporosis. Due to transportation issues, she has been unable to see her specialist and requests that you take over her laboratory surveillance for CKD–bone mineral disorder.

In addition to serum calcium, parathyroid hormone, vitamin D, and creatinine levels and the estimated glomerular filtration rate, which one of the following laboratory values should be routinely monitored?

A) Calcitonin
B) Magnesium
C) Parathyroid hormone–related peptide
D) Phosphorus
E) TSH

12. A 42-year-old premenopausal female presents to your office with new-onset bilateral nipple discharge for the past 4 weeks. She describes the discharge as green and nonbloody. She has a past medical history of diabetes mellitus, dyslipidemia, hypertension, and depression. Her current medications include the following:

Atorvastatin (Lipitor)
Escitalopram (Lexapro)
Hydrochlorothiazide
Lisinopril (Zestril)
Metformin

Her vital signs are unremarkable. A physical examination is significant for nonbloody green fluid expressed from the nipples. A TSH level, comprehensive metabolic panel, and CBC are all within normal range, and a serum hCG test is negative. A prolactin level is elevated at 85 ng/mL (N $<$30 in nonpregnant premenopausal females).

Which one of her medications is most likely to cause galactorrhea?

A) Atorvastatin
B) Escitalopram
C) Hydrochlorothiazide
D) Lisinopril
E) Metformin

13. A 73-year-old female with a history of obesity, essential hypertension, hyperlipidemia, and well-controlled type 2 diabetes presents to the emergency department (ED) with severe, crushing chest pain. She has a blood pressure of 115/64 mm Hg, a pulse rate of 90 beats/min, a respiratory rate of 15/min, a temperature of 37.2°C (99.0°F), and an oxygen saturation of 95% on room air. A point-of-care troponin level is 1.0 ng/mL (N < 0.04) and an EKG is normal, and you diagnose a non–ST-elevation myocardial infarction.

Which one of the following interventions in the ED has the greatest benefit with regard to decreasing mortality in this patient?

A) Supplemental oxygen
B) Aspirin
C) Metoprolol
D) Morphine
E) Nitroglycerin

14. A 48-year-old male with a history of type 2 diabetes, obesity, and tobacco use disorder presents to your office for evaluation of a 4-day history of fever, malaise, and a productive cough. He smokes a half-pack of cigarettes per day but does not use recreational drugs or drink alcohol in excess. He has no known medication allergies.

Aside from a temperature of 38.2°C (100.8°F) and a BMI of 32 kg/m^2, his vital signs, including oxygen saturation, are normal. On physical examination he appears mildly ill although well hydrated and is breathing comfortably. Lung auscultation reveals focal right-sided crackles and decreased breath sounds.

Which one of the following oral treatment options would be best in this situation?

A) Amoxicillin
B) Cefuroxime
C) Doxycycline
D) Amoxicillin/clavulanate (Augmentin) plus azithromycin (Zithromax)
E) Cephalexin plus sulfamethoxazole/trimethoprim (Bactrim)

15. A healthy 78-year-old female with no history of osteoporosis has a family history of hip fracture. Bone density screening reveals a lumbar T-score of –2.0 and a right hip T-score of –1.5. Her FRAX score is calculated at a 20% risk of major osteoporotic fracture and an 11% risk of hip fracture. She is concerned about the possibility of breaking her hip.

Which one of the following interventions would be most appropriate?

A) Initiating treatment with a bisphosphonate
B) Initiating treatment with combined estrogen/progesterone
C) A repeat bone density scan in 1 year
D) A repeat bone density scan in 3 years
E) A repeat bone density scan in 5 years

16. Which one of the following tests has the highest negative predictive value to rule out celiac disease?

A) An antigliadin antibody test
B) A C-reactive protein level
C) A fecal calprotectin level
D) Genetic testing for *HLA-DQ2* and *HLA-DQ8*
E) An IgA tissue transglutaminase (tTG) antibody test

17. A 42-year-old male with a history of chronic low back pain managed with extended-release morphine sulfate (MS Contin) comes to your office to discuss fatigue. Among other causes, you consider the impact that long-term opioid therapy may have on the endocrine system.

Which one of the following endocrine conditions is most commonly associated with long-term opioid therapy?

A) Hyperprolactinemia
B) Hypocortisolism
C) Hypogonadism
D) Hypoparathyroidism
E) Hypothyroidism

18. An unhoused 63-year-old male is brought to the emergency department in a state of agitation and confusion. He is found to be hypothermic with a body temperature of 31.1°C (88.0°F). He has a blood pressure of 90/70 mm Hg and a heart rate of 120 beats/min.

While undergoing warming, which one of the following should be given to this patient?

A) Normal saline at room temperature
B) Normal saline that has been warmed
C) Lactated Ringer solution at room temperature
D) Lactated Ringer solution that has been warmed
E) 50% dextrose in water at room temperature

19. According to the American Diabetes Association, which one of the following hemoglobin A_{1c} measurements fits the criteria for prediabetes?

A) 5%
B) 5.5%
C) 6%
D) 6.5%

20. A 69-year-old male presents 30 hours after the onset of difficulty speaking, right-sided facial droop, and marked weakness in his right arm and leg, with the arm more affected than the leg. You diagnose an ischemic stroke of the left middle cerebral artery (MCA). Noncontrast CT of the head reveals hypodensity in the area of the brain supplied by that artery, and CT angiography reveals occlusion of the left proximal MCA.

Which one of the following treatments would be indicated at this time?

A) Aspirin daily
B) Clopidogrel (Plavix) plus aspirin
C) Intravenous alteplase (Activase)
D) Intravenous tenecteplase (TNKase)
E) Thrombectomy of the MCA

21. A 35-year-old female with a history of heavy menstrual bleeding is found to have a hemoglobin level of 10.4 g/dL (N 12.0–15.0). An elevated blood level of which one of the following biomarkers would be most consistent with iron deficiency anemia in this patient?

A) Ferritin
B) Hepcidin
C) Reticulocyte count
D) Total iron-binding capacity
E) Transferrin saturation

22. A 70-year-old male presents with his wife because they are concerned that he may be developing dementia. Among other symptoms, he has a resting tremor and describes detailed hallucinations that are colorful, vivid, and include animals.

Which one of the following is the most likely diagnosis?

A) Alzheimer disease
B) Dementia with Lewy bodies
C) Frontotemporal dementia
D) Normal pressure hydrocephalus
E) Vascular dementia

23. Newborn screening for critical congenital heart disease with pulse oximetry is recommended for

A) all infants within the first 6 hours of life
B) all infants before 24 hours of life
C) all infants 24 hours or more after birth
D) only infants with clinical signs of hypoxemia
E) only infants with a heart murmur

24. A 64-year-old female presents to your office with a 1-week history of lesions on her legs (shown below). Her past medical history includes GERD, hypertension, and obesity. Her current medications include lisinopril (Zestril) and pantoprazole (Protonix). There is tenderness over the lesions but no itching or discharge. She feels well currently but recently completed a 3-day course of sulfamethoxazole/trimethoprim (Bactrim) for treatment of a urinary tract infection. The lesions started to appear about 3–4 days after finishing her course of antibiotics. She is normotensive and afebrile. A physical examination is otherwise unremarkable.

Which one of the following is the most likely diagnosis?

A) Erythema nodosum
B) Necrobiosis lipoidica
C) Purpura fulminans
D) Pyoderma gangrenosum
E) Superficial thrombophlebitis

25. You are playing in a community league soccer tournament and are asked to evaluate a 30-year-old female. She was in her usual state of health when she suddenly began having difficulty breathing while playing soccer. She tells you that she has had similar episodes in the past. Treatment with an albuterol (Proventil, Ventolin) inhaler does not improve her symptoms.

On examination you note dyspnea with audible inspiratory wheezing but no increased work of breathing, and she has an oxygen saturation of 98%.

Which one of the following is the most likely diagnosis?

A) Anaphylaxis
B) Exercise-induced asthma
C) Foreign body aspiration
D) Laryngeal edema
E) Vocal cord dysfunction

26. A 60-year-old male presents with left lower quadrant abdominal pain. His medical and surgical histories are remarkable only for a history of hypertension controlled with hydrochlorothiazide and lisinopril (Zestril), and a screening colonoscopy 5 years ago that showed diverticulosis without polyps. He is afebrile, and a physical examination is notable only for mild abdominal tenderness in the left lower quadrant without peritoneal signs. A urinalysis is normal. You diagnose mild diverticulitis.

Which one of the following would be indicated at this time?

A) Rest and clear liquids
B) Avoidance of seeds, nuts, and popcorn
C) Abdominal CT
D) Referral for colonoscopy
E) Hospital admission for intravenous fluids and intravenous antibiotics

Item #24

27. A 68-year-old female presents for evaluation of low back pain. Which one of the following signs or symptoms would be most consistent with a diagnosis of spinal stenosis syndrome?

A) Pain improvement when moving from sitting to standing
B) Pain improvement with lumbar extension
C) Pain worsened by bending forward at the waist
D) Poor balance
E) Urinary incontinence

28. The most common electrolyte abnormality in a patient with primary hyperaldosteronism is

A) hypocalcemia
B) hypokalemia
C) hyponatremia
D) hyperkalemia
E) hypernatremia

29. A 71-year-old male who resides at sea level travels to Colorado for a vacation. He spends the first night in a resort at 2700 m (8858 ft) above sea level. He notes a headache and sleeps poorly. The next morning he is somewhat nauseated and lightheaded, but feels well enough to proceed with his plans and ascends to his campsite at 4000 m (13,123 ft). During the first evening at the campsite, friends note that he is confused and having difficulty with his balance.

Which one of the following diagnoses best explains his symptoms at the campsite?

A) Acute mountain sickness
B) High-altitude cerebral edema
C) High-altitude headache
D) High altitude–induced central sleep apnea
E) High-altitude pulmonary edema

30. A 47-year-old female sees you for routine follow-up. Her past medical history is significant for hypertension, hyperlipidemia, depression, and osteoarthritis. She tells you that she has noticed her ankles swelling over the past few months. In addition to a physical examination and other indicated evaluations, you also review her medications, which include the following:

Acetaminophen
Amlodipine (Norvasc)
Atorvastatin (Lipitor)
Escitalopram (Lexapro)
Lisinopril (Zestril)

Which one of her medications is most likely to cause edema?

A) Acetaminophen
B) Amlodipine
C) Atorvastatin
D) Escitalopram
E) Lisinopril

31. A 3-year-old male is brought to your office by his parents for evaluation of constipation that began about a year ago. They report that he cries before bowel movements, has resisted toilet training, and has unusually large stools about every 3 days, including this morning. He had normal bowel movements in infancy and his growth and development have been normal.

An examination shows a healthy child with a soft, nondistended, nontender abdomen. A rectal examination reveals normal sphincter tone and minimal soft stool.

Which one of the following would be the most appropriate next step in correcting his functional constipation?

A) Increasing fluid intake
B) Increasing physical activity
C) Adding docusate (Colace)
D) Adding polyethylene glycol (MiraLAX)
E) Adding probiotic supplements with *Bifidobacterium* or *Lactobacillus* species

32. A 62-year-old male presents with daytime fatigue, sleepiness, snoring at night, and a BMI of 41 kg/m^2. You are concerned that he may have obesity hypoventilation syndrome (OHS) in addition to possible obstructive sleep apnea.

Which one of the following tests is most appropriate for establishing a diagnosis of OHS?

A) Daytime awake serum HCO_3^-
B) Daytime awake $PaCO_2$
C) Daytime awake PaO_2
D) Nighttime serial measurement of peripheral oxygen saturation during sleep
E) Nighttime serum HCO_3^- within 2 minutes of awakening

33. In a patient with new-onset polymyalgia rheumatica, which one of the following medications can be added to glucocorticoid therapy in order to reduce the risk of relapse?

A) Ibuprofen
B) Icosapent ethyl (Vascepa)
C) Indomethacin
D) Mesalamine
E) Methotrexate

34. You are caring for a 21-year-old female with previously diagnosed bipolar II disorder, generalized anxiety disorder, attention-deficit/hyperactivity disorder, and insomnia. The patient presents for a same-day appointment with new symptoms of chills, excess sweating, flushing, and nausea of approximately 2 hours' duration. The patient felt normal upon awakening, took methylphenidate (Ritalin), 5 mg with breakfast, and went to work. She began to feel shaky around lunchtime and took a second dose of methylphenidate, 5 mg. Thirty minutes later she began having agitation, chills, sweating, flushing, and nausea and had to leave work. Her current medications include the following:

Desvenlafaxine (Pristiq), 50 mg daily
Doxepin, 10 mg daily at bedtime
Methylphenidate, 5 mg twice daily
Ziprasidone (Geodon), 40 mg twice daily

An examination reveals an alert and anxious patient with damp skin, a temperature of 38.1°C (100.6°F), and a heart rate of 110 beats/min. The pupils are slightly dilated and briskly reactive. A neurologic examination reveals a mild tremor and hyperreflexia without clonus.

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

A) Discontinuing all current medications until her symptoms subside
B) Replacing methylphenidate with atomoxetine (Strattera)
C) Replacing methylphenidate with amphetamine salts such as dextroamphetamine/amphetamine (Adderall)
D) Symptomatic treatment with diphenhydramine (Benadryl Allergy)
E) Symptomatic treatment with ondansetron

35. The daughter of an 82-year-old bedbound female with Alzheimer dementia requests a home visit to discuss transitions of care due to continued deterioration of her mother's condition. The daughter has been the caregiver for the past 5 years since her mother began to struggle with independently managing her activities of daily living (ADLs). Recently, the patient's appetite has significantly diminished, and her daughter is concerned that she has lost 15 lb in the last 6 months. She asks about feeding tube placement, medications to help her appetite, or ways to improve her dementia. The patient no longer recognizes her daughter and is nonverbal but smiles when approached at her bedside upon examination. Her vital signs are stable, she appears cachectic, a physical examination is unremarkable, and pain is not present upon palpation.

Which one of the following is recommended at this time?

A) Assisted oral feeding
B) Initiation of a high-calorie supplement
C) Initiation of a cholinesterase inhibitor
D) Initiation of an appetite stimulant
E) Percutaneous feeding tube placement

36. A 24-year-old male presents for evaluation of a soft-tissue mass on his arm. Which one of the following features, if present, should prompt further evaluation with advanced imaging?

A) Diameter ≥5 cm
B) Fluctuant texture
C) Lack of tenderness with palpation
D) Persistent, slow growth over several years
E) Superficial location (above the fascia)

37. In patients with type 2 diabetes, medications from which one of the following classes have been shown to reduce the progression of chronic kidney disease?

A) Biguanides
B) DPP-4 inhibitors
C) SGLT2 inhibitors
D) Thiazolidinediones

38. Which one of the following is the most appropriate timing to initiate the use of fluoride varnish in infants and children to prevent dental caries?

A) At age 6 months if their primary water source is deficient in fluoride
B) At age 6 months and then four times yearly
C) At age 6 years and then four times yearly
D) When the first primary tooth erupts and then twice yearly
E) When the first permanent tooth erupts and then four times yearly

39. A 55-year-old male sees you for a health maintenance examination. He tells you that his father had a myocardial infarction at age 55 and asks you how he can reduce his risk for coronary artery disease. He exercises regularly and does not smoke. His vital signs include a blood pressure of 128/78 mm Hg, a pulse rate of 75 beats/min, and a BMI of 28 kg/m^2. A physical examination is unremarkable.

Which one of the following is needed to calculate this patient's American College of Cardiology/American Heart Association 10-year atherosclerotic cardiovascular disease event risk using the Pooled Cohort Equations?

A) An ankle-brachial index
B) A high-sensitivity C-reactive protein level
C) A lipid panel
D) A coronary artery calcium score

40. Which one of the following patients has an increased risk for autism spectrum disorder?

A) A 6-month-old who does not respond to his name
B) A 12-month-old who does not engage in pretend play
C) A 15-month-old who claps her hands when excited
D) An 18-month-old who does not point to objects of interest
E) A 24-month-old who looks at a parent's face to see how to react in a situation

41. A 56-year-old male with hypertension and a BMI of 39 kg/m^2 comes to your office for follow-up after a full-night study in the sleep laboratory for evaluation of snoring and fatigue. The study revealed an apnea-hypopnea index (AHI) of 12 events per hour of sleep. He has several questions about his treatment options. He reports that he is very concerned about this problem and is willing to try anything, but a family member suggested he consider the newer procedures.

In addition to diet, exercise, and behavioral modifications, which one of the following would be the most appropriate intervention at this time?

A) An oral appliance
B) CPAP therapy
C) Hypoglossal nerve stimulation
D) Pharyngeal soft-tissue modification
E) Bariatric surgery

42. A 35-year-old female presents with a 4-month history of pain in her neck, chest, mid and lower back, hip, and right leg. She has difficulty falling asleep at night and does not feel refreshed upon awakening in the morning. She feels like she is not as mentally sharp as she used to be and feels mildly depressed at times. A physical examination is notable for multiple soft-tissue tender points without evidence of joint deformity, inflammation, or erythema.

Which one of the following would be appropriate first-line pharmacologic therapy for this patient's condition?

A) Amitriptyline
B) Celecoxib (Celebrex)
C) Hydrocodone
D) Hydroxychloroquine (Plaquenil)
E) Naproxen

43. A 45-year-old female sees you for follow-up 3 days after a visit to the emergency department (ED) for acute abdominal pain due to an initial episode of a kidney stone. Her past medical history and family history are unremarkable. A CT scan in the ED demonstrated a nonobstructing, 4-mm mid-ureteral stone and several smaller stones in both kidneys, measuring up to 2 mm. Laboratory studies in the ED showed a calcium level of 11.4 mg/dL (N 8.0–10.0) and microscopic hematuria on urinalysis but were otherwise normal. She was treated with intravenous hydration and pain control and was discharged home. She passed the stone the next day.

A physical examination today is normal. Follow-up laboratory studies confirm an elevated serum calcium level, along with elevated serum parathyroid hormone and 24-hour urine calcium levels. A DEXA scan and repeat microscopic urinalysis are normal.

At this point, you should

A) prescribe a bisphosphonate
B) prescribe a thiazide diuretic
C) refer her for genetic evaluation
D) refer her for cystoscopy
E) refer her for parathyroidectomy

44. A 42-year-old male sees you for a routine health maintenance examination. He has no symptoms, no high-risk behaviors, and no past medical history. The physical examination is unremarkable. He has had no health care screenings since a sports preparticipation evaluation at age 14.

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

A) Carotid stenosis
B) Glaucoma
C) HIV
D) Testicular cancer
E) Vitamin D deficiency

45. A 20-year-old college student comes to your office on Monday morning after injuring his right arm during a rugby match 2 days earlier. He is not certain of the mechanism of injury but was struck forcefully on the lower posterior part of his upper arm above the elbow. He describes paresthesias on the extensor side of his forearm and the back of his hand. His upper arm is bruised and mildly swollen at the described location.

In addition to the paresthesias on the extensor forearm and the back of the hand, which one of the following motor findings would you expect?

A) An inability to maintain all fingers fanned out under resistance
B) Weakness of elbow flexion with the hand in a prone position
C) Weakness of finger and wrist extension under resistance
D) Weakness of flexion of the fourth and fifth fingers
E) Weakness of thumb apposition

46. A 55-year-old male sees you because of heartburn and dysphagia. Esophagogastroduodenoscopy shows moderately severe esophagitis.

Which one of the following is the most appropriate long-term pharmacologic management for this condition?

A) Famotidine (Pepcid), 10 mg daily
B) Metoclopramide (Reglan), 10 mg before meals
C) Omeprazole, 40 mg daily
D) Sucralfate (Carafate), 1 g twice daily

47. A 12-year-old transgender female accompanied by her mother comes to your office to discuss persistent gender dysphoria. The patient has been in counseling for 2 years along with her family, who is supportive of her gender identity. The patient's mother asks about puberty blockers.

In discussing GnRH analogs with her, you note that the current recommendation for beginning this medication is when she is at which Tanner stage of development?

A) 1
B) 2
C) 3
D) 4
E) 5

48. A 63-year-old female with a history of obesity and hypertension sees you for evaluation of shortness of breath on exertion and lower extremity edema. Echocardiography shows grade 2 diastolic dysfunction and an ejection fraction of 50%. You diagnose heart failure with preserved ejection fraction.

Which one of the following medications has the best evidence to reduce hospitalization due to heart failure or cardiovascular death in patients such as this?

A) Carvedilol (Coreg)
B) Empagliflozin (Jardiance)
C) Lisinopril (Zestril)
D) Sacubitril/valsartan (Entresto)
E) Spironolactone (Aldactone)

49. A 45-year-old male presents to the urgent care clinic with a 2-hour history of central chest pain that began at rest with associated shortness of breath. In addition, he has had a mild dry cough and rhinorrhea for a few days but no fever. He has not had any nausea, dizziness, or diaphoresis, and the chest pain does not radiate. He took a low-dose aspirin at home at the insistence of his partner but states that it did not affect the pain. He has no past medical history, takes no medications, consumes 4–6 alcoholic drinks per night, and does not smoke. He has a sedentary job in customer service and walks his dog twice a day. He lives at home with his partner and toddler, who also has a mild cough and runny nose.

On examination the patient has a temperature of 37.0°C (98.6°F), a blood pressure of 150/100 mm Hg, a heart rate of 118 beats/min, a respiratory rate of 14/min, and an oxygen saturation of 98% on room air. The patient is well appearing, and an HEENT examination reveals no jugular vein distention. A cardiovascular examination reveals tachycardia without murmur. There is no chest wall tenderness to palpation. The lung examination reveals decreased breath sounds on the right compared with the left, and there are no crackles or wheezes. There is no lower extremity edema.

A chest radiograph and an EKG are shown below. Laboratory studies including D-dimer and troponin levels, a CBC, and a comprehensive metabolic panel have been ordered and the results are pending.

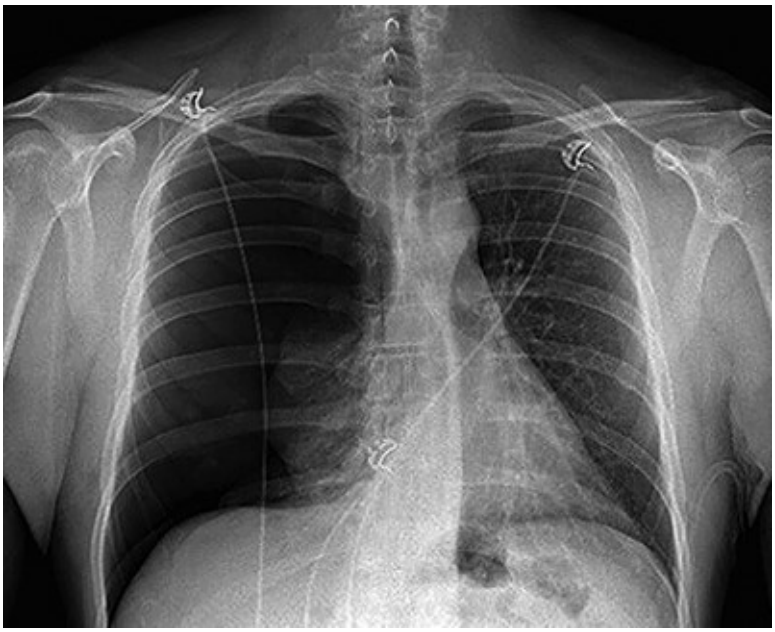
Which one of the following would be the most appropriate next step in management?

A) Initiation of antibiotics
B) Initiation of heparin infusion
C) Chest tube placement
D) Cardiac catheterization

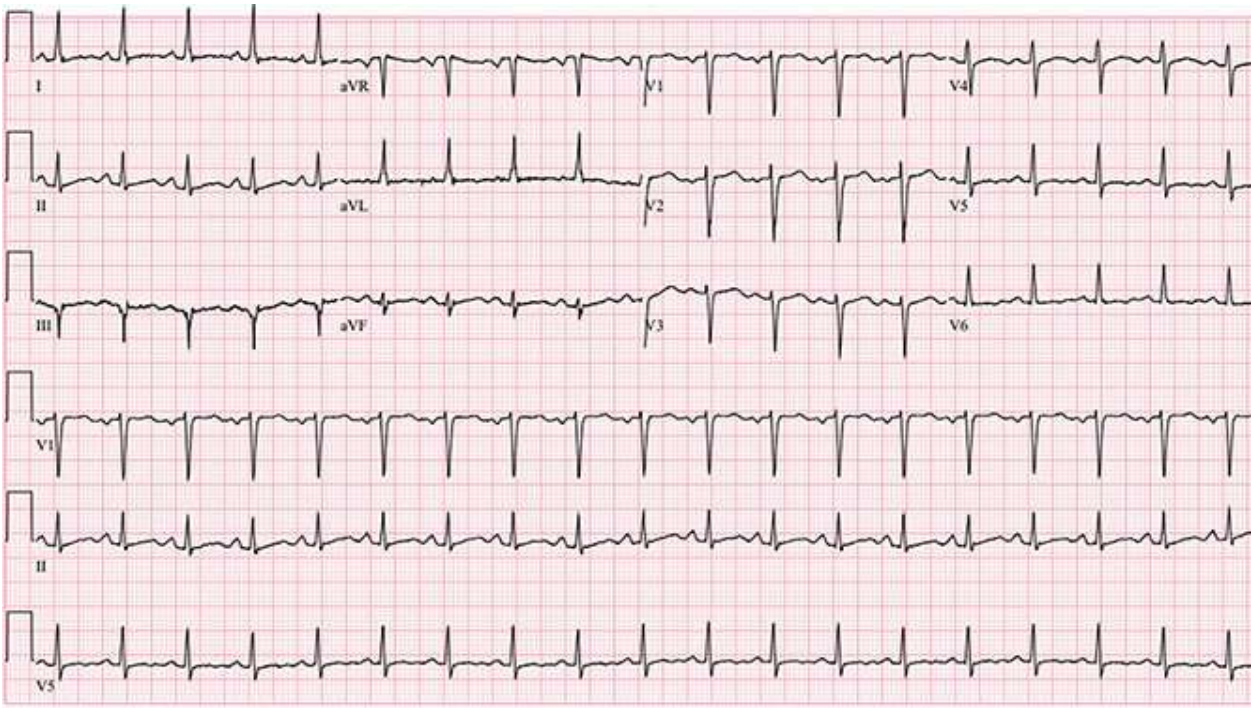
50. A 40-year-old male presents because he is losing large clumps of hair when he brushes or washes it. He feels well otherwise and does not take any medications. His past medical history is unremarkable except for a cholecystectomy 4 months ago for acute cholecystitis. A physical examination is normal except for uniform, diffuse thinning of the hair on his scalp. You do not observe any patches of hair loss, redness, inflammation, scaling, or scarring of his scalp.

Which one of the following would be the most appropriate next step in managing this patient's hair loss?

A) Reassurance only
B) Cognitive behavioral therapy
C) Terbinafine
D) Intracutaneous scalp corticosteroid injections



Item #49



Item #49

51. A 46-year-old female comes to your office because of left hip pain. After a thorough evaluation you make a diagnosis of osteoarthritis, likely associated with congenital hip dysplasia.

In addition to nonpharmacologic therapies, including physical exercise, which one of the following medications has the best evidence of treating her pain effectively?

A) Topical diclofenac
B) Topical lidocaine
C) Oral acetaminophen
D) Oral naproxen
E) Oral tramadol

52. A 25-year-old male presents for a pretravel consultation prior to embarking on a 10-day mission trip to Central America with his church. His past medical history includes GERD, irritable bowel syndrome, and generalized anxiety disorder. The last time he traveled internationally he experienced a prolonged bout of traveler's diarrhea, despite his best efforts at practicing good hand hygiene and careful food and drink selection. He asks if there are any medications that he can take to prevent a similar experience this time.

Which one of the following is most appropriate for prophylactic use in this situation?

A) Bismuth subsalicylate (Pepto-Bismol)
B) Calcium carbonate (Tums)
C) Ciprofloxacin (Cipro)
D) Omeprazole
E) A probiotic containing *Lactobacillus acidophilus*

53. A 39-year-old male with no known previous medical history sees you for follow-up of recently diagnosed depression. He works as a home renovation contractor and does not smoke. A physical examination is normal other than a BMI of 36 kg/m^2. Laboratory studies reveal a normal TSH level and a hemoglobin level of 17.4 g/dL (N 13.3–16.2).

You suspect that which one of the following is a cause of his polycythemia?

A) Alcohol use
B) Hemochromatosis
C) Hereditary spherocytosis
D) Lead exposure
E) Obstructive sleep apnea

54. A 48-year-old female presents to your office because of painful sexual intercourse occurring with both initial entry and deep penetration. She has been using lubricants, but still experiences burning and dryness. Her last menstrual period was 1 year ago. A pelvic examination reveals slightly pale vaginal mucosa.

Which one of the following would be the best and most cost-effective initial therapy?

A) Vaginal estradiol cream (Estrace Vaginal)
B) Vaginal prasterone (Intrarosa)
C) Ospemifene (Osphena)
D) OnabotulinumtoxinA (Botox)
E) Pelvic floor physical therapy

55. Which one of the following medications commonly causes hyponatremia in the elderly?

A) Amlodipine (Norvasc)
B) Amoxicillin
C) Atorvastatin (Lipitor)
D) Escitalopram (Lexapro)
E) Spironolactone (Aldactone)

56. A 16-year-old female sees you because she has not yet started her menses and has noticed little breast development. Both her mother and her older sister started menstruating at age 13. She has never been sexually active and has not had any abdominal pain, vaginal discharge, nipple discharge, appetite changes, or urinary symptoms. She does not take any medications and does not use tobacco, alcohol, or illicit substances. Her weight has been stable. She walks to and from school daily and plays recreational basketball during the winter season, but otherwise does not get regular exercise.

On examination the patient appears well. She has a blood pressure of 110/70 mm Hg and a heart rate of 70 beats/min, and she is in the 5th percentile for height and 50th percentile for weight. Cardiovascular, pulmonary, abdominal, and skin examinations are all normal. Her breast development is Tanner stage 2 and her genitourinary development is Tanner stage 4, with normal external genitalia and a normal-appearing nulliparous cervix. There is no edema to the extremities.

Laboratory studies include a normal TSH level, prolactin level, and basic metabolic panel. A urine pregnancy test is negative. Pelvic ultrasonography reveals a normal uterus and the ovaries are nonvisualized.

Which one of the following is the most likely diagnosis?

A) Congenital adrenal hyperplasia
B) Cushing syndrome
C) Functional hypothalamic amenorrhea
D) Polycystic ovary syndrome
E) Turner syndrome

57. A 28-year-old female comes to your office for follow-up after learning during an emergency department visit that she is pregnant. Ultrasonography reveals an estimated gestational age of 14 weeks and 4 days. She has been using increasing dosages of oxycodone (OxyContin) daily for the past 7 months and gets sick whenever she tries to stop. She reports using 90 mg daily without a prescription, and stealing when necessary to obtain the drug. She wishes to continue her pregnancy and is worried about the safety of her developing fetus.

Which one of the following is most appropriate for this patient?

A) A prescription for oxycodone, 90 mg daily
B) Buprenorphine/naloxone (Suboxone) therapy
C) Outpatient detoxification with a clonidine-based protocol
D) Inpatient detoxification with a clonidine-based protocol

58. In a patient with hyperuricemia with an elevated uric acid level but no prior episodes of acute gout, which one of the following is recommended?

A) No urate-lowering medication
B) Allopurinol (Zyloprim), 100 mg daily
C) Febuxostat (Uloric), 40 mg daily
D) Naproxen, 250 mg three times daily
E) Probenecid, 100 mg twice daily

59. You are concerned about the alcohol use of a 45-year-old family physician colleague in your community. One evening you smell alcohol on their breath when they are on-call making evening rounds at the hospital. When you try to talk with them about it, they deny having a problem and tell you to mind your own business.

Which one of the following should be your next course of action?

A) Do nothing further
B) Report your concern to your state medical board
C) Report your concern to the American Academy of Family Physicians
D) Report your concern to the American Board of Family Medicine
E) Report your concern to the American Medical Association

60. A previously healthy 30-year-old male who is a nonsmoker comes to your clinic for an acute visit because of a cough that produces yellowish phlegm. His illness started with a “cold” 10 days ago. He has no fever or chills, chest pain, or shortness of breath. On examination his vital signs are normal, and his lungs are clear bilaterally to the bases. A chest radiograph is normal.

The most appropriate next step is

A) reassurance only
B) amoxicillin
C) azithromycin (Zithromax)
D) doxycycline

61. A 75-year-old male with long-standing diabetes mellitus, tobacco use, and venous insufficiency presents to your office with bilateral leg heaviness and recent oozing from his left leg. A physical examination reveals venous stasis dermatitis, edema of both legs, and a well-circumscribed 3×4-cm area of superficial ulceration on the left medial shin with a thin layer of purulent exudate overlying a pink base. The surrounding skin has no erythema, warmth, or tenderness. Pedal pulses are nonpalpable bilaterally.

In addition to smoking cessation counseling and local wound care, which one of the following would be the most appropriate next step?

A) An ankle-brachial index
B) A medical-grade compression stocking
C) A zinc oxide–impregnated Unna boot
D) A wound culture specimen
E) A skin biopsy of the ulcer

62. You are treating a patient for hypertension and opt to start an ACE inhibitor. Six weeks later the patient's blood pressure is at goal, but the serum creatinine level has increased from 1.0 to 1.2 mg/dL (N 0.7–1.0).

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

A) Continuing the ACE inhibitor with close monitoring of renal function
B) Discontinuing the ACE inhibitor immediately
C) Ordering ultrasonography to evaluate for renal artery stenosis
D) Referring the patient to a nephrologist

63. A 55-year-old male presents with intermittent epigastric pain, early satiety, and bloating. His symptoms have been present for years with minimal change. You suspect a diagnosis of functional dyspepsia.

Which one of the following additional findings would constitute an alarm symptom and warrant further workup?

A) Epigastric tenderness
B) Increased abdominal pain when the abdominal wall muscles are tensed
C) Lymphadenopathy
D) Nausea
E) Weight gain

64. A 65-year-old female with end-stage renal disease, who has been on dialysis for 2 years, presents for a health maintenance examination. She has a history of diabetes mellitus and hypertension and does not want to be considered for renal transplantation.

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

A) No screening
B) A skin survey
C) A Papanicolaou smear
D) Mammography
E) Colonoscopy

65. A 45-year-old male sees you to review the results of a male hormone imbalance test that he took online. On the list of symptoms, he marked decreased sex drive and excessive sweating as severe; fatigue, mood changes, sleep problems, and muscle strength as moderate; and hair loss, decreased mental ability, weight gain, and muscle and joint pain as mild. The patient has no known chronic diseases and takes a daily multivitamin. His medical history and a physical examination are unremarkable. He would like to start testosterone therapy as soon as possible.

After discussing the limited indications for testosterone replacement, which one of the following would be the most appropriate next step to address this patient's concerns?

A) Reassurance only
B) FSH and LH levels
C) A total testosterone level at the end of this visit
D) Two separate fasting morning total testosterone levels
E) A clinical trial of testosterone replacement

66. A healthy 23-year-old presents for a physical examination required for entrance to nursing school. The patient's vital signs and a physical examination are unremarkable. To complete the immunization requirements, you administer Tdap and varicella vaccines. The nursing school requests tuberculosis (TB) test results.

Which one of the following would be most appropriate regarding TB testing?

A) No testing because the patient is asymptomatic
B) A sputum culture
C) A tuberculin skin test
D) An interferon-gamma release assay (IGRA, QuantiFERON-TB Gold)
E) A chest radiograph

67. A local corticosteroid injection is most likely to result in sustained improvement when offered early in the course of which one of the following conditions?

A) Adhesive capsulitis
B) De Quervain tenosynovitis
C) Lateral epicondylitis
D) Osteoarthritis of the knee
E) Subacromial impingement syndrome

68. A 70-year-old male presents for evaluation of an itchy rash (shown below) that started a few weeks ago in the interdigital areas of both feet. The rash has since extended to his dorsal feet and ankles. He has tried using a topical moisturizing lotion and hydrocortisone 1% cream without improvement.

Based on the extent of skin involvement, you offer him an oral medication to treat the infection. He is concerned about the risk of gastrointestinal side effects and asks if he could use a different topical medication instead.

Of the following options, which one is most likely to resolve his symptoms?

A) Clotrimazole/betamethasone dipropionate (Lotrisone) cream
B) Mupirocin cream
C) Nystatin cream
D) Nystatin ointment
E) Terbinafine cream

69. You are on a commercial aircraft at cruising altitude. One of the passengers rises from his seat and passes out on the aisle floor beside you. You offer your services as a physician and the flight attendant arrives at the patient's side. You find the scene safe and the patient unresponsive, not breathing, and without a carotid pulse. You request the automated external defibrillator (AED).

The most appropriate next step would be to

A) attach the AED
B) begin chest compressions at a rate of 100/min
C) give two slow breaths using the mouth-to-mouth technique
D) give two slow breaths with a bag-valve mask
E) tell the flight crew to land as soon as possible

70. A 72-year-old male presents with a recent history of cough with bloody sputum. For 3 weeks, he produced dark red to brown sputum with his usual morning cough. The last episode was a week ago. He has a chronic, minimally productive cough that he attributes to allergies. He has not had any fever, chest pain, or dyspnea associated with the bloody sputum. He has never smoked and has no known lung disease. His medications include bupropion (Wellbutrin) and fluoxetine (Prozac). His vital signs are unremarkable.

An examination including the nasal fossa and oropharynx reveals no evidence of bleeding. A pulmonary examination is normal. A CBC, comprehensive metabolic panel, and INR are also normal.

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

A) Reassurance only, with instructions to return if symptoms recur
B) Azithromycin (Zithromax)
C) A chest radiograph
D) CT of the chest with and without contrast
E) Referral for bronchoscopy

Item #68

71. You see a 5-year-old female for the first time for a new patient visit. Her mother notes that she tires easily and sometimes cannot keep up with other children her age. Laboratory studies reveal the following:

WBCs	6500/mm^3 (N 5000–14,500)
RBCs	5.6 million/mm^3 (N 3.90–5.30)
Hemoglobin	9.1 g/dL (N 11.5–15.5)
Hematocrit	27% (N 34–40)
Platelets	220,000/mm^3 (N 150,000–450,000)
Mean corpuscular volume	68 μm^3 (N 75–87)
Mean corpuscular hemoglobin	28 pg/cell (N 24–30)
Mean corpuscular hemoglobin concentration	34 g/dL (N 32–36)
Red cell distribution width	11% (N 11.5–15.0)
Ferritin	150 ng/mL (N 7–140)
Transferrin saturation	40% (N 15–50)

A peripheral smear shows target cells, microcytic cells, red cell fragments, teardrop cells, and nucleated RBCs.

Which one of the following is the most likely etiology of this patient's anemia?

A) Aplastic anemia
B) Iron deficiency
C) Megaloblastic anemia
D) Myelofibrosis
E) Thalassemia minor

72. A 34-year-old female presents to your office and insists that she be seen. She seeks your care frequently, showering you with compliments. Today she says that she feels depressed and hurts "all over." She reports that your medical assistant is not being friendly to her. She states that her symptoms started a few days ago, after her boyfriend broke up with her. She had thought he would propose soon although they had been dating for 2 months. She says he must have left her because she is unattractive. She asks to be tested for sexually transmitted infections since she frequently engages in unprotected intercourse. She was recently pulled over by a police officer for reckless driving, but states she was being punished unfairly.

A physical examination reveals a BMI of 31 kg/m^2, stable vital signs, and several scars on her upper arms, but is otherwise unremarkable. She appears anxious and depressed, and as in the past, mentions suicidal thoughts. Your staff asks you if she is just a difficult patient or whether a disease process is involved.

Which one of the following is the most likely diagnosis for this patient?

A) Bipolar disorder
B) Borderline personality disorder
C) Generalized anxiety disorder
D) Major depressive disorder
E) Posttraumatic stress disorder

73. Overdiagnosis is defined as the diagnosis of a condition that, if unrecognized, would not cause symptoms or harm during the patient's lifetime. Which one of the following interventions has the best likelihood of reducing overdiagnosis?

A) Broadening the criteria for diagnosis of a condition
B) Creating financial incentives for more testing
C) Focusing screening efforts on populations at highest risk for a disease
D) Redefining risk factors as pre-diseases
E) Using more sensitive screening tests

74. A 53-year-old female sees you because she would like treatment for hot flashes that she finds quite bothersome. Her last menstrual period was 8 months ago. She has a history of unprovoked deep vein thrombosis and a history of depression that is treated with venlafaxine (Effexor XR).

In addition to optimizing the dosage of her venlafaxine, which one of the following would be most effective for treatment of her hot flashes?

A) Black cohosh
B) Clonidine
C) Gabapentin (Neurontin)
D) Oral progesterone
E) Topiramate (Topamax)

75. A 72-year-old male who underwent total left knee arthroplasty 3 months ago is scheduled for a routine 6-month dental visit next week. His dentist contacts you for advice regarding antibiotic prophylaxis to prevent joint infection.

Which one of the following should you recommend?

A) No antibiotic prophylaxis
B) Amoxicillin, 2 g orally, 1 hour before the procedure
C) Ceftriaxone, 1 g parenterally, 1 hour before the procedure
D) Delaying the dental visit for 3 months
E) Contacting the orthopedic surgeon who performed the arthroplasty

76. An 8-year-old female is brought to the emergency department by her parents because of an asthma exacerbation that started earlier today in the context of a new upper respiratory infection. This morning she doubled her usual fluticasone (Flovent) inhaler and took 44 μg, four puffs. She has also been taking albuterol (Proventil, Ventolin), 90 μg, two puffs every hour for the past 3 hours, with minimal relief of shortness of breath and wheezing.

She has a temperature of 36.9°C (98.4°F), a respiratory rate of 28/min, a pulse rate of 128 beats/min, and an oxygen saturation of 96% on room air. On examination you note diffuse expiratory wheezing throughout both lungs. She received nebulized ipratropium/albuterol and oral prednisolone just prior to your assessment and reports feeling slightly better.

When administered intravenously, which one of the following has the best evidence of preventing the need for hospital admission for this patient's acute asthma exacerbation?

A) Diphenhydramine
B) Epinephrine
C) Magnesium
D) Terbutaline
E) Theophylline

77. A 90-year-old female sees you regularly for follow-up of several chronic medical conditions including systolic hypertension, coronary artery disease, previous ischemic stroke, and heart failure with preserved ejection fraction. Her systolic blood pressure is usually >160 mm Hg while her diastolic blood pressure is usually <50 mm Hg, making management challenging.

In managing this patient's blood pressure, an important physiologic consideration is that coronary artery perfusion is determined by which one of the following?

A) Diastolic blood pressure
B) Systolic blood pressure
C) Mean arterial pressure
D) Pulse pressure
E) Ejection fraction

78. A 54-year-old male with cervical disc disease, generalized anxiety disorder, and opioid use disorder on maintenance therapy presents with a 5-day history of pain and numbness in both hands and feet. He mentions that he had a COVID-19 booster vaccination 6 weeks ago.

On the review of systems, he reports increased urinary frequency and feeling less steady on his feet. A neurologic examination is notable for a slightly wide-based gait, decreased sensation in the upper extremities to the forearms and lower extremities to the calves, and brisk Achilles reflexes with clonus. His muscle strength is normal in both the upper and lower extremities, and there is no spinal tenderness. The remainder of the examination, including vital signs, is normal.

Which one of the following diagnoses is most consistent with this presentation?

A) Cervical myelopathy
B) Epidural abscess
C) Guillain-Barré syndrome
D) Multiple sclerosis

79. An otherwise healthy 70-year-old male presents with a 6-month history of hives recurring every week or so. A causative factor is not identified through the history and physical examination.

Which one of the following is recommended as the first-line treatment for this patient's chronic urticaria?

A) A first-generation H_1-antihistamine
B) A second-generation H_1-antihistamine
C) An H_2-antihistamine
D) Omalizumab (Xolair)
E) Prednisone

80. A 20-year-old college football player becomes disoriented and weak during an afternoon practice in the heat. On the field, he is sweaty and tachycardic, with a core (rectal) temperature of 40.9°C (105.6°F).

In this patient with exertional heatstroke, which one of the following would be the most important initial step to reduce his core body temperature?

A) Administering acetaminophen
B) Administering aspirin
C) Immersing him in cold water
D) Initiating intravenous fluids
E) Transporting him to an emergency facility for treatment

81. A 36-year-old female with recently diagnosed polycystic ovary syndrome (PCOS) sees you to discuss treatment options. Her menses are irregular and she only has 2–3 cycles per year. She does not wish to have any more children. She has no contraindications to hormonal contraceptives. Her BMI is 27 kg/m^2.

Which one of the following would be the most appropriate medication to initiate as first-line PCOS therapy?

A) Finasteride (Proscar)
B) Letrozole (Femara)
C) Metformin
D) Norgestimate/ethinyl estradiol (Sprintec)
E) Spironolactone (Aldactone)

82. A 72-year-old male presents to your office because of right hip pain and difficulty walking. He notes that the pain is relieved by activity and is worse at night. You obtain a plain film of the hip (shown below).

An elevation in which one of the following laboratory results would confirm the diagnosis?

A) Alkaline phosphatase
B) Calciferol
C) Creatine phosphokinase
D) Gamma-glutamyl transpeptidase
E) Phosphorus

83. For patients with terminal pancreatic cancer, lung cancer, or metastatic melanoma, which one of the following is the potential increase in life expectancy from receiving hospice care?

A) No increase
B) 3 months
C) 6 months
D) 9 months
E) 12 months

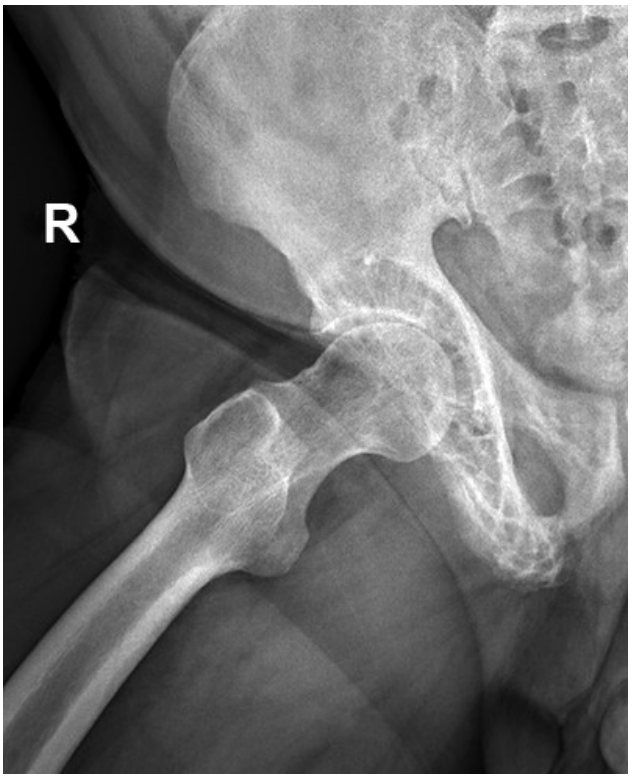
84. A 43-year-old male with hypertension and steatohepatitis sees you for follow-up after being treated for pneumonia and wheezing. On further questioning he reports mild shortness of breath for the past year. He is a former smoker with a 5-pack-year history. An examination is significant for diminished breath sounds diffusely, but no crackles or wheezing. Pulmonary function testing reveals a moderate nonreversible obstructive defect.

Which one of the following tests for genetic conditions would be most appropriate to order in this patient?

A) α_1-Antitrypsin levels
B) Cystic fibrosis gene panel
C) Ehlers-Danlos gene panel
D) Hemochromatosis HFE
E) *HLA-B27*

85. For patients with atrial fibrillation requiring anticoagulation, which one of the following concomitant conditions would indicate a need for treatment with warfarin instead of a direct oral anticoagulant?

A) Congestive heart failure
B) Diabetes mellitus
C) A history of stroke
D) Hypertension
E) Severe mitral stenosis



Item #82

86. A parent brings their 2-month-old infant to your office for a routine well check. The infant, who was born at full term, is formula fed and the parent is concerned about vomiting that occurs after every feeding. After taking a history and examining the infant you diagnose uncomplicated reflux.

The next appropriate intervention would be

A) prone positioning for sleep
B) celiac testing
C) a trial of thickened feeds
D) a trial of an acid suppressor
E) abdominal ultrasonography

87. A 27-year-old male took a COVID-19 rapid antigen test at home prior to coming to your office and reports that it was negative. Which one of the following pretest probability factors increases the likelihood that the test results were falsely negative?

A) No clinical signs or symptoms of COVID-19 infection
B) No known exposure to a person with COVID-19 infection
C) Clinical signs or symptoms that are best explained by an alternative diagnosis such as influenza
D) A high prevalence of COVID-19 infection in the community

88. A 28-year-old gravida 2 para 2 sees you for follow-up of heavy menstrual bleeding. She reports regular 30-day cycles with heavy bleeding that lasts for 5 days each month. She has tried ibuprofen and naproxen with minimal improvement. She and her husband desire more children but would prefer to wait a few years before trying again to conceive.

Which one of the following treatments is likely to be most effective in reducing her menstrual bleeding, while preserving future fertility?

A) An estrogen-progestin oral contraceptive
B) Tranexamic acid (Lysteda)
C) A levonorgestrel IUD (Mirena)
D) Uterine artery embolization
E) Endometrial ablation

89. A 70-year-old male with a COPD exacerbation is found to have a sodium level of 127 mEq/L (N 135–145). He is alert and oriented although he is in mild respiratory distress. After an appropriate evaluation, you determine that he has euvolemic hyponatremia from the syndrome of inappropriate secretion of antidiuretic hormone (SIADH), due to his worsening lung disease.

Aside from addressing his COPD, which one of the following is the most appropriate initial treatment for his hyponatremia?

A) Fluid restriction
B) Salt restriction
C) Hypertonic saline
D) Furosemide (Lasix)
E) Tolvaptan (Samsca)

90. A 70-year-old male presents with an acutely painful, swollen right knee that developed over 2–3 days without any known cause. There is no other joint pain. He has had similar, less severe episodes off and on in the past. He feels well otherwise and has not had any fever, chills, or rash.

Examination of other joints is negative except for some degenerative changes of the distal interphalangeal joints of the fingers. Examination of the right knee is notable for warmth, redness, diffuse tenderness, and swelling. There is no evidence of knee instability, meniscal injury, or trauma. A knee x-ray shows soft-tissue swelling and chondrocalcinosis (calcification of the cartilage). Knee aspiration is performed and a synovial fluid Gram stain is negative for bacteria with other results pending.

Which one of the following is the most likely explanation for these knee findings?

A) Calcium pyrophosphate deposition disease (pseudogout)
B) Gout
C) Osteoarthritis
D) Psoriatic arthritis
E) Septic arthritis

91. A 63-year-old male presents to your office because of intermittent chest pain with exertion. He has been building a new deck and noted the onset of chest pain following particularly intense workdays. He reports that the pain always resolves with rest, and he has not noticed any lower extremity edema or difficulty breathing. His past medical history is notable only for hypertension and coronary artery disease diagnosed 3 years ago. His current medications include atorvastatin (Lipitor), 40 mg daily; lisinopril (Zestril), 10 mg daily; and aspirin, 81 mg daily.

His vital signs include a weight of 80 kg (176 lb), a height of 178 cm (70 in), a blood pressure of 138/78 mm Hg, a pulse rate of 80 beats/min, a respiratory rate of 12/min, and an oxygen saturation of 96% on room air. A physical examination is normal. An EKG reveals normal sinus rhythm without ST-segment, T-wave, or Q-wave abnormalities.

In addition to prescribing as-needed, immediate-release nitroglycerin, which one of the following would be the most appropriate pharmacotherapy at this time?

A) Diltiazem (Cardizem LA), 180 mg daily
B) Ezetimibe (Zetia), 10 mg daily
C) Isosorbide mononitrate, 30 mg daily
D) Metoprolol succinate (Toprol-XL), 100 mg daily
E) Ranolazine (Ranexa), 500 mg twice daily

92. A 23-year-old graduate student presents to establish care at your office with a 2-week history of symptoms consistent with a major depressive episode. She reports being given a diagnosis of unipolar depression at age 16. For several years, she managed her symptoms effectively with psychotherapy alone. Last year, she was hospitalized for an initial episode of mania with psychotic features and was treated successfully with lithium and risperidone (Risperdal). After returning to her graduate studies 1 month later, she maintained a 9-month period of euthymia on lithium monotherapy before her recent major depressive symptoms began. She does not have any history of recreational drug use. A physical examination, CBC, comprehensive metabolic panel, and TSH level are all normal, and a urine pregnancy test is negative.

According to the *DSM-5*, her mood disorder diagnosis is

A) bipolar I disorder
B) bipolar II disorder
C) bipolar disorder, not otherwise specified
D) cyclothymia
E) schizoaffective disorder

93. Which one of the following is most appropriate for treatment of respiratory syncytial virus (RSV) bronchiolitis in otherwise healthy hospitalized infants?

A) Supportive care including as-needed oxygen and frequent nasal hygiene
B) Inhaled bronchodilators
C) Nebulized hypertonic saline every 4 hours
D) Systemic corticosteroids
E) Chest physiotherapy three times a day

94. A 94-year-old male with Alzheimer disease, heart failure, and chronic low back pain is brought to your office by his daughter who cares for him in her home. The daughter is interested in any support available for her father, and she asks specific questions about palliative care and hospice.

Which one of the following is needed to qualify for palliative care?

A) An advance directive
B) A do-not-resuscitate status
C) A life expectancy < 6 months
D) Pain
E) Serious illness

95. A 52-year-old male presents to your office because of increasing difficulty hearing conversations in social settings over the past 6 months. On examination the finger rub test is positive on the left ear. A Rinne test is positive on the left ear and negative on the right ear. A Weber test lateralizes to the left ear.

Which one of the following is the most likely etiology of this patient's hearing loss?

A) Conductive hearing loss
B) Sensorineural hearing loss
C) Meniere disease
D) Ototoxic medication
E) Presbycusis

96. A 45-year-old male with no past medical history presents to the urgent care clinic with hematuria and left-sided intermittent flank and inguinal pain. He has mild nausea but does not have any vomiting, fever, or other urinary symptoms. His vital signs are normal. He appears uncomfortable, but a physical examination is otherwise unremarkable. A urinalysis shows RBCs but no signs of infection. Same-day noncontrast CT shows a 3.5-mm left-sided ureteral stone. This is his first kidney stone.

In addition to encouraging oral hydration and pain control with NSAIDs, which one of the following would be appropriate in the management of this ureteral stone?

A) Observation only
B) Oral allopurinol (Zyloprim)
C) Oral cephalexin
D) Intravenous hydration with 2 L of lactated Ringer solution
E) Referral for surgical stone removal

97. A 47-year-old male presents to your office concerned about his "ugly" toenails. On examination you note that all of his toenails are discolored, thickened, and brittle. He was evaluated by a dermatologist and has been using topical ciclopirox 8% for 7 months. He does not recall any allergies to any medications.

After confirming your suspected diagnosis with a sample from the affected toenails, which one of the following would be the most appropriate oral pharmacotherapy?

A) Fluconazole (Diflucan)
B) Griseofulvin
C) Pulse dosing with itraconazole (Sporanox)
D) Continuous itraconazole
E) Terbinafine

98. A 45-year-old female presents with a 1-week history of pain at the base of her anterior neck radiating to her right jaw. Prior to the onset of pain she had a sore throat, fever, and body aches. These symptoms resolved and the neck pain started. She now reports palpitations and excessive sweating.

Her vital signs include a pulse rate of 110 beats/min, a blood pressure of 140/83 mm Hg, and a normal temperature. On examination she appears uncomfortable and diaphoretic. An HEENT examination is unremarkable and you note no cervical lymphadenopathy. Her thyroid is tender and mildly enlarged. A cardiac examination shows tachycardia with no murmurs.

Laboratory studies reveal a normal CBC, an erythrocyte sedimentation rate of 55 mm/hr (N 0–29), and a TSH level of 0.21 μU/mL (N 0.5–5.0). Total T_3 and free T_4 levels are within the normal range. You order a radioactive iodine uptake scan, which shows diffusely low iodine uptake in her thyroid.

In addition to a β-blocker, which one of the following would be most appropriate at this point?

A) Ibuprofen, 800 mg three times daily
B) Levothyroxine (Synthroid), 50 μg daily
C) Methimazole, 5 mg three times daily
D) Prednisone, 40 mg daily
E) Vancomycin, 20 mg/kg intravenously every 12 hours

99. You recently initiated treatment for hypertension in a 65-year-old male. One week later his creatinine level has increased from 1.2 to 2.4 mg/dL (N 0.6–1.2). You consider renal artery stenosis as an etiology because you are treating his hypertension with which one of the following medications?

A) Amlodipine (Norvasc)
B) Chlorthalidone
C) Lisinopril (Zestril)
D) Metoprolol
E) Spironolactone (Aldactone)

100. Your office staff proposes a practice improvement project to create a transgender-friendly clinical environment. Which one of the following interventions would help promote this goal?

A) Ensuring that intake forms and records use gender-neutral or inclusive language
B) Offering preventive services based on expressed gender only
C) Offering referral to a transgender clinic to all patients
D) Polling the staff to see if any of them are transgender

101. A 6-year-old female is brought to your office because of a 3-day history of productive cough, fever, and chills. She has not had any shortness of breath, wheezing, sore throat, or rash. Her past medical history is significant for mild intermittent asthma and seasonal allergies, treated with albuterol (Proventil, Ventolin), fluticasone furoate (Flonase Sensimist), and cetirizine (Children's Zyrtec Allergy). She is up to date on recommended vaccinations. Her vital signs include a temperature of 39.0°C (102.2°F), a pulse rate of 98 beats/min, a respiratory rate of 25/min, and an oxygen saturation of 98% on room air. Her weight today is 20 kg (44 lb). A pulmonary examination is notable for rhonchi in the right lung fields. A chest radiograph is shown below. A rapid COVID-19 test is negative.

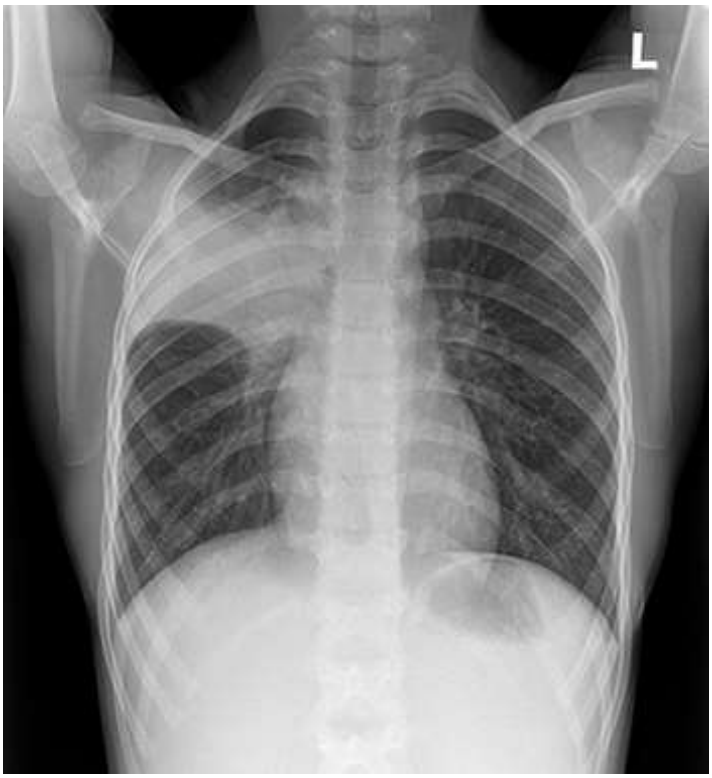
Which one of the following would be the most appropriate treatment?

A) Amoxicillin
B) Azithromycin (Zithromax)
C) Doxycycline
D) Levofloxacin
E) Oseltamivir (Tamiflu)

102. A 63-year-old female presents with pain in her right hand. She states that for 3 months she has experienced a catching sensation and her ring finger occasionally locks into a claw-like form. On examination a nodule is palpated and her pain is localized to the volar surface of the metacarpophalangeal joint on her ring finger. When instructed to clench her fist and subsequently release, her ring finger remains in a flexed position.

Which one of the following is considered first-line treatment for this condition?

A) Buddy taping
B) Transcutaneous electrical nerve stimulation (TENS) unit therapy
C) Corticosteroid injection
D) Physical therapy
E) Surgical release



Item #101

103. A 12-year-old female with Down syndrome is brought to your office by her parents to establish care after recently moving to the area. Which one of the following laboratory studies should you routinely check on an annual basis?

A) A TSH level only
B) A lipid panel only
C) A CBC with differential and a lipid panel
D) A CBC with differential, and TSH and IgA tissue transglutaminase (tTG) levels
E) A CBC with differential, and serum iron, total iron-binding capacity, and TSH levels

104. A 45-year-old male sees you for a routine health maintenance examination. You screen him for hepatitis C. A hepatitis IgG antibody is positive but on reflex testing there is no detectable viral RNA. When discussing the test results with him, he reports past use of injected opioids and intermittent use of cocaine. To his knowledge he has never been diagnosed with viral hepatitis.

Regarding hepatitis C, the patient's history and test results indicate

A) current infection with need for treatment
B) exposure less than 2 weeks prior to screening
C) a false-positive result
D) previous infection with immunity to future infection
E) previous infection with susceptibility to future infection

105. An 18-year-old female with a BMI of 21 kg/m^2 sees you for evaluation of recent hair loss and amenorrhea. During the review of systems she tells you that she thinks she is fat and reveals that she recently went on a restrictive diet and lost 15% of her body weight. On examination she is ill appearing, and her affect is blunted. Her blood pressure is 90/60 mm Hg and her heart rate is 50 beats/min. Laboratory testing reveals euthyroid sick syndrome and a decreased serum calcium level. Bone mineral density (BMD) testing shows bone loss. You refer her for extensive psychologic intervention.

Once this patient begins showing signs of improvement, the best indication for recovery of BMD would be

A) increased food intake
B) a normal calcium level
C) normal thyroid studies
D) the return of menses
E) weight restoration

106. A 19-year-old male presents with a 3-day history of fever, fatigue, and sore throat. He states that his girlfriend has been experiencing similar symptoms for the past couple of weeks. His past medical history is unremarkable. His vital signs include a temperature of 38.3°C (100.9°F), a heart rate of 92 beats/min, and a respiratory rate of 18/min. On examination you note tonsillar erythema, palatal petechiae, and anterior and posterior cervical lymphadenopathy. An abdominal examination reveals splenomegaly. A rapid streptococcal test is negative and a heterophile antibody test is positive. A CBC with differential demonstrates atypical lymphocytes.

Which one of the following would be the most appropriate pharmacotherapy for this patient's condition?

A) Amoxicillin
B) Dexamethasone
C) Foscarnet (Foscavir)
D) Ibuprofen
E) Valacyclovir (Valtrex)

107. A 70-year-old male with hypertension sees you because of a syncopal episode. During the examination you ask him to move from a supine position to standing.

Which one of the following results of this maneuver would confirm a diagnosis of orthostatic hypotension?

A) He becomes lightheaded
B) He feels chest pain
C) His systolic blood pressure decreases by at least 10 mm Hg
D) His systolic blood pressure decreases by at least 20 mm Hg

108. A 55-year-old male presents to your clinic for evaluation of COPD. He has a history of tobacco use and quit smoking 2 years ago. He reports occasional symptoms that limit his activities but has not had any exacerbations or hospitalizations. Pulmonary function tests indicate an FEV_1/FVC ratio < 0.7 and an FEV_1 of 75%. His vital signs are normal.

Which one of the following would be the most appropriate initial pharmacotherapy?

A) Budesonide/formoterol (Symbicort)
B) Ipratropium (Atrovent)
C) Levalbuterol
D) Tiotropium (Spiriva)
E) Umeclidinium/vilanterol (Anoro Ellipta)

109. A 56-year-old female comes to your office because she thinks she has a herniated disc in her lower back causing sciatica. She has electric pain shooting down her left leg all the way to her toes, and she requests MRI to see if she needs surgery. She has not had any injury, saddle anesthesia, or changes in bowel or bladder habits. On examination she has 2+ symmetric deep tendon reflexes of the lower extremities, a negative bilateral straight leg raising test, and a positive log roll test. Her pain is worse with external rotation of the left hip. You suspect piriformis syndrome.

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

A) Reassurance only
B) MRI of her lumbar spine
C) Injection of the piriformis muscle with a corticosteroid and local anesthetic
D) Referral to a physical therapist
E) Referral to an orthopedic surgeon

110. A 35-year-old female presents to your office after a recent trip to Brazil. She tells you that she has developed an extremely pruritic rash that started on her face and has spread to her trunk and limbs. In addition, she reports a headache, arthralgias, and myalgias. On examination you note a diffuse scarlatiniform rash, conjunctivitis, and small petechiae on the palate. She is afebrile.

Which one of the following is the most likely diagnosis?

A) Chikungunya virus
B) Dengue virus
C) West Nile virus
D) Yellow fever
E) Zika virus

111. You diagnose hand-foot-and-mouth disease in a 5-year-old male. His parents ask when he can return to kindergarten.

You advise that if he feels well enough to participate, he may return

A) 5 days after the onset of symptoms
B) when afebrile and there are no mouth sores causing drooling
C) when afebrile as long as all skin lesions can be covered with a dressing
D) when afebrile and all skin lesions have crusted over

112. A 35-year-old female with previously regular menses presents with a 3-month history of amenorrhea, hot flashes, and increased irritability. A pregnancy test is negative, an estrogen level is low, and an FSH level is markedly elevated. There is no change in repeat testing 1 month later and you make a diagnosis of primary ovarian insufficiency. Further testing does not reveal a cause for her condition. She does not desire more children.

Which one of the following should you recommend to this patient for hormone replacement therapy?

A) No treatment
B) Transdermal estradiol without progestogen
C) Continuous oral estradiol without progestogen
D) Continuous oral estradiol and cyclic progestogen
E) Continuous oral estradiol and a levonorgestrel IUD (Mirena)

113. A 40-year-old male presents to the urgent care clinic with a 2-day history of a progressive inability to walk. His husband is concerned that he has Guillain-Barré syndrome.

Which one of the following, if present in this patient, would be concerning for Guillain-Barré syndrome?

A) Afferent pupillary defect
B) Asymmetric flaccid weakness
C) Muscle spasticity
D) Nystagmus
E) Symmetric hyporeflexia

114. You are instructing a new medical assistant in preordering laboratory studies for upcoming patients. You have a series of patients with appointments for physical examinations in the next week.

Based on U.S. Preventive Services Task Force guidelines, which one of the following patients should have a screening fasting glucose level or hemoglobin A_{1c}?

A) A 24-year-old female with a BMI of 26 kg/m^2
B) A 36-year-old male with a BMI of 27 kg/m^2
C) A 52-year-old female with a BMI of 22 kg/m^2
D) A 72-year-old male with a BMI of 32 kg/m^2
E) An 84-year-old female with a BMI of 40 kg/m^2

115. A randomized, controlled study of 300 participants tested the effectiveness of a new medication to reduce breast cancer–related deaths. Within 2 years of treatment, 15 out of 150 participants with breast cancer in the treatment group died, while 60 out of the 150 participants in the control group died.

Based on this study, what is the number needed to treat to prevent one breast cancer–related death?

A) 2
B) 3
C) 5
D) 10
E) 15

116. An 88-year-old female is admitted to the hospital with a hip fracture after tripping and falling, and her orthopedist recommends surgery. You are consulted for co-management and risk stratification prior to surgery.

The patient has a history of controlled blood pressure and had a coronary artery bypass graft 10 years earlier. She is not experiencing any cardiac symptoms or syncope.

The most appropriate intervention would be operative management within how many hours?

A) 48
B) 60
C) 72
D) 84
E) 96

117. A 42-year-old male presents for evaluation of a persistent cough. Three weeks ago, he developed a runny nose, dry cough, and generalized malaise without fever. One week later, he began to develop persistent fits of coughing followed by bouts of posttussive emesis. You suspect pertussis.

Which one of the following laboratory tests should be used to confirm your diagnostic suspicion?

A) Culture
B) Direct fluorescent antibody assay
C) Polymerase chain reaction (PCR)
D) Serology for IgG

118. A 9-year-old male has persistent severe depression despite cognitive behavioral therapy. Which one of the following medications is approved by the FDA for the treatment of major depressive disorder in this age group?

A) No antidepressant medications
B) Bupropion (Wellbutrin)
C) Escitalopram (Lexapro)
D) Fluoxetine (Prozac)
E) Sertraline (Zoloft)

119. A 52-year-old male sees you for follow-up after a recent right-sided ischemic stroke. The evaluation in the hospital demonstrated an unremarkable cardiac workup, an LDL-cholesterol level of 110 mg/dL, and a right internal carotid artery stenosis of 45%. His blood pressure today is 120/75 mm Hg and an examination is notable for some residual right-sided facial weakness. His current medications are aspirin, clopidogrel (Plavix), and hydrochlorothiazide.

Which one of the following would be most likely to reduce his risk for a secondary stroke?

A) Atorvastatin (Lipitor)
B) Losartan (Cozaar)
C) Warfarin
D) Carotid endarterectomy

120. A 48-year-old male presents to the emergency department for an initial episode of acute gallstone pancreatitis with a lipase level of 700 U/L (N 10–140). A right upper quadrant ultrasound shows gallstones within the gallbladder but is otherwise normal. He is treated with intravenous fluids and medications to control pain and nausea, and is admitted to a regular medical floor bed. The next morning he reports that his symptoms are improving with oral medications. A physical examination is notable for normal vital signs and mild epigastric tenderness. A comprehensive metabolic panel shows improving leukocytosis and stable parameters including a normal bilirubin level.

Which one of the following management options is most appropriate in this situation?

A) Rechecking a serum lipase level and starting oral feeding if the result is normal
B) Initiating enteral feeding through a nasojejunal tube
C) Initiating parenteral feeding through an intravenous line
D) Consulting a gastroenterologist for endoscopic retrograde cholangiopancreatography (ERCP)
E) Consulting a general surgeon for cholecystectomy during this admission

121. Which one of the following supplements has been associated with an increased risk of lung cancer in people who smoke?

A) β-Carotene
B) Magnesium
C) Vitamin B_2
D) Vitamin B_{12}
E) Vitamin C

122. A 35-year-old female presents with a 2-week history of right posteromedial foot and ankle pain. The pain began during a vacation that included several days of sightseeing and hiking. She does not have a history of acute injury or trauma. Her pain is worse with weight bearing and improves with relative rest and ibuprofen use.

A physical examination reveals soft-tissue swelling and tenderness along the posterior edge of the medial malleolus into the medial arch of the foot. Standing alignment, range of motion, a strength assessment, and neurovascular testing are normal. Her symptoms are unchanged by gentle, repetitive tapping over the posteromedial ankle.

Which one of the following is the most likely diagnosis?

A) A deltoid ligament sprain
B) A medial malleolar stress fracture
C) Peroneal tendinopathy
D) Posterior tibialis tendinopathy
E) Tarsal tunnel syndrome

123. A 25-year-old male with no significant past medical history comes to your office to establish care. A physical examination reveals a cardiac murmur that has not been documented previously.

Which one of the following findings would be most concerning for hypertrophic cardiomyopathy as the cause of his murmur?

A) A diastolic murmur that increases in the left lateral decubitus position
B) A systolic murmur that increases with an isometric handgrip
C) A systolic murmur that increases when moving from squatting to standing
D) A systolic murmur that decreases with the Valsalva maneuver
E) A fixed split of the second heart sound

124. A 32-year-old female contacts you through the patient portal regarding a 5-day history of symptoms consistent with acute rhinosinusitis. Which one of the following treatment recommendations would be in alignment with current recommendations from the Infectious Diseases Society of America?

A) Symptomatic treatment only
B) Amoxicillin
C) Amoxicillin/clavulanate (Augmentin)
D) Azithromycin (Zithromax)
E) Levofloxacin

125. You provide care for a 65-year-old female who has metastatic breast cancer. She would like to consider simple treatments and/or admissions, but wishes to avoid any further surgeries, heroic procedures, transfers to the ICU, or intubation.

Which one of the following forms should you recommend as most beneficial for directing her end-of-life care?

A) Cardiopulmonary resuscitation (CPR) directives
B) A living will
C) A medical power of attorney
D) Physician Orders for Life-Sustaining Treatment (POLST)

126. A 60-year-old female comes to your office several weeks after an emergency department (ED) visit for ureteral colic. At that time, a comprehensive metabolic panel was normal except for a calcium level of 10.6 mg/dL (N 8.6–10.5). An ionized calcium level was also elevated. A urinalysis showed 20 RBCs/hpf but a urine culture was negative. CT of the abdomen and pelvis demonstrated a 4-mm radiopaque calculus in the distal ureter but no other abnormality. She was treated with analgesics and tamsulosin (Flomax) and passed the stone several days later.

She currently has no urinary or gastrointestinal symptoms. This is her third episode of ureterolithiasis in the past 5 years.

Which one of the following would be the most appropriate test to order next?

A) An intact parathyroid hormone level
B) A 24-hour urine sample for calcium
C) A TSH level
D) Repeat urinalysis and urine culture
E) Renal ultrasonography

127. A 30-year-old female reports that a new male sex partner told her that he has a urethral chlamydial infection. She has no symptoms, but testing with an endocervical swab confirms that she is also infected with *Chlamydia*. No other sexually transmitted infections are identified. She is not allergic to any medications.

Which one of the following would be the most appropriate treatment regimen for her?

A) Oral azithromycin (Zithromax), 1 g once
B) Oral cefixime (Suprax), 800 mg once
C) Oral doxycycline, 100 mg twice daily for 7 days
D) Oral levofloxacin, 500 mg daily for 7 days
E) Intramuscular ceftriaxone, 500 mg once

128. A 45-year-old female who lives in southern Florida presents to the urgent care clinic after a suspected spider bite. She was cleaning up some debris on her patio when she felt a pinprick on her right lower extremity and saw a spider crawl off her leg. The spider was shiny, with a dark-colored body and a red hourglass shape on its abdomen. She developed pain around the bite area. She applied ice to the wound, but the pain has persisted and comes in waves. She currently rates her pain as 4 points on a 10-point scale.

The patient is up to date on her tetanus vaccination and is unaware of any allergies. Her vital signs are stable. She is not experiencing any chest pain, chest tightness, tachycardia, abdominal pain, or muscle spasms. A physical examination reveals a small target lesion on her right lateral malleolus, with some erythema and swelling at the site. The remainder of the physical examination is unremarkable.

The most appropriate initial step in management would be

A) oral analgesia with NSAIDs
B) calcium and magnesium
C) parenteral opioids
D) antivenom
E) hospital admission

129. A 48-year-old female with alcohol use disorder presents to your clinic 2 days after she has stopped drinking alcohol. She reports some mild anxiety, sweating, and insomnia. On examination her vital signs are stable and she does not have a tremor. She has no history of alcohol withdrawal–related seizures or delirium.

Which one of the following medications is most appropriate for treating her alcohol withdrawal syndrome?

A) Atenolol (Tenormin)
B) Chlordiazepoxide
C) Diazepam (Valium)
D) Gabapentin (Neurontin)
E) Valproate

130. A 63-year-old retired banker presents for follow-up of diabetes mellitus. He has an 8-year history of diabetes and started metformin 7 years ago. His hemoglobin A_{1c} gradually worsened and glipizide (Glucotrol) was added 6 months ago. Since starting this medication he has had episodes of symptomatic hypoglycemia twice per week. His weight has been increasing and his current BMI is 29 kg/m^2. At the office visit today his hemoglobin A_{1c} is 7.7%. He tells you that his uncle with diabetes recently died from heart disease.

You discuss discontinuing glipizide since it is causing hypoglycemic episodes. He wants to remain on oral medications and does not want to start any medications that will make it harder to lose weight.

Given his priorities, which one of the following would be the most appropriate recommendation for this patient?

A) No additional medications
B) Glyburide
C) Insulin glargine (Lantus)
D) Semaglutide (Rybelsus)
E) Sitagliptin (Januvia)

131. A 9-year-old child is brought to your office for evaluation of right wrist pain after a fall from a swing at recess this morning. On examination you note tenderness and swelling over the lateral aspect of the distal radius. Radiographs are shown below.

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

A) A cock-up wrist splint
B) A double sugar-tong splint
C) A figure-of-8 sling
D) A short arm cast
E) A long arm cast

132. A 57-year-old male sees you for follow-up of a first episode of a distal deep vein thrombosis (DVT). He is currently taking apixaban (Eliquis) and has had no complications. He has no past medical history, including surgery or hospitalization, and he has not traveled recently. His vital signs today include a heart rate of 70 beats/min and a blood pressure of 118/76 mm Hg. His BMI is 32 kg/m^2. A physical examination is otherwise unremarkable.

Which one of the following would be the most appropriate duration of treatment for an unprovoked first DVT?

A) No treatment
B) 6 weeks
C) 3 months
D) 6 months
E) Indefinite

Item #131

133. An 82-year-old male requires a walker for ambulation. To be eligible for home health services, Medicare requires a patient to be homebound. The patient reports that leaving home is difficult and exhausting.

Which one of the following conditions could disqualify a patient from being considered homebound?

A) Attending a support group at an adult day care program two times per week
B) Going to the grocery store three times per week
C) Attending his church for Mass three times per week
D) Going to outpatient dialysis three times per week

134. A 39-year-old male presents during influenza season with symptoms of nasal congestion and sore throat associated with a cough. He is most bothered by his severe laryngitis, and is concerned about a planned conference where he will be speaking next week. He would like the symptoms to resolve quickly, and is being proactive so it does not lead to pneumonia. His symptoms started 5 days ago and have been constant. He had a fever of 100°F for the first 3 days.

On examination he has a fever, appears tired and mildly ill, and has a red pharynx and a very hoarse voice. The remainder of the examination is normal.

Which one of the following should you recommend for management of this patient's condition?

A) Reassurance and vocal rest
B) Inhaled fluticasone (Flovent)
C) Amoxicillin/clavulanate (Augmentin)
D) Levofloxacin
E) Oseltamivir (Tamiflu)

135. A 42-year-old male presents with a 2-day history of right lower quadrant pain, fever, nausea, and anorexia. His medical history is remarkable for hypertension treated with lisinopril (Zestril), type 2 diabetes managed without medication, microalbuminuria, and stage 3 chronic kidney disease with an estimated glomerular filtration rate of 48 mL/min/1.73 m^2. He has not had any previous surgeries. An examination is remarkable for tenderness in the right lower quadrant. You order a CBC, urinalysis, and metabolic panel.

To complete the initial workup, which one of the following would be the most appropriate imaging modality in this situation?

A) Ultrasonography
B) CT without contrast
C) CT with oral contrast
D) CT with intravenous contrast
E) MRI with intravenous contrast

136. Which one of the following is the hallmark of proliferative diabetic retinopathy?

A) Blot hemorrhages
B) Cotton-wool spots
C) Drusen
D) Macular edema
E) Neovascularization

137. You have recently acquired several patients from a retiring colleague. These patients have been using topical corticosteroids over a prolonged period of time.

Which one of the following patient groups is at highest risk for adverse systemic reactions to prolonged topical corticosteroid use?

A) Children
B) Young adults
C) Middle-aged adults
D) Pregnant women
E) Breastfeeding women

138. A 13-year-old female with a peanut allergy is brought to the urgent care clinic 15 minutes after she was inadvertently exposed to a peanut butter sandwich while at a friend's house. She develops swelling of the tongue, wheezing, and difficulty breathing.

Which one of the following should be administered at this time?

A) Subcutaneous epinephrine
B) Intramuscular epinephrine
C) Intravenous epinephrine
D) Intravenous dexamethasone
E) Intravenous diphenhydramine

139. A previously healthy 58-year-old female sees you for evaluation of increased hair growth on her face and a weight gain of 18 kg (40 lb) over the past year. An examination is significant for a blood pressure of 155/98 mm Hg, a BMI of 34 kg/m^2 with a truncal obesity pattern, striae on the sides of the torso and lower abdomen, marked hirsutism, and a rounded, swollen facial appearance. A urine pregnancy test is negative. Liver and renal function tests are normal, as are TSH, electrolyte, testosterone, and DHEA levels. A hemoglobin A_{1c} is 6.2%.

Which one of the following would be most useful to diagnose the condition suggested by this patient's presentation?

A) A 24-hour urinary free cortisol level
B) 24-hour urinary metanephrines
C) ACTH stimulation testing
D) FSH and LH levels
E) Plasma renin activity testing and an aldosterone level

140. According to the 2022 American Academy of Family Physicians clinical practice guideline, treatment to a blood pressure target of < 135/85 mm Hg in adults who have hypertension reduces which one of the following?

A) All-cause mortality
B) Cardiovascular mortality
C) Risk of myocardial infarction
D) Risk of stroke

141. A 55-year-old male with oxygen-dependent COPD plans to visit family 2000 miles away. For the last year, his COPD has been well controlled on medications and oxygen at 2 L/min. He wants to travel by commercial airline.

Which one of the following would be the most appropriate advice for this patient regarding air travel?

A) Choosing another mode of transit
B) Flying first class only
C) Continuing his oxygen flow rate at 2 L/min during the flight
D) Lowering his oxygen flow rate to 1 L/min during the flight
E) Doubling his oxygen flow rate to 4 L/min during the flight

142. Which one of the following is the most appropriate initial management for patients with patellofemoral pain syndrome?

A) A medial unloading knee brace
B) Exercise therapy
C) Intra-articular corticosteroid injection
D) Confirmation of the diagnosis with MRI
E) Referral for knee arthroscopy

143. A 51-year-old male presents to your office with right arm weakness. He has a history of multiple sclerosis (MS) with infrequent flares only. His MS is managed with interferon as the long-term disease-modifying therapy. After a thorough history and examination, you diagnose a flare of MS.

In addition to notifying his neurologist, which one of the following would be the most appropriate next step?

A) Doubling his dosage of interferon for 5 days
B) Initiating high-dose aspirin
C) Initiating corticosteroids
D) Ordering plasmapheresis
E) Referral to physical therapy

144. You are preparing to inform a patient of a diagnosis of terminal metastatic cancer. When sharing bad news with a patient, which one of the following is the most appropriate next step?

A) Selecting which information to share with the patient
B) Asking the family what the patient knows
C) Obtaining the patient's permission to discuss the diagnosis
D) Explaining palliative care
E) Informing the patient about hospice

145. A 56-year-old female with type 2 diabetes is hospitalized with acute epigastric pain, nausea, and vomiting. She reports that several of her diabetes medications were recently changed. Findings on physical examination and laboratory studies are consistent with acute pancreatitis.

Which one of the following classes of medications is the most likely cause?

A) Biguanides
B) GLP-1 receptor agonists
C) Insulin
D) SGLT2 inhibitors

146. A young adult who has been one of your patients for several years begins to exhibit symptoms of a thought disorder, and you are concerned about schizophrenia. In a review of the diagnostic criteria for schizophrenia, your resources refer to positive and negative symptoms.

Which one of the following is a negative symptom associated with schizophrenia?

A) Delusions
B) Depression
C) Disorganized speech
D) Hallucinations
E) Reduced speech

147. A 17-year-old high school football player presents the Monday after a weekend game during which he attempted a tackle and caught his left ring finger on his opponent's uniform. On examination he has mild swelling and tenderness over the volar aspect of the affected finger, and he is unable to actively flex the distal interphalangeal joint. Plain radiographs demonstrate no bony trauma.

Which one of the following management options would be most appropriate?

A) Early referral to occupational therapy for exercises to restore active range of motion
B) Corticosteroid injection into the flexor tendon sheath to restore active range of motion
C) Two weeks of immobilization in flexion, followed by buddy taping to the middle finger
D) Six weeks of full-time immobilization in an extension splint
E) Urgent referral to an orthopedist for surgical repair of the flexor tendon

148. A 55-year-old male with a 10-pack-year history of smoking as a young adult sees you for follow-up after a recent hospitalization for community-acquired right lower lobe pneumonia. His symptoms resolved after standard antibiotic treatment.

Which one of the following should you recommend regarding follow-up radiography?

A) No follow-up chest imaging
B) A standard chest radiograph 2 weeks after treatment
C) A standard chest radiograph 6 weeks after treatment
D) Standard chest CT 6 weeks after treatment
E) Low-dose chest CT 12 weeks after treatment and again in 1 year

149. A 42-year-old female sees you for follow-up 6 weeks after starting treatment for *Helicobacter pylori*. She was diagnosed with the urea breath test. She completed her antibiotic regimen as prescribed and stopped her proton pump inhibitor (PPI) 2 weeks ago. She is symptom free.

Which one of the following is the recommended next step?

A) Repeating the *H. pylori* urea breath test
B) Ordering *H. pylori* serology
C) Resuming PPI therapy
D) Screening for colon cancer
E) Screening for a peptic ulcer

150. A 74-year-old patient presents to your office for medical clearance for an upcoming surgery. In addition to basic laboratory studies requested by the surgeon, you obtain an EKG (shown below).

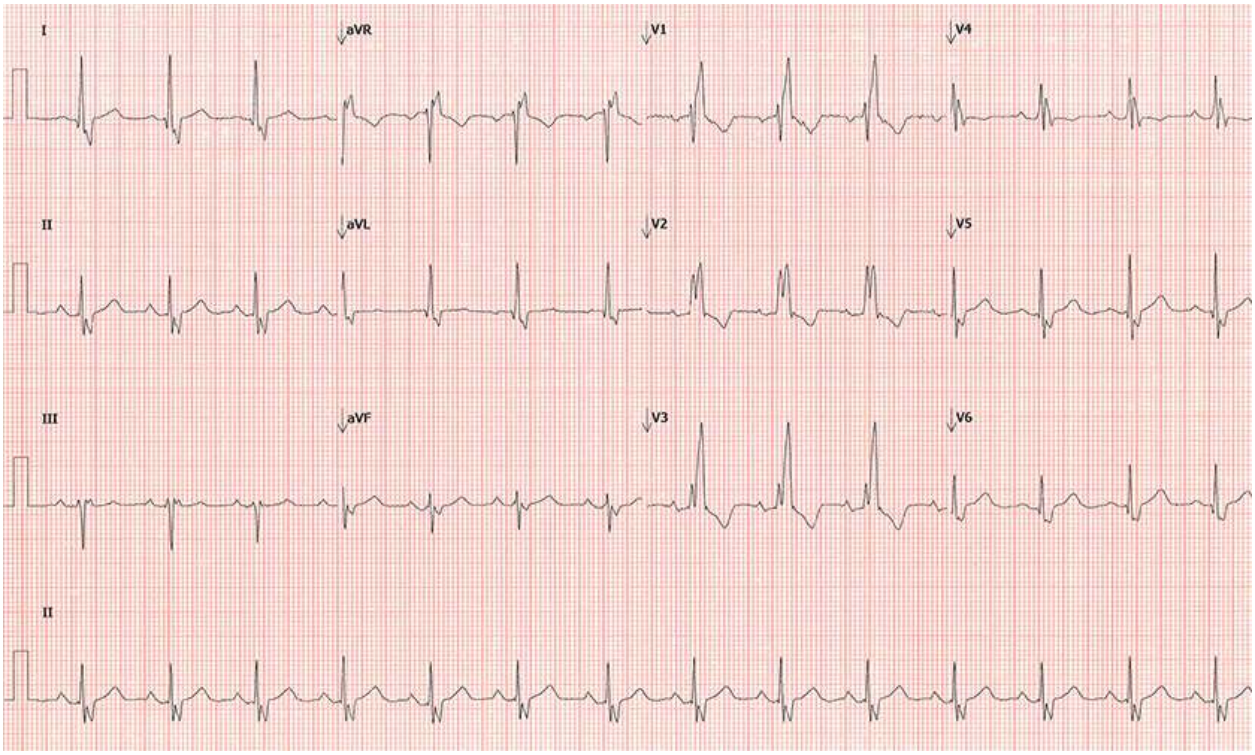
The EKG is most consistent with which one of the following?

A) Left bundle branch block
B) Right bundle branch block
C) Right ventricular hypertrophy
D) Paced rhythm
E) Wolff-Parkinson-White syndrome

151. A 72-year-old female with a history of hypertension, previous stroke with no residual deficits, and mild cognitive impairment presents for an annual health maintenance examination. Her documented weight 6 months ago was 79 kg (174 lb) and her current weight is 73 kg (161 lb). She is sedentary and has not changed her diet.

Which one of the following is true about this patient's condition?

A) It is associated with increased mortality
B) It is associated with a lower risk of cardiovascular disease
C) More than 50% of patients with this condition will be diagnosed with a malignancy
D) High-calorie dietary supplements are recommended as primary treatment
E) Medications do not contribute to her condition



Item #150

152. A 27-year-old gravida 2 para 2 presents because of tenderness in her left lower breast, which she first noticed this morning. Three weeks ago she vaginally delivered an 8 lb 1 oz infant. She breastfed her first child for 10 months and initiated breastfeeding after this delivery without difficulty. Currently she is feeding her infant on cue about every 2–4 hours. On examination she has 4 cm of focal tenderness at 6 o'clock on the breast with no skin erythema. Her vital signs include a temperature of 37.0°C (98.6°F), a pulse rate of 84 beats/min, and a blood pressure of 118/72 mm Hg.

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

A) A trial of conservative management of breastfeeding on cue and analgesics
B) Expressing breast milk by hand every 1½ hours to keep the breast emptied
C) Expressing breast milk with a breast pump hourly to keep the breast emptied
D) Amoxicillin/clavulanate (Augmentin), 875/125 mg twice daily for 5 days; plus pumping and discarding the breast milk
E) Cephalexin, 500 mg four times daily for 7 days; plus pumping and discarding the breast milk

153. Since the United States began fortifying grains with folic acid, which one of the following birth defects has declined?

A) Anencephaly
B) Cleft lip
C) Down syndrome
D) Omphalocele
E) Tetralogy of Fallot

154. A 36-year-old male presents to the urgent care clinic 2 days after he fell on his outstretched arm while snow skiing. He waited until his return home to seek evaluation and treatment. On presentation to your clinic he reports pain located in the deltoid region that is exacerbated when lifting the arms overhead. The pain is so severe that it awakens him at night. Examination of the shoulder demonstrates weakness with external rotation, internal rotation, and abduction. The empty can and drop arm tests are positive. Initial shoulder radiographs are negative.

Based on the presentation and examination, which one of the following would be the most appropriate next step in management?

A) Rest, ice, compression, elevation, and home exercises
B) NSAIDs and physical therapy
C) Corticosteroid injection
D) MRI

155. A 5-year-old female is brought to the emergency department by her parents after her temperature increases to 104°F. On examination she has noticeable inspiratory stridor. She is restless and drooling, and her voice is muffled. In spite of the nurse's repeated efforts to get the child to lie back, the patient continues to sit forward in a sniffing position. Her parents indicate that they have declined vaccinations for the patient since leaving the hospital after delivery.

Which one of the following is the most important next step in management?

A) Supplemental oxygen by nasal cannula
B) Intravenous fluids
C) Arterial blood gas measurement
D) A CBC
E) Direct visualization of the epiglottis in the operating room

156. An 8-year-old female is brought to your office by her parents for follow-up 6 months after you recommended a DASH diet and 1 hour of physical play daily to address her BMI and blood pressure, which were both greater than the 95th percentile for her age and height. Her mother also has a history of obesity and hypertension. The patient otherwise has an unremarkable past medical history. Although she has lost 1.4 kg (3 lb) her blood pressure remains at 125/77 mm Hg. You diagnose stage 1 hypertension and recommend management with medication.

In addition to a CBC; electrolyte, BUN, and creatinine levels; a urinalysis; and a lipid panel, you recommend

A) no further testing
B) serum or urine catecholamine measurement
C) renal Doppler ultrasonography
D) CT angiography of the kidneys
E) echocardiography

157. For a patient presenting for follow-up of monoclonal gammopathy of undetermined significance, which one of the following findings would be most concerning for progression to multiple myeloma?

A) A serum albumin level that is more than 1 g/dL below the lower limit of normal
B) A serum calcium level that is more than 1 mg/dL above the upper limit of normal
C) A hemoglobin level that is 2 g/dL above the upper limit of normal
D) The presence of 3 or more RBCs/hpf on microscopic urinalysis
E) An osteoblastic lesion seen on a skeletal radiograph

158. A 27-year-old male with no significant medical history presents for evaluation of a new onset of blood in his semen occurring on three occasions over the past 10 days. He has not had any additional genitourinary, gastrointestinal, or constitutional symptoms. He has no personal history of tobacco use and he is sexually active with his wife only. A physical examination, including a genitourinary examination, is unremarkable. A CBC, comprehensive metabolic panel, prothrombin time/partial thromboplastin time, urinalysis and culture, and sexually transmitted infection screening are all normal.

Which one of the following is the most appropriate next step?

A) Reassurance and no additional testing
B) A PSA level
C) Ultrasonography of the scrotum and prostate
D) CT of the abdomen and pelvis
E) Referral to a urologist

159. A 38-year-old female with a past medical history of posttraumatic stress disorder (PTSD) seeks treatment for recurring nightmares, which she has been experiencing for over 2 years following a near-drowning experience. During the daytime, she has unwanted intrusive thoughts and flash images of her drowning incident, and she avoids going near swimming pools. Her nightmares are increasingly distressing and she loses several hours of sleep nightly despite adequate behavioral therapy.

Which one of the following is the best initial pharmacotherapy for PTSD-associated nightmares?

A) Clonazepam (Klonopin)
B) Gabapentin (Neurontin)
C) Prazosin (Minipress)
D) Sertraline (Zoloft)
E) Venlafaxine (Effexor XR)

160. A 76-year-old male presents to your office for evaluation. He has a history of worsening New York Heart Association class IV heart failure and is on maximum medical therapy. He had a left ventricular assist device (LVAD) placed 6 months ago. He has a 50-pack-year smoking history and started smoking one pack a day at age 15. He quit smoking 10 years ago when he was diagnosed with heart failure. He asks you to schedule lung cancer screening with low-dose CT, which he has received annually for the last 10 years.

According to the U.S. Preventive Services Task Force, which one of the following is an indication to discontinue screening for lung cancer in this case?

A) Limited life expectancy
B) Age 76
C) Quitting smoking within the last 10 years
D) Recent cardiac procedure

161. A 37-year-old male sees you for a routine health maintenance examination. He is morbidly obese with a BMI of 42 kg/m^2. In addition to his obesity diagnosis, his past medical history is significant for diabetes mellitus, hypertension, hyperlipidemia, GERD, and bilateral knee osteoarthritis, which are all adequately controlled with oral medications. His father died of a myocardial infarction (MI), and the patient is worried about his risk of dying of an MI like his father, since they share a similar body habitus and comorbidities. He is concerned about his weight and has researched metabolic surgical interventions on the internet. He is overwhelmed with the options and is seeking your guidance.

Given his medical conditions, which one of the following surgical options is the recommended intervention?

A) Adjustable gastric band
B) Sleeve gastrectomy
C) Roux-en-Y gastric bypass
D) Biliopancreatic diversion with a duodenal switch

162. Which one of the following topical corticosteroids should be AVOIDED for long-term use on the face?

A) Clobetasol 0.05% lotion (Clobex)
B) Desonide 0.05% ointment (Desowen)
C) Hydrocortisone 1% lotion
D) Hydrocortisone 2.5% cream
E) Triamcinolone 0.025% cream

163. A 56-year-old female comes to your office for an acute visit because she has had increased urinary frequency, thirst, and fatigue over the past month. Her medical history includes hypertension and type 2 diabetes with microalbuminuria, and her current medications are extended-release metformin, 1500 mg daily; losartan (Cozaar), 50 mg daily; and rosuvastatin (Crestor), 10 mg daily. Her current BMI is 36 kg/m^2, and you note that she has lost 5 kg (11 lb) since her last visit 4 months ago. A point-of-care hemoglobin A_{1c} is 12%.

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

A) Basal insulin
B) A DPP-4 inhibitor
C) A GLP-1 receptor agonist
D) An SGLT2 inhibitor
E) A thiazolidinedione

164. A 45-year-old male works at a warehouse where he routinely lifts loads weighing more than 25 kg (55 lb). Which one of the following preventive measures has been shown to reduce the likelihood of developing chronic lower back pain?

A) Back braces
B) Over-the-counter insoles
C) Customized orthoses
D) Education on lifting techniques
E) Core strengthening exercises

165. A 45-year-old transgender female presents for a health maintenance visit. Her current medications include spironolactone (Aldactone), ethinyl estradiol, and escitalopram (Lexapro). Her blood pressure is within normal range. She transitioned 4 years ago and started estrogen therapy at that time. Her surgical history includes breast augmentation and vaginoplasty. There is no family history of colon, prostate, breast, or cervical cancers.

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

A) Breast cancer
B) Cervical cancer
C) Colon cancer
D) Osteoporosis
E) Prostate cancer

166. A 67-year-old male presents for a preoperative evaluation before a knee replacement. His past medical history is significant for well-controlled type 2 diabetes, hypertension, and atrial fibrillation, for which he is taking apixaban (Eliquis).

Which one of the following would be the most appropriate approach to managing anticoagulation prior to surgery?

A) Continuing apixaban therapy during the perioperative period
B) Discontinuing apixaban for 2 days prior to the procedure without bridging
C) Discontinuing apixaban for 2 days prior to the procedure, and bridging with enoxaparin (Lovenox)
D) Discontinuing apixaban for 5 days prior to the procedure without bridging
E) Discontinuing apixaban for 5 days prior to the procedure, and bridging with enoxaparin

167. A 66-year-old female with a past medical history of well-controlled type 2 diabetes diagnosed at age 60 presents for a health maintenance examination. She was previously vaccinated with 23-valent pneumococcal polysaccharide vaccine (PPSV23, Pneumovax 23) at the time of her diabetes diagnosis.

Based on CDC guidelines, which one of the following should you recommend to her today to complete her pneumococcal vaccination series?

A) No additional pneumococcal vaccine
B) A repeat dose of PPSV23
C) 13-valent pneumococcal conjugate vaccine (PCV13, Prevnar 13)
D) 15-valent pneumococcal conjugate vaccine (PCV15, Vaxneuvance)
E) 20-valent pneumococcal conjugate vaccine (PCV20, Prevnar 20)

168. In patients with severe COPD associated with chronic hypoxemia and hypercapnia, which one of the following has been shown to decrease mortality?

A) Oxygen therapy
B) Inhaled fluticasone (Flovent)
C) Inhaled formoterol (Perforomist)
D) Oral azithromycin (Zithromax)
E) Oral prednisone

169. Which one of the following tests should you obtain in a patient with lichen planus?

A) Antihistone antibodies
B) Hepatitis C antibody
C) HIV antibody
D) Sjögren syndrome–related antigen A (Ro) and Sjögren syndrome–related antigen B (La) antibodies

170. A 60-year-old male with recently diagnosed squamous cell lung cancer presents to the emergency department with generalized weakness and altered mental status. He has a temperature of 36.9°C (98.4°F) and a blood pressure of 134/78 mm Hg. His pulse rate is 100 beats/min and regular. A physical examination reveals confusion and dry oral mucosa. An EKG reveals sinus rhythm with first-degree atrioventricular block and a short ST segment. Aside from his known lung mass, imaging studies including head CT and a chest radiograph are normal. Laboratory studies, including a CBC, comprehensive metabolic panel, and lactate level, are normal except for a serum calcium level of 14.0 mg/dL (N 8.0–10.0) and a creatinine level of 1.4 mg/dL (N 0.7–1.3).

Which one of the following is the most important first step to address his hypercalcemia?

A) A 2-liter intravenous fluid bolus with normal saline
B) Furosemide, 40 mg intravenously
C) Methylprednisolone (Solu-Medrol), 125 mg intravenously
D) Pamidronate, 90 mg intravenously
E) Placement of a large bore central venous dialysis catheter

171. A 45-year-old nurse presents with a 3-week history of heel pain that is worse at the end of a workday. She reports that there has not been any trauma. An examination is significant for tenderness inferior to the lateral calcaneus extending below the malleolus to the lateral midfoot.

Which one of the following is the most likely diagnosis?

A) Achilles tendinopathy
B) Lisfranc arthropathy
C) Peroneal tendinopathy
D) Plantar fasciitis
E) Tarsal tunnel syndrome

172. A 78-year-old male presents to your office for a health maintenance visit at the request of his spouse. He does not have any current symptoms or concerns. He states that he has not seen a physician since he was a teenager. The patient reports breaking his arm as a child but has no other known medical conditions. He has a 30-pack-year history of smoking cigarettes but has not smoked for 10 years. He has one glass of wine with dinner 3–4 times a month and does not use illicit substances. His sexual history consists of sex with only his wife. His family history includes a mother who died of a stroke and a father who died of pancreatic cancer. He walks 2 miles five times a week. His vital signs and a physical examination are normal.

Which one of the following screenings is recommended by the U.S. Preventive Services Task Force for this patient?

A) Hepatitis B testing
B) Prostate-specific antigen testing
C) Abdominal aortic aneurysm ultrasonography
D) A DEXA scan
E) Low-dose CT of the chest

173. A 47-year-old female presents to your office with a 3-day history of sore throat, a fever of 100.9°F, and a dry cough. On examination she has tender anterior cervical lymphadenopathy and swollen tonsils without exudate. Her lungs are clear to auscultation. A point-of-care streptococcal rapid antigen detection test is negative.

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

A) Supportive care only
B) Penicillin V potassium
C) A repeat streptococcal rapid antigen test
D) A throat culture
E) Laryngoscopy

174. A 15-year-old male is brought to the clinic for evaluation of his eating habits. His parents note that on several occasions they have found him alone with multiple empty food packages. He confirms that yesterday he consumed two fried chicken sandwiches, two orders of French fries, and two milkshakes in a 1-hour time period in which he was alone in his room. After this episode he was uncomfortably full for several hours.

Which one of the following would support your suspicion that this individual has binge-eating disorder?

A) Distorted body image
B) Feeling content after eating
C) Markedly low body weight for age and sex
D) Sense of loss of control during overeating episodes
E) Use of laxatives to control weight

175. A 35-year-old female presents for contraceptive counseling. Her last menstrual period was 3 weeks ago and she had unprotected sex 2 days ago. A pregnancy test is negative.

Which one of the following would be the most effective emergency contraceptive agent for this patient?

A) Oral levonorgestrel (Plan B One-Step)
B) Oral ulipristal (Ella)
C) Subcutaneous depot medroxyprogesterone acetate (Depo-Provera)
D) An etonogestrel subdermal implant (Nexplanon)
E) A copper IUD (Paragard)

176. An 80-year-old male with well-controlled hypertension undergoes surgery to repair a hip fracture. He had coronary artery stenting 6 years ago and is asymptomatic. His current medications include lisinopril (Zestril), atorvastatin (Lipitor), and low-dose aspirin. He also takes chronic gabapentin (Neurontin) for postherpetic neuralgia, which is continued postoperatively. Multimodal analgesia is used, including intravenous morphine as needed after surgery.

In the postoperative period, this patient would be at greatest risk for which one of the following?

A) Gabapentin withdrawal symptoms
B) Heart failure
C) Respiratory depression
D) Restless legs syndrome
E) Seizure

177. A 20-year-old college football player is struck by another athlete and is lying still in the supine position on the field. On examination on the field, the athlete reports bilateral numbness, tingling, and pain radiating to his fingertips but does not appear to be confused. He is alert and apprehensive of cervical range of motion but does not exhibit weakness of the upper extremities.

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

A) Immediate examination for neurologic compromise and return to play if the examination is unremarkable
B) Return to play if symptoms resolve in less than 15 minutes and a repeat neurologic examination is normal
C) Serial neurologic examinations; if there is no progression of neurologic symptoms, he may remain on the sideline but may not re-enter the same game
D) Immediate removal of his helmet and pads sequentially, log-rolling him, and transporting him to the emergency department (ED) via EMS if symptoms continue for more than 15 minutes
E) Keeping his helmet and pads intact, log-rolling him, and transporting him to the ED via EMS

178. A patient with early-stage Alzheimer disease is brought to your office by his wife to discuss the benefits and risks of possible major surgery. Which one of the following would be the most appropriate next step in determining this patient's decision-making capacity for surgical informed consent?

A) Assessing his ability to understand the risks, benefits, and alternatives
B) Reviewing his living will
C) Determining his health care surrogate
D) Obtaining a competence evaluation
E) Obtaining a psychiatric evaluation

179. A 62-year-old female with a history of compensated cirrhosis secondary to nonalcoholic steatohepatitis presents to establish care and has no acute issues. She has read that she may have an increased risk for liver cancer and asks if she should be screened.

Which one of the following should you advise?

A) No routine surveillance, but evaluation based on signs or symptoms
B) Ultrasonography every 6 months
C) Annual α-fetoprotein testing
D) Annual CT
E) Annual MRI

180. A 58-year-old female with coronary artery disease and alcohol use disorder presents with progressive shortness of breath over the past 3 weeks. A chest radiograph demonstrates bilateral pleural effusions that are greater on the right side. Laboratory studies, including pleural fluid analysis, show the following:

Serum protein	5.5 g/dL (N 6.0–8.0)
Serum LDH	305 IU/L (N 105–333)
Plasma glucose	88 mg/dL (N 70–100)
Pleural fluid protein	2.9 g/dL
Pleural fluid LDH	295 IU/L
Pleural fluid glucose	51 mg/dL

Which one of the following is the most likely cause of the effusion?

A) Cirrhosis of the liver
B) Congestive heart failure
C) COPD
D) Malignancy
E) Pulmonary embolism

181. A 60-year-old female presents to the emergency department after developing confusion with severe headache and nausea. Shortly after arrival she has a generalized tonic-clonic seizure lasting less than 30 seconds. She has a blood pressure of 220/130 mm Hg, a pulse rate of 85 beats/min, and an oxygen saturation of 98% on room air. Cardiac enzymes are negative. Noncontrast CT of the head is negative for hemorrhage and contrast CT of the chest and abdomen reveals no aortic dissection. Based on guidelines from the American Heart Association, the patient's blood pressure is lowered by approximately 20% during the first hour of treatment.

Assuming the patient remains clinically stable, the goal over the next 2–6 hours is to lower her blood pressure to

A) 130/90 mm Hg
B) 140/90 mm Hg
C) 150/100 mm Hg
D) 160/100 mm Hg
E) 170/100 mm Hg

182. A 58-year-old female sees you to request testing for a possible vitamin D deficiency. She lives independently and has no health problems except for osteoarthritis. Her BMI is 25 kg/m^2 and she has no pain or muscle weakness. After discussing the U.S. Preventive Services Task Force recommendations regarding screening for vitamin D deficiency, she chooses to be tested. A serum 25-hydroxyvitamin D level is 18 ng/mL.

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

A) Explaining to her that there is no accepted cut-off for deficiency, and that the benefits of supplementation with this laboratory result are unclear
B) Initiating vitamin D supplementation to decrease the risk of cardiovascular events because her serum 25-hydroxyvitamin D level is <20 ng/mL
C) Initiating vitamin D supplementation to decrease the risk of mortality because her serum 25-hydroxyvitamin D level is <20 ng/mL
D) Ordering a 1,25-dihydroxyvitamin D study

183. Which one of the following is a predictor of a poor response to psychotherapy in adolescents with major depressive disorder?

A) High global functioning on assessment
B) Hypersomnia
C) Inappropriate guilt
D) Presence of family conflict

184. A 32-year-old male presents to your office because of a 3-month history of severe headaches. The pain is localized to the right orbital area and is accompanied by a red, watery eye. He notes rhinorrhea and sweating on the right side of his face along with feeling restless. The headaches occur daily and usually last 30 minutes to 1 hour. They can be triggered by strong odors or consuming alcohol. The patient reports that his symptoms improved when he tried a friend's sumatriptan (Imitrex). A neurologic examination is unremarkable. He asks about medication to prevent these bouts of pain.

The first-line prophylactic medication for this condition is

A) lithium
B) topiramate (Topamax)
C) ubrogepant (Ubrelvy)
D) valproic acid
E) verapamil

185. Which one of the following is an indication for urgent dialysis in a patient with an acute kidney injury?

A) Encephalopathy
B) A potassium level of 5.5 mEq/L (N 3.4–4.5)
C) Pulmonary edema that is responsive to diuretics
D) Negligible urine output for 2 hours
E) A urine output of 500 mL over 24 hours

186. A 63-year-old female presents to your office for evaluation of a lesion on her left forearm (shown below). She reports that it started as a "pimple" about a month ago and has since increased in size. It is not painful or itchy and has not bled. She has no personal or family history of skin cancer.

Which one of the following should you recommend for management of this lesion?

A) Reassurance that the lesion is benign
B) Intralesional corticosteroid injection
C) Cryotherapy
D) Shallow shave biopsy
E) Excisional biopsy with 3- to 5-mm margins

187. A 56-year-old male presents to your clinic for evaluation of knee pain. He reports several weeks of right knee pain with an occasional locking sensation. He has tried rest, acetaminophen, and ibuprofen with minimal relief. He usually walks for 1 hour daily but is currently unable to do this due to pain. His vital signs are normal except for a BMI of 33 kg/m^2.

On examination the left knee is unremarkable. The right knee is notable for pain localized to the right anterolateral region. There is no tenderness to palpation. You gently rotate the patient's torso while he stands on the affected leg with the knee at 20° of flexion, resulting in pain in the right knee. The remainder of the examination is unremarkable.

Which one of the following is the most likely diagnosis?

A) An anterior cruciate ligament tear
B) Gout
C) Iliotibial band syndrome
D) A lateral collateral ligament sprain
E) A meniscal tear

188. A 37-year-old male presents for a medical clearance examination. He has no symptoms or concerns. His past medical and surgical histories are unremarkable. His social history is significant for a 20-pack-year cigarette use and occasional alcohol intake. When asked if he has considered quitting smoking, he says that he may wish to quit some day for his health, but he is not currently ready.

In addition to behavioral counseling, which one of the following medications has been shown to be effective for smoking cessation in patients who are reluctant to quit?

A) Bupropion (Wellbutrin SR)
B) Clonidine
C) Nicotine transdermal patch (Nicoderm CQ)
D) Nortriptyline (Pamelor)
E) Varenicline

Item #186

189. You are considering a workup for resistant hypertension in a 58-year-old male due to a lack of response to medication therapy. Which one of the following is the most common cause of uncontrolled hypertension?

A) Hyperaldosteronism
B) Increased salt intake
C) Medication nonadherence
D) Obstructive sleep apnea
E) Renal artery stenosis $>75\%$

190. A 68-year-old male with a past medical history of tobacco use and alcohol abuse presents with halitosis. On physical examination you note that he has thick white hyperkeratosis with a furry appearance on the anterior two-thirds of his tongue.

Which one of the following should you recommend?

A) Serial observations with close follow-up
B) Increased fiber intake and regular tongue brushing
C) Oral fluconazole (Diflucan)
D) Topical corticosteroids
E) Referral for biopsy of the tongue

191. For a patient with a borderline low serum cobalamin (vitamin B_{12}) level, which one of the following additional findings is the most sensitive and specific for a true vitamin B_{12} deficiency state?

A) High methylmalonic acid level
B) Low ferritin level
C) Low folate level
D) Low homocysteine level
E) Negative intrinsic factor antibodies

192. Which one of the following is associated with a shorter duration of active labor and reduction of risk for cesarean section or operative vaginal delivery?

A) Admission to the labor and delivery unit during the latent phase of labor
B) Amniotomy prior to the onset of active labor
C) The use of high-dose rather than low-dose oxytocin (Pitocin)
D) Membrane stripping prior to the onset of labor
E) Using an individual labor support person (doula)

193. Which one of the following is the strongest risk factor for the development of nonalcoholic fatty liver disease?

A) Chronic acetaminophen toxicity
B) Hereditary hemochromatosis
C) Obesity
D) Severe hypertriglyceridemia
E) Type 2 diabetes

194. A 45-year-old female comes to your clinic for follow-up of pruritus. She notes swelling in her distal fingers. She reports that her fingers become pale and numb, and they tingle when exposed to cold. An examination shows multiple telangiectasias and bilateral thickening and swelling of her fingers. An erythrocyte sedimentation rate and C-reactive protein level are elevated. An antinuclear antibody titer is positive at 1:320 with a nucleolar pattern. Anti–double-stranded DNA antibodies and anti-Smith antibodies are negative. Antiribonucleoprotein antibodies, anti–Sjögren-syndrome-related antigen A and B, anticardiolipin, and lupus anticoagulant are negative. Anticentromere and anti–Scl-70 antibodies are positive.

Which one of the following is the most likely diagnosis?

A) Dermatomyositis
B) Mixed connective tissue disease
C) Sjögren syndrome
D) Systemic lupus erythematosus
E) Systemic sclerosis (scleroderma)

195. A 52-year-old postmenopausal female presents for evaluation of a lump on her neck. Other than a palpable thyroid nodule measuring approximately 1 cm, a history and physical examination are unremarkable.

Based on this finding, which one of the following additional evaluations is indicated at this time?

A) TSH, T_3, and free T_4 levels, and an antithyroid antibodies assay
B) A TSH level and thyroid ultrasonography
C) A TSH level and neck CT
D) A TSH level, thyroid ultrasonography, and neck CT
E) A TSH level and a radionucleotide thyroid uptake scan

196. A 32-year-old female presents to your office with a 6-month history of difficulty sleeping. This occurs 4–5 nights per week and often it takes her more than 2 hours to fall asleep.

Which one of the following is the first-line therapy for this condition?

A) Diphenhydramine (Benadryl Allergy), 25–50 mg before bed
B) Lorazepam (Ativan), 0.5 mg before bed
C) Zolpidem (Ambien), 5 mg before bed
D) Positive airway pressure therapy
E) Cognitive behavioral therapy

197. A 30-year-old security guard who runs 15–20 miles per week and works 12-hour shifts 3–4 days per week presents with a 2-week history of heel pain. The pain is especially intense when she first steps out of bed in the morning and at the end of her shift. A physical examination reveals tenderness to palpation over the medial plantar region of the heel.

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

A) NSAIDs, stretching, and ice massage
B) Corticosteroid injection of the heel
C) Ultrasound-guided botulinum toxin injection of the heel
D) Extracorporeal shock wave therapy
E) Referral to a surgeon for plantar fasciotomy

198. A male with active tuberculosis in the United States refuses treatment. Which one of the following entities has the ultimate power to enforce isolation and treatment of this patient in order to protect public health and safety?

A) No entities
B) City government
C) County government
D) State government
E) Federal government

199. A 66-year-old male with a current history of tobacco use, hypertension, and gout presents for an annual health maintenance examination. He does not have any concerns today. A physical examination is unremarkable except for an elevated blood pressure of 149/90 mm Hg and a bruit heard over his abdomen. Abdominal duplex ultrasonography shows an abdominal aortic aneurysm with a diameter of 4.5 cm.

In addition to encouraging smoking cessation, which one of the following would be the most appropriate next step?

A) No further surveillance
B) Repeating abdominal duplex ultrasonography in 6–12 months
C) Repeating abdominal duplex ultrasonography in 2 years
D) Referral to a vascular surgeon for elective surgical repair
E) Referral to a vascular surgeon for emergent surgical repair

200. A 32-year-old male sees you for a routine health maintenance examination in the fall and you recommend influenza vaccination. He mentions a previous possible allergic reaction to eggs. Upon further questioning, you determine that he had hives and no other symptoms after exposure to eggs.

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

A) Avoiding any influenza vaccine
B) Receiving any influenza vaccine
C) Pretreatment with diphenhydramine (Benadryl Allergy) before receiving an influenza vaccine
D) Prophylactic oseltamivir (Tamiflu) for the influenza season

American Board of Family Medicine

2023 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: E

Because of the prevalence of cancer in the United States, it is important for family physicians to recognize oncologic emergencies. This patient presents with signs and symptoms related to superior vena cava syndrome, which is caused by compression of the superior vena cava. This is most often caused by lung cancer or lymphoma, but it can also be related to indwelling catheters, lymph nodes, or metastatic tumors. After ensuring that the patient is hospitalized and stable, the initial treatment options include intravenous corticosteroids, chemotherapy, radiation, and occasionally intravascular stenting.

This condition is not the result of an infection, so antibiotics would not be appropriate. Hyperviscosity syndrome is another oncologic emergency associated with leukemia, multiple myeloma, and Waldenström macroglobulinemia. It is treated with chemotherapy and plasmapheresis. Echocardiography and bronchoscopy are not indicated in the initial management of superior vena cava syndrome.

Ref: Higdon ML, Atkinson CJ, Lawrence KV. Oncologic emergencies: recognition and initial management. *Am Fam Physician*. 2018;97(11):741-748. 2) Zimmerman S, Davis M. Rapid fire: superior vena cava syndrome. *Emerg Med Clin North Am*. 2018;36(3):577-584.

Item 2

ANSWER: B

In the single maintenance and reliever therapy (SMART) approach for asthma control, combination therapy with an inhaled corticosteroid and a long-acting bronchodilator is used as both controller and rescue medication. SMART is recommended as the preferred therapeutic approach in steps 3 and 4 in the 2020 National Asthma Education and Prevention Program guidelines. Formoterol is the only medication available in the United States recommended for use in SMART therapy due to its rapid onset of action. Budesonide monotherapy, fluticasone/salmeterol, fluticasone/vilanterol, and tiotropium/olodaterol are not appropriate options for SMART in asthma control.

Ref: Cloutier MM, Dixon AE, Krishnan JA, Lemanske RF Jr, Pace W, Schatz M. Managing asthma in adolescents and adults: 2020 asthma guideline update from the National Asthma Education and Prevention Program. *JAMA*. 2020;324(22):2301-2317.

Item 3

ANSWER: B

Proton pump inhibitors (PPIs) are some of the most commonly used prescription or over-the-counter medications. However, many patients do not have a clear indication for their use, leading to situations in which the risks may outweigh the benefits. In 2022 the American Gastroenterological Association published 10 best practice statements to assist clinicians in addressing this issue. Key recommendations include regular review and documentation of the indication for any ongoing PPI use, and to consider discontinuing PPIs for any patient without a clear indication. Strategies for PPI discontinuation include tapering or abrupt discontinuation. Rebound acid hypersecretion can lead to a temporary increase in symptoms in either approach. If deprescribing is attempted but not tolerated, patients may reasonably be continued on the lowest effective dose. Possible risks, mostly reported in retrospective rather than prospective studies, include an increased incidence of chronic kidney disease, fractures, dementia, and respiratory infections, including COVID-19.

While many patients remain on long-term PPI therapy without a clear indication, in some situations the benefits of PPIs do clearly outweigh the risks. Such indications include Barrett esophagus, severe erosive esophagitis, eosinophilic esophagitis, and high risk for upper gastrointestinal (GI) bleeding. Risk factors for GI bleeding include prior ulcer, age >65, high-dose NSAID therapy, or concurrent use of aspirin, corticosteroids, or anticoagulants. Such patients should be advised to use PPIs indefinitely. PPIs are recommended for short-term use for eradication of *Helicobacter pylori* and treatment of NSAID-induced gastric ulcers. They may also be considered as adjunctive short-term therapy in Mallory-Weiss tears and after sclerotherapy or band ligation treatment of esophageal varices. None of these are indications for long-term use in the absence of other indications.

Ref: Targownik LE, Fisher DA, Saini SD. AGA clinical practice update on de-prescribing of proton pump inhibitors: expert review. *Gastroenterology*. 2022;162(4):1334-1342.

Item 4

ANSWER: A

Dementia is a significant condition affecting 5 million adults and that number is likely to expand in the future due to the increasing number of individuals over age 65. The overall prevalence of dementia is around 5%, but it is 37% in those over age 90. Sixty percent to 80% of dementia is due to Alzheimer disease. The greatest risk factor for dementia is older age. Strong risk factors include diabetes mellitus, midlife obesity, a family history of dementia, a personal history of cardiovascular disease, cerebrovascular disease, use of anticholinergic medications, apolipoprotein E4 genotype, and a low education level. Other potential risk factors that lack strong evidence include atrial fibrillation, smoking, head trauma, substance abuse such as alcohol use disorder, and medications such as benzodiazepines and proton pump inhibitors.

Ref: Falk N, Cole A, Meredith TJ. Evaluation of suspected dementia. *Am Fam Physician*. 2018;97(6):398-405.

Item 5

ANSWER: C

The initial first-line pharmacologic therapy for temporomandibular disorders is naproxen. Cyclobenzaprine may also be added if there is evidence of muscle spasm (A recommendation). If this is unsuccessful, other options include a trial of amitriptyline or gabapentin. Opioid therapy is not appropriate first-line treatment for temporomandibular disorders. Corticosteroid injections should be avoided due to potential cartilage damage (B recommendation).

Ref: Matheson EM, Fermo JD, Blackwelder RS. Temporomandibular disorders: rapid evidence review. *Am Fam Physician*. 2023;107(1):52-58.

Item 6

ANSWER: B

Thyroiditis, a general term for inflammation of the thyroid gland, is associated with thyroid gland dysfunction. It is classified based on clinical symptoms: painless or painful, acute or subacute, and underlying etiology (medication-induced, infection, radiation-induced, or autoimmune). The most common forms of thyroiditis include Hashimoto, subacute, and postpartum. Thyroiditis often results in a triphasic disease pattern of thyroid dysfunction: hyperthyroidism due to the release of preformed thyroid hormone from damaged thyroid cells followed by hypothyroidism when the thyroid stores are depleted. Eventually normal thyroid function is restored, or the patient develops permanent hypothyroidism. This patient presents with symptoms commonly seen in thyroid disease. Further testing reveals elevated TSH and thyroid peroxidase (TPO) levels. Elevated TPO levels are found in 95% of patients with Hashimoto thyroiditis. In addition, this patient's family history includes rheumatoid arthritis, another autoimmune disease, making Hashimoto thyroiditis the most likely diagnosis. Treatment is lifelong thyroid hormone therapy.

Several medications are linked to thyroiditis, including lithium, amiodarone, interferon-alfa, interleukin-2, immune checkpoint inhibitors, and tyrosine kinase inhibitors. However, there is no proven link between oral contraceptives and Hashimoto thyroiditis. Postpartum thyroiditis occurs within 1 year of delivery, miscarriage, or medical abortion, not 2–3 years. Subacute thyroiditis is self-limited and often occurs after upper respiratory infections, causing thyroid pain and dysphagia due to inflammatory destruction of thyroid follicles.

Ref: Martinez Quintero B, Yazbeck C, Sweeney LB. Thyroiditis: evaluation and treatment. *Am Fam Physician*. 2021;104(6):609-617.

Item 7

ANSWER: D

Postpartum depression is common and patients who have given birth should be screened for a minimum of 1 year. A mother who knows what to feed an infant may have trouble executing it because of severe postpartum depression, leading to poor infant feeding practices. In this case, the provider will be more likely to successfully treat the child's anemia by treating the mother's postpartum depression.

While mothers with depression often need encouragement and support, false reassurance is paternalistic and potentially harmful. Education of the mother is sometimes useful, but studies have demonstrated that the more likely barrier to implementing her knowledge is not a need for education on infant nutrition, but rather severe depression or other psychosocial barriers. It is ideal to involve all caretakers in efforts to support a child's health, but a number of steps need to be taken prior to calling the father, including screening for domestic violence, checking on HIPAA consents, and asking about custody. Referring the mother to a psychiatrist may ultimately be helpful but puts unnecessary barriers in place for the testing and treatment of postpartum depression.

Ref: Weinfield NS, Anderson CE. Postpartum symptoms of depression are related to infant feeding practices in a national WIC sample. *J Nutr Educ Behav*. 2022;54(2):118-124.

Item 8

ANSWER: A

Although testicular cancer is the most common solid cancer in men ages 15–34, with effective treatment and an overall survival rate of 97%, the U.S. Preventive Services Task Force recommends against screening for testicular cancer in asymptomatic adolescent or adult males (D recommendation).

A detailed history and physical examination should be obtained in symptomatic patients, followed by scrotal ultrasonography if there are positive findings on history and physical examination. Tumor markers and CT of the abdomen and pelvis are required for staging, treatment recommendations, and surveillance, but not for screening purposes.

Ref: US Preventive Services Task Force. Final recommendation statement: testicular cancer: screening. Updated April 15, 2011. 2) Baird DC, Meyers GJ, Hu JS. Testicular cancer: diagnosis and treatment. *Am Fam Physician*. 2018;97(4):261-268.

Item 9

ANSWER: D

The first step in managing delirium in end-of-life care is to assess for any reversible or treatable causes, including uncontrolled pain, constipation, urinary retention, infections (e.g., urinary tract infections), and medication side effects. Antipsychotic medications, such as haloperidol and risperidone, are recommended if conservative measures fail to control the symptoms of delirium. Benzodiazepines should be used with caution as they can worsen delirium, especially in older patients. Melatonin is not indicated in the management of delirium.

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

Item 10

ANSWER: E

Patients with dark skin are at greater risk for postinflammatory hyperpigmentation, a reactive hypermelanosis. These are irregular hyperpigmented macules or patches that can occur after endogenous inflammation (e.g., acne vulgaris, pseudofolliculitis barbae, atopic dermatitis, lichen planus, psoriasis, contact dermatitis) and external injuries (e.g., insect bites, chemical peels, cryotherapy, laser surgery). This condition can occur at any age and is particularly noticeable in Fitzpatrick skin phototypes III, IV, V, and VI. Fitzpatrick skin phototype is used to classify the skin color spectrum and is based on an individual's propensity for sunburn (photodermatitis). It is not a surrogate marker for race or ethnicity. Broad-spectrum, water-based sunscreen with SPF ≥30 should be used to prevent postinflammatory hyperpigmentation (SOR C). Sunscreen that blocks visible light such as iron oxide is also useful.

Acanthosis nigricans, acne keloidalis nuchae, dermatosis papulosa nigra, and melasma are conditions that are also more common in skin of color. However, they are not related to external injuries such as insect bites. Acanthosis nigricans are usually on the posterior neck, axillae, and groin. These are velvety, irregularly defined, hyperpigmented patches. Acne keloidalis nuchae occur in the nuchal and occipital scalp. These are keloid-like papules, plaques, and cicatricial alopecia. Dermatosis papulosa nigra is usually on the face and neck. They are hyperpigmented, filiform, or sessile papules. Melasma are gray-brown patches that usually occur on the face.

Ref: Frazier WT, Proddutur S, Swope K. Common dermatologic conditions in skin of color. *Am Fam Physician*. 2023;107(1):26-34.

Item 11

ANSWER: D

Routine laboratory monitoring is required for patients with chronic kidney disease–bone mineral disorder (CKD-BMD) or secondary hyperparathyroidism due to renal disease. This patient has secondary hyperparathyroidism due to CKD, which interferes with normal calcium, phosphorus, and vitamin D regulation. Parathyroid hormone (PTH) stimulates bone resorption and increases serum calcium and phosphorus levels, and an elevated PTH level can result in significant hypercalcemia and hyperphosphatemia. Controlling these levels through diet and medication reduces fracture risk and mortality. Monitoring calcitonin, magnesium, and TSH levels on a routine basis is not useful for the management of CKD-BMD. PTH-related peptide is useful in diagnosing humoral hypercalcemia of malignancy but does not play a role in CKD-BMD monitoring.

Ref: Sell J, Ramirez S, Partin M. Parathyroid disorders. *Am Fam Physician*. 2022;105(3):289-298.

Item 12

ANSWER: B

Of this patient's medications, escitalopram is most likely to induce galactorrhea. SSRIs are responsible for 95% of medication-induced galactorrhea cases. The etiology of an elevated prolactin level <100 ng/mL is commonly medication, systemic pathology, or a microadenoma. Macroadenomas are associated with higher prolactin levels (>250 ng/mL). A normal physical examination, negative hCG level, and unremarkable TSH level, BUN level, creatinine level, and liver function tests further support a medication-induced etiology for this patient's galactorrhea. Antihypertensives such as calcium channel blockers and methyldopa may cause galactorrhea, while diuretics such as hydrochlorothiazide and ACE inhibitors such as lisinopril are not known offenders. Neither atorvastatin nor metformin are common etiologies for medication-induced hyperprolactinemia, although atorvastatin can cause gynecomastia.

Ref: Bruehlman RD, Winters S, McKittrick C. Galactorrhea: rapid evidence review. *Am Fam Physician*. 2022;106(6):695-700.

Item 13

ANSWER: B

Based on a large, randomized, multicenter trial with 17,187 participants, the administration of aspirin for suspected acute myocardial infarction (MI) saves one life for every 24 patients. Supplemental oxygen appears to have no benefit in patients with an oxygen saturation $>94\%$. Excessive oxygen can be toxic to endothelial cells and may decrease coronary blood flow and increase systemic vascular resistance. β-Blockers given immediately after MI do not decrease mortality, likely due to increased cardiogenic shock, although β-blockers administered in the subacute period following the event do have benefit. Morphine does not appear to have benefit and may increase mortality. The use of nitroglycerin does not lower the risk of mortality.

Ref: Meine TJ, Roe MT, Chen AY, et al. Association of intravenous morphine use and outcomes in acute coronary syndromes: results from the CRUSADE quality improvement initiative. *Am Heart J*. 2005;149(6):1043-1049. 2) Perez MI, Musini VM, Wright JM. Effect of early treatment with anti-hypertensive drugs on short and long-term mortality in patients with an acute cardiovascular event. *Cochrane Database Syst Rev*. 2009;(4):CD006743. 3) Andrade-Castellanos CA, Colunga-Lozano LE, Delgado-Figueroa N, Magee K. Heparin versus placebo for non-ST elevation acute coronary syndromes. *Cochrane Database Syst Rev*. 2014;(6):CD003462. 4) Moss BJ, Sargsyan Z. Things we do for no reason: supplemental oxygen for patients without hypoxemia. *J Hosp Med*. 2019;14(4):242-244.

Item 14

ANSWER: D

This patient presents with symptoms and examination findings that are consistent with community-acquired pneumonia (CAP) with significant medical comorbidity, and he is stable for outpatient treatment. Medical comorbidities in this context include chronic heart, lung, liver, or kidney disease; diabetes mellitus; alcohol use disorder; cancer; or asplenia. One option for treatment in this situation is monotherapy with a respiratory fluoroquinolone, such as levofloxacin or moxifloxacin. Other options for outpatient treatment of CAP in adults with comorbidities include either the β-lactam amoxicillin/clavulanate or a cephalosporin (specifically cefpodoxime, a third-generation cephalosporin, or cefuroxime, a second-generation cephalosporin), in combination with either doxycycline or a macrolide (SOR A). Of the available choices, only amoxicillin/clavulanate plus azithromycin would provide the appropriate spectrum of antimicrobial coverage.

Amoxicillin or doxycycline monotherapy would be appropriate outpatient CAP treatment for an adult without a significant medical comorbidity. Another option in such a case is a macrolide such as azithromycin if the local pneumococcal resistance rate to macrolides is known to be less than 25% (SOR B). Oral cefuroxime would be appropriate in combination with either doxycycline or azithromycin in this scenario, but it would not provide broad enough coverage as monotherapy. Sulfamethoxazole/trimethoprim has encountered increasing pneumococcal resistance over the past several decades and therefore does not factor into current management for CAP, either alone or in combination with cephalexin, a first-generation cephalosporin that provides coverage against skin flora but not against typical CAP pathogens.

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. 2) Womack J, Kropa J. Community-acquired pneumonia in adults: rapid evidence review. *Am Fam Physician*. 2022;105(6):625-630.

Item 15

ANSWER: A

The National Osteoporosis Foundation supports treatment of postmenopausal women with low bone mass and a 10-year risk $>20\%$ for any major fracture or $\geq 3\%$ for hip fracture. First-line treatment options include bisphosphonates (alendronate, ibandronate, risedronate, and zoledronic acid), teriparatide, and denosumab. These medications are considered first line due to their proven efficacy in reducing both hip and vertebral fractures. Hormonal treatment such as raloxifene and hormone replacement therapy is not recommended as first-line treatment due to associated risk and side effects as well as lack of evidence supporting efficacy in preventing hip fractures. Women with a 10-year fracture risk $<20\%$ but who have osteopenia and/or risk factors for bone loss can be monitored with periodic bone density scans, though the optimal intervals for repeat evaluation have not been definitively established.

Ref: Cosman F, de Beur SJ, LeBoff MS, et al. Clinician's guide to prevention and treatment of osteoporosis. *Osteoporos Int*. 2014;25(10):2359–2381. 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 16

ANSWER: D

Celiac disease occurs almost exclusively in people with *HLA-DQ2* or *HLA-DQ8* genotypes. Though not routinely performed, a negative result has more than a 99% negative predictive value for the disease. A positive IgA tissue transglutaminase (tTG) antibody test is helpful in making a diagnosis if symptoms are present and has 95% sensitivity and specificity for active disease, but a negative IgA tTG test does not rule out future risk. A negative antigliadin antibody test has lower sensitivity and specificity than IgA tTG, and is used to diagnose the disease in the presence of symptoms rather than to rule out future risk. Negative C-reactive protein and fecal calprotectin levels make active inflammatory bowel disease less likely.

Ref: Pietzak MM, Schofield TC, McGinniss MJ, Nakamura RM. Stratifying risk for celiac disease in a large at-risk United States population by using HLA alleles. *Clin Gastroenterol Hepatol*. 2009;7(9):966-971. 2) Rubio-Tapia A, Hill ID, Kelly CP, Calderwood AH, Murray JA; American College of Gastroenterology. ACG clinical guidelines: diagnosis and management of celiac disease. *Am J Gastroenterol*. 2013;108(5):656-677. 3) Williams PM, Harris LM DO, Odom MR. Celiac disease: common questions and answers. *Am Fam Physician*. 2022;106(1):36-43.

Item 17

ANSWER: C

Long-term opioid therapy is associated with several endocrine conditions, the most common of which is hypogonadism. A 2020 systematic review and meta-analysis that included 52 studies on the endocrine effects of opioids found hypogonadism in 69% of male patients. Lower androgen levels were also found in women, while estradiol was not affected. Menstrual cycle disorders were noted in 87% of premenopausal women taking opioids chronically. Seven of the included studies assessed prolactin levels, which were elevated in 40% of participants. Adrenal insufficiency was noted in 24% of patients. Parathyroid disorders were not included in this manuscript and have not been reported to have an association with opioid use. Two included studies showed lower free T_4 levels in those taking opioids, with an estimated incidence of 34%.

Ref: de Vries F, Bruin M, Lobatto DJ, et al. Opioids and their endocrine effects: a systematic review and meta-analysis. *J Clin Endocrinol Metab*. 2020;105(3):1020-1029.

Item 18

ANSWER: B

When fluid resuscitation is necessary in hypothermia, normal saline is preferred because hypothermic patients cannot metabolize lactate. The fluid should be warmed to 38°C–42°C (100.4°F–107.6°F.) Lactated Ringer solution and 50% dextrose in water would not be appropriate.

Ref: Rathjen NA, Shahbodaghi SD, Brown JA. Hypothermia and cold weather injuries. *Am Fam Physician*. 2019;100(11):680-686.

Item 19

ANSWER: C

Classifying prediabetes is important because it identifies a population at increased risk for developing type 2 diabetes in the future and provides an opportunity for prevention. According to the American Diabetes Association, a hemoglobin A_{1c} of 5.7%–6.4% fits the criteria for prediabetes. Patients whose hemoglobin A_{1c} falls into this range should attempt diabetes prevention including lifestyle changes, medication, cardiovascular risk prevention, and monitoring.

Ref: American Diabetes Association. 3. Prevention or delay of type 2 diabetes: standards of medical care in diabetes—2021. *Diabetes Care*. 2021;44(Suppl 1):S34-S39. 2) Rey JB, Hawks M. Prevention or delay of type 2 diabetes mellitus: recommendations from the American Diabetes Association. *Am Fam Physician*. 2022;105(4):438-439.

Item 20

ANSWER: A

The benefit of interventions for the treatment of acute ischemic stroke is time dependent. A 21-day course of clopidogrel plus aspirin, followed by clopidogrel alone is indicated for patients with mild, non-debilitating stroke who do not require other interventions. Intravenous alteplase is most beneficial if given within 4.5 hours after the onset of stroke symptoms. In some selected patients, this time window may extend up to 9 hours. Tenecteplase is still experimental. Thrombectomy should be performed within 6 hours if possible, although select patients may benefit from thrombectomy up to 24 hours after onset of symptoms. This patient meets none of the above criteria, so he should be started on daily aspirin.

Ref: Powers WJ. Acute ischemic stroke. *N Engl J Med*. 2020;383(3):252-260. 2) Bhatia K, Jain V, Aggarwal D, et al. Dual antiplatelet therapy versus aspirin in patients with stroke or transient ischemic attack: meta-analysis of randomized controlled trials. *Stroke*. 2021;52(6):e217-e223. 3) Minhas JS, Chithiramohan T, Wang X, et al. Oral antiplatelet therapy for acute ischaemic stroke. *Cochrane Database Syst Rev*. 2022;1(1):CD000029.

Item 21

ANSWER: D

Patients with iron deficiency anemia have an increase in total iron-binding capacity. All the other listed biomarkers, including ferritin and hepcidin levels, reticulocyte count, and transferrin saturation, are decreased in the setting of iron deficiency anemia. Other laboratory findings with iron deficiency anemia include a low mean corpuscular volume, a low mean corpuscular hemoglobin, a high red cell distribution width on a CBC, and a low serum iron level.

Ref: Short MW, Domagalski JE. Iron deficiency anemia: evaluation and management. *Am Fam Physician*. 2013;87(2):98-104. 2) Camaschella C. Iron-deficiency anemia. *N Engl J Med*. 2015;372(19):1832-1843. 3) Adamson JW. Iron deficiency and other hypoproliferative anemias. In: Loscalzo J, Fauci A, Kasper D, et al, eds. *Harrison's Principles of Internal Medicine*. 21st ed. McGraw Hill; 2022:747-754.

Item 22

ANSWER: B

Core clinical features of dementia with Lewy bodies (DLB) include:

- delirium-like fluctuations in cognition with pronounced variations in attention and alertness
- hallucinations
- spontaneous parkinsonism features such as bradykinesia, resting tremor, or rigidity
- REM sleep behavior disorder (recurrent dream enactment behavior that includes movements mimicking dream content and absence of normal REM sleep atonia)

Vivid, colorful hallucinations occur in about 80% of patients with DLB. They can be three-dimensional and tend to include people, children, or animals. Patients are generally able to report these hallucinations to physicians. While hallucinations can occur in other types of dementia, they are a clinical signpost to the diagnosis of DLB.

Ref: Neef D, Walling AD. Dementia with Lewy bodies: an emerging disease. *Am Fam Physician*. 2006;73(7):1223-1229. 2) McKeith IG, Boeve BF, Dickson DW, et al. Diagnosis and management of dementia with Lewy bodies: fourth consensus report of the DLB Consortium. *Neurology*. 2017;89(1):88-100.

Item 23

ANSWER: C

All infants, regardless of whether heart murmurs are present, should be screened for critical congenital heart disease using pulse oximetry in the right upper extremity and either of the lower extremities. The ideal time frame to conduct pulse oximetry is 24 hours or more after birth. False-positive results are more likely when testing is performed within the first 24 hours of life. All infants should be screened, not only those with clinical signs of hypoxemia.

Ref: Ford B, Lara S, Park J. Heart murmurs in children: evaluation and management. *Am Fam Physician*. 2022;105(3):250-261.

Item 24

ANSWER: A

Tender, symmetric erythematous nodules on the lower extremities are consistent with erythema nodosum (EN), the most common form of panniculitis. EN is a result of a hypersensitivity reaction to an antigen. The nodules are usually of acute onset, 1–6 cm in diameter, and occur symmetrically on the pretibial areas but can also appear on the thighs, ankles, and forearms. They generally resolve without ulceration or scarring within 1–6 weeks. While the etiology is usually unknown, they can be due to an infection (often streptococcal), systemic disease (such as Behçet syndrome), inflammatory bowel disease, sarcoidosis, or medications (sulfonamides, penicillins, and oral contraceptives are most common). Depending on the clinical picture and presence of systemic disease, the workup can include biopsy and laboratory testing.

Necrobiosis lipoidica is strongly associated with diabetes mellitus, and occurs as reddish-brown plaques on the anterior legs. Purpura fulminans is associated with severe disseminated intravascular coagulation and is characterized by large ecchymoses that evolve into bullae, then black necrotic lesions. Patients are severely ill with associated hypotension. Pyoderma gangrenosum is exquisitely tender with pain out of proportion to appearance. It appears as a rapidly developing large ulceration arising from an initial pustule or papule. Superficial thrombophlebitis is characterized by tender isolated venous nodules that are rarely numerous and symmetric.

Ref: Kumetz EA, Logemann NF, Rivard SC. Painful lower extremity ulcerations with hyperpigmentation. *Am Fam Physician*. 2020;101(3):177-178. 2) Pérez-Garza DM, Chavez-Alvarez S, Ocampo-Candiani J, Gomez-Flores M. Erythema nodosum: a practical approach and diagnostic algorithm. *Am J Clin Dermatol*. 2021;22(3):367-378.

Item 25

ANSWER: E

Vocal cord dysfunction occurs when the vocal cords close when they should be open, particularly during inspiration. It should be suspected in patients who develop sudden, severe dyspnea that presents with inspiratory stridor or wheezing and is not associated with hypoxia, tachypnea, or increased work of breathing. It is most common in women ages 30–40. Anaphylaxis and foreign body aspiration would be unlikely without an antecedent trigger. Exercise-induced asthma usually presents with expiratory wheezing and responds to the use of an albuterol inhaler. Laryngeal edema is usually preceded by signs of illness.

Ref: Malaty J, Wu V. Vocal cord dysfunction: rapid evidence review. *Am Fam Physician*. 2021;104(5):471-475.

Item 26

ANSWER: A

In patients with mild diverticulitis, outpatient management with rest and oral clear liquids is preferred. Avoidance of seeds, nuts, and popcorn does not reduce recurrence rates. CT of the abdomen may be indicated if the diagnosis is uncertain or if complications are suspected. Colonoscopy is contraindicated acutely and is only necessary for follow-up when age-appropriate cancer screening is indicated, or in cases of complicated disease. Antibiotics may not be necessary in all cases, and hospital admission is unnecessary for mild cases.

Ref: Young-Fadok TM. Diverticulitis. *N Engl J Med*. 2018;379(17):1635-1642. 2) Qaseem A, Etxeandia-Ikobaltzeta I, Lin JS, Fitterman N, Shamliyan T, Wilt TJ. Diagnosis and management of acute left-sided colonic diverticulitis: a clinical guideline from the American College of Physicians. *Ann Intern Med*. 2022;175(3):399-415.

Item 27

ANSWER: D

A diagnosis of lumbar spinal stenosis is characterized by the narrowing of a neural foramen or the spinal canal, which causes impingement of the nerve roots. It is most often caused by disc protrusion/herniation or degenerative changes. Degenerative changes cause ligamentous hypertrophy and development of osteophytes that cause symptoms by impinging on spinal roots. Compression of the posterior columns of the spinal canal can impact the awareness of position sense (proprioception). A report of balance problems by patients with low back pain is 70% sensitive for spinal stenosis syndrome, and the patient may exhibit a positive Romberg test and a wide-based gait. Spinal stenosis pain is increased by movements of lumbar extension such as standing upright and improved by forward flexion such as bending over a shopping cart or while sitting. Severe impingement as in cauda equina syndrome causes urinary retention and not incontinence.

Ref: Katz JN, Zimmerman ZE, Mass H, Makhni MC. Diagnosis and management of lumbar spinal stenosis: a review. *JAMA*. 2022;327(17):1688-1699.

Item 28

ANSWER: B

Primary hyperaldosteronism was previously thought to be rare, but it is now considered one of the more common causes of secondary hypertension. Hypokalemia is the most common electrolyte abnormality in patients with hyperaldosteronism. Excess aldosterone secretion independent of the renin-angiotensin system causes renal potassium wasting, although about half of patients with hyperaldosteronism have normal potassium levels. Hypocalcemia is commonly associated with inadequate levels of parathyroid hormone. Hyponatremia and hyperkalemia are associated with primary hypoaldosteronism. Hypernatremia is not a common finding in primary hyperaldosteronism.

Ref: Charles L, Triscott J, Dobbs B. Secondary hypertension: discovering the underlying cause. *Am Fam Physician*. 2017;96(7):453-461. 2) Byrd JB, Turcu AF, Auchus RJ. Primary aldosteronism: practical approach to diagnosis and management. *Circulation*. 2018;138(8):823-835.

Item 29

ANSWER: B

This patient likely had a high-altitude headache on arrival, central sleep apnea during his first night in the hotel, and acute mountain sickness by the next morning. None of these conditions are life-threatening, and proper acclimatization would have been helpful. The addition of ataxia and confusion to his symptom list points to high-altitude cerebral edema, which can progress to coma and death. Immediate descent is indicated. Symptoms of high-altitude pulmonary edema include cough with pinkish sputum, respiratory distress, and cyanosis.

Ref: Luks AM, Hackett PH. Medical conditions and high-altitude travel. *N Engl J Med*. 2022;386(4):364-373.

Item 30

ANSWER: B

Edema is a common clinical condition in the primary care setting and may indicate numerous pathologies. Medications, including many antihypertensives, anti-inflammatory medications, hormones, gabapentinoids, and chemotherapy, can be a contributing factor and should be reviewed in the evaluation and management of edema. Of the agents in this patient's medication regimen, amlodipine is the most likely to cause or contribute to her edema. Acetaminophen, atorvastatin, escitalopram, and lisinopril are not likely the cause of her edema.

Ref: Patel H, Skok C, DeMarco A. Peripheral edema: evaluation and management in primary care. *Am Fam Physician*. 2022;106(5):557-564.

Item 31

ANSWER: D

Polyethylene glycol is the most effective treatment for functional constipation in children. Increased fluid intake does not affect stool frequency in children. While evidence indicates that increased physical activity may improve functional constipation in adults, it does not have the same effect in children. There is conflicting evidence regarding the effectiveness of docusate in pediatric patients with functional constipation. Probiotic supplements do not have enough evidence to be recommended.

Ref: Khan L. Constipation management in pediatric primary care. *Pediatr Ann*. 2018;47(5):e180-e184. 2) Southwell BR. Treatment of childhood constipation: a synthesis of systematic reviews and meta-analyses. *Expert Rev Gastroenterol Hepatol*. 2020;14(3):163-174. 3) Mulhem E, Khondoker F, Kandiah S. Constipation in children and adolescents: evaluation and treatment. *Am Fam Physician*. 2022;105(5):469-478.

Item 32

ANSWER: B

Obesity hypoventilation syndrome (OHS) is characterized by obesity and alveolar hypoventilation while awake, which is defined by an awake $PaCO_2$ level >45 mm Hg. Ninety percent of patients have coexistent obstructive sleep apnea (OSA). The pathogenesis is related to the increased physical demands on breathing caused by obesity. While decreased PaO_2 or oxygen saturation is often present, it is not part of the diagnostic criteria. In obese patients with lower risk (often with lower BMIs), a serum HCO_3^- level <27 mmol/L may obviate the need for an arterial blood gas measurement as OHS becomes very unlikely. If the HCO_3^- level is ≥ 27 mmol/L (a renal compensatory mechanism for hypoventilation-induced acidosis), a $PaCO_2$ measurement should be obtained to establish the diagnosis. The first-line treatment for ambulatory patients with this condition is CPAP. Nighttime measurement of peripheral oxygen saturation during sleep is a key component of sleep studies that are used to diagnose OSA, but it is not used to diagnose OHS.

Ref: Mokhlesi B, Masa JF, Brozek JL, et al. Evaluation and management of obesity hypoventilation syndrome. An official American Thoracic Society clinical practice guideline. *Am J Respir Crit Care Med*. 2019;200(3):e6-e24.

Item 33

ANSWER: E

Polymyalgia rheumatica (PMR) should be treated with glucocorticoids to induce remission. There is good evidence that adjunctive therapy with methotrexate reduces both the cumulative dose of corticosteroids needed and the risk of relapse (evidence rating A). NSAIDs such as ibuprofen and indomethacin reduce pain but do not modify the inflammatory process. Icosapent ethyl is a derivative of omega-3 fatty acids that reduces cardiovascular events and may improve rheumatoid arthritis, likely via anti-inflammatory properties. However, it has not been shown to be effective in PMR. Mesalamine is used to reduce inflammation in inflammatory bowel disease but is not effective against PMR.

Ref: Buttgereit F, Dejaco C, Matteson EL, Dasgupta B. Polymyalgia rheumatica and giant cell arteritis: a systematic review. *JAMA*. 2016;315(22):2442-2458. 2) Matteson EL, Dejaco C. Polymyalgia rheumatica. *Ann Intern Med*. 2017;166(9):ITC65-ITC80. 3) Kostoglou-Athanassiou I, Athanassiou L, Athanassiou P. The effect of omega-3 fatty acids on rheumatoid arthritis. *Mediterr J Rheumatol*. 2020;31(2):190-194. 4) Raleigh MF, Stoddard J, Darrow HJ. Polymyalgia rheumatica and giant cell arteritis: rapid evidence review. *Am Fam Physician* 2022;106(4):420-426.

Item 34

ANSWER: A

Serotonin syndrome is a serious condition that can be life-threatening. This patient is taking multiple serotonergic medications and displays features suggestive of serotonin syndrome. Signs and symptoms of serotonin syndrome include mental status changes (e.g., agitation, hallucinations, delirium, coma), autonomic instability (e.g., hyperthermia, tachycardia, labile blood pressure, diaphoresis, dizziness, flushing), neuromuscular changes (e.g., tremor, rigidity, hyperreflexia), and gastrointestinal symptoms (e.g., nausea, vomiting, diarrhea). A timely diagnosis and immediate discontinuation of serotonergic medications can help prevent worsening of the condition. Supportive care, sometimes in a hospital or intensive-care setting depending on severity, is the mainstay of treatment. Severe symptoms that necessitate hospital management include a temperature $>38.5°C$, confusion, delirium, and rigidity. Multiple classes of medications are associated with serotonin syndrome, including SSRIs/SNRIs, tricyclic antidepressants, antipsychotics, stimulants, triptans, and others. Changing to a different stimulant, or to a nonstimulant, would not help resolve serotonin syndrome, nor would symptomatic treatment with diphenhydramine or similar agents. Serotonin syndrome has been reported with 5-HT3 receptor antagonists such as ondansetron, particularly when used in combination with other serotonergic medications.

Ref: Foong AL, Grindrod KA, Patel T, Kellar J. Demystifying serotonin syndrome (or serotonin toxicity). *Can Fam Physician*. 2018;64(10):720-727.

Item 35

ANSWER: A

According to the American Geriatrics Society's Choosing Wisely recommendations, oral handfeeding is no worse for outcomes such as aspiration pneumonia, patient comfort, and death compared to percutaneous feeding tube placement. Agitation and pressure ulcers may worsen with tube feeding. High-calorie shakes or supplements and appetite stimulants are not recommended as they may increase weight but do not improve patient-oriented outcomes such as functional status, quality of life, or survival. Furthermore, appetite stimulants such as megestrol acetate may increase the risk of thrombosis and edema, and hasten death. According to randomized, controlled trials, cholinesterase inhibitors may statistically improve cognitive testing results, but they do not produce meaningful improvement. This patient is approaching end-stage Alzheimer dementia and initiating a cholinesterase inhibitor will not improve functioning and may even worsen appetite, as a common side effect is gastrointestinal disturbance.

Ref: American Geriatrics Society. Tip sheet: ten things clinicians and patients should question. ABIM Foundation Choosing Wisely campaign. Updated June 2017 2) Unwin BK, Bedsaul NB, Stubbs S. The physician's role in transitioning older adults into long-term care facilities. *Am Fam Physician*. 2022;106(6):714-717.

Item 36

ANSWER: A

Soft-tissue masses that are ≥5 cm in diameter carry a higher risk of malignancy and should prompt further evaluation with advanced imaging. Other features that raise concern for possible malignancy include rapid growth, sudden presentation without explanation, and lesions that are firm, deep, and adhere to surrounding structures. Both benign and malignant masses can be painless, but a lack of tenderness with palpation alone would not prompt the need for advanced imaging. Advanced imaging would also not be necessary for a mass that has a fluctuant texture, has grown persistently and slowly over several years, or is superficially located (above the fascia).

Ref: Achar S, Yamanaka J, Oberstar J. Soft tissue masses: evaluation and treatment. *Am Fam Physician*. 2022;105(6):602-612.

Item 37

ANSWER: C

SGLT2 inhibitors are recommended for people with stage 3 or higher chronic kidney disease (CKD) and type 2 diabetes, as they slow CKD progression, reduce cardiovascular events, and reduce heart failure risk independent of glucose management. GLP-1 receptor agonists reduce the risk of cardiovascular disease events and hypoglycemia and appear to slow CKD progression. Biguanides (e.g., metformin), DPP-4 inhibitors, and thiazolidinediones have not been shown to reduce the progression of CKD in patients with type 2 diabetes (SOR B).

Ref: ElSayed NA, Aleppo G, Aroda VR, et al. 9. Pharmacologic approaches to glycemic treatment: standards of care in diabetes—2023. *Diabetes Care*. 2023;46(Suppl 1):S140-S157. 2) ElSayed NA, Aleppo G, Aroda VR, et al. 11. Chronic kidney disease and risk management: standards of care in diabetes—2023. *Diabetes Care*. 2023;46(Suppl 1):S191-S202.

Item 38

ANSWER: D

Fluoride helps to prevent tooth decay and is an important aspect of good oral care. Family physicians can impact oral health, which directly affects overall health, by incorporating this into their routine practice.

Fluoride varnish should be applied when the first primary tooth erupts. It should then be applied twice yearly in all infants and young children (SOR B). Also, if the patient's primary water source is deficient in fluoride, then fluoride supplements should be prescribed for children beginning at 6 months of age.

Ref: Silk H, McCallum W: Fluoride: The family physician's role. *Am Fam Physician* 2015;92(3):174-179. 2) Stephens MB, Wiedemer JP, Kushner GM: Dental problems in primary care. *Am Fam Physician* 2018;98(11):654-660. 3) US Preventive Services Task Force. Final recommendation statement: prevention of dental caries in children younger than 5 years: screening and interventions. Updated December 7, 2021.

Item 39

ANSWER: C

A lipid panel provides total cholesterol and HDL-cholesterol data, which are two of the components necessary to calculate the American College of Cardiology/American Heart Association 10-year atherosclerotic cardiovascular disease (ASCVD) event risk using the Pooled Cohort Equations. Other components required to compute the ASCVD event risk score include race, sex, age, systolic blood pressure level, smoking status, presence of diabetes mellitus, and antihypertension treatment. An ankle-brachial index, a high-sensitivity C-reactive protein level, and a coronary artery calcium score are not used in the Pooled Cohort Equations to calculate a patient's 10-year ASCVD event risk.

Ref: Goff DC Jr, Lloyd-Jones DM, Bennett G, et al. American College of Cardiology/American Heart Association Task Force on Practice Guidelines: 2013 ACC/AHA guideline on the assessment of cardiovascular risk: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. *Circulation*. 2014;129(25 Suppl 2):S49-S73. 2) US Preventive Services Task Force. Final recommendation statement: cardiovascular disease: risk assessment with nontraditional risk factors. Updated July 10, 2018.

Item 40

ANSWER: D

Autism spectrum disorder (ASD) is comprised of a range of neurodevelopment conditions that affect social communication and interaction and involve repetitive patterns of behavior, interests, or activities. Because early diagnosis and treatment can improve outcomes in affected patients and families, the American Academy of Pediatrics recommends universal screening for ASD with standardized autism-specific screening tools, such as the M-CHAT, at 18 and 24 months; regular developmental surveillance at all visits; and an appropriate response to family and caregiver concerns. An 18-month-old who does not point to show interest would be concerning for an increased risk for ASD, and further evaluation is warranted. A child who does not respond to his or her name by 12 months of age or engage in pretend play by 18–24 months of age would also be at risk for ASD. Clapping hands when excited is a normal milestone for a 15-month-old, and clapping is not considered a repetitive activity in this context. Looking at the parent's face to see how to react, particularly in a new situation, is also a normal milestone for a 24-month-old.

Ref: Hyman SL, Levy SE, Myers SM; Council on Children with Disabilities, Section on Developmental and Behavioral Pediatrics. Identification, evaluation, and management of children with autism spectrum disorder. *Pediatrics*. 2020;145(1):e20193447. 2) Autism spectrum disorder (ASD): signs and symptoms. Centers for Disease Control and Prevention. Reviewed March 28, 2022. 3) Learn the signs. Act early: milestones. Centers for Disease Control and Prevention. Reviewed June 6, 2023.

Item 41

ANSWER: B

This patient has obstructive sleep apnea (OSA) based on an apnea-hypopnea index (AHI) of ≥5 in the presence of symptoms and cardiovascular disease, such as hypertension. CPAP therapy is considered the most effective treatment for OSA if used correctly and consistently and is the first-line treatment recommendation. However, many patients struggle with tolerating CPAP, which results in poor adherence and undertreatment. An oral appliance may be tried for mild sleep apnea (an AHI of 5 to <15) and is better than no treatment for patients who do not tolerate CPAP. Given the development of newer surgical treatments, the American Academy of Sleep Medicine (AASM) recommends that clinicians discuss referrals for additional treatments if adult patients with obesity cannot tolerate or do not accept CPAP. The AASM recommends that clinicians who treat OSA discuss referral to a sleep surgeon who can perform upper airway surgery (pharyngeal soft-tissue modification, skeletal modification, and upper airway stimulation such as hypoglossal nerve stimulation) with adult patients who have a BMI >40 kg/m^2 and are intolerant or unaccepting of CPAP (Strong Recommendation). It also recommends discussing referral to a bariatric surgeon with adult OSA patients with obesity (class II/III, BMI ≥35 kg/m^2) who are intolerant or unaccepting of CPAP (Strong Recommendation). Discussing a referral does not necessarily have to result in a referral, but patients should be informed that other viable alternative treatments exist and can reduce disease burden.

Ref: Semelka M, Wilson J, Floyd R. Diagnosis and treatment of obstructive sleep apnea in adults. *Am Fam Physician*. 2016;94(5):355-360. 2) Kent D, Stanley J, Aurora RN, et al. Referral of adults with obstructive sleep apnea for surgical consultation: an American Academy of Sleep Medicine clinical practice guideline. *J Clin Sleep Med*. 2021;17(12):2499-2505.

Item 42

ANSWER: A

This patient meets diagnostic criteria for fibromyalgia, which is characterized by diffuse, chronic pain without evidence of inflammation, erythema, or joint deformities. Pharmacologic treatments for fibromyalgia include tricyclic antidepressants such as amitriptyline, SNRIs such as duloxetine and milnacipran, and gabapentinoids such as pregabalin. Evidence does not show benefit from NSAIDs such as celecoxib or naproxen or opioids such as hydrocodone. Hydroxychloroquine is a disease-modifying antirheumatic agent used to treat rheumatoid arthritis and malaria and is not appropriate for the treatment of fibromyalgia.

Ref: Winslow BT, Vandal C, Dang L. Fibromyalgia: diagnosis and management. *Am Fam Physician*. 2023;107(2):137-144.

Item 43

ANSWER: E

This patient has laboratory evidence of primary hyperparathyroidism, with hypercalcemia and an inappropriately elevated (as opposed to suppressed) parathyroid hormone (PTH) level. An elevated 24-hour urine calcium level further distinguishes primary hyperparathyroidism from familial hypocalciuric hypercalcemia. Treatment of primary hyperparathyroidism with parathyroidectomy has been shown to normalize PTH and calcium levels, decrease kidney stone production, and prevent declines in renal function and bone mineral density. Untreated primary hyperparathyroidism increases overall mortality as well as cardiovascular and cerebrovascular disease risk, in addition to increasing the risk of kidney stone production, renal function decline, and loss of bone mineral density. Parathyroidectomy is indicated in this patient based on her symptomatic hypercalcemia, age < 50, and serum calcium level > 1 mg/dL above the upper limit of normal. Other potential indications include the presence of osteoporosis, reduced kidney function, or other asymptomatic renal involvement, including silent nephrolithiasis on imaging, nephrocalcinosis, or hypercalciuria.

Patients with primary hyperparathyroidism who are not candidates for surgery may be managed medically. Bisphosphonates may be used to increase bone mineral density. For this patient with a normal DEXA scan, surgical treatment would obviate the possible future need to treat her for bone density loss related to hyperparathyroidism. Thiazides may be used for treating certain hyperparathyroid states due to their impact on reducing calcium excretion and improving bone mineral density, although they are typically avoided in primary hyperparathyroidism because they can worsen hypercalcemia. Genetic evaluation would be warranted for a patient suspected of having multiple endocrine neoplasia type 1 or 2A, although this patient does not have any family history or presenting features to suggest involvement of either of these rare familial syndromes. Cystoscopy may be indicated in the setting of ureteral obstruction but is not necessary in this case.

Ref: Insogna KL. Primary hyperparathyroidism. *N Engl J Med*. 2018;379(11):1050-1059. 2) Sell J, Ramirez S, Partin M. Parathyroid disorders. *Am Fam Physician*. 2022;105(3):289-298.

Item 44

ANSWER: C

The U.S. Preventive Services Task Force recommends that all adolescents and adults between the ages of 15 and 65 be screened for HIV (A recommendation). Screening for carotid stenosis and for testicular cancer is not recommended (D recommendation). The evidence for glaucoma screening and vitamin D deficiency is unclear and no recommendation has been made.

Ref: US Preventive Services Task Force. Final recommendation statement: testicular cancer: screening. Updated April 15, 2011. 2) US Preventive Services Task Force. Final recommendation statement: human immunodeficiency virus (HIV) infection: screening. Updated June 11, 2019. 3) US Preventive Services Task Force. Final recommendation statement: asymptomatic carotid artery stenosis: screening. Updated February 2, 2021. 4) US Preventive Services Task Force. Final recommendation statement: vitamin D deficiency in adults: screening. Updated April 13, 2021. 5) US Preventive Services Task Force. Final recommendation statement: primary open-angle glaucoma: screening. Updated May 24, 2022.

Item 45

ANSWER: C

This student athlete likely has a contusion to the radial nerve in the spiral groove of the distal humerus, resulting in the so-called "Saturday night palsy" after undue pressure on the distal upper arm. This could be the result of significant direct pressure over several hours, or such an injury could happen acutely, as in the described scenario. Findings include paresthesias and possible decreased light or sharp touch sensation on the back of the hand and extensor forearm. Motor findings include weakness of finger and wrist extension, best evaluated by testing while the examiner applies resistance to the actions. Thumb apposition is controlled by the median nerve and splaying out the fingers (lumbricals) is mainly an ulnar nerve function. Unless the nerve has been severed, the sensory loss and motor weakness typically resolve within days to weeks.

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 46

ANSWER: C

Patients with moderately severe esophagitis require ongoing proton pump inhibitors (PPIs) to manage symptoms. There is a nearly 100% recurrence of symptoms at 6 months if a PPI is stopped. Lifelong omeprazole use would be the best choice for this patient. PPIs are recommended over H_2-blockers such as famotidine for maintenance and healing of erosive esophagitis. Prokinetic agents such as metoclopramide are not recommended for GERD unless gastroparesis is also present. Sucralfate is not recommended for GERD except in the case of pregnancy.

Ref: Katz PO, Dunbar KB, Schnoll-Sussman FH, Greer KB, Yadlapati R, Spechler SJ. ACG clinical guideline for the diagnosis and management of gastroesophageal reflux disease. *Am J Gastroenterol*. 2022;117(1):27-56.

Item 47

ANSWER: B

The 2022 World Professional Association for Transgender Healthcare (WPATH) standards of care recommends that in eligible adolescents, pubertal suppression may begin at Tanner stage 2. Treatment prior to the onset of puberty is not recommended. Tanner stage 1 is prepubescent and Tanner stage 2 is the initial pubescent stage. It is not necessary and may be harmful to wait for further pubertal stages before initiating puberty blockers in an eligible transgender adolescent.

Ref: Coleman E, Radix AE, Bouman WP, et al. Standards of care for the health of transgender and gender diverse people, version 8. *Int J Transgend Health*. 2022;23(Suppl 1):S1-S259.

Item 48

ANSWER: B

Heart failure with preserved ejection fraction (HFpEF), defined as an EF ≥50%, has a relative paucity of evidence-based treatments leading to improved patient outcomes compared to heart failure with reduced ejection fraction (HFrEF), defined as an EF <40%. While all of the options listed have good evidence of benefit in HFrEF, only the SGLT2 inhibitor empagliflozin has been shown to improve the composite outcome of hospitalization due to heart failure or cardiovascular death in HFpEF. The 2022 American Heart Association/American College of Cardiology/Heart Failure Society of America guideline for the management of heart failure recommends SGLT2 inhibitors as having the best evidence of benefit in HFpEF.

β-Blockers such as carvedilol may be used for rate control in patients with atrial fibrillation and HFpEF but are not clearly beneficial otherwise. Clinical trials of ACE inhibitors such as lisinopril and angiotensin receptor blockers such as valsartan have not shown improved outcomes for patients with HFpEF. Sacubitril/valsartan similarly did not achieve the primary end point of improvement in time to HF hospitalization or cardiovascular death in this patient population. The mineralocorticoid antagonist spironolactone is associated with improved diastolic function in patients with HFpEF and was found to improve hospitalizations but not cardiovascular death as a primary outcome.

Ref: Pitt B, Pfeffer MA, Assmann SF, et al. Spironolactone for heart failure with preserved ejection fraction. *N Engl J Med*. 2014;370(15):1383-1392. 2) Empagliflozin (Jardiance) for heart failure with reduced ejection fraction. *Med Lett Drugs Ther*. 2021;63(1636):171-172. 3) Anker SD, Butler J, Filippatos G, et al. Empagliflozin in heart failure with a preserved ejection fraction. *N Engl J Med*. 2021;385(16):1451-1461. 4) Heidenreich PA, Bozkurt B, Aguilar D, et al. 2022 AHA/ACC/HFSA guideline for the management of heart failure: a report of the American College of Cardiology/American Heart Association joint committee on clinical practice guidelines. *Circulation*. 2022;145(18):e895-e1032.

Item 49

ANSWER: C

This patient's chest radiograph is consistent with a large right pneumothorax and complete lung collapse. In addition, there is a leftward mediastinal shift that raises the concern for a tension pneumothorax. The most appropriate next step in management would be placement of a chest tube. The chest radiograph is not consistent with pneumonia, so antibiotics would not be appropriate. While a pulmonary embolus and non–ST-elevation myocardial infarction could have a similar presentation, the abnormal chest radiograph points to the most likely diagnosis, and a heparin infusion would not be indicated. Cardiac catheterization is not the most appropriate next step in the management of a pneumothorax because the focus should be on stabilizing the lung condition and ensuring proper healing before considering invasive procedures.

Ref: Walls RM, Hockberger RS, Gausche-Hill M, et al, eds. *Rosen's Emergency Medicine: Concepts and Clinical Practice*. 9th ed. Elsevier; 2018:881-885. 2) DeMaio A, Semaan R. Management of pneumothorax. *Clin Chest Med*. 2021;42(4):729-738.

Item 50

ANSWER: A

There are three phases of hair growth: the anagen, or growth phase; the catagen, or degeneration phase; and the telogen, or resting phase. It is during the telogen phase that hair sheds. This patient has telogen effluvium in which diffuse, not patchy, hair loss is caused by large numbers of hairs entering the telogen phase and falling out 3–5 months after a stressor. The stress may be emotional or physiologic, such as this patient's acute cholecystitis with cholecystectomy. A history of hair coming out in clumps is suggestive of this diagnosis. The incidence is similar among age groups and sexes. Telogen effluvium is usually self-limited and resolves within 2–6 months. The treatment is reassurance.

Cognitive behavioral therapy is used to treat trichotillomania, an impulse-control disorder in which patients pull, twist, or twirl hair, typically in the frontoparietal area. It can include the eyelashes and eyebrows. Terbinafine is an antifungal that can be used to treat tinea capitis, a patchy dermatophyte infection of the hair shaft and follicles that is associated with itching, scaling, and pustules. Intralesional corticosteroids can be used for alopecia areata where the hair loss pattern is patchy or involves the entire scalp. It can also involve the entire body. The hair loss is more gradual in this condition.

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

Item 51

ANSWER: D

Symptomatic osteoarthritis of the hip is estimated to affect 10% of U.S. adults. Nonpharmacologic measures are the cornerstone of treatment and include physical activity, including strength training, aerobic exercise, tai chi, and yoga; weight loss for those who are overweight; and education in self-management. When these interventions are not adequate to manage pain, medications should be considered. In patients without contraindications, oral NSAIDs such as naproxen should be considered as first-line management. The hip joint is less amenable to topical therapies than the knee joint and topical NSAIDs such as diclofenac do not have evidence of benefit for hip osteoarthritis. Topical lidocaine is similarly without evidence of benefit at the hip joint. Those with risk factors for gastrointestinal toxicity should receive prophylaxis with proton pump inhibitors when treated with oral NSAIDs. Acetaminophen is less effective than NSAIDs but may be considered for use. Tramadol should not be used as a first-line treatment for pain due to osteoarthritis of the hip.

Ref: Katz JN, Arant KR, Loeser RF. Diagnosis and treatment of hip and knee osteoarthritis: a review. *JAMA*. 2021;325(6):568-578. 2) Drugs for osteoarthritis. *JAMA*. 2021;325(6):581-582.

Item 52

ANSWER: A

Bismuth subsalicylate has been shown to decrease the risk of contracting traveler's diarrhea by 50%–65% and may be considered for patients who are at increased risk. Drawbacks include the frequent dosing of four times daily and the risk of developing a black tongue and black stool. Bismuth subsalicylate is contraindicated in the setting of aspirin allergy, kidney disease, breastfeeding, or concurrent anticoagulant use. Medications that decrease gastric acidity, such as proton pump inhibitors, H_2-blockers, and antacids, substantially increase one's risk of contracting traveler's diarrhea. Therefore, avoiding calcium carbonate and omeprazole would be preferable for this patient. Prophylactic antibiotics typically are not recommended in this situation although may be considered for those who are at particularly high risk of health complications from a gastrointestinal illness. If a prophylactic antibiotic is desired, rifaximin should be considered. Fluoroquinolones such as ciprofloxacin, however, should be avoided for prophylactic use due to risks of inducing antibiotic resistance and causing central nervous system side effects, QTc prolongation, medication interactions, and tendon injuries. Probiotics have insufficient evidence of benefit for preventing traveler's diarrhea.

Ref: Sanford C, McConnell A, Osborn J. The pretravel consultation. *Am Fam Physician*. 2016;94(8):620-627. 2) Giddings SL, Stevens AM, Leung DT. Traveler's diarrhea. *Med Clin North Am*. 2016;100(2):317-330. 3) Riddle MS, Connor BA, Beeching NJ, et al. Guidelines for the prevention and treatment of travelers' diarrhea: a graded expert panel report. *J Travel Med*. 2017;24(suppl_1):S57-S74.

Item 53

ANSWER: E

Secondary polycythemia, or elevation of red blood cells, can have multiple causes. Conditions that affect oxygenation such as obstructive sleep apnea may cause secondary polycythemia. While hemochromatosis causes elevation of iron levels, it does not typically cause polycythemia. Hereditary spherocytosis causes hemolytic anemia. Smoking cigarettes is a common cause of secondary polycythemia, but alcohol use is often associated with macrocytic anemia. This patient may be at risk for lead toxicity, which can lead to anemia.

Ref: Djulbegovic M, Dugdale LS, Lee AI. Evaluation of polycythemia: a teachable moment. *JAMA Intern Med*. 2018;178(1):128-130. 2) Fox S, Griffin L, Robinson Harris D. Polycythemia vera: rapid evidence review. *Am Fam Physician*. 2021;103(11):680-687.

Item 54

ANSWER: A

Dyspareunia is common in menopausal women and may be caused by vaginal atrophy that results in burning and dryness. Pain is generally caused by entry and deep penetration. An examination may show pale and dry vaginal mucosa, although this may appear normal in early menopause. It may be treated with vaginal moisturizers or lubricants, but further treatment may be needed. Topical estrogen is the most effective initial therapy and is much more cost-effective than other alternatives. For patients with a preference for non-estrogen treatment, ospemifene is a selective estrogen receptor modulator. However, it costs more than $200 per month and should not be used if there is a history of thromboembolism. A vaginal dehydroepiandrosterone formulation called prasterone decreases pain by increasing epithelial thickness, but also costs over $200 monthly. OnabotulinumtoxinA and pelvic floor physical therapy are utilized when pelvic floor dysfunction is the cause of dyspareunia.

Ref: Hill DA, Taylor CA. Dyspareunia in women. *Am Fam Physician*. 2021;103(10):597-604.

Item 55

ANSWER: D

A possible side effect of SSRIs is hyponatremia, which is more pronounced in the elderly. This fact is particularly pertinent in elderly patients with poorly controlled psychiatric illness who are more inclined to psychogenic polydipsia, which also leads to hyponatremia. Amlodipine is known to cause peripheral edema, dizziness, and medication-induced hepatitis. Amoxicillin causes eosinophilia and ALT and AST elevations. Atorvastatin causes elevations in ALT, AST, and creatine kinase levels. Spironolactone causes hyperkalemia and hyperuricemia, but it is not known to cause hyponatremia.

Ref: Jacob S, Spinier SA. Hyponatremia associated with selective serotonin-reuptake inhibitors in older adults. *Ann Pharmacother*. 2006;40(9):1618-1622. 2) Lexapro. Highlights of prescribing information. US Food and Drug Administration; revised May 2023.

Item 56

ANSWER: E

Turner syndrome is the most likely cause of this patient's primary amenorrhea. Turner syndrome is characterized by a lack of normal X chromosome gene expression (45,X karyotype) and is estimated to occur in 1/3000 births. Females with Turner syndrome have ovarian sex hormone insufficiency, which leads to delayed puberty. Delayed diagnosis of Turner syndrome is common, and short stature and delayed puberty are sometimes the only symptoms. Diagnosis is made via karyotyping.

Individuals with congenital adrenal hyperplasia would most likely have other signs, including clitoromegaly. Similarly, individuals with Cushing syndrome will have other features such as a dorsocervical fat pad and a rounded, swollen facial appearance. There is nothing in this patient's history or physical examination to suggest functional hypothalamic amenorrhea given that her weight is normal and has not changed recently. Polycystic ovary syndrome more typically presents with oligomenorrhea rather than primary amenorrhea.

Ref: Klein DA, Paradise SL, Reeder RM. Amenorrhea: a systematic approach to diagnosis and management. *Am Fam Physician*. 2019;100(1):39-48.

Item 57

ANSWER: B

Treatment with buprenorphine/naloxone, along with counseling, is considered optimal care for all pregnant women with active opioid addiction. Benefits include the avoidance of cycles of withdrawal and intoxication and a decrease in high-risk behaviors associated with opioid dependence and associated medical complications. A prescription for oxycodone would not be appropriate for this patient. Medically supervised withdrawal is associated with dramatically higher rates of relapse, and should only be offered to women who refuse maintenance therapy or are unable to access such therapy.

Ref: Jones HE, Finnegan LP, Kaltenbach K. Methadone and buprenorphine for the management of opioid dependence in pregnancy. *Drugs*. 2012;72(6):747-757. 2) Dooley J, Gerber-Finn L, Antone I, et al. Buprenorphine-naloxone use in pregnancy for treatment of opioid dependence. *Can Fam Physician*. 2016;62(4):e194-e200.

Item 58

ANSWER: A

Uric acid–lowering treatment is recommended for all patients with an elevated uric acid level who have had two or more gout flareups per year. Consider starting it in patients with a second flareup occurring more than 1 year later, those without an attack but who are at high risk, such as in those with kidney stones, patients with a uric acid level ≥9.0 mg/dL, or patients with stage 3 or greater chronic kidney disease.

There is no benefit for urate lowering in asymptomatic patients with an elevated uric acid level who have never had an acute episode of gout, thus allopurinol, febuxostat, and probenecid would not be appropriate. NSAIDs, colchicine, or corticosteroids are recommended for gout prophylaxis for the first 3–6 months after initiating urate-lowering therapy to prevent acute flares, but this patient has no history of acute gout. Additionally, vitamin C is not effective.

Ref: Dakkak M, Lanney H. Management of gout: update from the American College of Rheumatology. *Am Fam Physician*. 2021;104(2):209-210.

Item 59

ANSWER: B

There is an ethical and, in most states, legal obligation to report this physician for the safety of their patients. The state medical board is the appropriate agency to contact with such a concern. They will investigate the report and have the authority to intervene. The American Academy of Family Physicians and American Board of Family Medicine are not involved with licensing or intervention in the event of physician impairment.

Ref: Weiss BD. Duty to report incompetent physicians. *Am Fam Physician*. 2022;106(4):450-452.

Item 60

ANSWER: A

Antibiotics do not show any benefit in the treatment of acute bronchitis. While patients may report previous success with antibiotics for the same condition, a Cochrane review found no difference in general improvement at follow-up between antibiotics, no treatment, and placebo. Due to the frequency of side effects of antibiotics and the problems of antibiotic resistance, the NNT Group has rated antibiotics for acute bronchitis as red on its rating system, indicating no benefits.

Ref: Harris AM, Hicks LA, Qaseem A. Appropriate antibiotic use for acute respiratory tract infection in adults. *Ann Intern Med*. 2016;165(9):674. 2) Killeen BM, Wolfson AB. Antibiotics for acute bronchitis. *Am Fam Physician*. 2020;102(9):Online.

Item 61

ANSWER: A

This patient's presentation is typical for a venous ulcer resulting from long-standing venous hypertension. Patients with venous disease may have leg heaviness, pain, and swelling that worsens throughout the day. Common physical manifestations of venous disease include leg edema, varicose veins, and venous stasis dermatitis. Ulcers also may develop, often over a bony prominence in the lower leg, such as the medial malleolus. Venous ulcers are typically shallow with an exudative appearance over a granulating base and well-defined borders.

The mainstay treatment of venous ulcers is compression, which may be accomplished through various methods that are often used in combination. Options include elastic sleeves, compression stockings, non-elastic wraps such as Unna boots, and intermittent pneumatic compression. However, when underlying significant peripheral arterial disease is also present, compression therapy may further compromise distal circulation and cause unintentional harm. Therefore, patients with suspected arterial disease should have distal pulses evaluated and ankle-brachial indexes (ABIs) measured prior to starting compression therapy. When noninvasive testing suggests underlying arterial disease, consultation with a vascular surgeon is indicated. This patient has several risk factors for peripheral arterial disease, including an abnormal pedal pulse examination, and therefore should be evaluated further with ABI measurements before treating his ulcer with either a medical-grade compression stocking or an Unna boot. Although ulcers are often colonized with bacteria, antibiotics are not indicated in the absence of infection. This patient does not have symptoms or signs to suggest active infection and a culture swab would have no impact on his present management. Obtaining a biopsy of a skin ulcer may be indicated in the setting of suspected connective tissue disease, vasculitis, or malignancy but is not indicated in this situation.

Ref: Singer AJ, Tassiopoulos A, Kirsner RS. Evaluation and management of lower-extremity ulcers. *N Engl J Med*. 2017;377(16):1559-1567. 2) Bonkemeyer Millan S, Gan R, Townsend PE. Venous ulcers: diagnosis and treatment. *Am Fam Physician*. 2019;100(5):298-305.

Item 62

ANSWER: A

The renal protective effects of ACE inhibitors have been shown to be so efficacious in long-term trials as to warrant tolerating up to a 30% increase in baseline serum creatinine level within the first 6–8 weeks of therapy, assuming blood pressure goals are reached. The degree of long-term renal protection is a high priority in patients with diabetes mellitus, but this is not part of the decision-making process for cessation of ACE inhibitors.

Many patients with a severe increase in serum creatinine levels have renal artery stenosis and may require renal artery ultrasonography, and ACE inhibitors would need to be stopped in these patients.

Ref: Ohkuma T, Jun M, Rodgers A, et al. Acute increases in serum creatinine after starting angiotensin-converting enzyme inhibitor-based therapy and effects of its continuation on major clinical outcomes in type 2 diabetes mellitus. *Hypertension*. 2019;73(1):84-91.

Item 63

ANSWER: C

In patients with epigastric pain, alarm symptoms include age ≥60, persistent vomiting, unintended weight loss, dysphagia or odynophagia, gastrointestinal bleeding, a palpable mass, lymphadenopathy, night waking, symptoms that have a sudden/recent onset or are progressive in character, a family history of gastrointestinal cancer, and a poor response to empiric therapy. Epigastric tenderness is common in patients with functional dyspepsia and is not concerning unless accompanied by other alarm findings. Abdominal pain that increases when the abdominal wall muscles are tensed is called the Carnett sign. It is indicative of abdominal wall pain (musculoskeletal) and is not an alarm symptom for patients with dyspepsia. Chronic nausea is common and, unless accompanied by chronic vomiting, it is not an alarm symptom. Weight loss, not weight gain, is an alarm symptom.

Ref: Chona DL, Tubb MR, Gilinsky NH. Dyspepsia: a stepwise approach to evaluation and management. *J Fam Pract*. 2021;70(7):320-325.

Item 64

ANSWER: A

Routine cancer screening is not recommended for patients with end-stage renal disease with limited life expectancy who are not candidates for kidney transplantation. In the Choosing Wisely campaign, the American Society of Nephrology recommends avoiding routine cancer screenings for patients who are receiving dialysis who are not candidates for kidney transplantation. The U.S. Preventive Services Task Force has concluded that the current evidence is insufficient to assess the balance of benefits and risks of visual skin examination for skin cancer screening.

Ref: Wouk N: End-stage renal disease: medical management. *Am Fam Physician* 2021;104(5):493-499. 2) US Preventive Services Task Force. Recommendation topics. Updated 2023.

Item 65

ANSWER: D

A diagnosis of hypogonadism in men with symptoms and signs of testosterone deficiency should be confirmed by unequivocally and consistently low serum total testosterone and/or free testosterone concentrations. Significant diurnal and day-to-day variations affect testosterone concentration measurements. Testosterone levels are also affected by food intake and blood glucose levels. The 2018 Endocrine Society guidelines recommend that measurements of total testosterone concentrations should be obtained on two separate fasting morning specimens, using an accurate, reliable, and certified laboratory assay method. Because acute illness can also affect testosterone levels, testing should be postponed until after full recovery. Testing for testosterone deficiency in men on short-term treatment with medications such as opioids or cimetidine, which can suppress testosterone concentrations, should also be delayed until after the treatment ends. LH and FSH levels should be obtained once low testosterone has been confirmed, in order to help differentiate between primary or secondary hypogonadism. According to the 2020 evidence-based guidelines from the American College of Physicians, testosterone replacement is recommended for men with age-related testosterone deficiency and sexual dysfunction, and is not recommended to help with physical function, cognition, or energy.

Ref: Bhasin S, Brito JP, Cunningham GR, et al. Testosterone therapy in men with hypogonadism: an Endocrine Society clinical practice guideline. *J Clin Endocrinol Metab*. 2018;103(5):1715-1744. 2) Qaseem A, Horwitch CA, Vijan S, Etxeandia-Ikobaltzeta I, Kansagara D. Testosterone treatment in adult men with age-related low testosterone: a clinical guideline from the American College of Physicians. *Ann Intern Med*. 2020;172(2):126-133.

Item 66

ANSWER: D

Initial tuberculosis screening is recommended for all health care providers upon hire and extends to health care students. Recommended tests for initial screening include the interferon-gamma release assay (IGRA, QuantiFERON-TB Gold) and tuberculin skin testing (TST). TST can be affected by live virus vaccines given within the previous 4 weeks. Since this patient received a live virus vaccine (varicella), a TST may be falsely negative. The IGRA, which is not affected by prior live vaccines, would be most appropriate for this patient. Additional advantages to the assay test include higher sensitivity and specificity than the TST, the need for only one visit, and objective results. While the TST is less expensive, there is risk for subjective or misread results and a requirement of two clinic visits. A sputum culture and a chest radiograph are only indicated in the setting of positive screening results with the above-mentioned tests.

Ref: Sosa LE, Njie GJ, Lobato MN, et al. Tuberculosis screening, testing, and treatment of U.S. health care personnel: recommendations from the National Tuberculosis Controllers Association and CDC, 2019. *MMWR Morb Mortal Wkly Rep*. 2019;68(19):439-443. 2) Hartman-Adams H, Gerbo RM, George S. Tuberculosis: common questions and answers. *Am Fam Physician*. 2022;106(3):308-315.

Item 67

ANSWER: B

Corticosteroid injections for musculoskeletal conditions are frequently effective for temporary pain relief, but these injections do not always modify the overall course of the underlying condition. In the case of de Quervain tenosynovitis, such an injection is frequently curative. In adhesive capsulitis, lateral epicondylitis, osteoarthritis of the knee, and subacromial impingement syndrome, only temporary pain relief is expected, and other treatments, such as physical therapy, are usually required for longer-term symptomatic and functional improvement.

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

Item 68

ANSWER: E

Tinea infections, such as the tinea pedis seen in this patient, are caused by dermatophytes, which include the three genera *Trichophyton*, *Microsporum*, and *Epidermophyton*. The rash of tinea pedis is often limited to the webspace between the toes and/or the plantar aspect of the foot but infections may also involve the dorsum of the foot, even into the ankle region. This patient's more proximal involvement displays the classic "ringworm" pattern with an active border that is red, raised, and scaly. Cases in which the diagnosis is in doubt may be confirmed by a potassium hydroxide skin scraping that demonstrates the presence of hyphae. Most cases of tinea pedis respond well to topical therapy. Systemic treatment may be indicated in cases with widespread skin involvement, immunocompromise, failed topical treatment, or the chronic moccasin pattern marked by plantar and lateral foot hyperkeratosis, erythema, and silvery-white scale. Of the available oral options, ketoconazole is the most hepatotoxic and therefore should be avoided for the treatment of any tinea infection; however, itraconazole, fluconazole, and terbinafine are all suitable alternatives.

In this case, the patient has reasonably requested a trial of topical treatment. Newer fungicidal agents, such as butenafine and terbinafine, work more effectively and require a shorter treatment course than older fungistatic alternatives such as clotrimazole. Combination products that include corticosteroids, such as clotrimazole/betamethasone, should be avoided because they can aggravate fungal infections. Mupirocin is an antibiotic used for limited skin infections caused by *Staphylococcus aureus* or *Streptococcus pyogenes* but does not play a role in treatment of tinea infections without bacterial superinfection. This patient has a classic appearance of a tinea infection without evidence of superimposed cellulitis or abscess; therefore, an antibacterial medication is not indicated. Nystatin is useful for treating cutaneous *Candida* infections, but is ineffective for dermatophyte infections.

Ref: Ely JW, Rosenfeld S, Seabury Stone M. Diagnosis and management of tinea infections. *Am Fam Physician*. 2014;90(10):702-710. 2) Trayes KP, Savage K, Studdiford JS. Annular lesions: diagnosis and treatment. *Am Fam Physician*. 2018;98(5):283-291. 3) Dinulos JGH. *Habif's Clinical Dermatology: A Color Guide to Diagnosis and Therapy*. 7th ed. Elsevier; 2021:483-524.e1.

Item 69

ANSWER: B

The American Heart Association recommends starting immediate chest compressions when a lack of responsiveness, pulse, and breath are confirmed after 10 seconds. This can be followed by ventilation attempts in a ratio of 30 compressions to 2 breaths. In the most recent guidelines, the traditional A-B-C model has been revised to C-A-B to emphasize the early institution of compressions.

It is appropriate to attach the automated external defibrillator (AED) as soon as it arrives, but it is not the most appropriate next step. Two minutes of good-quality compressions are required before analyzing the cardiac rhythm with the AED.

A medical professional on board can make a recommendation to land, but the pilot will follow established protocols for in-flight medical emergencies. The flight crew will be in contact with an emergency consulting agency on the ground within minutes of an in-flight medical emergency.

Ref: Resuscitation science: CPR & ECC guidelines: algorithms. American Heart Association. 2020.

Item 70

ANSWER: C

The most common causes of mild hemoptysis in developed countries include COPD, bronchiectasis, acute respiratory infections, and malignancy. Physicians should first rule out pseudohemoptysis (bleeding originating from above the glottis) with a careful examination of the nose and oral cavity. Laboratory studies should be performed to evaluate for anemia, thrombocytopenia, renal function, and hepatic function.

The most appropriate next step would be posteroanterior and lateral chest radiographs (SOR C). Chest radiographs can demonstrate pneumonia, abscess, masses, and cavitary lesions. Since they are quick, easily accessible, and provide only a low level of radiation, they are preferred for initial imaging. If the chest radiograph is normal, further evaluation is recommended. The preferred follow-up imaging for nonmassive hemoptysis is CT angiography of the chest with contrast or CT of the chest with contrast, according to the American College of Radiology (ACR) appropriateness criteria (SOR C). The ACR also indicates that CT of the chest with and without contrast is "usually not appropriate."

Deferring further workup unless hemoptysis recurs is not recommended as the underlying cause of bleeding should be identified and treated. The risk of missed diagnoses of potentially fatal conditions makes watchful waiting a poor option. Empiric use of antibiotics is not recommended as the initial step given the lack of infectious symptoms and signs in this patient. Referral for bronchoscopy would be an appropriate step when the initial chest radiographs are normal and the etiology has not been identified. Up to 10% of patients with hemoptysis and a normal chest radiograph have been diagnosed with bronchogenic carcinoma.

Ref: Goldman L, Schafer AI (eds): *Goldman-Cecil Medicine*, ed 26. Elsevier, 2020, pp 504-510.e2. 2) Olsen KM, Manouchehr-Pour S, Donnelly EF, et al; Expert Panel on Thoracic Imaging; ACR Appropriateness Criteria: Hemoptysis. *J Am Coll Radiol* 2020;17(5S):S148-S159. 3) O'Gurek D, Choi HYJ: Hemoptysis: Evaluation and management. *Am Fam Physician* 2022;105(2):144-151.

Item 71

ANSWER: E

This patient most likely has thalassemia minor and will need further genetic testing to confirm the diagnosis. Thalassemia minor is associated with microcytic anemia. Thalassemia can be differentiated from iron deficiency based on low red cell distribution width (RDW), elevated reticulocyte count, normal or slightly elevated RBC count, slightly elevated ferritin, and nucleated RBCs on peripheral smear. Aplastic anemia is associated with a poor reticulocyte response and low counts. Iron deficiency is associated with an elevated RDW; a low reticulocyte count; and low RBC, ferritin, and transferrin saturation levels. Megaloblastic anemia is typically associated with an elevated mean corpuscular volume. Myelofibrosis is associated with bone marrow failure and pancytopenia.

Ref: Baird DC, Batten SH, Sparks SK. A- and β-thalassemia: rapid evidence review. *Am Fam Physician*. 2022;105(3):272-280.

Item 72

ANSWER: B

Borderline personality disorder is characterized by pervasive patterns of instability that affect regulation, self-image, and interpersonal relationships. These patients may frequently seek medical care, sabotage healthy behavior, and engage in high-risk sexual behaviors and substance use. These patients also have an increased suicide risk. The hallmark symptoms are unstable interpersonal relationships, chronic suicidal tendencies, a negative self-image, difficulty controlling moods, and marked impulsivity. Patients with borderline personality disorder can also present with vague somatic complaints and chronic pain. It is thought to be caused by a combination of neurobiologic, psychosocial, and genetic factors. Treatment includes a multifaceted approach with psychotherapy being the first-line treatment, but patients do have a high dropout rate. There are no FDA-approved medications for the treatment of borderline personality disorder, although SSRIs and quetiapine are commonly prescribed.

Bipolar disorder is characterized by alternating periods of depression and mania or, in the case of bipolar type II, hypomania. The *DSM-5* criteria for generalized anxiety disorder include excessive worry and anxiety about many events, difficulty controlling the worry, and three or more of the following symptoms: restlessness, fatigue, concentration difficulty, irritability, muscle tension, and sleep disturbance.

The essential feature of posttraumatic stress disorder is the development of characteristic symptoms after experiencing a psychologically traumatic event (or events) outside the range of human experience usually considered to be normal. The characteristic symptoms involve reexperiencing the traumatic event; numbing of responsiveness to, or involvement with, the external world; and a variety of other autonomic, dysphoric, or cognitive symptoms, such as exaggerated startle response, difficulty concentrating, memory impairment, feelings of guilt, and sleep difficulties. Criteria for major depressive disorder include depressed mood, loss of interest or pleasure, appetite or weight changes, sleep disturbances, fatigue, and difficulty concentrating.

Ref: Mendez-Miller M, Naccarato J, Radico JA. Borderline personality disorder. *Am Fam Physician*. 2022;105(2):156-161.

Item 73

ANSWER: C

Overdiagnosis is a consequence of a health system that seeks to diagnose disease before it is clinically evident in the hope of intervening to improve morbidity and mortality. The benefits of a system in which disease is detected early and health is improved must be balanced against the drawbacks in which patients are more often labeled as "sick" and engage in treatments that may cause harm without always resulting in benefit. Focusing screening efforts on populations most at risk of a disease will result in more true positive test results and the identification of patients more likely to benefit from intervention.

Examples of lack of benefit include the identification of an indolent cancer that would never have spread or caused harm (e.g., low-grade prostate cancer detected via prostate-specific antigen screening) and improvements in technology leading to increased sensitivity for the detection of disease for which there is a lack of clarity in what to treat or not treat (e.g., improvements in CT scanning technology resulting in an increased sensitivity for diagnosing small pulmonary emboli, including those that are clinically unimportant). Other examples of overdiagnosis include changes in the definition of chronic kidney disease that lead to an increase in the number of patients labeled with this diagnosis, few of whom will progress to end-stage disease, and defining prediabetes as a disease rather than as a risk factor for a disease when only about one-third of patients with prediabetes will progress to diabetes over 10 years.

Ref: Kale MS, Korenstein D. Overdiagnosis in primary care: framing the problem and finding solutions. *BMJ*. 2018;362:k2820.

Item 74

ANSWER: C

Vasomotor symptoms such as hot flashes are experienced by 50%–75% of women during the menopausal transition. These are most effectively treated by systemic estrogen replacement therapy. For patients with an intact uterus, progesterone needs to be added for endometrial protection. In patients with contraindications to estrogen therapy, SSRIs and SNRIs have been shown to be 50%–65% effective and are often the next choice. Their mechanism of action remains unknown. Gabapentin has also been shown to reduce vasomotor symptoms by 40%–65%. Black cohosh and oral progesterone are not effective. Clonidine has some effect with vasomotor symptom reduction of 20%–40%. Topiramate has not been known to be effective.

Ref: Crandall CJ, Mehta JM, Manson JE. Management of menopausal symptoms: a review. *JAMA*. 2023;329(5):405-420.

Item 75

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. Therefore, prophylaxis with antibiotics is not recommended for routine outpatient dental procedures in patients with joint replacements. Amoxicillin, 2 g orally, 1 hour prior to a dental procedure such as a cleaning would be recommended for patients with congenital heart disease and valve replacement to prevent subacute bacterial endocarditis. Prophylaxis with parenteral ceftriaxone, delaying the dental visit for 3 months, and contacting the orthopedic surgeon who performed the arthroplasty would not be appropriate in this scenario.

Ref: American Academy of Orthopaedic Surgeons: Appropriate Use Criteria for the Management of Patients Undergoing Dental Procedures, 2016. 2) Earwood JS, Walker TR, Sue GJC. Septic arthritis: diagnosis and treatment. *Am Fam Physician*. 2021;104(6):589-597.

Item 76

ANSWER: C

This child's persistent asthma symptoms despite frequent use of an inhaled short-acting β-agonist (SABA) indicate an acute asthma exacerbation. Her vital signs show significant tachypnea and tachycardia consistent with this clinical picture and inhaled ipratropium is a good next step. Given this patient's persistent symptoms and abnormal vital signs, intravenous magnesium is an appropriate next-line intervention. Its bronchodilator effects are thought to be related to improvements in airway excitability and smooth muscle relaxation. Its use has been associated with reduced hospitalization in children and adults without a subsequent increase in return for emergency care. It has a low incidence of side effects and toxicity. Diphenhydramine would be indicated if there were concern for an allergic process, but that is not the case in this patient. Parenteral epinephrine is indicated in asthma only if it is associated with anaphylaxis. Terbutaline is a SABA that can be administered parenterally and does not improve symptoms in patients who are already receiving an inhaled SABA. Theophylline is no longer recommended due to concerns about side effects and toxicity.

Ref: Griffiths B, Kew KM. Intravenous magnesium sulfate for treating children with acute asthma in the emergency department. *Cochrane Database Syst Rev*. 2016;4(4):CD011050. 2) Erumbala G, Anzar S, Tonbari A, Salem R, Powell C. Stating the obvious: intravenous magnesium sulphate should be the first parenteral bronchodilator in paediatric asthma exacerbations unresponsive to first-line therapy. *Breathe (Sheff)*. 2021;17(4):210113. 3) Kwofie K, Wolfson AB. Intravenous magnesium sulfate for acute asthma exacerbation in children and adults. *Am Fam Physician*. 2021;103(4):245-246. 4) Global Initiative for Asthma. *Global Strategy for Asthma Management and Prevention*. Updated 2022.

Item 77

ANSWER: A

Perfusion of the myocardium occurs during diastole; therefore, the diastolic blood pressure (DBP) determines the coronary artery perfusion pressure. The systolic blood pressure (SBP), mean arterial pressure, pulse pressure (PP), and cardiac ejection fraction do not determine the coronary artery perfusion pressure.

PP is the SBP minus the DBP. The wide PP observed in older patients results from arterial stiffness. This causes an increase in the SBP and PP and a decrease in the DBP. This stiffness results from both arterial structural and functional changes with aging, including wall hypertrophy, calcifications, atheromatous lesions, changes in the extracellular matrix, and impairment of vascular endothelial function and smooth muscle cell reactivity. A wide PP makes it challenging to manage blood pressure with the goal of lowering SBP while ensuring a DBP that maintains coronary artery blood flow and avoids cardiac ischemia.

Guidelines from the American Heart Association, American College of Cardiology, and the American Society of Hypertension recommend that blood pressure should be lowered slowly in patients with an elevated DBP and coronary artery disease with evidence of myocardial ischemia. The guidelines further recommend caution in lowering DBP to <60 mm Hg in patients older than 60 or who have diabetes mellitus.

Ref: Rosendorff C, Lackland DT, Allison M, et al. Treatment of hypertension in patients with coronary artery disease: a scientific statement from the American Heart Association, American College of Cardiology, and American Society of Hypertension. *Circulation*. 2015;131(19):e435-e470. 2) Benetos A, Petrovic M, Strandberg T. Hypertension management in older and frail older patients. *Circ Res*. 2019;124(7):1045-1060.

Item 78

ANSWER: A

This patient presents with findings suggestive of cord compression causing degenerative cervical myelopathy. Cord compression in the cervical spine typically causes ascending loss of sensation in all four extremities, hyperreflexia, and gait instability, and it can progress to cause extremity weakness and bladder and bowel dysfunction. Patients with active intravenous drug use are at risk for epidural abscess, but this would typically cause localized tenderness and signs of systemic inflammation, including fever. Guillain-Barré syndrome is an autoimmune demyelinating disease that can cause ascending numbness and weakness, but is associated with loss of reflexes. Neurologic deficits associated with multiple sclerosis (MS) are variable and MS is in the differential in this case, though the history and presentation are much more consistent with degenerative myelopathy.

Ref: Kane SF, Abadie KV, Willson A. Degenerative cervical myelopathy: recognition and management. *Am Fam Physician*. 2020;102(12):740-750.

Item 79

ANSWER: B

A stepwise method is recommended for the treatment of chronic urticaria of unknown cause. The first step is the regular use of a second-generation H_1-antihistamine. An increase of up to four times the approved dosage is safe and may be helpful as part of step two. If the urticaria is still poorly controlled, an H_2-antihistamine or antileukotriene agent may be added in step two. Systemic corticosteroids can be used for short-term control of severe acute episodes, but long-term use should be avoided. First-generation H_1-antihistamines can be used if control cannot be achieved at step two, but they should be used cautiously, as sedation and confusion may occur, especially in the elderly. The options available in the third step of treatment are omalizumab and cyclosporine.

Ref: Lang DM. Chronic urticaria. *N Engl J Med*. 2022;387(9):824-831.

Item 80

ANSWER: C

Urgent alleviation of hyperthermia is the primary objective in the treatment of heatstroke. Treatment should be started in the field with immersion in cold water or, if this is not an option, pouring copious amounts of water on the patient and fanning. No pharmacologic agents are indicated for temperature reduction in this situation, and acetaminophen and aspirin may exacerbate coagulopathy and liver injury in this situation. Infusion of cold fluids would be one of the treatments of choice in elderly patients with classic heatstroke. Transfer to an emergency facility would not be the most important initial step for this patient since treatment should be started on the field.

Ref: Epstein Y, Yanovich R. Heatstroke. *N Engl J Med*. 2019;380(25):2449-2459.

Item 81

ANSWER: D

While the second-line medications for polycystic ovary syndrome (PCOS) continue to shift as the evidence is refined, the primary goal of protecting the endometrial lining from unopposed estrogen effects remains consistent. The first-line therapy for PCOS in women who do not desire pregnancy remains combined oral contraception and/or progestin-containing contraceptives. Finasteride, letrozole, metformin, and spironolactone are second-line treatments for specific conditions caused by PCOS such as type 2 diabetes, anovulatory oligomenorrhea, infertility, and hirsutism.

Ref: American College of Obstetricians and Gynecologists' Committee on Practice Bulletins—Gynecology. ACOG Practice Bulletin No. 194: polycystic ovary syndrome. *Obstet Gynecol*. 2018;131(6):e157-e171. 2) Al Wattar BH, Fisher M, Bevington L, et al. Clinical practice guidelines on the diagnosis and management of polycystic ovary syndrome: a systematic review and quality assessment study. *J Clin Endocrinol Metab*. 2021;106(8):2436-2446. 3) Williams T, Moore JB, Regehr J. Polycystic ovary syndrome: common questions and answers. *Am Fam Physician*. 2023;107(3):264-272.

Item 82

ANSWER: A

This patient presents with characteristic symptoms and plain film radiographic findings of Paget disease of bone, and an elevated alkaline phosphatase level would confirm the diagnosis. Paget disease is a benign skeletal condition characterized by focal areas of increased bone turnover and disorganized bone formation. It occurs most commonly in older men and pain is the most common symptom. Abnormalities may occur in any bone, but the pelvis, spine, skull, and long bones are most often affected. The radiograph in this scenario exhibits typical features of Paget disease with areas of osteosclerosis, bone deformity, bone enlargement, and pronounced trabeculae. Generally, Paget disease is not associated with metabolic disease, although polyostotic disease (multiple focal areas involved) may cause increased urinary calcium excretion and hypercalcemia in rare cases. Calciferol (vitamin D) and phosphorus levels would not be elevated in this condition. Elevation of the creatine phosphokinase level is associated with muscle, rather than bone, disease. The gamma-glutamyl transpeptidase level is not elevated in Paget disease of bone but may be elevated in liver disease, which can also increase alkaline phosphatase levels.

Ref: Rianon NJ, des Bordes JK. Paget disease of bone for primary care. *Am Fam Physician*. 2020;102(4):224-228.

Item 83

ANSWER: B

Multiple retrospective cohort studies from 2007, 2014, and 2015 have demonstrated an increased life expectancy of up to 3.3 months for patients with terminal cancer, specifically terminal pancreatic cancer, lung cancer, and metastatic melanoma, who received 3 or more days of hospice care. Some benefit was noted in patients with even 1 day of hospice care (SOR B). This extended life expectancy associated with hospice care was not observed in patients with terminal prostate or breast cancer. Family physicians should present the option of home hospice care to such patients early in their prognosis.

Ref: Eichelberger T, Shadiack A. Life expectancy with hospice care. *Am Fam Physician*. 2018;97(5):online.

Item 84

ANSWER: A

This patient is a relatively young person with a limited smoking history who has significant COPD, which should prompt consideration of testing for α_1-antitrypsin deficiency. Cystic fibrosis primarily causes restrictive lung disease, typically presents in childhood, and is now often included in routine prenatal and newborn screening tests. Ehlers-Danlos syndrome is a genetic connective tissue disease. Genetic testing is available for rare subtypes, but not the most common hypermobile form. Hemochromatosis can cause cardiac disease but does not typically cause obstructive lung disease. Both α_1-antitrypsin and hemochromatosis can cause liver inflammation. *HLA-B27* is associated with seronegative spondyloarthropathies rather than COPD.

Ref: Strnad P, McElvaney NG, Lomas DA. α_1-Antitrypsin deficiency. *N Engl J Med*. 2020;382(15):1443-1455.

Item 85

ANSWER: E

In general, direct oral anticoagulants such as dabigatran, rivaroxaban, apixaban, or edoxaban are preferred over warfarin for patients with atrial fibrillation and a CHA_2DS_2-VASc score of at least 3 for women and at least 2 for men. However, if the patient has concomitant moderate or severe mitral stenosis or a mechanical heart valve, warfarin is preferred.

Ref: Croke L. Management of atrial fibrillation: updated guidance from the AHA, ACC, and HRS. *Am Fam Physician*. 2020;101(2):123-124.

Item 86

ANSWER: C

For uncomplicated reflux, a trial of thickened feeds and/or switching to a soy formula would be appropriate, as a milk protein allergy can present similarly. Prone positioning for sleep is not recommended for infants due to increased risk of sudden infant death syndrome (SIDS). Celiac testing may not be helpful in a formula-fed infant who has not been exposed to gluten-containing grains. A trial of an acid suppressor should take place if symptoms are not improved after omitting cow's milk formula and thickening feeds. Abdominal ultrasonography would be indicated for bilious forceful vomiting, failure to thrive, or other clinical signs that would suggest pyloric stenosis.

Ref: Rosen R, Vandenplas Y, Singendonk M, et al. Pediatric gastroesophageal reflux clinical practice guidelines: joint recommendations of the North American Society for Pediatric Gastroenterology, Hepatology, and Nutrition and the European Society for Pediatric Gastroenterology, Hepatology, and Nutrition. *J Pediatr Gastroenterol Nutr*. 2018;66(3):516-554. 2) Finck A, Morris L. Thickened feedings for infants with gastroesophageal reflux. *Am Fam Physician*. 2019;100(7):437.

Item 87

ANSWER: D

Pretest probability is the estimated likelihood of disease prior to testing. A false-negative result occurs when the test result is negative, but the person does, in fact, have the disease. False-negative test results are more common when the pretest probability is high. Factors that increase the pretest probability of COVID-19 infection include a positive exposure history, having clinical signs or symptoms of COVID-19 infection, not having an alternative diagnosis to explain the symptoms, and a higher prevalence of infection in the community. Therefore, false-negative results occur more frequently when the prevalence of infection in a community is high (i.e., ≥20%) and consideration should be given to verification of the results.

Ref: Dinnes J, Deeks JJ, Berhane S, et al. Rapid, point-of-care antigen and molecular-based tests for diagnosis of SARS-CoV-2 infection. *Cochrane Database Syst Rev*. 2021;3(3):CD013705. 2) Nettleton WD. Interpreting SARS-CoV-2 diagnostic tests: common questions and answers. *Am Fam Physician*. 2021;103(8):465-472.

Item 88

ANSWER: C

Of the available treatment options, the levonorgestrel IUD is the most effective for reducing heavy menstrual bleeding (SOR A), with a 71%–95% decrease in menstrual blood loss expected. Estrogen-progestin oral contraceptives are less effective, with expected reduction in blood loss of 35%–69%, although they provide an added benefit of regulating menstrual bleeding in patients with anovulatory cycles. Nonhormonal medication options include tranexamic acid and NSAIDs, with an expected blood loss reduction of 26%–54% and 10%–52%, respectively. Two effective procedural options that are lower risk and less invasive compared to hysterectomy include uterine artery embolization and endometrial ablation, although both would present significant risk of reducing future fertility and therefore would not be the preferred treatment for this patient.

Ref: Matteson KA, Rahn DD, Wheeler TL 2nd, et al. Nonsurgical management of heavy menstrual bleeding: a systematic review. *Obstet Gynecol*. 2013;121(3):632-643. 2) Wouk N, Helton M. Abnormal uterine bleeding in premenopausal women. *Am Fam Physician*. 2019;99(7):435-443.

Item 89

ANSWER: A

The treatment for euvolemic hyponatremia involves correcting the underlying cause and restricting fluid intake. A fluid restriction of 500 mL less than the daily urine output is a reasonable goal, although adherence can be difficult. The intake of salt as well as protein should not be restricted. The use of hypertonic saline is restricted to cases of severe symptomatic hyponatremia. Diuretics such as furosemide factor into managing hypervolemic hyponatremia but not euvolemic hyponatremia. Vaptans such as tolvaptan are vasopressin receptor antagonists that may be considered for short-term use in addition to fluid restriction for select cases of severe asymptomatic hyponatremia, defined as a sodium level < 125 mEq/L.

Ref: Braun MM, Barstow CH, Pyzocha NJ. Diagnosis and management of sodium disorders: hyponatremia and hypernatremia. *Am Fam Physician*. 2015;91(5):299-307. 2) Adrogué HJ, Tucker BM, Madias NE. Diagnosis and management of hyponatremia: a review. *JAMA*. 2022;328(3):280-291.

Item 90

ANSWER: A

These symptoms and radiographic findings are most consistent with calcium pyrophosphate deposition (CPPD) disease, also known as pseudogout. CPPD disease is an asymmetric, inflammatory, pauciarticular arthritis most frequently involving the knee, wrist, or first metatarsophalangeal joint. Inflammatory symptoms include erythema, warmth, swelling, and tenderness. The differential diagnosis includes CPPD disease, gout, and septic arthritis. The chondrocalcinosis, or calcification of the cartilage, is characteristic of CPPD disease and not gout. On polarized microscopy of joint fluid, CPPD disease is confirmed by positively birefringent crystals whereas gout is confirmed by negatively birefringent crystals. Osteoarthritis is noninflammatory in nature. There is no history of psoriasis in this patient and the history and physical examination are not suggestive of psoriatic arthritis. Septic arthritis is less likely as this patient's Gram stain is negative for bacteria and the patient has not had a fever.

Ref: Johnson MW. Acute knee effusions: a systematic approach to diagnosis. *Am Fam Physician*. 2000;61(8):2391-2400. 2) Swagerty DL Jr, Hellinger D. Radiographic assessment of osteoarthritis. *Am Fam Physician*. 2001;64(2):279-286. 3) Eggebeen AT. Gout: an update. *Am Fam Physician*. 2007;76(6):801-808. 4) American Academy of Family Physicians. Information from your family doctor. Gout: what you should know. *Am Fam Physician*. 2007;76(6):811-812. 5) Pujalte GG, Albano-Aluquin SA. Differential diagnosis of polyarticular arthritis. *Am Fam Physician*. 2015;92(1):35-41.

Item 91

ANSWER: D

This patient has coronary artery disease with symptoms of angina but without symptoms of heart failure. In addition to lifestyle modifications, management of blood pressure and lipids, and antiplatelet therapy, the management of coronary artery disease includes pharmacotherapy for the symptoms of angina. Immediate-release nitroglycerin is appropriate for the short-term relief of angina. However, β-blockers are first-line treatments for long-term relief. Nondihydropyridine calcium channel blockers may be used in addition to β-blockers if symptoms are not controlled with a β-blocker alone or if β-blockers are contraindicated due to conditions such as asthma or elderly age. This patient does not have any of these contraindications, and metoprolol succinate is likely to provide relief for his angina. Ezetimibe is used as add-on therapy to statins for cholesterol management but does not have a role in the medical management of angina. The addition of long-acting nitrates and ranolazine may be considered if his angina persists despite treatment. If medical management does not control anginal symptoms, surgical treatment such as percutaneous coronary intervention or coronary artery bypass grafting may be considered.

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

Item 92

ANSWER: A

The primary feature that distinguishes bipolar I disorder from bipolar II disorder is a history of a manic or a mixed manic/depressive episode. Additionally, in bipolar I, there may or may not be a history of psychosis and/or major depression. This patient has a history of a manic episode with psychotic features involving hospitalization, which fulfills the criteria for bipolar I disorder. Her major depressive episodes are consistent with a diagnosis of bipolar I but are not essential to it.

Patients with bipolar II disorder, in contrast, have a history of hypomania along with major depression, although no history of mania. Cyclothymia includes hypomanic and depressive symptoms that do not meet bipolar II criteria or a major depressive episode and occur over 2 or more years with no more than 2 symptom-free months during that time. Bipolar disorder, not otherwise specified, defines cases that do not meet full criteria for bipolar I, bipolar II, or cyclothymia, for example, in the setting of manic symptoms lasting less than 1 week, without psychosis or hospitalization. Although overlap exists between bipolar and schizoaffective disorders, for the latter, patients must meet criteria for schizophrenia, which includes a minimum of 2 weeks of euthymic psychosis.

Ref: American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. 5th ed. American Psychiatric Association; 2013:123–154. 2) Marzani G, Price Neff A. Bipolar disorders: evaluation and treatment. *Am Fam Physician*. 2021;103(4):227-239.

Item 93

ANSWER: A

Supportive care including as-needed oxygen and frequent nasal hygiene, in addition to hydration with intravenous fluids if indicated, are the mainstays of treatment in otherwise healthy infants hospitalized with respiratory syncytial virus (RSV) bronchiolitis. Inhaled bronchodilators, nebulized hypertonic saline, systemic corticosteroids, and chest physiotherapy do not reduce the length of hospitalization and are not indicated as first-line treatment in infants hospitalized with RSV bronchiolitis.

Ref: Gadomski AM, Scribani MB. Bronchodilators for bronchiolitis. *Cochrane Database Syst Rev*. 2014;(6):CD001266. 2) Heikkilä P, Korppi M. Hypertonic saline in bronchiolitis: an updated meta-analysis. *Arch Dis Child*. 2021;106(1):102. 3) Carlone G, Graziano G, Trotta D, et al. Bronchiolitis 2021–2022 epidemic: multicentric analysis of the characteristics and treatment approach in 214 children from different areas in Italy. *Eur J Pediatr*. 2023;182(4):1921-1927.

Item 94

ANSWER: E

Palliative care is a team-based approach to the care of patients with serious illness. Palliative care aims to reduce symptoms and stress from a serious illness. Palliative care can function alongside treatment for serious illness. While it has traditionally been used for patients with cancer, it is available to any patient with a disease that cannot be cured.

While palliative care teams can assist patients and their caregivers with advance directives and resuscitation status, there is no requirement for these to be done prior to qualifying for care. Patients are not required to have a limited life expectancy as with hospice care. The most common symptom in patients receiving palliative care is pain but it is not a criterion for qualification.

Ref: Endsley S, Main R. Palliative care in advanced dementia. *Am Fam Physician*. 2019;99(7):456-458. 2) National Institute on Aging. End of life: frequently asked questions about palliative care. Updated February 8, 2021. 3) Walsh SC, Murphy E, Devane D, et al. Palliative care interventions in advanced dementia. *Cochrane Database Syst Rev*. 2021;9(9):CD011513.

Item 95

ANSWER: A

This patient notes progressive hearing loss and has a positive finger rub test on the left, which indicates the left ear is affected. The Rinne test measures bone conduction compared to air conduction in which air conduction should be greater than bone conduction. A positive test indicates that bone conduction is greater and is indicative of conductive hearing loss. When the Weber test lateralizes to the bad ear, this indicates conductive hearing loss. If the Weber test lateralizes to the good ear, then this indicates sensorineural hearing loss. This patient has conductive hearing loss, not sensorineural hearing loss. Both Meniere disease and ototoxic medications cause a sensorineural hearing loss. Presbycusis is age-related hearing loss that is typically bilateral and sensorineural.

Ref: Michels TC, Duffy MT, Rogers DJ. Hearing loss in adults: differential diagnosis and treatment. *Am Fam Physician*. 2019;100(2):98-108.

Item 96

ANSWER: A

Ureteral stones ≤4 mm typically pass without intervention within 40 days. This patient is hemodynamically stable without signs of infection and therefore should be managed conservatively with oral hydration and pain control. α_1-Blockers such as tamsulosin can be used to aid in the passage of ureteral stones >5 mm. Allopurinol can be used to reduce stone recurrence in patients with calcium oxalate stones but does not have a role in the management of existing stones. There is no indication for antibiotics. Intravenous fluids are not indicated as the patient is not vomiting. Because this patient's stone should pass without intervention, referral for surgical stone removal would not be appropriate.

Ref: Frassetto L, Kohlstadt I. Treatment and prevention of kidney stones: an update. *Am Fam Physician*. 2011;84(11):1234-1242. 2) Pearle MS, Goldfarb DS, Assimos DG, et al. Medical management of kidney stones: AUA guideline. *J Urol*. 2014;192(2):316-324. 3) Fontenelle LF, Sarti TD. Kidney stones: treatment and prevention. *Am Fam Physician*. 2019;99(8):490-496.

Item 97

ANSWER: E

Onychomycosis, a chronic fungal infection affecting the toenail and fingernail beds, leads to discolored, brittle, and thickened nails. This is not just a cosmetic problem, but can cause discomfort, pain, and physical impairment affecting the quality of life. Obtaining an accurate diagnosis prior to initiating treatment is important to avoid adverse effects caused by lengthy treatment. Dermatophytes are the cause of 70% of onychomycosis. Risk factors include age older than 60; trauma; tobacco use; and comorbidities such as diabetes mellitus, peripheral vascular disease, HIV, malignancy, and obesity. Onychomycosis is classified into several subtypes based on nail invasion. Treatment includes topical and oral options. Terbinafine is the most effective oral agent for this patient who did not benefit from topical therapy and has all toenails affected. Fluconazole may be used off-label as an alternative or if a patient cannot tolerate terbinafine. Griseofulvin is rarely used due to its long treatment duration, lower cure rates, and higher risk of adverse reactions. A pulse-dosing regimen of itraconazole is used for the treatment of fingernails. Continuous itraconazole has a higher relapse rate than terbinafine.

Ref: Frazier WT, Santiago-Delgado ZM, Stupka KC 2nd. Onychomycosis: rapid evidence review. *Am Fam Physician*. 2021;104(4):359-367.

Item 98

ANSWER: A

This patient has signs and symptoms consistent with subacute thyroiditis, which is confirmed by laboratory testing (an elevated erythrocyte sedimentation rate, a low TSH level, and normal T_3 and T_4 levels) and a radioactive iodine uptake scan with diffusely low iodine uptake. Subacute thyroiditis often follows a viral infection and is most common in women in their fifties, with peak occurrence in the late summer and fall months. The goal of treatment is to reduce thyroid pain and treat symptoms of thyrotoxicosis. High-dose NSAIDs or acetylsalicylic acid are first-line recommendations (SOR C). This patient would also benefit from the use of a β-blocker to ameliorate her tachycardia and diaphoresis.

During the acute thyroiditis phase, thyroid hormone supplementation is not indicated and will likely worsen symptoms. Levothyroxine would be indicated once the acute thyrotoxic phase resolves and there is evidence of hypothyroidism. Since subacute thyroiditis is a self-limited condition, levothyroxine is recommended for 12 months. Antithyroid medications such as methimazole are not indicated in subacute thyroiditis, which is a destructive process itself. While glucocorticoids such as prednisone provide faster pain relief than first-line NSAIDs or aspirin, they should not be used unless first-line treatments have failed to resolve symptoms in 4 days. Antibiotics are prescribed in suppurative thyroiditis, which is characterized by fever, leukocytosis, and cervical lymphadenopathy in addition to thyroid pain. They should be started empirically after negative blood cultures have been obtained.

Ref: Sencar ME, Calapkulu M, Sakiz D, et al. An evaluation of the results of the steroid and non-steroidal anti-inflammatory drug treatments in subacute thyroiditis in relation to persistent hypothyroidism and recurrence. *Sci Rep*. 2019;9(1):16899. 2) Quintero BM, Yazbeck C, Sweeney LB. Thyroiditis: evaluation and treatment. *Am Fam Physician*. 2021;104(6):609-617.

Item 99

ANSWER: C

A creatinine elevation can occur as a result of decreased glomerular pressure, which can follow the initiation of an ACE inhibitor or an angiotensin receptor blocker. According to the American College of Cardiology/American Heart Association, renal artery stenosis should be considered when this elevation is >50% of the initial creatinine value. Amlodipine, chlorthalidone, metoprolol, and spironolactone would not cause a significant rise in creatinine levels related to renal artery stenosis.

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

Item 100

ANSWER: A

Many transgender patients report negative experiences with health care providers, which can lead to avoidance of health care interactions. It is important to create a safe and welcoming environment to establish and maintain rapport. Ensuring that intake forms and records use gender-neutral or inclusive language is one way to signal this. Preventive services should be offered based on the patient's current anatomy, not on expressed gender. Offering a referral to a transgender clinic to all patients is not necessary. Asking staff if they are transgender is invasive and unnecessary, and they may not be willing to disclose this information.

Ref: Klein D, Paradise SL, Goodwin ET. Caring for transgender and gender-diverse persons: what clinicians should know. *Am Fam Physician*. 2018;98(11):645-653.

Item 101

ANSWER: A

The examination and chest radiograph indicate the presence of a focal bacterial pneumonia, commonly caused by *Streptococcus pneumoniae*. Amoxicillin provides effective coverage against this infection. Local resistance of *S. pneumoniae* to azithromycin may be high, so it would not be the best choice. Doxycycline should not be used in children younger than 9 years. There is no evidence of atypical pneumonia (nonproductive cough, sore throat, rash, myalgia, fatigue) requiring levofloxacin. Oseltamivir is not indicated as there is no evidence of influenza or lobar pneumonia seen on chest radiography.

Ref: Bradley JS, Byington CL, Shah SS, et al. Executive summary: the management of community acquired pneumonia in infants and children older than 3 months of age: clinical practice guidelines by the Pediatric Infectious Diseases Society and the Infectious Diseases Society of America. *Clin Infect Dis*. 2011;53(7):617-630. 2) Smith DK, Kuckel DP, Recidoro AM. Community-acquired pneumonia in children: rapid evidence review. *Am Fam Physician*. 2021;104(6):618-625.

Item 102

ANSWER: C

First-line therapy for stenosing flexor tenosynovitis, or trigger finger, is a corticosteroid injection into the affected flexor tendon sheath (SOR A). It may take 1–4 weeks for the patient to experience relief. Splinting may be considered if the patient is not a candidate for corticosteroid injections. Buddy taping, transcutaneous electrical nerve stimulation (TENS) unit therapy, and physical therapy are not effective treatments for trigger finger. Surgical correction may be considered after 2–3 corticosteroid injections are attempted without improvement of symptoms.

Ref: Nicholson CA, Alland JA. Tips for managing 4 common soft-tissue finger and thumb injuries. *J Fam Pract*. 2022;71(5):206-213.

Item 103

ANSWER: E

Children with Down syndrome can have iron insufficiency that can lead to long-term neurologic effects. Macrocytosis, which is present in up to one-third of patients with Down syndrome, can mask the diagnosis of iron deficiency anemia. As a result, a CBC with differential and serum iron and total iron-binding capacity testing are recommended annually. In addition, it is recommended that a TSH level be checked annually as the risk of hypothyroidism increases with age, and by late childhood the incidence of thyroid abnormalities is 50%. Children with Down syndrome do not have an increased risk of hyperlipidemia compared to the general population and do not need annual lipid screening. While children with Down syndrome are at increased risk for celiac disease, there is no evidence that routine screening of IgA tissue transglutaminase (tTG) levels in asymptomatic individuals is beneficial.

Ref: Bull MJ, Trotter T, Santoro SL, et al. Health supervision for children and adolescents with Down syndrome. *Pediatrics*. 2022;149(5):e2022057010.

Item 104

ANSWER: E

Hepatitis C can be spontaneously cleared but patients with antibodies can still be reinfected. This patient has behaviors that put him at risk for exposure to hepatitis C. There is no viral RNA detected, so he does not have a current infection. Exposure to hepatitis C less than 2 weeks prior to screening would not explain a positive IgG antibody test. The patient's test result is not likely to be a false positive, but rather indicates a previous hepatitis C infection given his history of intravenous drug use.

Ref: Viral hepatitis: Q&As for health professionals. Centers for Disease Control and Prevention. Reviewed August 7, 2020.

Item 105

ANSWER: D

This patient has anorexia nervosa. While weight restoration is important, the return of menses is the best indication of bone mineral density (BMD) recovery. Increased food intake, a normal calcium level, and normal thyroid function are important but not indicative of BMD recovery.

Ref: Klein DA, Sylvester JE, Schvey NA. Eating disorders in primary care: diagnosis and management. *Am Fam Physician*. 2021;103(1):22-32.

Item 106

ANSWER: D

Supportive therapy including medication, adequate hydration, and rest is the standard of care for the treatment of infectious mononucleosis. For example, ibuprofen is recommended as an antipyretic and an analgesic. Since streptococcal pharyngitis is most common in ages 5–15 and this patient's rapid streptococcal test is negative, it is highly unlikely as a concomitant diagnosis. Thus, amoxicillin therapy would not be appropriate. Though Epstein-Barr virus and cytomegalovirus are the etiology of infectious mononucleosis, there is insufficient evidence to recommend the use of antivirals (including foscarnet or valacyclovir) or corticosteroids for the treatment of infectious mononucleosis.

Ref: Sylvester JE, Buchanan BK, Silva TW. Infectious mononucleosis: rapid evidence review. *Am Fam Physician*. 2023;107(1):71-78.

Item 107

ANSWER: D

Orthostatic hypotension, which is more prevalent in older adults, is defined as a decrease of at least 20 mm Hg in systolic blood pressure or a drop of at least 10 mm Hg in diastolic blood pressure within 3 minutes of standing from the supine position. There are multiple etiologies, both neurogenic and nonneurogenic. Clinical symptoms are not a preferred method of diagnosing orthostatic hypotension.

Ref: Kim MJ, Farrell J. Orthostatic hypotension: a practical approach. *Am Fam Physician*. 2022;105(1):39-49.

Item 108

ANSWER: D

COPD is a common condition, which led to 3.23 million deaths worldwide in 2019. A variety of treatments are available to alleviate symptoms, and family physicians are well suited to manage this condition through lifestyle modifications and pharmacotherapy. Guidelines suggest that patients with mild disease, as in this patient's case per the Global Initiative for Chronic Obstructive Lung Disease (GOLD) class 2 findings on pulmonary function tests and no exacerbations, are best managed through once-daily inhalation of a long-acting muscarinic antagonist (LAMA) such as tiotropium. Short-acting medications such as ipratropium and levalbuterol require frequent dosing and lack the mortality benefit seen with LAMAs. The combination of LAMAs and long-acting β-agonists (LABAs) can be initiated in those with persistent symptoms but would not be used as initial therapy. Inhaled corticosteroids may be beneficial in those with significant asthma and COPD overlap, but in general corticosteroids should be reserved for those with persistent symptoms despite LAMA and LABA therapy.

Ref: Gentry S, Gentry B. Chronic obstructive pulmonary disease: diagnosis and management. *Am Fam Physician*. 2017;95(7):433-441. 2) Celli BR, Wedzicha JA. Update on clinical aspects of chronic obstructive pulmonary disease. *N Engl J Med*. 2019;381(13):1257-1266. 3) Global Initiative for Chronic Obstructive Lung Disease. 2023 Report: global strategy for the diagnosis, management, and prevention of chronic obstructive pulmonary disease. Updated 2023.

Item 109

ANSWER: D

This patient's history and the physical examination are classic for piriformis syndrome and she will likely recover with physical therapy and home exercises. Reassurance only is not the best management option for piriformis syndrome. An MRI may be warranted later, but it is not the first step in the workup and treatment in this patient's case. Injecting the piriformis muscle with a corticosteroid and local anesthetic is inappropriate therapy for this condition. This patient does not have any red-flag signs for lumbar radiculopathy and therefore does not require referral to an orthopedic surgeon at this time.

Ref: Park JW, Lee Y-K, Lee YJ, Shin S, Kang Y, Koo K-H. Deep gluteal syndrome as a cause of posterior hip pain and sciatica-like pain. *Bone Joint J*. 2020;102-B(5):556-567. 2) Chamberlain R. Hip pain in adults: evaluation and differential diagnosis. *Am Fam Physician*. 2021;103(2):81-89.

Item 110

ANSWER: E

Zika virus, an RNA virus belonging to the *Flaviviridae* family, is most frequently found in tropical regions and is spread by the female *Aedes* species mosquito. While Zika virus infection shares many of the same symptoms as the other viruses listed, it often has no fever and the rash is accompanied by severe pruritus and conjunctivitis. Zika virus infection typically develops 3–12 days following a bite by the *Aedes* species mosquito and the symptoms last between a few days to 1 week. The disease is typically self-limited and does not require hospitalization. Zika virus infection during pregnancy can cause infants to be born with microcephaly and other congenital malformations, known as congenital Zika syndrome. Infection with Zika virus is also associated with miscarriage and preterm birth. Diagnosis is usually based on clinical presentation but may be confirmed with serologic testing. Chikungunya virus, dengue virus, West Nile virus, and yellow fever are also spread by mosquitos but have slightly different clinical presentations.

Chikungunya virus is an RNA virus in the *Togaviridae* family that is characterized by an abrupt onset of high fever, and is frequently accompanied by debilitating joint pain that usually lasts for a few days, but may prolong for weeks, months, or even years.

Like Zika virus, dengue virus is an RNA virus belonging to the *Flaviviridae* family spread by the *Aedes* species mosquito. The incubation period varies from 4 to 10 days and common symptoms include a high fever (40°C [104°F]) that is usually accompanied by at least two of the following symptoms: headaches, pain behind the eyes, nausea, vomiting, swollen glands, joint, bone or muscle pains, and rash.

West Nile virus is an RNA virus in the *Flaviviridae* family and is the leading cause of mosquito-borne disease in the continental United States. The incubation period varies from 3 to 14 days. Symptoms include fever, headache, tiredness and body aches, nausea, vomiting, swollen lymph glands, and sometimes a skin rash on the trunk.

Yellow fever is an RNA virus in the *Flaviviridae* family. Incubation time for the virus is 3–6 days. The most common symptoms are fever, muscle pain with prominent backache, headache, loss of appetite, and nausea or vomiting. In most cases, symptoms disappear after 3–4 days, but a small minority of patients become quite ill.

Ref: The National Institute for Occupational Safety and Health (NIOSH): mosquito-borne diseases. Centers for Disease Control and Prevention. Updated March 21, 2016. 2) World Health Organization. Vector-borne diseases. Updated March 2, 2020.

Item 111

ANSWER: B

Hand-foot-and-mouth disease (HFMD) is very common among children younger than 10 years of age, and is very easily spread by fecal-oral, oral-oral, and respiratory droplet routes. As the disease is ubiquitous and has a very low complication rate, the CDC recommends allowing children to return to school or day care when they are afebrile, feel well enough to participate, and are not actively drooling with mouth lesions. There is no specific time course that must be followed, and the status of skin lesions does not affect return to school.

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. 2) Hand, foot, and mouth disease (HFMD): how hand, foot, and mouth disease spreads. Centers for Disease Control and Prevention. Reviewed May 11, 2023.

Item 112

ANSWER: E

Patients with primary ovarian insufficiency should be started on hormone replacement therapy (HRT) as soon as possible after diagnosis, preferably within a year. HRT treats symptoms and benefits bone health, cardiovascular health, and cognitive function. It should be continued until the age of expected natural menopause. In a patient with a uterus, protection against endometrial cancer with progesterone is required. A significant proportion of patients with this disorder occasionally ovulate or have spontaneous return of menses. HRT does not provide contraception. A levonorgestrel IUD provides both endometrial protection and contraception.

Ref: Stuenkel CA, Gompel A. Primary ovarian insufficiency. *N Engl J Med*. 2023;388(2):154-163.

Item 113

ANSWER: E

Guillain-Barré syndrome (GBS) is a common cause of acute weakness. While the clinical presentation can vary, patients commonly present with progressive symmetric ascending flaccid weakness and symmetrical hyporeflexia or areflexia. Asymmetric flaccid weakness and muscle spasticity are not seen in GBS. While patients may have cranial nerve findings, those are not common. Nystagmus is not typically associated with GBS.

Ref: Shahrizaila N, Lehmann HC, Kuwabara S. Guillain-Barré syndrome. *Lancet*. 2021;397(10280):1214-1228.

Item 114

ANSWER: B

The U.S. Preventive Services Task Force (USPSTF) recommends that all nonpregnant adults ages 35–70 who are overweight (BMI ≥25 kg/m^2) or obese (BMI ≥30 kg/m^2) be screened for diabetes mellitus and prediabetes with a fasting glucose level, hemoglobin A_{1c}, or glucose tolerance test (B recommendation). In 2021, the age of screening was decreased from 40 to 35.

In addition to the above recommendations, patients with a family history of diabetes or a personal history of gestational diabetes or polycystic ovary syndrome should be considered for screening at a younger age. In patients who belong to groups with high rates of diabetes such as American Indian/Alaska Native, Asian American, Black, Hispanic/Latino, or Native Hawaiian/Pacific Islander, screening can also start at a younger age. The recommended interval for screening is every 3 years.

Routine screening for prediabetes and diabetes in persons over the age of 70 is not a current recommendation. While the risk of prediabetes and diabetes increases with age, patients older than 70 with prediabetes have a low likelihood of progressing to diabetes. More commonly, they either maintain prediabetes status or regress to normoglycemia (SOR B).

Ref: US Preventive Services Task Force. Final recommendation statement: prediabetes and type 2 diabetes: screening. Updated August 24, 2021. 2) Rooney MR, Rawlings AM, Pankow JS, et al. Risk of progression to diabetes among older adults with prediabetes. *JAMA Intern Med*. 2021;181(4):511-519.

Item 115

ANSWER: B

The number needed to treat (NNT) is the number of patients who need to be treated with a specific medication to prevent one negative outcome or to achieve one positive outcome. It is the inverse of the absolute risk reduction (ARR), which is the difference in risk between participants in the control group and the treatment group. The closer the NNT is to 1, the more effective the new treatment is versus the placebo.

Event rate in the control group (CER) = 60/150 = 0.4
Event rate in the experimental group (EER) = 15/150 = 0.1
Absolute risk reduction (ARR) = CER – EER = 0.4 – 0.1 = 0.3
NNT = 1/ARR = 3.33

Ref: EBM tools: number needed to treat. Oxford University's Centre for Evidence-Based Medicine.

Item 116

ANSWER: A

The American Academy of Orthopaedic Surgeons' clinical practice guideline recommends operative management of a hip fracture within 24–48 hours of injury unless a delay is needed to stabilize comorbidities (SOR C). Early intervention reduces complications, improves pain control, and reduces the duration of hospitalization.

Ref: American Academy of Orthopaedic Surgeons. Management of hip fractures in older adults: evidence-based clinical practice guideline. American Academy of Orthopaedic Surgeons, 2021. 2) Schroeder JD, Turner SP, Buck E. Hip fractures: diagnosis and management. *Am Fam Physician*. 2022;106(6):675-683.

Item 117

ANSWER: C

Polymerase chain reaction (PCR) is the most rapid and accurate test to confirm pertussis and is the diagnostic test of choice (evidence rating B). Cultures are challenging to grow and results take 7–10 days. Direct fluorescent antibody assays have low sensitivity and specificity and are no longer used. Serology for IgG does not peak until the paroxysmal and convalescent stages, and is used primarily for epidemiologic purposes.

Ref: Kline JM, Smith EA, Zavala A. Pertussis: common questions and answers. *Am Fam Physician*. 2021;104(2):186-192.

Item 118

ANSWER: D

Only two medications, escitalopram and fluoxetine, are approved by the FDA for the treatment of major depressive disorder in children and adolescents. Fluoxetine is approved for treatment in children age ≥8 while escitalopram is only approved for use in children age ≥12. Bupropion and sertraline are not approved by the FDA for the treatment of major depressive disorder in children.

Ref: Selph SS, McDonagh MS. Depression in children and adolescents: evaluation and treatment. *Am Fam Physician*. 2019;100(10):609-617.

Item 119

ANSWER: A

Two randomized, controlled trials (RCTs) have demonstrated significant reduction in risk for secondary stroke with high-dose statin therapy. The studies further demonstrated that an LDL-cholesterol goal <70 mg/dL was superior to targets of 90–100 mg/dL in preventing secondary stroke events.

Data from RCTs and large meta-analyses show compelling evidence that blood pressure targets in patients with previous stroke should be similar to targets for other cardiovascular conditions, namely $<130/80$ mm Hg. There has been no benefit shown with lower blood pressure targets. Although calcium channel blockers such as losartan are recommended for the treatment of hypertension, there is limited evidence of efficacy for secondary stroke prevention, so losartan would not be appropriate for this patient whose blood pressure is at goal. Use of warfarin in addition to aspirin does not provide any benefit and increases the risk for hemorrhage. Several randomized clinical trials have demonstrated that the greatest benefit for carotid endarterectomy (CEA) was in asymptomatic patients with $>70\%$ stenosis, with other analyses demonstrating no benefit in patients with $<50\%$ stenosis. In symptomatic patients (e.g., ipsilateral TIA or nondisabling stroke), CEA is recommended in those with moderate (50%–69%) or severe (70%–99%) carotid artery stenosis.

Ref: Kleindorfer DO, Towfighi A, Chaturvedi S, et al. 2021 guideline for the prevention of stroke in patients with stroke and transient ischemic attack: a guideline from the American Heart Association/American Stroke Association. *Stroke*. 2021;52(7):e364-e467.

Item 120

ANSWER: E

When compared to delayed cholecystectomy, early cholecystectomy has been shown to decrease complications, hospital readmission rates, and length of hospital stay without increasing surgical complication rates. Therefore, patients with mild acute gallstone pancreatitis should be considered for cholecystectomy during the index admission (SOR B). Evidence also supports early enteral feeding as tolerated, as opposed to restricted oral intake (SOR A). In this case, the patient should be offered oral feeding without a repeat serum lipase level factoring into this decision. Both placement of an enteral feeding tube and initiation of parenteral nutrition would be inappropriate, given the evidence to support early oral feeding. The risks of parenteral feeding include longer hospitalization and increased rates of infection, multiorgan failure, and mortality when compared to enteral feeding (SOR A). Endoscopic retrograde cholangiopancreatography (ERCP) within 24 hours is indicated when acute pancreatitis is complicated by cholangitis or persistent biliary tract obstruction, but otherwise it is not indicated.

Ref: Crockett SD, Wani S, Gardner TB, Falck-Ytter Y, Barkun AN; American Gastroenterological Association Institute Clinical Guidelines Committee. American Gastroenterological Association Institute guideline on initial management of acute pancreatitis. *Gastroenterology*. 2018;154(4):1096-1101. 2) Oppenlander KE, Chadwick C, Carman K. Acute pancreatitis: rapid evidence review. *Am Fam Physician*. 2022;106(1):44-50.

Item 121

ANSWER: A

While many supplements are harmless, β-carotene has been shown to increase the risk of lung cancer in smokers and increase the risk of cardiovascular mortality. It can also cause reversible skin yellowing. The U.S. Preventive Services Task Force recommends against (D recommendation) β-carotene supplementation for the prevention of cardiovascular disease or cancer. There is insufficient evidence to draw conclusions on the use of magnesium, vitamin B_2, or vitamin B_{12} for the prevention of cardiovascular disease or cancer. Vitamin C can increase the risk of nephrolithiasis.

Ref: O'Connor EA, Evans CV, Ivlev I, et al. Vitamin, mineral, and multivitamin supplementation for the primary prevention of cardiovascular disease and cancer: a systematic evidence review for the US Preventive Services Task Force. Evidence Synthesis, No. 209. Agency for Healthcare Research and Quality. January 2021. 2) US Preventive Services Task Force. Final recommendation statement: vitamin, mineral, and multivitamin supplementation to prevent cardiovascular disease and cancer: preventive medication. Updated June 21, 2022.

Item 122

ANSWER: D

This is a typical presentation for posterior tibialis tendinopathy, a common overuse injury that presents with pain in the posteromedial foot and ankle in the distribution of the posterior tibialis tendon. If not identified and treated early, patients may develop more progressive posterior tibialis tendon dysfunction and eventual arch collapse of the foot. Deltoid ligament sprains present with pain over the medial ankle ligament complex after an acute ankle injury involving an eversion mechanism. A medial malleolar stress fracture would present with pain and bony tenderness over the medial malleolus, rather than over the course of the posterior tibialis tendon as described in this scenario. Peroneal tendon injuries may occur with overuse or an acute injury, although the pain is lateral rather than medial. Tarsal tunnel syndrome is caused by compression neuropathy due to pressure on the posterior tibial nerve and presents with pain, burning, tingling, and/or numbness in the medial midfoot and medial heel. As with posterior tibialis tendinopathy, the pain from tarsal tunnel syndrome is often worse with prolonged weight bearing. Symptoms can be reproduced by tapping over the nerve (Tinel sign), which does not occur with posterior tibialis tendinopathy. The negative Tinel sign described in this scenario is more consistent with posterior tibialis tendinopathy than tarsal tunnel syndrome.

Ref: Tu P. Heel pain: diagnosis and management. *Am Fam Physician*. 2018;97(2):86-93. 2) Deu RS, Coslick AM, Dreher G. Tendinopathies of the foot and ankle. *Am Fam Physician*. 2022;105(5):479-486.

Item 123

ANSWER: C

Hypertrophic cardiomyopathy (HCM) is the leading cause of sudden cardiac death in young people. HCM often presents with symptoms related to exertion, including dyspnea, chest pain, palpitations, or syncope, although it also may be discovered incidentally based on its characteristic findings on physical examination and/or EKG abnormalities. Because only 30%–60% of people with HCM are found to have a genetic variant, family physicians play a key role in the early detection of new cases. The cardiac structural changes with HCM usually lead to a dynamic left ventricular outflow tract obstruction (LVOTO) that worsens with decreased preload and decreased afterload states. An LVOTO causes a harsh midsystolic ejection murmur that intensifies with exertion or with provocative maneuvers that increase contractility or decrease cardiac preload and/or afterload. One such method is to have the patient move from a squatting position to a standing position. This leads to temporary pooling of blood in the legs, decreasing venous return and preload and thereby increasing the relative obstruction and the intensity of the murmur. The Valsalva maneuver also causes reduced preload by decreasing left ventricular filling, thus increasing the relative obstruction and the murmur intensity. An isometric handgrip, in contrast, increases afterload and decreases the obstruction, resulting in a softer murmur. A diastolic murmur that increases in the left lateral decubitus position is associated with aortic regurgitation. A fixed split of the second heart sound occurs due to an atrial septal defect.

Ref: Authors/Task Force members, Elliott PM, Anastasakis A, et al. 2014 ESC guidelines on diagnosis and management of hypertrophic cardiomyopathy: the task force for the diagnosis and management of hypertrophic cardiomyopathy of the European Society of Cardiology (ESC). *Eur Heart J*. 2014;35(39):2733-2779. 2) Marian AJ, Braunwald E. Hypertrophic cardiomyopathy: genetics, pathogenesis, clinical manifestations, diagnosis, and therapy. *Circ Res*. 2017;121(7):749-770. 3) Leggit JC, Whitaker D. Diagnosis and management of hypertrophic cardiomyopathy: updated guidelines from the ACC/AHA. *Am Fam Physician*. 2022;105(2):207-209.

Item 124

ANSWER: A

The Infectious Diseases Society of America guidelines recommend observation and symptomatic treatment for acute rhinosinusitis until after 7 days, at which point antibiotics are recommended. However, the number needed to treat to achieve clinical cure is 17 and the number needed to harm is 8. About 64% of patients will reach clinical cure at 14 days without antibiotics. When antibiotic treatment is warranted, amoxicillin/clavulanate rather than amoxicillin alone is recommended as empiric therapy for children and adults. Macrolides such as azithromycin are not recommended for empiric therapy due to high rates of resistance. Levofloxacin or doxycycline are recommended as an alternative agent in adults who are allergic to penicillin.

Ref: 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. 2) Franck N, Zehtabchi S. Antibiotics for acute rhinosinusitis in adults. *Am Fam Physician*. 2019;100(7):Online.

Item 125

ANSWER: D

Physician Orders for Life-Sustaining Treatment (POLST) forms are a portable order set signed by the provider and either the patient or the surrogate to direct care across various settings (including EMS, residential retirement facilities, nursing homes, emergency departments, and inpatient settings) at the end of life. The form is typically printed on bright-colored cardboard to make it easier to locate by EMS, with scanned versions available for electronic medical charts. It describes the patient's wishes for cardiopulmonary resuscitation (CPR) and indicates the levels of care desired including full treatment, limited or selective interventions, and comfort-focused care. It is the best way to direct end-of-life patient care and respect diverse wishes. POLST forms are more useful than CPR directives because they describe broader end-of-life treatment choices. A living will is applicable only under the narrow conditions of a terminal or persistent vegetative state. A medical power of attorney is useful but does not convey values and wishes.

Ref: Abbott J. The POLST paradox: opportunities and challenges in honoring patient end-of-life wishes in the emergency department. *Ann Emerg Med*. 2019;73(3):294-301.

Item 126

ANSWER: A

Hyperparathyroidism is an under-recognized cause of recurrent nephrolithiasis. Mild elevations of serum calcium levels are often overlooked or ignored. Surgical treatment of hyperparathyroidism can reduce serum calcium levels, hypercalciuria, and the formation of kidney stones.

A 24-hour urine sample for calcium would not be the most appropriate next step. Thyroid disorders are not directly linked to nephrolithiasis so a TSH level is not indicated. Repeat urine studies will not affect management. A CT scan in the emergency department was sufficient to rule out anatomic abnormality, so renal ultrasonography is not necessary.

Ref: Fontenelle LF, Sarti TD. Kidney stones: treatment and prevention. *Am Fam Physician*. 2019;99(8):490-496. 2) Ganesan C, Weia B, Thomas I-C, et al. Analysis of primary hyperparathyroidism screening among US veterans with kidney stones. *JAMA Surg*. 2020;155(9):861-868.

Item 127

ANSWER: C

The current recommendation for the treatment of uncomplicated urogenital chlamydial infections is oral doxycycline, 100 mg twice daily for 7 days. Single-dose azithromycin may be considered if compliance is a concern, but the increasing resistance to macrolides is a potential problem. Levofloxacin is another alternative, but it is more costly and side effects may be an issue. Cefixime and ceftriaxone are used to treat gonococcal infections, not *Chlamydia*.

Ref: Yonke N, Aragón M, Phillips JK: Chlamydial and gonococcal infections: screening, diagnosis, and treatment. *Am Fam Physician* 2022;105(4):388-396.

Item 128

ANSWER: A

While they are rarely life-threatening, there are two medically relevant spiders in the United States: the recluse spider and the widow spider. The patient in this case likely has a widow bite. These are medium-sized spiders, reaching up to 4 cm (2 in). They have shiny, dark-colored bodies with a characteristic red hourglass marking. Widow spiders are rarely found inside the home, but rather in shady, enclosed spaces outdoors such as in a shed, under gardening equipment, and amid yard debris. Latrodectism, a systemic envenomation caused by excessive acetylcholine release that results in muscle spasm and diaphoresis of the affected extremity, is rare. Envenomation severity can be graded to help determine treatment. Mild presentations can be treated with oral nonopioid pain medications such as NSAIDs. Calcium and magnesium have not demonstrated any benefit in spider bites. Parenteral opioids are sometimes indicated for poorly controlled pain, and benzodiazepines can be used for painful muscle spasms. This patient is not experiencing these effects. The use of antivenom is controversial, especially because widow spider bites are rarely life-threatening. Antivenom may decrease pain duration, but there is a risk of allergic reaction in up to 5% of patients. Hospital admission is reserved for grade 3 clinical presentations with generalized muscular pain in the chest, abdomen, and back; diaphoresis of the bite site; headache; nausea; vomiting; and abnormal vital signs.

Ref: Herness J, Snyder MJ, Newman RS. Arthropod bites and stings. *Am Fam Physician*. 2022;106(2):137-147.

Item 129

ANSWER: D

Patients at minimal risk of developing severe or complicated alcohol withdrawal who can safely be treated in an outpatient setting include those who are <65 years of age and who have no history of alcohol withdrawal–related seizures or delirium, no multiple prior withdrawal episodes, no comorbid illness, and no marked autonomic hyperactivity on presentation. Mild symptoms of alcohol withdrawal syndrome include mild to moderate anxiety, sweating, and insomnia but no tremor. Moderate symptoms include moderate anxiety, sweating, and insomnia with mild tremor. Severe symptoms include severe anxiety and moderate to severe tremor but no confusion, hallucinations, or seizures that are indicative of complicated alcohol withdrawal symptoms. For patients with alcohol withdrawal syndrome who have mild symptoms and minimal risk of developing severe or complicated alcohol withdrawal, a nonbenzodiazepine anticonvulsant such as gabapentin or carbamazepine is recommended. Benzodiazepines are first-line treatment for moderate alcohol withdrawal syndrome, and β-blockers can be used as adjunctive therapy with benzodiazepines. Valproate should not be used as monotherapy for withdrawal.

Ref: Tiglao SM, Meisenheimer ES, Oh RC. Alcohol withdrawal syndrome: outpatient management. *Am Fam Physician*. 2021;104(3):253-262.

Item 130

ANSWER: D

Combination treatment has been shown to be more effective than metformin alone in terms of lowering hemoglobin A_{1c}, controlling weight, and improving blood pressure control. This otherwise healthy patient should be able to tolerate a hemoglobin A_{1c} $<7\%$ and therefore remains above goal, so consideration of an additional medication is reasonable. It is important to consider the patient's goals when determining which medication to add. Of the options listed, semaglutide has been shown to produce a reduction in cardiovascular mortality and weight and is preferred over sulfonylureas such as glyburide and DPP-4 inhibitors such as sitagliptin. The potentially high cost of semaglutide would need to be discussed with the patient. Insulin is always a reasonable option but would not meet the patient's stated priorities.

Ref: Hauk L. Type 2 diabetes mellitus: ACP releases updated recommendations for oral pharmacologic treatment. *Am Fam Physician*. 2017;96(7):472-473.

Item 131

ANSWER: A

This patient has a distal radius buckle fracture (or torus fracture) and a cock-up wrist splint is appropriate. Buckle fractures are stable because they only involve the bony cortex (outer layer), and the goal of treatment is the alleviation of pain and protecting the bone from further injury. A double sugar-tong splint more completely immobilizes the humerus, radius, and ulna and is not necessary for this type of fracture. A figure-of-8 sling is an option in the treatment of clavicle fractures and is not appropriate for radius fractures. A 2016 systematic review and meta-analysis found that patients treated with splint immobilization had better recovery of wrist motion, quicker return to normal activity, and less overall disability while also experiencing fewer complications than those immobilized with a cast. Patients and their families also preferred splint immobilization and stated they would choose splints over casts if needed in the future.

Ref: Jiang N, Cao ZH, Ma YF, Lin Z, Yu B. Management of pediatric forearm torus fractures: a systematic review and meta-analysis. *Pediatr Emerg Care*. 2016;32(11):773-778. 2) National Clinical Guideline Centre (UK): fractures (non-complex): assessment and management. National Institute for Health and Care Excellence, 2016. 3) Zwillenberg M, Kwak E. Splint vs. cast for forearm buckle fracture in children. *Am Fam Physician*. 2022;105(4):Online. 4) Distal radius and Galeazzi fractures. Pediatric Orthopaedic Society of North America.

Item 132

ANSWER: E

Venous thromboembolism (VTE) is a common occurrence and is the cause of up to 100,000 deaths per year in the United States. When determining a course of treatment, it is key to identify whether the VTE or deep vein thrombosis (DVT) was caused by a temporary or transient risk factor. Common transient risk factors include surgery, hospitalization, trauma, and prolonged travel. VTE in the setting of a transient risk factor should be treated with anticoagulation for 3 months. In this patient's case, there is no obvious transient risk factor. However, obesity and male sex may be considered chronic or persistent risk factors. In this setting, the rate of recurrence in the first year is as high as 10.3%. NICE and CHEST guidelines recommend an indefinite duration of treatment for VTE that is due to chronic risk factors or VTE that is otherwise unprovoked (SOR C). Risk factors for bleeding should prompt consideration to discontinue treatment. While guidelines include the option for serial ultrasonographic monitoring of distal DVT without anticoagulation, this course of action is not recommended in patients with unprovoked DVT. Neither 6 weeks nor 6 months are established treatment durations.

Ref: Kirkilesis G, Kakkos SK, Bicknell C, Salim S, Kakavia K. Treatment of distal deep vein thrombosis. *Cochrane Database Syst Rev*. 2020;4(4):CD013422. 2) Stevens SM, Woller SC, Kreuziger LB, et al. Antithrombotic therapy for VTE disease: second update of the CHEST guideline and expert panel report. *Chest*. 2021;160(6):e545-e608. 3) Mount HR, Rich M, Putnam MS. Recurrent venous thromboembolism. *Am Fam Physician*. 2022;105(4):377-385.

Item 133

ANSWER: B

A Medicare beneficiary must meet certain criteria to be considered homebound and obtain home health services. The first criterion is that when leaving the home, the patient requires the assistance of another person, special transportation, or a support device such as a cane, walker, or wheelchair. Alternatively, a medical contraindication to leaving home could exist. If the first criterion is met, there must be a normal inability to leave home and leaving requires a considerable and taxing effort. It is stipulated that attending religious services, therapeutic or psychosocial treatment at a licensed adult day care program, or outpatient dialysis or cancer treatments should not disqualify a patient from being considered homebound. Visiting the grocery store is not stipulated as an exception.

Ref: Rerucha CM, Salinas R Jr, Shook J, Duane M. House calls. *Am Fam Physician*. 2020;102(4):211-220.

Item 134

ANSWER: A

Laryngitis and an accompanying hoarse voice are viral symptoms, and antibiotics will not help. Fluticasone is effective for the treatment of asthma, but has no value in acute laryngitis. Oseltamivir can be used during influenza season for empiric treatment for influenza-like illness, but is only effective if started within the first 3 days of illness.

Ref: Reveiz L, Cardona AF. Antibiotics for acute laryngitis in adults. *Cochrane Database Syst Rev*. 2015;2015(5):CD004783. 2) Sur DKC, Plesa ML. Antibiotic use in acute upper respiratory tract infections. *Am Fam Physician*. 2022;106(6):628-636.

Item 135

ANSWER: D

The preferred imaging for suspected appendicitis in an adult is CT with intravenous (IV) contrast (SOR C). While there is concern about the use of IV contrast in patients with chronic kidney disease, studies have shown that there is no significant increase in the risk for acute kidney injury with the use of IV contrast in patients with or without pre-existing renal dysfunction (SOR B). IV contrast is considered safe in patients with an estimated glomerular filtration rate (eGFR) ≥30 mL/min/1.73 m^2. Pretreating patients with an eGFR <30 mL/min/1.73 m^2 with isotonic crystalloid volume expansion is recommended.

Oral contrast has not been shown to increase the sensitivity or specificity of CT in the evaluation of appendicitis. Ultrasonography is the preferred imaging modality for children with suspected appendicitis, but not adults. MRI is not recommended for the evaluation of appendicitis.

Ref: Rud B, Vejborg TS, Rappeport ED, Reitsma JB, Wille-Jørgensen P. Computed tomography for diagnosis of acute appendicitis in adults. *Cochrane Database Syst Rev*. 2019;2019(11):CD009977. 2) Ford B, Dore M, Moullet P. Diagnostic imaging: appropriate and safe use. *Am Fam Physician*. 2021;103(1):42-50.

Item 136

ANSWER: E

Diabetic retinopathy is caused by chronic hyperglycemia and is the leading cause of blindness in adults in the United States. Routine screening with a dilated eye examination or retinal imaging performed and interpreted by a skilled clinician shortly after the diagnosis of diabetes mellitus is recommended. Diabetic retinopathy is classified in two stages. Nonproliferative diabetic retinopathy may occur within the first decade following hyperglycemia and is characterized by blot hemorrhages, cotton-wool spots, and retinal vascular microaneurysms. As the number of hemorrhages and microaneurysms increases, normal blood flow is interrupted. Proliferative diabetic retinopathy is the second stage and is characterized by neovascularization, which occurs in response to poor blood flow and retinal ischemia. These new blood vessels are fragile and rupture easily leading to vitreous hemorrhage, fibrosis, and retinal detachment. Drusen are extracellular deposits that accumulate within the macula in macular degeneration, which is unrelated to diabetic retinopathy. Macular edema can occur in both stages of diabetic retinopathy.

Ref: Loscalzo J, Fauci AS, Kasper DL, Hauser SL, Longo DL, Jameson JL, eds. *Harrison's Principles of Internal Medicine*. 21st ed. McGraw Hill; 2022:3120-3128.

Item 137

ANSWER: A

All patients using topical corticosteroids chronically should be monitored for adverse systemic effects, such as adrenal suppression, cataracts, decreased growth rate, and hypertension. Patients at highest risk for adverse systemic reactions to prolonged topical corticosteroid use are children and the elderly. There has been no evidence that maternal use of topical corticosteroids causes adverse pregnancy outcomes or that their use while breastfeeding is problematic.

Ref: Stacey SK, McEleney M. Topical corticosteroids: choice and application. *Am Fam Physician*. 2021;103(6):337-343.

Item 138

ANSWER: B

This patient is having an anaphylactic reaction to peanuts. Intramuscular epinephrine administered in the outer mid-thigh, preferably via an autoinjector, is the appropriate treatment. The absorption of epinephrine via the subcutaneous route is erratic and results in slow increases in plasma and tissue concentrations compared to the intramuscular route. Intravenous epinephrine needs trained personnel to administer it. Its administration is restricted to refractory cases of anaphylaxis as it is associated with higher cardiovascular complications. Corticosteroids and antihistamines are not first-line treatments.

Ref: Pflipsen MC, Vega Colon KM. Anaphylaxis: recognition and management. *Am Fam Physician*. 2020;102(6):355-362.

Item 139

ANSWER: A

This patient presents with clinical findings strongly suggestive of Cushing disease, which is defined as the excessive production of adrenal cortical hormones. Options for confirmatory testing include 24-hour urinary free cortisol and overnight salivary cortisol levels. Metanephrines are used to diagnose pheochromocytoma. ACTH stimulation testing is used to diagnose adrenal insufficiency. FSH and LH levels test the hypothalamic-pituitary-gonadal axis. Plasma renin activity testing and an aldosterone level are useful in the workup of secondary hypertension to help diagnose hyperaldosteronism.

Ref: Charles L, Triscott J, Dobbs B. Secondary hypertension: discovering the underlying cause. *Am Fam Physician*. 2017;96(7):453-461. 2) Fitzgerald PA. Anterior hypopituitarism. In: Papadakis MA, McPhee SJ, Rabow MW, McQuiad KR, eds. *Current Medical Diagnosis & Treatment 2023*. McGraw Hill; 2023.

Item 140

ANSWER: C

The 2022 American Academy of Family Physicians clinical practice guideline recommends treating adults who have hypertension to a standard target of $<140/90$ mm Hg based on high-quality evidence. Moderate-quality evidence showed that treating adults to a lower blood pressure target of $<135/85$ mm Hg further reduced the risk of myocardial infarction compared to the standard target, with a number needed to treat of 137 over 3.7 years. There was no benefit in mortality or stroke risk. Of note, treating to a lower target blood pressure does increase the absolute risk of serious adverse events by 3%, with a number needed to harm of 33 over 3.7 years.

Ref: Coles S, Fisher L, Lin KW, Lyon C, Vosooney AA, Bird MD. Blood pressure targets in adults with hypertension: a clinical practice guideline from the AAFP. *Am Fam Physician*. Published online November 14, 2022.

Item 141

ANSWER: E

Commercial airline carriers typically permit Federal Aviation Administration–approved portable oxygen compressors. Patients whose usual oxygen requirements are < 4 L/min are advised to double the flow rate during the flight. Conditions such as bullous lung disease, cystic fibrosis, and severe COPD may require the Hypoxia Altitude Simulation Test to determine in-flight oxygen requirements prior to air travel. It would not be appropriate to recommend this patient choose another mode of transit, fly first class only, continue his current oxygen flow rate, or lower his oxygen flow rate.

Ref: Powell-Dunford N, Adams JR, Grace C. Medical advice for commercial air travel. *Am Fam Physician*. 2021;104(4):403-410.

Item 142

ANSWER: B

Patellofemoral pain syndrome (PFPS) involves pain around the patella during weight bearing on a flexed knee. PFPS is a clinical diagnosis and does not require imaging to make the diagnosis, although imaging may be indicated if other pathology is suspected. Exercise therapy is the mainstay of treatment. A medial unloading knee brace may be beneficial for symptomatic pain relief in knee osteoarthritis, but knee braces in general have poor evidence of benefit in PFPS. Intra-articular corticosteroids may be beneficial for pain relief in refractory cases but are not generally appropriate for initial treatment. Surgery may be indicated for refractory cases to correct patellar maltracking.

Ref: Armstrong AD, Hubbard MC, eds. *Essentials of Musculoskeletal Care*. 5th ed. American Academy of Orthopaedic Surgeons; 2018:739-745. 2) Gaitonde DY, Ericksen A, Robbins RC. Patellofemoral pain syndrome. *Am Fam Physician*. 2019;99(2):88-94.

Item 143

ANSWER: C

Although multiple sclerosis (MS) is often managed by a neurologist and a multidisciplinary team, family physicians sometimes see these patients for symptoms that could be related to their disease process. If an MS flare is thought to be the etiology, corticosteroids are the treatment of choice, most often oral methylprednisolone with recommendations of 500 mg daily for 5 days or 1000 mg daily for 3 days. Intravenous administration has not been found to be more efficacious than oral administration. Corticosteroids speed the recovery process but do not generally alter the long-term outcomes. Patients without an adequate response to the corticosteroid burst may potentially benefit from plasmapheresis. High-dose interferon, high-dose aspirin, and physical therapy are not used to treat acute exacerbations.

Ref: Saguil A, Farnell EA IV, Jordan TS. Multiple sclerosis: a primary care perspective. *Am Fam Physician*. 2022;106(2):173-183.

Item 144

ANSWER: C

As health care has moved to a patient-centered, decision-making model, there is a focus on communication skills and patient preferences. These apply when physicians share serious or bad news with patients.

The Setting, Perception, Invitation, Knowledge, Emotions, and Strategy/Summary (SPIKES) protocol can be used for sharing bad news.

It is during the invitation step of SPIKES that a physician determines how much information or detail a patient desires to hear. Patient preferences vary and are influenced by demographics including age, sex, education, and culture (SOR B). While most patients want to know their diagnosis, the amount of detail varies. It is important to recognize this before sharing serious or bad news.

Asking permission to discuss the information enables the patient to control the conversation. The following questions are examples of how to ask for patient permission: Would it be okay if I give you those test results now? Are you someone who likes to know all of the details, or would you prefer that I focus on the most important results? If the patient declines, then offer to review the diagnosis again when they are ready or when a family member is present.

Previously in the paternalistic patient care model, the physician would select the information to share to help steer the patient toward the best decision. While the family is important, SPIKES is directed toward the patient because it is the patient, not the family, who controls the amount of detail that is discussed.

The last S in SPIKES is for Strategy and Summary. While palliative care and hospice could be included in that discussion, it would vary based upon what the patient wants to discuss at the time the bad news is initially shared.

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

GLP-1 receptor agonists should be discontinued in patients suspected to have pancreatitis. Additionally, therapy with GLP-1 receptor agonists should not be restarted once the pancreatitis has resolved. Although pancreatitis has been reported in clinical trials, the causality between GLP-1 receptor agonists and pancreatitis has not been established. Other medication classes such as DPP-4 inhibitors can also cause pancreatitis. Biguanides, insulin, and SGLT2 inhibitors do not cause pancreatitis (SOR C).

Ref: ElSayed NA, Aleppo G, Aroda VR, et al. 9. Pharmacologic approaches to glycemic treatment: standards of care in diabetes—2023. *Diabetes Care*. 2023;46(Suppl 1):S140-S157.

Item 146

ANSWER: E

The diagnosis of schizophrenia requires that at least one positive and one negative symptom or disorganized behavior be present for 6 months and be severe for at least 1 month. Positive symptoms include delusions, hallucinations, and disorganized speech. Negative symptoms include alogia (reduced number of words spoken), blunted affect, avolition (a decrease in motivated, self-initiated, purposeful activities), asociality, and anhedonia. Depression may be present in schizophrenia but is neither a positive nor negative symptom.

Ref: Crawford P, Go KV. Schizophrenia. *Am Fam Physician*. 2022;106(4):388-396.

Item 147

ANSWER: E

This patient has sustained an avulsion of the flexor digitorum profundus (FDP) tendon, also known as jersey finger. The ring finger is most often involved, representing 75% of cases. The injury occurs due to forced hyperextension of an actively flexed digit, often in collision sports that involve tackling when a finger catches on an opponent's clothing. Patients may hold the affected finger in extension relative to the other digits when the hand is at rest. The key physical examination finding is the inability to flex the distal interphalangeal (DIP) joint. Surgical repair is the appropriate treatment for a ruptured FDP tendon, with a worsening prognosis when treatment is delayed.

Although patients with jersey finger often require extended hand rehabilitation after surgery, a referral to occupational therapy prior to expedited surgical repair would delay the definitive treatment and likely result in a worse outcome. Corticosteroid injection into the flexor tendon sheath often benefits patients with stenosing tenosynovitis of the flexor tendon, also known as trigger finger. However, injecting a corticosteroid into a ruptured FDP tendon sheath would be inappropriate for management of this injury, not only by likely causing a delay in presentation to a hand surgeon, but also by potentially increasing the perioperative risk of infection and/or poor tissue healing caused by the local corticosteroid. Temporary immobilization in partial flexion followed by buddy taping is the treatment of choice for certain injuries to the proximal interphalangeal volar plate but not for FDP tendon injuries. Full-time immobilization in an extension splint for 6–8 weeks is the recommended treatment for an extensor tendon avulsion at the DIP joint, otherwise known as a mallet finger.

Ref: Leggit JC, Meko CJ. Acute finger injuries: part I. Tendons and ligaments. *Am Fam Physician*. 2006;73(5):810-816. 2) Bachoura A, Ferikes AJ, Lubahn JD. A review of mallet finger and jersey finger injuries in the athlete. *Curr Rev Musculoskelet Med*. 2017;10(1):1-9. 3) Shapiro LM, Kamal RN. Evaluation and treatment of flexor tendon and pulley injuries in athletes. *Clin Sports Med*. 2020;39(2):279-297.

Item 148

ANSWER: A

For most patients with community-acquired pneumonia and resolution in 7 days, a follow-up chest radiograph is not recommended. Exceptions would include suspicion of a possible mass or lymphadenopathy. Although this patient is over 50 years of age, he does not meet the criteria for low-dose CT screening for lung cancer, which is recommended in adults ages 50–80 who have a ≥20-pack-year smoking history, and who currently smoke or have quit within the past 15 years.

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. 2) AMDA – The Society for Post-Acute and Long-Term Care Medicine. Don't order routine follow-up chest imaging for post-acute and long-term care residents with CAP whose symptoms have resolved within five to seven days. ABIM Foundation Choosing Wisely campaign, 2020.

Item 149

ANSWER: A

According to current American College of Gastroenterology guidelines, whenever *Helicobacter pylori* is identified and treated, testing to prove eradication should be performed at least 4 weeks after completing antibiotic therapy and 2 weeks after discontinuing the proton pump inhibitor (PPI). With increasing resistance and thus declining success in treatment, many patients will be persistently infected after treatment and remain at risk for complications, including gastric malignancy. There is no role for *H. pylori* serology in testing for treatment success. This patient does not need further PPI therapy since she is symptom free. She is not at the age threshold to begin colon cancer screening, and without further familial risk information there is no indication to begin screening earlier. There is no evidence that she needs to be screened for a peptic ulcer.

Ref: Chey WD, Leontiadis GI, Howden CW, Moss SF. ACG clinical guideline: treatment of *Helicobacter pylori* infection. *Am J Gastroenterol*. 2017;112(2):212-239.

Item 150

ANSWER: B

This image demonstrates many of the typical EKG findings of a complete right bundle branch block (RBBB). This pattern results when the normal sequence of conduction along the His-Purkinje system is altered, resulting in widening of the QRS complex and changes in the directional vectors of the R and S waves due to delayed activation of the right ventricle. The secondary R wave is indicated by the notation R' or r'. An expert task force has created a list of electrocardiographic criteria for RBBB, including a QRS duration of ≥120 ms; Rsr', rsR', or rSR' in leads V1 or V2; an S wave of greater duration than the R wave or >40 ms in leads I and V6 (due to terminal electrical forces being rightward and anterior); and a normal R peak time in leads V5 and V6, but >50 ms in lead V1 associated with the R' wave.

A left bundle branch block (LBBB) would also have a prolonged QRS; however, the EKG would show broad monophasic R waves in leads I, V5, and V6 that are usually notched or slurred, secondary ST and T wave changes opposite in direction to the major QRS deflection, and an rS or QS complex in the right precordial leads.

Right ventricular hypertrophy would show a similar right axis deviation with an rSR' in V1 but would also have a dominant R wave in V1 >7 mm and an R wave in V1 and an S wave in V5 or V6 >10.5 mm. This EKG is not consistent with a paced rhythm strip. A Wolff-Parkinson-White pattern would also have an apparent wider QRS but would be due to an initial slurring of the QRS (delta wave). The PR interval would be decreased.

Ref: Surawicz B, Childers R, Deal BJ, et al. AHA/ACCF/HRS recommendations for the standardization and interpretation of the electrocardiogram: part III: intraventricular conduction disturbances: a scientific statement from the American Heart Association Electrocardiography and Arrhythmias Committee, Council on Clinical Cardiology; the American College of Cardiology Foundation; and the Heart Rhythm Society. Endorsed by the International Society for Computerized Electrocardiology. *J Am Coll Cardiol*. 2009;53(11):976-981.

Item 151

ANSWER: A

This patient has experienced a significant but unintentional weight loss of more than 5% in 6 months. Such weight loss has been associated with increased mortality in the elderly in several studies. An evaluation for etiology of the weight loss should be completed, including a history with a medication review and a physical examination, but many medical and psychiatric conditions are associated with unintentional weight loss. Unintentional weight loss is not associated with a lower risk of cardiovascular disease. About one-third of patients with unintentional weight loss will be diagnosed with a malignancy. In the Choosing Wisely campaign, the American Geriatrics Society recommended avoidance of high-calorie dietary supplements and appetite stimulants due to the lack of evidence that they improve quality of life or offer a survival benefit. A Cochrane review of supplements in elderly patients showed a small weight gain but no overall mortality benefit. Medications, including polypharmacy, can contribute to unintentional weight loss.

Ref: Gaddey HL, Holder KK. Unintentional weight loss in older adults. *Am Fam Physician*. 2021;104(1):34-40.

Item 152

ANSWER: A

This patient has mild lactational mastitis with no systemic symptoms. Antibiotics are unnecessary and the condition may be managed conservatively with rest, cold compresses, over-the-counter acetaminophen or NSAIDs, and close monitoring for systemic symptoms. The patient should continue on-demand breastfeeding (physiologic feeding). Efforts to keep the breast drained of milk, such as frequent breast pumping or decreased feeding intervals, increase milk production, which may increase breast pain or abscess formation. If the patient develops fever or chills, antibiotics covering *Staphylococcus* and *Streptococcus* should be started. The standard treatment is dicloxacillin, 500 mg four times daily for 10–14 days. Other commonly used antibiotics are amoxicillin/clavulanate, 875/125 mg twice daily, or cephalexin, 500 mg four times daily, for 10–14 days. Breast milk does not need to be discarded when the patient is taking these antibiotics.

Ref: Louis-Jacques AF, Berwick M, Mitchell KB. Risk factors, symptoms, and treatment of lactational mastitis. *JAMA*. 2023;329(7):588-589.

Item 153

ANSWER: A

In the United States birth defects affect 1 in 33 infants and are the leading cause of infant mortality. The CDC tracks data on birth defects to better understand genetic, behavioral, and environmental factors and to direct resources and develop interventions for appropriate populations. Most causes of birth defects are unknown. However, adequate folic acid intake during pregnancy can reduce the risk of neural tube defects such as anencephaly and spina bifida. There has been a 28% decline in anencephaly since the United States began fortifying grains with folic acid.

Cleft lip and cleft palate are associated with maternal smoking, diabetes mellitus, and the use of antiseizure medications such as topiramate and valproic acid during the first trimester. Down syndrome is associated with maternal age over 35. It is worth noting, however, that because most pregnancies occur in women under the age of 35, the majority of babies born with Down syndrome also occur in mothers younger than 35. Omphalocele is associated with maternal smoking, alcohol use, SSRI use, and obesity. The cause of tetralogy of Fallot is unknown, but like all other birth defects it is likely associated with a combination of genes, maternal behavioral, and environmental exposures.

Ref: National environmental public health tracking: birth defects. Centers for Disease Control and Prevention. Reviewed October 21, 2020. 2) Birth defects: specific birth defects. Centers for Disease Control and Prevention. Reviewed June 28, 2023.

Item 154

ANSWER: D

Weakness and pain are common symptoms of rotator cuff tears. The empty can test has a sensitivity of 70% and a specificity of 81% for supraspinatus muscle tear. The drop arm test has a low sensitivity of 21% for supraspinatus muscle tear, but a very high specificity of 96%. MRI would allow evaluation of the size and degree of tear as the next step in evaluation. In large or full thickness rotator cuff tears, immediate surgical repair is recommended in otherwise young, healthy individuals. Delayed repair of such tears can result in tendon degeneration, retraction, and compromised surgical results. Surgical repair should be performed within 6 weeks of the injury. Rest, ice, compression, elevation, and home exercises; NSAIDs and physical therapy; and corticosteroid injection would not be the most appropriate options for the next step in the management of this patient's injury.

Ref: Lähteenmäki HE, Virolainen P, Hiltunen A, Heikkilä J, Nelimarkka OI. Results of early operative treatment of rotator cuff tears with acute symptoms. *J Shoulder Elbow Surg*. 2006;15(2):148-153. 2) Jain NB, Luz J, Higgins LD, et al. The diagnostic accuracy of special tests for rotator cuff tear: the ROW cohort study. *Am J Phys Med Rehabil*. 2017;96(3):176-183.

Item 155

ANSWER: E

The most likely diagnosis is epiglottitis. Inflammatory edema of the epiglottis and surrounding tissues is potentially life-threatening, as this edema can lead to complete airway obstruction. The epiglottis must be visualized in the operating room in case of life-threatening spasms that can lead to airway obstruction. The surgeon must be prepared to perform tracheostomy if airway obstruction develops.

Supplemental oxygen, intravenous fluids, and laboratory studies are reasonable supportive and diagnostic options. However, immediate intervention in the operating room is the most important next step to prevent airway obstruction.

Ref: Sobol SE, Zapata S. Epiglottitis and croup. *Otolaryngol Clin North Am*. 2008;41(3):551-566. 2) Kliegman RM, St Geme JW III, Blum NJ, et al, eds. *Nelson Textbook of Pediatrics*. 21st ed. Elsevier Saunders; 2020:2203-2204. 3) Sur DKC, Plesa ML. Antibiotic use in acute upper respiratory tract infections. *Am Fam Physician*. 2022;106(6):628-636.

Item 156

ANSWER: E

Echocardiography should be performed to assess for cardiac target end-organ damage, such as left ventricular hypertrophy, when medication is being considered in children with hypertension. Evaluation for secondary causes of hypertension is not needed in children >6 years of age with stage 1 hypertension if they are overweight or have a positive family history of hypertension and there are no physical examination findings indicative of a secondary cause. Renal imaging, catecholamine and steroid levels, and renin activity are indicated in children <6 years of age or patients with stage 2 hypertension (≥95th percentile plus 12 mm Hg systolic or diastolic blood pressure or ≥140/90 mm Hg, whichever is lower).

Ref: Flynn JT, Kaelber DC, Baker-Smith CM, et al. Clinical practice guideline for screening and management of high blood pressure in children and adolescents. *Pediatrics*. 2017;140(3):e20171904. 2) Smith DK, McMullan SM, Martin MJ. Getting hypertension under control in the youngest of patients. *J Fam Pract*. 2021;70(5):220-228.

Item 157

ANSWER: B

Multiple myeloma (MM), a malignancy of plasma cells, represents 1.6% of all cancer cases and approximately 10% of the hematologic malignancies seen in the United States. Patients with monoclonal gammopathy of undetermined significance (MGUS) have a 1% annual risk of progression to MM. Patients who have progressed to MM typically manifest one or more of the classic CRAB findings: calcium (hypercalcemia of >11 mg/dL), renal impairment (a creatinine level >2 mg/dL or an estimated glomerular filtration rate <40 mL/min/1.73 m^2), anemia (a hemoglobin level <10 g/dL), and bone involvement (osteolytic lesions, pathologic fractures, and/or severe osteopenia), which represent evidence of end-organ disease. Of the options listed, only hypercalcemia raises concern for progression of MGUS to MM. While patients with MM often have an elevated total serum protein level, the increase is from plasma cell–related proliferation and the resulting monoclonal protein production, not from an increase in albumin. Patients with MM would be expected to have a decrease in the hemoglobin level, not an increase. Renal manifestations typically involve a decrease in the serum creatinine level rather than microscopic hematuria. Finally, bone involvement in MM includes lytic, as opposed to blastic, lesions.

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

Item 158

ANSWER: A

In most cases, hematospermia (visible blood in the ejaculate) is benign and self-limiting, often caused by infection or inflammation of the genitourinary tract. Other potential etiologies include trauma or iatrogenic injury, systemic diseases including severe uncontrolled hypertension or a bleeding disorder, cysts, calculi, or prolonged abstinence. Hematospermia is rarely caused by genitourinary cancer, and underlying malignancy is particularly unlikely in men <40 years of age with new-onset hematospermia. Although acute-onset hematospermia may cause great distress to the patient, if the initial evaluation is unrevealing the most appropriate intervention for a man <40 years of age is reassurance that the problem will likely self-resolve, with the recommendation to return for follow-up if the problem persists or recurs. Further evaluation with PSA testing and referral to a urologist is indicated for men with symptoms persisting beyond 10 occasions or 1 month's duration and for men over 40 years of age. After an unremarkable history, examination, and basic laboratory workup, the next step is to provide reassurance with appropriate return precautions. PSA testing, ultrasonography of the scrotum and prostate, CT of the abdomen and pelvis, and referral to a urologist are not warranted at this time.

Ref: Drake T, Hanna L, Davies M. Haematospermia. *BMJ*. 2016;355:i5124. 2) Papadakis MA, McPhee SJ, Rabow MW, eds. *Current Medical Diagnosis & Treatment*. 61st ed. McGraw Hill; 2022:952-977.

Item 159

ANSWER: C

Posttraumatic stress disorder (PTSD) is a psychiatric condition associated with previous exposure to a traumatic event (or events). There are four symptom categories: intrusive/re-experiencing (e.g., flashbacks, nightmares), avoidance/numbing, negative change in cognition and mood, and hyperarousal (e.g., anger outbursts, hypervigilance).

Prazosin, an α_1-adrenergic receptor antagonist, is efficient and remains the first choice for pharmacologic therapy of PTSD-associated nightmares. The data is insufficient to support the use of clonazepam for treating nightmares associated with PTSD. Gabapentin and sertraline may be used as adjunctive therapy with antipsychotic and anxiolytic agents in treating PTSD-associated nightmares. Venlafaxine may improve behavioral symptoms, but it is ineffective for treating PTSD-associated nightmares.

Ref: Lancaster CL, Teeters JB, Gros DF, Back SE. Posttraumatic stress disorder: overview of evidence-based assessment and treatment. *J Clin Med*. 2016;5(11):105. 2) Morgenthaler TI, Auerbach S, Casey KR, et al. Position paper for the treatment of nightmare disorder in adults: an American Academy of Sleep Medicine position paper. *J Clin Sleep Med*. 2018;14(6):1041-1055.

Item 160

ANSWER: A

Lung cancer is the leading cause of cancer-related death in the United States. It is estimated that 90% of cases are related to tobacco exposure. Effective lung cancer screening programs are thought to reduce lung cancer–related morbidity and mortality via early detection in persons at high risk. The U.S. Preventive Services Task Force recommends annual screening for lung cancer with low-dose CT in adults ages 50–80 who have a 20-pack-year smoking history. Eligible individuals include those who currently smoke or have quit within the past 15 years. In this case, this patient's New York Heart Association class IV heart failure refractory to medical and surgical therapy limits his life expectancy and screening should be discontinued. The lack of ability or willingness to have curative lung surgery would also be an indication to discontinue lung cancer screening. A recent cardiac procedure is not an indication to discontinue screening for lung cancer.

Ref: US Preventive Services Task Force. Final recommendation statement: lung cancer: screening. Updated March 9, 2021.

Item 161

ANSWER: C

In obese patients with a medical history of GERD, a Roux-en-Y gastric bypass is preferred over sleeve gastrectomy (SOR A). Adjustable gastric band, sleeve gastrectomy, and biliopancreatic diversion all function by limiting the physical size of the stomach. This has a potential for exacerbating GERD symptoms, despite anticipated significant weight loss. This patient meets criteria for metabolic surgery due to a diagnosis of morbid obesity, in addition to comorbidities such as diabetes mellitus and hypertension.

Ref: Erlandson M, Ivey LC, Seikel K. Update on office-based strategies for the management of obesity. *Am Fam Physician*. 2016;94(5):361-368. 2) Public Education Committee. Bariatric surgery procedures. American Society for Metabolic and Bariatric Surgery. Updated May 2021. 3) Banerjee ES, Schroeder R, Harrison TD. Metabolic surgery for adult obesity: common questions and answers. *Am Fam Physician*. 2022;105(6):593-601.

Item 162

ANSWER: A

Topical corticosteroids are extremely common agents prescribed by family physicians and it is important to understand the safe and appropriate use of these agents. Many common dermatologic conditions are best treated with mid- or low-potency corticosteroids, but some conditions will only improve with high-potency agents. High-potency agents should typically be avoided on the face and eyelids, and on infants. These agents should be used as sparingly as possible when indicated and tapered off (SOR B). Of the agents listed, clobetasol 0.05% lotion is a very high-potency corticosteroid and should be avoided for long-term use on the face. Desonide 0.05% ointment, hydrocortisone 1% lotion, hydrocortisone 2.5% cream, and triamcinolone 0.025% cream are low-potency corticosteroids.

Ref: Stacey SK, McEleney M. Topical corticosteroids: choice and application. *Am Fam Physician*. 2021;103(6):337-343.

Item 163

ANSWER: A

This patient presents with symptomatic hyperglycemia associated with uncontrolled type 2 diabetes. She is in a catabolic state, experiencing symptoms, and has a hemoglobin A_{1c} ≥10%. According to the American Diabetes Association (ADA) Standards of Care in Diabetes, early initiation of insulin is recommended. Once the acute glucose toxicity has resolved with insulin treatment, this patient could be switched to a noninsulin agent. With her comorbid hypertension, albuminuria, and obesity, a GLP-1 receptor agonist or an SGLT2 inhibitor with proven cardiovascular and renal benefits would be the next best choices. DPP-4 inhibitors have intermediate efficacy for lowering glucose with neutral cardiovascular and heart failure benefit and a neutral effect on weight and progression of chronic kidney disease. Thiazolidinediones have high efficacy for lowering glucose but are associated with weight gain and increased risk of heart failure.

Ref: ElSayed NA, Aleppo G, Aroda VR, et al. 9. Pharmacologic approaches to glycemic treatment: standards of care in diabetes—2023. *Diabetes Care*. 2023;46(Suppl 1):S140-S157.

Item 164

ANSWER: E

There is reliable and consistent evidence to support core strengthening exercises as a preventive measure for low back pain. In contrast, back braces, over-the-counter insoles, customized orthoses, and education on lifting techniques have shown little or no benefit.

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

Item 165

ANSWER: C

Family physicians should provide appropriate age-based and organ inventory–based screening recommendations to all patients. Current guidelines from the U.S. Preventive Services Task Force recommend initiating colon cancer screening at age 45 in average-risk individuals. Breast cancer screening in transgender females is complicated by a lack of consensus on screening recommendations in cisgender females and limited evidence. In general, expert guidelines recommend starting breast cancer screening in transgender females at age 50 and after 5–10 years of feminizing hormone therapy. Cervical cancer screening would be a concern in transgender males, not transgender females. Osteoporosis screening is not recommended at this age for a patient of any gender unless there have been concerning fractures or other risk factors. The prostate is not removed during vaginoplasty, but screening is not recommended prior to age 50, if at all.

Ref: Deutsch MB. Screening for breast cancer in transgender women. UCSF Transgender Care, 2016. 2) Wesp L. Prostate and testicular cancer considerations in transgender women. UCSF Transgender Care, 2016. 3) US Preventive Services Task Force. Final recommendation statement: colorectal cancer: screening. Updated May 18, 2021. 4) The World Professional Association for Transgender Health. Standards of care for the health of transsexual, transgender, and gender nonconforming people. 8th ed. 2022.

Item 166

ANSWER: B

Patients taking apixaban for stroke prevention in atrial fibrillation should discontinue the medication for 1–2 days prior to the procedure without bridging. This approach is associated with a low risk of bleeding complications without increasing the incidence of thromboembolism. The choice between 1 and 2 days depends on the bleeding risk associated with the procedure.

Ref: Douketis JD, Spyropoulos AC, Duncan J, et al. Perioperative management of patients with atrial fibrillation receiving a direct oral anticoagulant. *JAMA Intern Med*. 2019;179(11):1469-1478. 2) Douketis JD, Spyropoulos AC, Murad MH, et al. Perioperative management of antithrombotic therapy: an American College of Chest Physicians clinical practice guideline. *Chest*. 2022;162(5):e207-e243.

Item 167

ANSWER: E

In patients who were previously vaccinated with 23-valent pneumococcal polysaccharide vaccine between the ages of 19 and 64 due to risk factors such as type 2 diabetes, the CDC now recommends one dose of 20-valent pneumococcal conjugate vaccine.

Ref: Vaccines and preventable diseases: pneumococcal vaccination: summary of who and when to vaccinate. Centers for Disease Control and Prevention. Reviewed February 13, 2023.

Item 168

ANSWER: A

Hospice and palliative care should be considered in patients with severe COPD. Oxygen therapy has been shown to reduce mortality in patients with severe hypoxemia and hypercapnia. Additionally, noninvasive ventilation (i.e., CPAP therapy) added to oxygen can also improve mortality. While inhaled therapies such as fluticasone and formoterol can decrease hospitalizations and improve dyspnea, they have not been shown to improve mortality. There is some evidence that inhaled triple therapy with a long-acting muscarinic antagonist, a long-acting β-agonist, and an inhaled corticosteroid may improve mortality, but that possibility has not been demonstrated consistently and additional studies are needed. In select patients, lung reduction surgery may also reduce mortality. Azithromycin and oral prednisone are options for adjunctive therapy to reduce exacerbations for some patients, but neither has been shown to decrease mortality in patients with severe COPD associated with chronic hypoxemia and hypercapnia.

Ref: Global Initiative for Chronic Obstructive Lung Disease. 2023 Report: global strategy for the diagnosis, management, and prevention of chronic obstructive pulmonary disease. Updated 2023.

Item 169

ANSWER: B

Lichen planus is a disorder of unknown etiology affecting the skin, genitals, oral cavity, scalp, nails, and esophagus. Patients with lichen planus have a higher (up to sixfold) incidence of hepatitis C virus infection. Hence, screening for hepatitis C should be performed in patients with lichen planus even though the cause-and-effect relationship between hepatitis C and lichen planus is unknown.

Antihistone antibodies are present in patients with medication-induced lupus erythematosus. HIV antibody is used in screening for HIV infection. Sjögren syndrome–related antigen A (Ro) and Sjögren syndrome–related antigen B (La) antibodies are present in patients with Sjögren syndrome.

Ref: Randall DA, Wilson Westmark NL, Neville BW. Common oral lesions. *Am Fam Physician*. 2022;105(4):369-376.

Item 170

ANSWER: A

This patient presents with malignant hypercalcemia, which in this case is most likely due to parathyroid hormone–related peptide (PTHrP) production from his squamous cell lung cancer. The first step in management is to correct the volume depletion that is associated with the hypercalcemia, which commonly occurs due to the combined effects of anorexia, nausea/vomiting, and nephrogenic diabetes insipidus. This often leads to extreme dehydration followed by a decreased glomerular filtration rate, which reduces the kidneys' ability to excrete calcium, thereby compounding the electrolyte disturbance. An initial 2-liter intravenous fluid bolus in this case would be an appropriate first step. Once the volume status has been addressed and renal function is stabilized, additional treatment options may include loop diuretics such as furosemide, corticosteroids such as prednisone or methylprednisolone, and/or bisphosphonates such as pamidronate, depending on the clinical circumstances. In patients with severe chronic kidney disease or acute, life-threatening hypercalcemia, calcium may be removed via dialysis, although preparing for imminent dialysis would not be appropriate for this patient.

Ref: Higdon ML, Atkinson CJ, Lawrence KV. Oncologic emergencies: recognition and initial management. *Am Fam Physician*. 2018;97(11):741-748. 2) Guise TA, Wysolmerski JJ. Cancer-associated hypercalcemia. *N Engl J Med*. 2022;386(15):1443-1451.

Item 171

ANSWER: C

Peroneal tendinopathy is most commonly an overuse injury and results in tenderness along the path of the peroneal tendon from the lateral heel to the midfoot. Achilles tendinopathy involves tenderness in the posterior heel about 2–4 cm above the insertion of the Achilles tendon onto the calcaneus. Lisfranc arthropathy is caused by damage to the ligaments that support the midfoot and causes tenderness across the dorsal midfoot. Plantar fasciitis is characterized by pain and tenderness at the insertion of the plantar fascia on the plantar heel. Tarsal tunnel syndrome causes medial ankle pain that typically radiates to the medial midfoot.

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

Item 172

ANSWER: E

The U.S. Preventive Services Task Force (USPSTF) recommends annual screening for lung cancer with low-dose CT of the chest for men and women ages 50–80 with a 20-pack-year smoking history or more, or patients who currently smoke or have quit smoking in the past 15 years (B recommendation). This patient is 78 years old with a 30-pack-year history and he quit smoking only 10 years ago.

Patients at increased risk for hepatitis B virus infection should be tested (B recommendation). This patient does not have a history that is high risk for hepatitis B infection, such as needle-sharing, injecting illicit substances, having sex with other men, and HIV infection, so he does not need to be tested at this time. Shared clinical decision-making to discuss the benefits and harms of prostate-specific antigen (PSA) testing in men ages 55–69 years should be considered. This patient's age makes PSA testing inappropriate (D recommendation).

According to the clinical evidence, one-time screening for abdominal aortic aneurysm (AAA) with ultrasonography demonstrates moderate benefit for males between the ages of 65–75 who have ever smoked or have smoked at least 100 cigarettes (B recommendation). Smoking history is the strongest predictor for AAA (B recommendation). This patient does have a smoking history, but his age is outside the recommended window for AAA screening. According to the USPSTF, there is insufficient evidence to screen men for osteoporosis (I recommendation), so a DEXA scan would not be appropriate.

Ref: US Preventive Services Task Force. Recommendation topics. Updated 2023.

Item 173

ANSWER: A

This patient presents with symptoms of pharyngitis that are most likely attributed to a viral infection. However, many patients expect to receive prescriptions for antibiotics when evaluated for common respiratory infections. Use of the Modified Centor Criteria can assist with determining the likelihood of a group A streptococcal infection before prescribing antibiotics. The Modified Centor Criteria gives points for age, absence of cough, fever, tender anterior cervical lymphadenopathy, and tonsillar exudates or swelling. This patient would receive 0 points because she has a cough, −1 point because she is older than 45, 1 point because she has a fever ≥100.4°F, 1 point because she has tender anterior cervical lymphadenopathy, and 1 point because she has tonsillar swelling. Therefore, her total Modified Centor Criteria score is 2, and she should be additionally evaluated with a rapid antigen detection test for group A *Streptococcus* (GAS).

Rapid streptococcal antigen tests can reduce inappropriate antibiotic prescriptions for adults at the point of care without adverse consequences (SOR A). Since this adult patient's test is negative she does not require treatment with antibiotics, and supportive care is recommended. There is no role for repeating a rapid streptococcal antigen test due to the high specificity of these tests. A confirmatory throat culture is not required in adults due to the low incidence of GAS pharyngitis and rheumatic fever in this age group. In contrast, children and adolescents with negative rapid streptococcal antigen test results should have confirmatory throat cultures because of the high prevalence of GAS. An order for laryngoscopy is not appropriate in this patient without symptoms of epiglottis.

Ref: Kim HN, Kim J, Jang WS, Nam J, Lim CS. Performance evaluation of three rapid antigen tests for the diagnosis of group A *Streptococci*. *BMJ Open*. 2019;9(8):e025438. 2) Sur DKC, Plesa ML. Antibiotic use in acute upper respiratory tract infections. *Am Fam Physician*. 2022;106(6):628-636.

Item 174

ANSWER: D

Eating disorders are potentially life-threatening. The true prevalence of eating disorders is unclear, but it is estimated that 2%–4% of adolescents may meet criteria for binge-eating disorder (BED) with equal distribution across gender. The *DSM-5* has specific criteria for diagnosing eating disorders. BED has several key features, including recurrent episodes of binge eating. Binge eating occurs in a distinct period of time and consists of consuming an amount of food outside the accepted norms for a meal, typically 3000–5000 kcal, and experiencing a sense of loss of control during the episode. Distorted body image and markedly low body weight for age and sex are seen in anorexia nervosa. There is no weight specification in the diagnostic criteria for BED and it is estimated that 50% of those suffering with BED are overweight or obese. Patients with BED feel a sense of distress, anguish, or despair (not contentment) after the eating episode and regarding this eating pattern in general. The use of laxatives to control weight or compensate for binge eating is typically seen with bulimia nervosa.

Ref: Hornberger LL, Lane MA; Committee on Adolescence. Identification and management of eating disorders in children and adolescents. *Pediatrics*. 2021;147(1):e2020040279.

Item 175

ANSWER: E

The copper IUD is the most effective form of emergency contraception with a pregnancy rate of 0.1%, followed by oral ulipristal with a pregnancy rate of 1.3%. Oral levonorgestrel is less effective than both with a pregnancy rate of 2.5%. Subcutaneous depot medroxyprogesterone acetate and the etonogestrel subdermal implant are not recommended as emergency contraceptives.

Ref: Paradise SL, Landis CA, Klein DA. Evidence-based contraception: common questions and answers. *Am Fam Physician*. 2022;106(3):251-259.

Item 176

ANSWER: C

In the postoperative period, this patient would be at greatest risk for respiratory depression. In 2019 the FDA issued a Drug Safety Communication about the risk of serious breathing difficulties that may occur with the use of gabapentin or pregabalin in patients who have respiratory risk factors. The FDA found that respiratory depression can occur when opioids or other medications that depress the central nervous system (CNS) are administered to patients who are taking gabapentinoids or to those with underlying respiratory impairments such as COPD or age-related loss of function. This patient is taking chronic gabapentin, is elderly, and is being prescribed the opioid morphine as needed for postoperative pain.

Gabapentinoids, including gabapentin, are being increasingly used for conditions such as seizures, nerve pain, and restless legs syndrome. Misuse is also increasing. They are often combined with other CNS depressants such as opioids, anti-anxiety medications, antidepressants, and antihistamines, thus increasing the risk of respiratory depression.

Since gabapentin is continued after surgery in this patient, withdrawal symptoms would not be likely. While the patient should be monitored for heart failure, his cardiac status is stable on the current regimen. This patient would not be at increased risk for restless legs syndrome or seizures due to continued management with gabapentin.

Ref: US Food & Drug Administration. FDA warns about serious breathing problems with seizure and nerve pain medicines gabapentin (Neurontin, Gralise, Horizant) and pregabalin (Lyrica, Lyrica CR): when used with CNS depressants or in patients with lung problems. Updated December 19, 2019. 2) Goodman CW, Brett AS. Gabapentinoids for pain: potential unintended consequences. *Am Fam Physician*. 2019;100(11):672-675. 3) Roth AR, Lazris A, Haskell H, James J. Appropriate use of opioids for chronic pain. *Am Fam Physician*. 2020;102(6):335-337. 4) Mattson CL, Chowdhury F, Gilson TP. Notes from the field: trends in gabapentin detection and involvement in drug overdose deaths—23 states and the District of Columbia, 2019–2020. *MMWR Morb Mortal Wkly Rep*. 2022;71(19):664-666.

Item 177

ANSWER: E

According to consensus recommendations, athletes with suspected neck injuries and red flags such as bilateral symptoms of pain, numbness, tingling, and apprehension of cervical range of motion should be assumed to have a cervical spine injury and should be log-rolled without removal of helmet and pads, and transported via EMS to the emergency department (SOR C). Due to red flags concerning neck injury in this athlete, it is not safe for him to return to the field and he should be emergently transported for further assessment and diagnostic imaging. This athlete reported bilateral symptoms, and 15 minutes of resolution is not considered acceptable for release and return to play. In the case of a cervical spine injury with associated altered mental status and/or airway compromise, the helmet and pads may be removed but only simultaneously to avoid further cervical injury. Resolution of symptoms within 5 minutes, lack of bilaterality, and a normal neurologic examination may allow for return to play at the physician's discretion.

Ref: Usman S. Management of head and neck injuries by the sideline physician. *Am Fam Physician*. 2022;106(5):543-548.

Item 178

ANSWER: A

Medical decision-making capacity is defined as a patient's ability to understand the benefits, risks, and alternatives to a given treatment, or the option of no treatment. Other elements of medical decision-making capacity include the ability to demonstrate appreciation of said benefits, risks, and alternatives; the ability to demonstrate reasoning in making a decision; and the ability to communicate a choice.

A living will and surrogate decision maker are considerations when a patient has been determined to lack decision-making capacity. They are not used to determine decision-making capacity. A living will is an advance directive that communicates a patient's values and treatment preferences when and if they are incapacitated.

A surrogate decision maker is an advocate for the patient when it has been determined they do not have decision-making capacity. For example, a surrogate can be someone the patient has appointed in a type of advance directive called a durable power of attorney for health care. If the patient has not appointed someone, then a default person according to state law is specified.

Capacity and competence are not the same. Capacity is a medical term about the ability or inability to make decisions about medical treatments and care, whereas competence is a legal term referring to global decision-making about issues such as finances, property, and wills. Capacity is determined by the treating physician and can vary with the circumstances of the decision such as its complexity. While a psychiatric consultation may be helpful in certain circumstances, it is not required.

Ref: Talebreza S, Widera E. Advance directives: navigating conflicts between expressed wishes and best interests. *Am Fam Physician*. 2015;91(7):480-484. 2) Barstow C, Shahan B, Roberts M. Evaluating medical decision-making capacity in practice. *Am Fam Physician*. 2018;98(1):40-46.

Item 179

ANSWER: B

Patients with cirrhosis are at higher risk for development of hepatocellular carcinoma (HCC). Surveillance leads to detection of HCC at earlier stages and improvements in survival rates. It is recommended that adults with cirrhosis undergo ultrasonography surveillance every 6 months with or without the addition of α-fetoprotein levels. Annual CT and annual MRI are not indicated for this patient.

Ref: Heimbach JK, Kulik LM, Finn RS, et al. AASLD guidelines for the treatment of hepatocellular carcinoma. *Hepatology*. 2018;67(1):358-380. 2) Smith A, Baumgartner K, Bositis C. Cirrhosis: diagnosis and management. *Am Fam Physician*. 2019;100(12):759-770.

Item 180

ANSWER: D

The modified Light's criteria are used to determine whether pleural effusions are transudative or exudative. This fluid is exudative as defined by a pleural fluid protein to serum protein ratio >0.5, a pleural fluid LDH to serum LDH ratio >0.6, and a pleural fluid LDH greater than two-thirds the upper limit of normal for serum. Lung malignancy is a cause of exudative pleural effusions. Cirrhosis and congestive heart failure cause transudative rather than exudative effusions. COPD does not cause pleural effusions. This fluid also has low glucose, which suggests malignancy or infection rather than pulmonary embolism.

Ref: Light RW. Disorders of the pleura. In: Loscalzo J, Fauci AS, Kasper DL, Hauser SL, Longo DL, Jameson JL, eds. *Harrison's Principles of Internal Medicine*. 21st ed. McGraw Hill; 2022:2197-2200.

Item 181

ANSWER: D

This patient is having a hypertensive emergency with encephalopathy and the goal is to lower her blood pressure by no more than 25% in the first hour. Over the next 2–6 hours, her blood pressure should be lowered to 160/100 mm Hg. After that level is achieved, her blood pressure may be cautiously lowered to normal over the ensuing 24–48 hours. Lowering blood pressure too aggressively can lead to cerebral ischemia and should be avoided.

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: executive summary: a report of the American College of Cardiology/American Heart Association task force on clinical practice guidelines. *Circulation*. 2018;138(17):e426-e483.

Item 182

ANSWER: A

There are unclear benefits of vitamin D supplementation with a total serum 25-hydroxyvitamin D level of 18 ng/mL even though this test is considered the best available study of vitamin D status. There are many laboratory assays with poor standardization and no consensus regarding what 25-hydroxyvitamin D level is sufficient or recommended for health optimization. In community-dwelling, nonpregnant individuals without risk factors there is insufficient evidence to support that supplementation decreases all-cause mortality, cardiovascular events, or fractures. A 1,25-dihydroxyvitamin D level would be used to test for rickets and osteomalacia.

Ref: US Preventive Services Task Force. Final recommendation statement: vitamin D deficiency in adults: screening. Updated April 13, 2021. 2) Campos-Outcalt D. How to proceed when it comes to vitamin D. *J Fam Pract*. 2021;70(6):289-292.

Item 183

ANSWER: D

Predictors of a poor response to psychotherapy in adolescents with major depressive disorder include presence of family conflict, severe depression, low global functioning on assessment, high scores on suicidality measures, coexisting anxiety, distorted thought patterns, and feelings of hopelessness. High global functioning on assessment, hypersomnia, and inappropriate guilt are not predictors of a poor response to psychotherapy in adolescents with major depressive disorder.

Ref: Miller L, Campo JV. Depression in adolescents. *N Engl J Med*. 2021;385(5):445-449.

Item 184

ANSWER: E

While cluster headache is rare, it can be diagnosed clinically and the individual can be properly managed. It is much more common in males, with a mean age of onset of 30. Attacks are severe and unilateral, and located in the supraorbital, orbital, or temporal regions. They can occur as frequently as every other day or as often as eight times per day. The pain is severe and has accompanying autonomic symptoms, including nasal congestion, rhinorrhea, unilateral watery eye, eyelid edema, sweating of the forehead, and a constricted pupil. The pain may last for only 15 minutes but can last up to 3 hours. One key feature is a sense of restlessness or agitation. These bouts can be triggered by alcohol, nitrates in food, strong odors, and nitroglycerin.

Abortive treatments include triptans or supplemental oxygen 100% at 12–15 L/min for 15–20 minutes. The first-line prophylaxis for cluster headache is verapamil. Lithium is also effective for prophylaxis, however it is not first line. Topiramate has been recommended, but clinical trials have shown no evidence. Ubrogepant is indicated for acute treatment for migraine. Valproic acid is ineffective for prophylaxis for cluster headache.

Ref: Malu OO, Bailey J, Hawks MK. Cluster headache: rapid evidence review. *Am Fam Physician*. 2022;105(1):24-32.

Item 185

ANSWER: A

Uremic complications such as encephalopathy, neuropathy, or pericarditis are indications for urgent dialysis in patients with acute kidney injury. Other indications include a potassium level >6.5 mEq/L, pulmonary edema that is not responsive to diuretics, negligible urine output for >6 hours, and a urine output of <200 mL over 24 hours.

Ref: Mercado MG, Smith DK, Guard EL. Acute kidney injury: diagnosis and management. *Am Fam Physician*. 2019;100(11):687-694.

Item 186

ANSWER: E

Keratoacanthomas begin as round, firm papules that grow rapidly over weeks to months into dome-shaped nodules with keratin-filled centers. They cannot be distinguished clinically or histologically from squamous cell carcinoma. Therefore, they should have early definitive management such as excisional biopsy with 3- to 5-mm margins. Mohs surgery may be considered if tissue sparing is desired for cosmetic reasons. Reassurance, intralesional corticosteroid injection, cryotherapy, and shallow shave biopsy are not adequate management strategies.

Ref: Higgins JC, Maher MH, Douglas MS. Diagnosing common benign skin tumors. *Am Fam Physician*. 2015;92(7):601-607.

Item 187

ANSWER: E

This patient likely has a meniscal tear as demonstrated by a positive Thessaly maneuver. Meniscal tears can be acute after a traumatic twisting injury or chronic and degenerative in nature. They are often comorbid with osteoarthritis, as is likely in this case. A joint effusion may be present with a meniscal tear but is not always seen. Typically, a tear to the anterior cruciate ligament will present acutely after an injury, with edema and moderate to severe pain. Provocative testing may be limited due to pain, but a positive Lachman test is the most sensitive maneuver. Gout typically presents with an acutely red, warm, swollen joint that may be confused with septic arthritis. Iliotibial band syndrome presents as leg or knee pain, often with tenderness just proximal to the lateral femoral epicondyle and would be unlikely to result in a positive Thessaly maneuver. A sprain of the lateral collateral ligament may have tenderness to palpation and should have laxity of the ligament noted on provocative testing.

Ref: Bunt CW, Jonas CE, Chang JG. Knee pain in adults and adolescents: the initial evaluation. *Am Fam Physician*. 2018;98(9):576-585.

Item 188

ANSWER: E

Randomized, controlled studies demonstrate that varenicline is effective in smoking cessation, even when patients are not ready to quit (SOR B). According to the American Thoracic Society, varenicline is also preferred for smoking cessation compared to bupropion and nicotine replacement therapy. Other smoking cessation pharmacotherapies, such as bupropion, nicotine replacement therapy, and alternative treatment with clonidine and nortriptyline, are only initiated when an individual is ready to quit.

Ref: Gaddey HL, Dakkak M, Jackson NM. Smoking cessation interventions. *Am Fam Physician*. 2022;106(5):513-522.

Item 189

ANSWER: C

The most common cause of uncontrolled blood pressure is medication nonadherence, with an incidence of 83.7%. Hyperaldosteronism, high salt intake, obstructive sleep apnea, and renal artery stenosis are all possible causes of treatment-resistant hypertension, but they are less likely than medication nonadherence.

Ref: Abegaz TM, Shehab A, Gebreyohannes EA, Bhagavathula AS, Elnour AA. Nonadherence to antihypertensive drugs: a systematic review and meta-analysis. *Medicine (Baltimore)*. 2017;96(4):e5641. 2) Smith DK, Lennon RP, Carlsgaard PB. Managing hypertension using combination therapy. *Am Fam Physician*. 2020;101(6):341-349.

Item 190

ANSWER: B

This description is typical for a patient with retention hyperkeratosis of the filiform papillae, or "hairy tongue," on the anterior two-thirds of the tongue. It causes a furry appearance with hair-like projections that become colonized with bacteria and can take on a dark pigmentation. This condition occurs in up to 11% of the population and is more common in older patients, with a 3:1 predilection for males. Tobacco and alcohol use, poor oral hygiene, a low-fiber diet, hyposalivation, mouth breathing, and immunosuppression are associated with hairy tongue. It can cause halitosis but otherwise lacks symptoms. Of the options listed, the most effective treatment is increased fiber intake and regular tongue brushing with toothpaste or hydrogen peroxide. Serial observations with close follow-up, oral fluconazole, topical corticosteroids, and referral for biopsy of the tongue should not be recommended for this patient.

Ref: Randall DA, Wilson Westmark NL, Neville BW: Common oral lesions. *Am Fam Physician*. 2022;105(4):369-376.

Item 191

ANSWER: A

In some patients, a low-normal serum cobalamin (vitamin B_{12}) level can mask a clinical vitamin B_{12} deficiency state. Patients with low-normal vitamin B_{12} levels who are truly vitamin B_{12} deficient manifest elevated methylmalonic acid (MMA) and homocysteine levels, due to the role that vitamin B_{12} plays as a cofactor in converting MMA to succinyl coenzyme A and in converting homocysteine to methionine. A high MMA level is slightly more sensitive and specific for vitamin B_{12} deficiency than is an elevated homocysteine level, as homocysteine also may be increased due to folate deficiency. A low or normal homocysteine (or MMA) level would render vitamin B_{12} deficiency less likely, not more likely. A low ferritin level indicates iron deficiency, not vitamin B_{12} deficiency. Although vitamin B_{12} deficiency leads to a pseudofolate deficiency due to the vitamin B_{12} role in converting 5-methyltetrahydrofolate to tetrahydrofolate, a low serum folate level may represent a folate deficiency without an associated vitamin B_{12} deficiency. The presence of anti-intrinsic factor antibodies suggests pernicious anemia with a 95% positive predictive value, although an isolated negative intrinsic factor antibody result in the setting of a low-normal vitamin B_{12} level neither confirms nor excludes a vitamin B_{12} deficiency state.

Ref: Stabler SP. Vitamin B_{12} deficiency. *N Engl J Med*. 2013;368(2):149-160. 2) Langan RC, Goodbred AJ. Vitamin B_{12} deficiency: recognition and management. *Am Fam Physician*. 2017;96(6):384-389.

Item 192

ANSWER: E

A Cochrane review of more than 15,000 patients demonstrated that a trained personal labor support person (doula) was associated with both shortened labor and with reduction of cesarean or operative (i.e., vacuum, forceps) vaginal delivery (SOR A). These patients also reported greater satisfaction with labor and delivery when a doula was in attendance. Admission to the labor and delivery unit during the latent phase of labor, prior to 4- to 5-cm dilatation and 80% effacement, was associated with higher rates of cesarean section. Amniotomy and membrane stripping are not associated with shorter labor or reduced rates of cesarean section. High-dose oxytocin induction was no better than low-dose oxytocin induction regarding duration of labor or the rate of cesarean section, and low-dose oxytocin induction was associated with fewer contractions and a more comfortable labor experience.

Ref: LeFevre NM, Krumm E, Cobb WJ. Labor dystocia in nulliparous women. *Am Fam Physician*. 2021;103(2):90-96.

Item 193

ANSWER: C

The strongest risk factor for developing nonalcoholic fatty liver disease (NAFLD) is obesity. Type 2 diabetes and metabolic syndrome are also risk factors, but less so than obesity. NAFLD is most often asymptomatic and may be found incidentally on abdominal imaging. The presence of inflammation or hepatocellular injury with elevated liver enzymes raises suspicion for nonalcoholic steatohepatitis (NASH) and these patients need further evaluation for possible fibrosis, which could increase the risk for developing cirrhosis and end-stage liver disease.

The primary treatment of NAFLD is weight loss through diet and exercise. Secondary treatment options include bariatric surgery, thiazolidinediones, and/or GLP-1 receptor agonists.

Chronic acetaminophen toxicity, hereditary hemochromatosis, and severe hypertriglyceridemia can be associated with liver disease but are not considered significant risk factors for the development of NAFLD.

Ref: Westfall E, Jeske R, Bader AR. Nonalcoholic fatty liver disease: common questions and answers on diagnosis and management. *Am Fam Physician*. 2020;102(10):603-612.

Item 194

ANSWER: E

This patient presents with symptoms and signs that are more common in systemic sclerosis (scleroderma). She has a positive antinuclear antibody titer with a nucleolar pattern, and further testing shows anticentromere and anti–Scl-70 antibodies that are indicative of systemic sclerosis. Dermatomyositis is associated with muscle weakness and elevated creatine kinase levels. Sjögren syndrome typically presents with dry eyes, a dry mouth, and positive Sjögren antibodies with anti–Sjögren-syndrome-related antigen A and B. Systemic lupus erythematosus (SLE) is more commonly associated with joint pain and a butterfly rash with positive anti–double-stranded and anti-Smith antibodies. Mixed connective tissue disease has symptoms that overlap with SLE and scleroderma including joint symptoms and myositis. In mixed connective tissue disease, an antinuclear antibody titer and antiribonucleoprotein antibodies would likely be positive.

Ref: Ali Y. Rheumatologic tests: a primer for family physicians. *Am Fam Physician*. 2018;98(3):164-170.

Item 195

ANSWER: B

The primary objective of evaluating a thyroid nodule is to determine malignancy. The next step after a history and physical examination is to order a serum TSH level and thyroid ultrasonography. Further biochemical analysis beyond a TSH level, including measuring total T_3 and free T_4 levels along with testing for antithyroid antibodies, may assist with the evaluation of suspected thyroiditis but does not impact the diagnostic workup for a thyroid nodule. CT imaging is useful for evaluating other masses in the head and neck region, although it does not factor into the diagnostic algorithm for an isolated thyroid nodule. A radionucleotide uptake scan is indicated when the TSH level is low to discern whether the nodule is hyperfunctioning (hot) or nonfunctioning (cold). A hyperfunctioning nodule is much less likely to be malignant and does not require cell or tissue sampling. If the TSH level is normal or high, an uptake scan is not indicated. In such cases, as well as when an uptake scan reveals a nonfunctioning nodule, the malignancy potential is stratified based on the nodule's size and characteristics on ultrasonography. Higher-risk nodules require fine-needle aspiration, while lower-risk nodules may be monitored with follow-up ultrasonography.

Ref: Burman KD, Wartofsky L. Thyroid nodules. *N Engl J Med*. 2015;373(24):2347-2356. 2) Kant R, Davis A, Verma V. Thyroid nodules: advances in evaluation and management. *Am Fam Physician*. 2020;102(5):298-304.

Item 196

ANSWER: E

This patient meets diagnostic criteria for insomnia. She has prolonged sleep latency (>30 minutes) for at least 3 nights per week for at least 3 months. First-line therapy for chronic insomnia is a trial of cognitive behavioral therapy; if this is not effective a trial of pharmacologic therapy may be considered. Antihistamine therapy is often used but the American Academy of Sleep Medicine notes the benefits are essentially equal to the harms and does not recommend this for insomnia treatment. Benzodiazepines have dependency issues and can also increase the risk of falls in elderly patients. Benzodiazepine receptor agonists (zolpidem, eszopiclone, and zaleplon) have shown limited effectiveness but are approved only for short-term use. Positive airway pressure is used for treatment of sleep apnea but not insomnia.

Ref: Holder S, Narula NS. Common sleep disorders in adults: diagnosis and management. *Am Fam Physician*. 2022;105(4):397-405.

Item 197

ANSWER: A

This is a classic presentation of plantar fasciitis. This patient is very active and is on her feet for prolonged periods of time with heel pain that is most painful when she first gets out of bed in the morning. The initial treatment for plantar fasciitis is conservative, including NSAIDs, stretching, ice massage, heel padding, and activity modification. If this is not effective, corticosteroid and botulinum toxin injections can be helpful in improving short-term pain and avoiding surgery. Studies of extracorporeal shock wave therapy have shown mixed results, but a meta-analysis of nine randomized, controlled trials concluded that this therapy may be considered after failure of traditional conservative therapy to avoid the need for surgery. Surgery is a last resort and is generally considered after all of the listed treatments have failed. Most cases of plantar fasciitis are self-limited and more than three quarters of all patients improve in 1 year.

Ref: Trojian T, Tucker AK. Plantar fasciitis. *Am Fam Physician*. 2019;99(12):744-750.

Item 198

ANSWER: D

In the United States, the Supreme Court has held that states have plenary power (ability to enact and enforce public health laws), but are subject to constitutional constraints. This enforcement may be delegated to county or city governments, but starts at the state level. The federal government lacks police enforcement power.

Ref: Mello MM, Parmet WE. U.S. public health law–foundations and emerging shifts. *N Engl J Med*. 2022;386(9):805-808.

Item 199

ANSWER: B

The U.S. Preventive Services Task Force recommends a one-time ultrasonography screening for abdominal aortic aneurysm (AAA) for men ages 65–75 who have ever smoked. The major risk factors for AAA include male sex, age 65 and older, and tobacco use. Smoking history is responsible for about 75% of cases, and smoking cessation should be recommended in all patients diagnosed with AAA.

An aneurysm diameter of 2.5–3.0 cm requires no surveillance, while a 6- to 12-month surveillance is required for a diameter of 4.0–5.0 cm. In males, elective surgical repair may be considered in patients with an aneurysm of 5.0–5.4 cm. However, surgical repair is required in men for asymptomatic aneurysms ≥5.5 cm and for rapidly expanding aneurysms. In women, surgical repair is indicated when the aneurysm is ≥5.0 cm.

Ref: US Preventive Services Task Force. Final recommendation statement: abdominal aortic aneurysm: screening. Updated December 10, 2019. 2) Haque K, Bhargava P. Abdominal aortic aneurysm. *Am Fam Physician*. 2022;106(2):165-172.

Item 200

ANSWER: B

Patients whose only allergic reaction to egg is hives can receive any influenza vaccine. Patients with more serious allergic reactions can also receive any influenza vaccine, but the vaccine should be administered in an inpatient or outpatient medical setting with supervision by a health care provider who is able to recognize and manage allergic reactions. Pretreatment with diphenhydramine before receiving an influenza vaccine is not recommended. Prophylaxis with oseltamivir should be reserved for high-risk populations who are unable to be vaccinated.

Ref: Gaitonde DY, Moore FC, Morgan MK. Influenza: diagnosis and treatment. *Am Fam Physician*. 2019;100(12):751-758. 2) Grohskopf LA, Blanton LH, Ferdinands JM, et al. Prevention and control of seasonal influenza with vaccines: recommendations of the Advisory Committee on Immunization Practices—United States, 2022–23 influenza season. *MMWR Recomm Rep*. 2022;71(No. RR-1):1-28.