

American Board of Family Medicine



2020 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: C

This patient has hypertension and according to both JNC 8 and American College of Cardiology/American Heart Association 2017 guidelines, antihypertensive treatment should be initiated. For the general non-African-American population, monotherapy with an ACE inhibitor, an angiotensin receptor blocker, a calcium channel blocker, or a thiazide diuretic would be appropriate for initial management. It is also appropriate to initiate combination antihypertensive therapy as an initial management strategy, although patients should not take an ACE inhibitor and an angiotensin receptor blocker simultaneously. Studies have shown that blood pressure control is achieved faster with the initiation of combination therapy compared to monotherapy, without an increase in morbidity. Lisinopril/hydrochlorothiazide would be an appropriate choice in this patient. α -Blockers, vasodilators, β -blockers, and potassium-sparing diuretics are not recommended as initial choices for the treatment of hypertension.

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

Item 2

ANSWER: C

In long-term care facilities, an influenza outbreak is defined as two laboratory-confirmed cases of influenza within 72 hours in patients on the same unit. The CDC recommends chemoprophylaxis for all asymptomatic residents of the affected unit. Any resident exhibiting symptoms of influenza should be treated for influenza and not given chemoprophylaxis dosing. Chemoprophylaxis is not recommended for residents of other units unless there are two laboratory-confirmed cases in those units. Facility staff of the affected unit can be considered for chemoprophylaxis if they have not been vaccinated or if they had a recent vaccination, but chemoprophylaxis is not recommended for all staff in the entire facility.

Ref: Influenza (flu): Interim guidance for influenza outbreak management in long-term care and post-acute care facilities. Centers for Disease Control and Prevention, 2019. 2) Gaitonde DY, Moore FC, Morgan MK: Influenza: Diagnosis and treatment. *Am Fam Physician* 2019;100(12):751-758.

Item 3

ANSWER: A

Pelvic inflammatory disease (PID) is a clinical diagnosis, and treatment should be administered at the time of diagnosis and not delayed until the results of the nucleic acid amplification testing (NAAT) for gonorrhea and *Chlamydia* are returned. The clinical diagnosis is based on an at-risk woman presenting with lower abdominal or pelvic pain, accompanied by cervical motion, uterine, or adnexal tenderness that can range from mild to severe. There is often a mucopurulent discharge or WBCs on saline microscopy. Acute phase indicators such as fever, leukocytosis, or an elevated C-reactive protein level may be helpful but are neither sensitive nor specific. A positive NAAT is not required for diagnosis and treatment because an upper tract infection may be present, or the causative agent may not be gonorrhea or *Chlamydia*. PID should be considered a polymicrobial infection. Pelvic ultrasonography may be used if there is a concern about other pathology such as a tubo-ovarian abscess.

Ref: Brunham RC, Gottlieb SL, Paavonen J: Pelvic inflammatory disease. *N Engl J Med* 2015;372(21):2039-2048.

Item 4**ANSWER: E**

For patients with gender dysphoria or gender incongruence who desire hormone treatment, the treatment goal is to suppress endogenous sex hormone production and maintain sex hormone levels in the normal range for their affirmed gender. For a female-to-male transgender patient this is most easily accomplished with testosterone. When testosterone levels are maintained in the normal genetic male range, gonadotropins and ovarian hormone production is suppressed, which accomplishes both goals for hormonal treatment without the need for additional gonadotropin suppression from medications such as leuprolide.

Clomiphene can increase serum testosterone levels, but only in the presence of a functioning testicle. Letrozole is an estrogen receptor antagonist, but it would not increase serum testosterone levels. Spironolactone has androgen receptor blocking effects and would not accomplish either of the hormone treatment goals.

Ref: Hembree WC, Cohen-Kettenis PT, Gooren L, et al: Endocrine treatment of gender-dysphoric/gender-incongruent persons: An Endocrine Society clinical practice guideline. *J Clin Endocrinol Metab* 2017;102(11):3869-3903. 2) Wilkes J: Gender-dysphoric/gender-incongruent persons: Treatment recommendations from the Endocrine Society. *Am Fam Physician* 2018;97(9):608-609.

Item 5**ANSWER: D**

According to American Cancer Society guidelines for cervical cancer screening, Papanicolaou (Pap) testing should begin at age 21 irrespective of sexual activity and should be continued every 3 years until age 29. The preferred screening strategy beginning at age 30 is Pap testing with HPV co-testing, which should be continued every 5 years until age 65. Cervical screening may be discontinued at that time if the patient's last two tests have been negative and the patient was tested within the previous 5 years.

Ref: Lambert M: Cancer screening recommendations from the ACS: A summary of the 2017 guidelines. *Am Fam Physician* 2018;97(3):208-210.

Item 6**ANSWER: D**

Acid suppression therapy is associated with an increased risk of community-acquired and health care-associated pneumonia, which is related to gastric overgrowth by gram-negative bacteria. Long-term treatment of Barrett's esophagus is an indication for chronic proton pump inhibitor (PPI) use. PPI therapy does not increase the risk of gout, hypertension, or type 2 diabetes.

Ref: Mandell LA, Niederman MS: Aspiration pneumonia. *N Engl J Med* 2019;380(7):651-663.

Item 7**ANSWER: B**

A Trousseau sign, defined as spasmodic contraction of muscles caused by pressure on the nerves that control them, is present in up to 94% of patients with hypocalcemia. Hypercalcemia is more likely to present with hyperreflexia. Patients with hypokalemia, hypernatremia, or hyponatremia may present with weakness and confusion, but tetany is not a common sign of either sodium or potassium imbalance.

Ref: Larson ST, Wilbur J: Muscle weakness in adults: Evaluation and differential diagnosis. *Am Fam Physician* 2020;101(2):95-108.

Item 8**ANSWER: D**

This patient presents with symptoms of chronic insomnia. Cognitive-behavioral therapy for insomnia (CBT-I) and brief behavioral therapy for insomnia (BBT-I) are effective nonpharmacologic treatments for chronic insomnia. Modified CBT-I and BBT-I can be administered by a primary care physician. The basic principles include stimulus control (sleep hygiene) and sleep restriction. Reducing time in bed increases sleep efficiency. In this case, 6 hours of time in bed would improve the patient's sleep efficiency and a bedtime of 12:30 a.m. would accomplish this goal. Generally, reduced time in bed is accomplished by postponing bedtime rather than getting up earlier. Naps generally do not improve sleep efficiency. While getting out of bed is recommended after being in bed for 30 minutes without falling asleep, or being awake for 30 minutes after being asleep, staying up for a prescribed period of time is not recommended.

Ref: Troxel WM, Germain A, Buysse DJ: Clinical management of insomnia with brief behavioral treatment (BBTI). *Behav Sleep Med* 2012;10(4):266-279. 2) Maness DL, Khan M: Nonpharmacologic management of chronic insomnia. *Am Fam Physician* 2015;92(12):1058-1064. 3) Hooker S, Punjabi A, Justesen K, et al: Encouraging health behavior change: Eight evidence-based strategies. *Fam Pract Manag* 2018;25(2):31-36.

Item 9**ANSWER: B**

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.

Antibiotics are not warranted because this condition is not the result of an infection. Hyperviscosity syndrome is another oncologic emergency associated with leukemia, multiple myeloma, and Waldenström's 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 10

ANSWER: E

Stridor is a high-pitched whistling, crowing sound on inspiration. It can be caused by obstruction of the larynx or trachea by a foreign body, vocal cord edema, a neoplasm, or a pharyngeal abscess. Acute stridor requires urgent evaluation for obstruction. This patient may have a foreign body or other obstruction in his airway and requires urgent assessment. Oral antibiotics, oral corticosteroids, nebulized albuterol, or nebulized epinephrine would not be appropriate at this time.

Ref: Eskander A, de Almeida JR, Irish JC: Acute upper airway obstruction. *N Engl J Med* 2019;381(20):1940-1949.

Item 11

ANSWER: B

Family physicians are often asked to manage mild to moderate acne vulgaris. Topical retinoids such as adapalene and benzoyl peroxide are first-line therapy and a trial of therapy is typically 8–12 weeks. Topical antibiotics may be added to topical retinoids or benzoyl peroxide to achieve better symptom control. To decrease emerging antibiotic resistance, studies support limiting antibiotic use to 12 weeks except in severe cases, not using antibiotics as monotherapy, and using clindamycin rather than erythromycin. Adding clindamycin gel rather than erythromycin gel for up to 12 weeks is recommended for this patient at this time.

Ref: Ogé LK, Broussard A, Marshall MD: Acne vulgaris: Diagnosis and treatment. *Am Fam Physician* 2019;100(8):475-484.

Item 12

ANSWER: A

This patient has symptoms of acute simple cystitis and does not have any symptoms that would suggest a complicated urinary tract infection or vaginal infection. In these cases treatment with oral antibiotic therapy may be prescribed without further evaluation (SOR B). Simple cystitis is a clinical diagnosis and a urinalysis and urine culture are not necessary. The patient does not have any symptoms that warrant evaluation with abdominal radiographs or pelvic ultrasonography.

Ref: Michels TC, Sands JE: Dysuria: Evaluation and differential diagnosis in adults. *Am Fam Physician* 2015;92(9):778-786. 2) Arnold JJ, Hehn LE, Klein DA: Common questions about recurrent urinary tract infections in women. *Am Fam Physician* 2016;93(7):560-569.

Item 13**ANSWER: E**

Heparin-induced thrombocytopenia (HIT) is an immune-mediated process that occurs in approximately 1 in 5000 hospitalized patients. Patients are at highest risk 7–10 days after exposure to unfractionated heparin, and the risk is particularly high after cardiac surgery, which is associated with an estimated rate of 1%–3%. In contrast to other causes of thrombocytopenia, HIT places patients at a paradoxically increased risk of thrombotic complications, with clotting events occurring in roughly 50% of confirmed cases of HIT. Lower-extremity deep vein thrombosis and pulmonary embolism are the most common thrombotic complications, followed by arterial thromboses, stroke, and myocardial infarction, in descending order of frequency. Thromboses often occur concurrently with the development of thrombocytopenia or shortly thereafter. The risk of HIT can be determined with the 4T scoring system, which evaluates the acuity of thrombocytopenia, timing of onset, presence of thrombosis, and alternative causes of thrombocytopenia. Patients with an intermediate or high pretest probability should be managed with prompt discontinuation of heparin and initiation of full-dose anticoagulation with a non-heparin anticoagulant, such as argatroban, danaparoid, fondaparinux, or bivalirudin, pending results of further HIT diagnostic evaluation. Anaphylaxis, disseminated intravascular coagulation, hemorrhage, and sepsis are all less common complications of HIT compared to thrombotic events.

Ref: Greinacher A: Heparin-induced thrombocytopenia. *N Engl J Med* 2015;373(3):252-261.

Item 14**ANSWER: D**

In the United States falls are the leading cause of injury-related morbidity and mortality among older adults. The U.S. Preventive Services Task Force (USPSTF) concluded with moderate certainty that exercise interventions provide a moderate net benefit in fall prevention in community-dwelling adults 65 years of age or older who are at increased risk for falls (B recommendation). The USPSTF also concluded with moderate certainty that supplementation with calcium and vitamin D has no clear benefit in preventing falls in older adults. Environmental modifications and psychological interventions lack sufficient evidence for fall prevention.

Ref: *Final Recommendation Statement: Falls Prevention in Community-Dwelling Older Adults: Interventions*. US Preventive Services Task Force, 2018.

Item 15**ANSWER: C**

This patient has hoarseness that has been present for less than 2 weeks. In addition to voice rest, treatment in patients with a history of GERD should include a 3- to 4-month trial of a high-dose proton pump inhibitor (SOR C). In patients with hoarseness lasting longer than 2 weeks without an apparent benign etiology, the larynx should be examined by direct or indirect laryngoscopy (SOR C). Antibiotics and oral corticosteroids should not be used for the empiric treatment of hoarseness in the absence of signs and symptoms that suggest an underlying cause.

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

Item 16**ANSWER: B**

The appropriate classification of heart failure is important for monitoring the disease. The most common currently used system is the New York Heart Association (NYHA) functional classification. In this system, class I is defined as heart disease in a patient with no symptoms and no limitations of physical activity. Patients with class II heart failure have mild symptoms with normal physical activity. Class III heart failure refers to significant limitations of activity, including symptoms with less than normal activities. Patients with class IV heart failure have symptoms at rest and are unable to carry on activity without discomfort.

Ref: The Criteria Committee of the New York Heart Association: *Nomenclature and Criteria for Diagnosis of the Heart and Great Vessels*, ed 9. Little Brown and Co, 1994, p 253. 2) Wu A: Heart failure. *Ann Intern Med* 2018;168(11):ITC81-ITC96.

Item 17**ANSWER: A**

For a suspected tibial stress fracture, plain radiography is indicated as the initial imaging modality due to its availability and low cost. Its sensitivity is highest when symptoms have been present for at least 3 weeks, as in this case. Ultrasonography and CT are not indicated for this patient. If plain radiography is normal and further imaging is warranted, MRI or bone scintigraphy should be considered. Both modalities have a similar sensitivity, but MRI is preferred due to the greater specificity and ability to inform alternate diagnoses.

Ref: Arnold MJ, Moody AL: Common running injuries: Evaluation and management. *Am Fam Physician* 2018;97(8):510-516.

Item 18**ANSWER: D**

The most appropriate management of a recurrent Bartholin gland abscess would be marsupialization, which has a 0% recurrence rate at 6 months. Local anesthesia can be used in the office to effectively treat Bartholin gland abscesses and sedation is not required (SOR A). If the Bartholin gland abscess is > 5 cm, referral to a gynecologist is recommended. Expectant management, fine-needle aspiration, or incision and drainage would likely lead to recurrence.

Ref: Omole F, Kelsey RC, Phillips K, Cunningham K: Bartholin duct cyst and gland abscess: Office management. *Am Fam Physician* 2019;99(12):760-766.

Item 19**ANSWER: E**

Larger ocean fish that consume other fish may accumulate mercury levels that can cause neurologic problems when consumed, so these fish should be avoided by children and pregnant or nursing women. Shark and swordfish are among the fish with the highest mercury content. Catfish, crawfish, shrimp, lobster, flounder, haddock, salmon, and trout have the least amount of mercury.

Ref: Zolotor AJ, Carlough MC: Update on prenatal care. *Am Fam Physician* 2014;89(3):199-208. 2) Advice about eating fish for women who are or might become pregnant, breastfeeding mothers, and young children. US Food and Drug Administration, updated 2019.

Item 20**ANSWER: A**

This patient has croup, which is diagnosed clinically and no further testing is usually indicated. A CBC is nonspecific and is usually only indicated if a bacterial cause of stridor is suspected, such as bacterial tracheitis, epiglottitis, retropharyngeal abscess, or peritonsillar abscess. Viral cultures and rapid antigen testing should be reserved for instances in which the patient fails to respond as expected to initial treatment. A neck radiograph is not indicated in the absence of findings that suggest possible epiglottitis, such as drooling or a muffled voice.

Ref: Smith DK, McDermott AJ, Sullivan JF: Croup: Diagnosis and management. *Am Fam Physician* 2018;97(9):575-580.

Item 21**ANSWER: C**

Crohn's disease may present insidiously with diarrhea, abdominal pain, rectal bleeding, fever, weight loss, and fatigue. Red-flag symptoms include perianal lesions, a first degree relative with inflammatory bowel disease, weight loss of 5% of the patient's usual weight, abdominal pain for more than 3 months, nocturnal diarrhea, fever, the absence of abdominal pain for 30–45 minutes after eating, and the absence of rectal urgency. This patient exhibits symptoms consistent with Crohn's disease. While anemia is also common in celiac disease, rectal bleeding is not. Chronic pancreatitis does not generally present with improved pain after eating. Irritable bowel syndrome is not associated with fever, rectal bleeding, anemia, or perianal fistulas. Ulcerative colitis is not associated with perianal lesions.

Ref: Jameson JL, Kasper DL, Fauci AS, Kasper DL, et al (eds): *Harrison's Principles of Internal Medicine*, ed 20. McGraw-Hill, 2018, pp 2258-2276. 2) Veauthier B, Hornecker JR: Crohn's disease: Diagnosis and management. *Am Fam Physician* 2018;98(11):661-669.

Item 22**ANSWER: B**

Metoclopramide and acetaminophen are the only two medications considered safe for abortive migraine treatment during pregnancy (SOR B). The dopamine antagonist antiemetics are considered second-line abortive treatments in the general population. Dihydroergotamine should not be used during pregnancy due to its oxytocic properties and the potential risk of intrauterine growth restriction with its use. NSAIDs are not considered safe during pregnancy, particularly in the first and third trimesters. Opioids are only moderately useful for migraine treatment and should be avoided during pregnancy due to their abuse potential. Triptans are generally considered safe during the first trimester but not in the second and third trimesters. Their use has been associated with uterine atony, increased risk of bleeding during delivery, and increased risk of preterm birth.

Ref: Briggs GG, Freeman RK, Towers CV, Forinash AB (eds): *Drugs in Pregnancy and Lactation*, ed 11. Wolters Kluwer, 2017. 2) Mayans L, Walling A: Acute migraine headache: Treatment strategies. *Am Fam Physician* 2018;97(4):243-251.

Item 23**ANSWER: A**

Among the available U-100 insulin products, the one with the longest duration of action is ultralong-acting degludec, which lasts 42 hours. The duration of action of rapid-acting lispro is 3–6.5 hours, short-acting regular is 5–8 hours, intermediate-acting isophane is 12–16 hours, and long-acting glargine is 11–24 hours.

Ref: Howard-Thompson A, Khan M, Jones M, George CM: Type 2 diabetes mellitus: Outpatient insulin management. *Am Fam Physician* 2018;97(1):29-37.

Item 24**ANSWER: D**

The foundation of geriatric assessment is assessing the individual's ability to perform tasks required for living. Activities of daily living are self-care activities that are performed daily, such as eating, bathing, dressing, transferring between the bed and a chair, and toileting, including bladder and bowel function. Instrumental activities of daily living include activities necessary to live independently, such as using a telephone, doing housework, preparing meals, taking medications properly, and managing finances.

Ref: Tatum III PE, Talebreza S, Ross JS: Geriatric assessment: An office-based approach. *Am Fam Physician* 2018;97(12):776-784.

Item 25

ANSWER: A

Anorexia has multiple effects on the hypothalamic-pituitary axis. Bone loss can be significant. In a study of 130 women, bone mineral density was reduced by at least 1.0 standard deviation at one or more skeletal sites in 92% of patients. Testosterone levels are often low, contributing to bone loss. Hypoglycemia, not hyperglycemia, can occur but this is not common. Anorexia often results in amenorrhea and infertility, and TSH and T₄ levels may be normal or low.

Ref: Grinspoon S, Thomas E, Pitts S, et al: Prevalence and predictive factors for regional osteopenia in women with anorexia nervosa. *Ann Intern Med* 2000;133(10):790-794. 2) Harrington BC, Jimerson M, Haxton C, Jimerson DC: Initial evaluation, diagnosis, and treatment of anorexia nervosa and bulimia nervosa. *Am Fam Physician* 2015;91(1):46-52.

Item 26

ANSWER: B

Children who present to the emergency department with an asthma exacerbation and fail to improve adequately with inhaled short-acting bronchodilators and corticosteroids may benefit from treatment with intravenous (IV) magnesium sulfate. A 2016 Cochrane review of three randomized, controlled trials found that this reduced hospital admissions by 68%. Ketorolac is not known to have any benefit in the treatment of asthma. Oral administration of corticosteroids is as effective as IV administration, so there is no reason to give IV methylprednisolone. Omalizumab may be used to prevent exacerbations in patients with severe asthma who do not achieve adequate control with high-dose inhaled corticosteroids, but it has no role in the management of acute exacerbations. IV theophylline is not recommended for asthma exacerbations given its safety profile and poor efficacy compared to short-acting bronchodilators.

Ref: Griffiths B, Kew KM: Intravenous magnesium sulfate for treating children with acute asthma in the emergency department. *Cochrane Database Syst Rev* 2016;(4):CD011050. 2) Stojak BJ, Halajian E, Guthmann RA, Nashelsky J: Intravenous magnesium sulfate for acute asthma exacerbations. *Am Fam Physician* 2019;99(2):127-128. 3) Global Strategy for Asthma Management and Prevention. Global Initiative for Asthma (GINA), updated 2020.

Item 27

ANSWER: E

This patient is a skeletally immature female with a Cobb angle that puts her at increased risk for progression (>29°). Referral to a spine specialist for consideration of bracing and appropriate follow-up is recommended. Genetic testing is available to help determine the risk of progression, but it is not a widely validated tool at this time. MRI does not provide any additional information to help with decision-making. Because of the patient's increased risk of progression, simple follow-up in 1 year is not recommended. Physical therapy is not indicated for the primary treatment of scoliosis.

Ref: Tan KJ, Moe MM, Vaithinathan R, Wong HK: Curve progression in idiopathic scoliosis: Follow-up study to skeletal maturity. *Spine (Phila Pa 1976)* 2009;34(7):697-700. 2) Horne JP, Flannery R, Usman S: Adolescent idiopathic scoliosis: Diagnosis and management. *Am Fam Physician* 2014;89(3):193-198.

Item 28**ANSWER: D**

Removal of cerumen should be attempted when the patient has symptoms such as pain, tinnitus, hearing loss, or itching. Removal of the impaction is also indicated in patients who are not able to communicate about their symptoms, such as patients with developmental delay or dementia, a nonverbal patient who has had recent behavioral changes, or children with fever or speech delay. Cerumen impaction resulting in hearing loss can cause reversible cognitive impairment in older persons with dementia. Treatment options include irrigation with warm water, cerumenolytic agents such as carbamide peroxide otic, or manual removal if the patient is cooperative and if the procedure can be completed without the use of restraints. The use of cold water, olive oil drops, ear candling, or cotton-tipped swabs should be avoided.

Ref: Michaudet C, Malaty J. Cerumen impaction: Diagnosis and management. *Am Fam Physician* 2018;98(8):525-529.

Item 29**ANSWER: B**

This patient has herpetic whitlow, which is a viral infection of the distal finger caused by herpes simplex. Primary herpetic whitlow is generally a self-limited infection. The recommended treatment is pain management and keeping it covered with a dressing to prevent transmission. Warm water soaks are useful to manage superficial hand infections but are not indicated to treat herpetic whitlow. Herpetic whitlow is a viral infection, so antibiotics and antifungals would not be beneficial, although antibiotics would be appropriate if a secondary bacterial infection is suspected or if an abscess is confirmed by ultrasonography. Off-label use of antiviral medications should be considered only for patients with recurrent lesions, those with symptoms for less than 48 hours, and those who are immunocompromised. Incision and drainage should not be performed because it increases the risk of bacterial superinfection.

Ref: Rerucha CM, Ewing JT, Oppenlander KE, Cowan WC: Acute hand infections. *Am Fam Physician* 2019;99(4):228-236.

Item 30**ANSWER: A**

Cough stress testing helps detect urine leakage with coughing in patients with at least 200–300 cc of urine in the bladder or with the sensation of a full bladder. This test is recommended as part of the initial evaluation of women with symptoms of stress urinary incontinence. It has excellent sensitivity when compared to urodynamic testing. The initial evaluation could also include the cotton swab test (insertion of a lubricated swab into the urethra and evaluating angle change with the Valsalva maneuver). Urodynamic testing, pelvic ultrasonography, and cystoscopy are not recommended.

Ref: Committee on Practice Bulletins—Gynecology and the American Urogynecologic Society: ACOG Practice Bulletin No. 155: Urinary incontinence in women. *Obstet Gynecol* 2015;126(5):e66-e81. 2) Hu JS, Pierre EF: Urinary incontinence in women: Evaluation and management. *Am Fam Physician* 2019;100(6):339-348.

Item 31**ANSWER: C**

The number needed to treat (NNT) is the number of patients that must be treated with a particular therapy to prevent one bad outcome. It is calculated as $1/\text{absolute risk reduction (ARR)}$ where the ARR is written as a decimal (if the ARR is 5%, the $\text{NNT} = 1/0.05 = 20$). ARR is the arithmetic difference in risk or outcome rates between the treatment group and the control group. The relative risk reduction indicates how much the risk or outcome was reduced in the treatment group compared to the control group. The number needed to harm is the number of patients necessary to receive an intervention instead of the alternative in order for one additional patient to experience an adverse event. Prevalence is the proportion of a particular population found to be affected by a medical condition (SOR A). According to a recent Cochrane review, five children would need to receive influenza vaccination to prevent one case of influenza, and 12 children would need to be vaccinated to prevent influenza-like illness.

Ref: Jefferson T, Rivetti A, Di Pietrantonj C, Demicheli V: Vaccines for preventing influenza in healthy children. *Cochrane Database Syst Rev* 2018;2(2):CD004879. 2) EBM glossary of statistical terms and concepts used in evidence-based medicine. *Am Fam Physician* 2019;100(7):402.

Item 32**ANSWER: D**

There are numerous extrapulmonary manifestations of sarcoidosis that require periodic monitoring, even in asymptomatic patients. Because ocular involvement occurs in 20%–50% of patients and asymptomatic inflammation of the eye caused by sarcoidosis can cause permanent damage, an annual eye examination is very important. Anterior uveitis and keratoconjunctivitis are the most common symptomatic presentations of eye disease. Bone density screening is indicated for monitoring bone health during corticosteroid treatment. Cardiopulmonary manifestations of sarcoidosis are well known, but general testing, such as echocardiography or high-resolution CT of the chest, is reserved for the evaluation of symptoms, or possibly as a response to ongoing therapy. The genitourinary tract is generally not impacted by sarcoidosis and routine urine studies are not required.

Ref: Soto-Gomez N, Peters JI, Nambiar AM: Diagnosis and management of sarcoidosis. *Am Fam Physician* 2016;93(10):840-850.

Item 33**ANSWER: D**

This patient's lesion is a digital mucous cyst, also known as a cutaneous myxoid cyst. Mucous cysts most commonly occur on the dorsal surface of the distal phalanx. Toe lesions are less common. The etiology is controversial. Treatment options include intralesional corticosteroid injections, repeated puncture and drainage, or surgical excision (SOR A). The other options listed are unlikely to be found on the finger with the exception of a wart, which would have a verrucous texture and appearance. While basal cell carcinomas and dermatofibromas are also smooth and nodular, neither are common on the fingers. Keratoacanthomas are smooth, dome-shaped, red papules that often expand rapidly over a few weeks' time on sun-damaged skin and may have a central keratin plug. They are more common in older patients.

Ref: Habib TP: *Clinical Dermatology: A Color Guide to Diagnosis and Therapy*, ed 6. Elsevier, 2016, pp 982-983.

Item 34**ANSWER: A**

This patient is generally healthy and highly functional at baseline. She has multiple medical problems but they are unlikely to significantly reduce her longevity. She has no known history of cardiovascular or cerebrovascular disease, so aspirin was being used for primary prevention. The U.S. Preventive Services Task Force (USPSTF) has stated that there is insufficient evidence to recommend for or against the use of aspirin for primary prevention of cardiovascular disease in adults over the age of 70. Since the USPSTF guidelines were published, evidence from two large randomized, controlled trials provided strong support for the discontinuation of aspirin for most older adults without prior cardiovascular disease, with an indication that it increases the risk of all-cause mortality.

In this patient at low to moderate risk who is already taking a statin, the risk of continuing aspirin exceeds the potential benefit. There is no indication for changing this patient from a moderate-intensity to a high-intensity statin. For uncomplicated gastric reflux in older adults, H₂-blockers are preferred over proton pump inhibitors, which are associated with an increased risk of infections and fractures. This patient has no concerns about osteoarthritis, and although she has a remote history of alcohol abuse, her dosing of daily acetaminophen is well below the threshold of concern for liver injury. Switching to an NSAID such as diclofenac would place her at risk for short-term and long-term renal complications. Melatonin is not known to have long-term adverse effects in older adults.

Ref: *Final Recommendation Statement: Aspirin Use to Prevent Cardiovascular Disease and Colorectal Cancer: Preventive Medication*. US Preventive Services Task Force, 2016. 2) McNeil JJ, Nelson MR, Woods RL, et al: Effect of aspirin on all-cause mortality in the healthy elderly. *N Engl J Med* 2018;379(16):1519-1528. 3) Lin KW, Middleton J: Rethinking aspirin for the primary prevention of cardiovascular disease. *Am Fam Physician* 2019;99(11):670-671.

Item 35

ANSWER: C

Family physicians are often asked to evaluate delays in puberty. Underlying etiologies should be excluded in females > 13 years of age who lack any breast development, which may signify delayed puberty. A past medical history and a physical examination, as well as a gonadotropin measurement, should be performed. The incidence of Turner syndrome (TS) is 1/3000 births. Females with TS lack normal X chromosome gene expression and typically have delayed puberty; amenorrhea; elevated FSH, reflecting hypogonadism; and short stature. Delayed diagnosis of TS is common, and short stature and delayed puberty are sometimes the only symptoms. This patient has unexplained short stature, delayed puberty, and an elevated FSH level, so karyotyping to rule out TS is the next step in evaluation.

Ongoing surveillance after 13 years is not indicated and may delay therapy. A corticotropin stimulation test would usually be used to rule out Cushing syndrome in a setting of precocious puberty and would not be used in this situation. Radiography of the hand for bone age may support a finding of delayed growth (and thus support treatment with growth hormone for a TS patient), but would not provide valuable diagnostic information in this scenario. An elevated FSH level is consistent with a functioning hypothalamus and pituitary and does not support obtaining MRI of the brain.

Ref: Morgan T: Turner syndrome: Diagnosis and management. *Am Fam Physician* 2007;76(3):405-410. 2) Barstow C, Rerucha C: Evaluation of short and tall stature in children. *Am Fam Physician* 2015;92(1):43-50. 3) Klein DA, Emerick JE, Sylvester JE, Vogt KS: Disorders of puberty: An approach to diagnosis and management. *Am Fam Physician* 2017;96(9):590-599.

Item 36

ANSWER: A

This patient is in his forties without clear risk factors and has both an irreversible obstructive pulmonary defect consistent with COPD ($FEV_1 < 80\%$ of predicted and an FEV_1/FVC ratio < 0.70) and liver abnormalities associated with advanced fibrosis. These combined findings are the hallmark of α_1 -antitrypsin deficiency. This patient has a high likelihood of advanced liver fibrosis based on the low albumin level and noninvasive scoring using the fibrosis-4 (FIB-4) index ($\text{age} \times \text{AST}/(\text{platelets} [\text{in mm}^3] \times \text{ALT}^{1/2}) = 3.52$ for this patient). Further evaluation with transient elastography should be performed to confirm cirrhosis.

Cystic fibrosis is less likely to cause a typical obstructive picture on pulmonary function tests (PFTs) and does not typically cause liver fibrosis. Goodpasture syndrome is a vasculitis that classically involves the lungs and the kidneys and is more likely to cause a restrictive pattern on PFTs. Hereditary hemochromatosis can cause early liver disease, including cirrhosis, but is not a significant cause of respiratory disease. Sarcoidosis may involve both the lung and the liver, and can cause obstructive or restrictive patterns on PFTs. However, this patient's radiograph did not show the characteristic hilar adenopathy and granulomatous disease of sarcoidosis.

Ref: Benjamin II, Griggs RC, Wing EJ, Fitz G (eds): *Andreoli and Carpenter's Cecil Essentials of Medicine*, ed 9. Elsevier Saunders, 2016, pp 207-239. 2) Hudson M, Sheron N, Rowe IA, Hirschfield GM: Should we screen for cirrhosis? *BMJ* 2017;358:j3233.

Item 37**ANSWER: B**

False-positive results on drug testing can occur from cross-reactivity of commonly used medications with the assay. Multiple commonly used medications are known to cause a false-positive result for amphetamines, including bupropion, labetalol, ranitidine, and trazodone. Amlodipine is not implicated in abnormal drug screen results. Levofloxacin can cause a false-positive result for opioids. Proton pump inhibitors such as pantoprazole are known to cause a false-positive result for cannabinoids. Sertraline can cause a false-positive result for benzodiazepines.

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

Item 38**ANSWER: A**

Currently the U.S. Preventive Services Task Force recommends that all adults should be screened for depression, as it is one of the leading causes of disability in persons older than 15 years of age (B recommendation). The optimal interval is yet to be defined. Depression is more common in women, but screening is recommended for all adults. While a family history of depression, a personal history of depression, disability, medical illness, grief, sleep disturbance, and loneliness are all risk factors for depression, these factors do not need to be present to screen.

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

Item 39**ANSWER: A**

Breast cancer, the most common noncutaneous malignancy among women, has a 5-year survival rate of almost 90%, so medical care of such patients is increasingly common. To help provide guidance to primary care physicians, the American Cancer Society and the American Society of Clinical Oncology published their joint Breast Cancer Survivorship Care Guideline in 2016. This guideline includes a recommendation for annual mammography for women with prior treatment for breast cancer to screen for local recurrence or a new primary breast cancer. MRI is not recommended in the absence of specific high-risk criteria such as a *BRCA* mutation. Similarly, other imaging modalities such as ultrasonography are not recommended in the absence of symptoms. Imaging is not indicated to screen for metastatic disease. Though breast cancer most commonly metastasizes to the lung, bone, and liver, there is no evidence that screening CT or a bone scan provides mortality or quality-of-life benefits.

Ref: Runowicz CD, Leach CR, Henry NL, et al: American Cancer Society/American Society of Clinical Oncology Breast Cancer Survivorship Care Guideline. *J Clin Oncol* 2016;34(6):611–635. 2) Shapiro CL: Cancer survivorship. *N Engl J Med* 2018;379(25):2438-2450.

Item 40**ANSWER: A**

While oxygen supplementation is routinely initiated for patients who are suspected of having acute coronary syndrome, evidence does not support a benefit from this unless the patient is hypoxic. Oxygen supplementation is recommended if the patient has an oxygen saturation < 90%, if the patient is at risk for hypoxemia, or if the patient is in respiratory distress.

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

Item 41**ANSWER: E**

Eating problems in patients with advanced dementia are common and include oral dysphagia, pharyngeal dysphagia including aspiration, the inability to feed oneself, and refusal to eat. Patients with these symptoms should be examined for reversible causes such as dental problems. In the absence of a reversible cause, conservative measures such as altering food texture or offering small portions and high-calorie supplements may promote weight gain, although none of these interventions improve function or survival.

Tube feeding patients who have advanced dementia has not been compared to hand feeding in randomized, controlled trials. Observational studies have shown no difference in survival, quality of life, nutritional status, functional status, the prevention of aspiration, or the prevention and healing of pressure ulcers between the two groups. Risks associated with feeding tubes include the risks associated with placement of the tube, including the chemical and physical restraint of patients who attempt to remove the tube. Once the tube is in place, tube blockages and dislodgments are common reasons for transfer to an emergency department (ED) for care, and in one study accounted for 47% of all ED visits by nursing home residents with advanced dementia.

Ref: Givens JL, Selby K, Goldfeld KS, Mitchell SL: Hospital transfers of nursing home residents with advanced dementia. *J Am Geriatr Soc* 2012;60(5):905-909. 2) Mitchell SL: Advanced dementia. *N Engl J Med* 2015;372(26):2533-2540.

Item 42**ANSWER: C**

Exercise alone does have some substantial benefits, including improved insulin and glycemic control in diabetes, a beneficial effect on blood pressure, a reduction of cardiovascular risks, and a maintenance of weight loss. However, it is only moderately beneficial for promoting weight loss, including when exercise is added to diet changes.

Ref: Shaw K, Gennat H, O'Rourke P, Del Mar C: Exercise for overweight or obesity. *Cochrane Database Syst Rev* 2006;(4):CD003817. 2) Thorogood A, Mottillo S, Shimony A, et al: Isolated aerobic exercise and weight loss: A systematic review and meta-analysis of randomized controlled trials. *Am J Med* 2011;124(8):747-755. 3) Erlandson M, Ivey LC, Seikel K: Update on office-based strategies for the management of obesity. *Am Fam Physician* 2016;94(5):361-368.

Item 43

ANSWER: C

According to the National Osteoporosis Foundation, treatment is indicated for patients at high risk of fracture, including those with osteoporosis, defined as a T-score of -2.5 or less, or osteopenia, defined as a T-score of -1 to -2.5 and a 10-year probability of hip fracture of at least 3% using the FRAX tool. Bisphosphonates are considered first-line pharmacologic therapy. Treatment beyond 5 years in women who do not have a persistent T-score of -2.5 or less has not been shown to result in further decreases in rates of clinical vertebral fractures, nonvertebral fractures, or mortality (SOR C). In addition, there is increasing evidence that the risk of atypical fracture of the femur increases with the use of bisphosphonates beyond 5 years. Inappropriate prescribing of drugs that are not discontinued after their usual effective or recommended period is known as “legacy prescribing” and can contribute to inappropriate polypharmacy.

Ref: Black DM, Schwartz AV, Ensrud KE, et al: Effects of continuing or stopping alendronate after 5 years of treatment: The Fracture Intervention Trial Long-term Extension (FLEX): A randomized trial. *JAMA* 2006;296(24):2927-2938. 2) Erviti J, Alonso A, Oliva B, et al: Oral bisphosphonates are associated with increased risk of subtrochanteric and diaphyseal fractures in elderly women: A nested case-control study. *BMJ Open* 2013;3(1):e002091. 3) Lam HC, Thomas CM, Shaver JM: Duration of bisphosphonate therapy. *Am Fam Physician* 2018;97(7):online. 4) Mangin D, Lawson J, Cuppage J, et al: Legacy drug-prescribing patterns in primary care. *Ann Fam Med* 2018;16(6):515-520.

Item 44

ANSWER: C

The differential diagnosis of pleuritic chest pain includes several serious causes that should be considered in the evaluation of a patient with this type of pain. Pulmonary embolism is the most common cause of pleuritic chest pain. This patient presents with the acute onset of pleuritic chest pain associated with travel, a swollen leg, and smoking, which are common risk factors for pulmonary embolism. A filling defect on CT angiography can confirm this diagnosis. Elevated troponin levels would confirm a diagnosis of acute myocardial infarction, which would be more likely if the patient were older, experienced pain with exertion, and had other red-flag symptoms such as diaphoresis, nausea and vomiting, or radiating pain. Acid-fast bacilli on a Gram stain would confirm a diagnosis of tuberculosis (TB), which is associated with travel to or exposure to contacts from high-risk areas. TB would also present with other red-flag symptoms such as hemoptysis, fever, night sweats, and weight loss. A chest radiograph showing air in the pleural space would confirm a diagnosis of pneumothorax, which is usually present with decreased breath sounds on physical examination. An EKG with diffuse ST-segment elevation would confirm a diagnosis of pericarditis, which is usually associated with a recent or current viral infection or prior history of pericarditis.

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

Item 45**ANSWER: A**

Because of the importance of urine drug testing and the ramifications for patients, it is essential that physicians understand and properly interpret these results. The most appropriate next step in this case is to perform confirmatory testing for alprazolam. Immunoassays can have false-positive and false-negative results, and unexpected negative results must have confirmatory testing for verification (SOR C).

The immunoassay for benzodiazepines detects the metabolite nordiazepam only, which is a metabolite of diazepam, oxazepam, and temazepam but not of alprazolam, lorazepam, or clonazepam. This negative immunoassay screening test would require confirmatory testing for alprazolam.

A repeat immunoassay for benzodiazepines would likely show the same negative result and would not change decision-making. The immunoassay for opioids detects only nonsynthetic opioids such as morphine and codeine, and a positive immunoassay for codeine would be expected in this case. It would be inappropriate to suspect drug diversion, or to stop prescribing alprazolam or controlled substances, based upon the negative immunoassay for benzodiazepines in this patient.

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

Item 46**ANSWER: C**

According to 2019 guidelines from the American College of Cardiology, American Heart Association, and Heart Rhythm Society, patients with nonvalvular atrial fibrillation and an elevated CHA₂DS₂-VASc score (≥ 2 in men and ≥ 3 in women) should receive anticoagulation, preferably with a direct-acting oral anticoagulant (DOAC), rather than warfarin (level of evidence A). Recent evidence has shown that DOAC options are not inferior to, and in some studies are superior to, warfarin for preventing strokes and systemic embolic events, with a lower risk of serious bleeding. However, warfarin is still recommended over a DOAC for valvular atrial fibrillation that occurs in the presence of moderate to severe mitral stenosis or a mechanical heart valve. For atrial fibrillation in patients with other forms of valvular heart disease, including mitral regurgitation and mild mitral stenosis, DOAC therapy is preferred over warfarin. For patients with atrial fibrillation and end-stage chronic kidney disease, both apixaban (a direct factor Xa inhibitor) and warfarin are comparable options.

Ref: Writing Group Members, January CT, Wann LS, et al: 2019 AHA/ACC/HRS focused update of the 2014 AHA/ACC/HRS guideline for the management of patients with atrial fibrillation: A report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines and the Heart Rhythm Society. *Heart Rhythm* 2019;16(8):e66-e93. 2) Croke L: Management of atrial fibrillation: Updated guidance from the AHA, ACC, and HRS. *Am Fam Physician* 2020;101(2):123-124.

Item 47**ANSWER: C**

Social determinants of health are key drivers of health inequities because of their impact on the health of patients. Some examples of social determinants are socioeconomic status, education, employment, social support networks, and neighborhood characteristics. These social determinants of health have a greater impact on the health of a population than health care, behavior, or biologic factors. Thus, a focus on health equity is an essential component of population health.

The 2001 Institute of Medicine (IOM) Crossing the Quality Chasm report defined six domains of health care quality, including care that does not vary regardless of factors such as gender, ethnicity, geographic location, and socioeconomic status. The other IOM-defined domains of quality care include providing health care services likely to benefit the patient while avoiding those not likely to benefit (effectiveness), avoiding waste in health care (efficiency), avoiding harm to patients (safety), avoiding unnecessary waiting for care and harmful delays in care (timeliness), and care that respects individual patient values (patient-centered care).

Ref: 1) Social determinants of health policy. American Academy of Family Physicians, 2012. 2) Six domains of health care quality. Agency for Healthcare Research and Quality, reviewed 2018. 3) Advancing health equity by addressing the social determinants of health in family medicine (position paper). American Academy of Family Physicians, 2019.

Item 48**ANSWER: A**

In older adults the onset of alcohol withdrawal syndrome may not occur until several days after the cessation of drinking. Confusion, rather than tachycardia or tremor, is often the predominant clinical sign, and the severity and duration of withdrawal tend to increase with age. Alcohol withdrawal should be considered as a cause of confusion in older patients and may be manifested as new-onset confusion in a hospitalized older patient. Confusion is also a more common symptom of alcohol withdrawal in the elderly than seizures or vomiting.

Ref: Lehmann SW, Fingerhood M: Substance-use disorders in later life. *N Engl J Med* 2018;379(24):2351-2360.

Item 49**ANSWER: B**

The Ottawa ankle and foot rules were designed to determine the need for radiographic films in ankle and foot injuries. The instrument has a sensitivity of nearly 100% and a specificity of 30%–40%. According to these rules, ankle radiographs are indicated if there is any pain in the malleolar zone, plus one or more of the following: bony tenderness over the distal 6 cm of the posterior lateral or medial malleolus (the areas of potential fracture) or the inability to bear weight for four steps immediately after the injury and at the time of the examination. Foot radiographs are indicated if there is any pain in the mid-foot zone, plus one or more of the following: bony tenderness at the base of the fifth metatarsal or the navicular bone or the inability to bear weight for four steps immediately after the injury and at the time of the examination.

Ref: Bachmann LM, Kolb E, Koller MT, et al: Accuracy of Ottawa ankle rules to exclude fractures of the ankle and mid-foot: Systematic review. *BMJ* 2003;326(7386):417-423. 2) Jonckheer P, Willems T, De Ridder R, et al: Evaluating fracture risk in acute ankle sprains: Any news since the Ottawa Ankle Rules? A systematic review. *Eur J Gen Pract* 2016;22(1):31-41. 3) McGovern RP, Martin RL: Managing ankle ligament sprains and tears: Current opinion. *Open Access J Sports Med* 2016;7:33-42.

Item 50**ANSWER: B**

Intestinal adhesions are the most common cause of small bowel obstruction, accounting for 60%–75% of cases. Less common causes include neoplasms in 13%–20% of cases, herniation in 2%–15% of cases, and volvulus in <5% of cases. Severe constipation is a rare cause of small bowel obstruction. Further evaluation with CT of the abdomen and pelvis would be indicated to rule out ischemia or perforation and to determine the etiology of this patient's small bowel obstruction. Initial management includes nasogastric tube decompression and intravenous fluid resuscitation. Surgical consultation is recommended. Immediate surgery is indicated for unstable patients, a closed loop obstruction such as volvulus that cannot be reduced, intestinal ischemia, or perforation. Most cases resolve with conservative management, but surgery is recommended if the obstruction has not resolved after 3–5 days.

Ref: Jackson P, Vigiola Cruz M: Intestinal obstruction: Evaluation and management. *Am Fam Physician* 2018;98(6):362-367.

Item 51

ANSWER: D

The cause of this patient's hypercalcemia is primary hyperparathyroidism. Though the calcium levels are not severely elevated and she is asymptomatic, the overproduction of parathyroid hormone leads to calcium loss from bones and acceleration of osteoporosis. She would be a candidate for definitive management of her hyperparathyroidism via surgical removal of the offending parathyroid gland. Indications for surgery include a serum calcium level > 1 mg/dL above the normal range, skeletal indications, renal indications, or age < 50 years. Skeletal indications include either a previous vertebral fracture or a bone density more than 2.5 standard deviations below peak mean bone mass at the hip, lumbar spine, or distal radius. Renal indications can include an estimated glomerular filtration rate < 60 mL/min/1.73 m²; a 24-hour urinary calcium level > 400 mg/day; or nephrolithiasis or nephrocalcinosis seen on a radiograph, ultrasound examination, or CT.

Ref: Bilezikian JP, Brandi ML, Eastell R, et al: Guidelines for the management of asymptomatic primary hyperparathyroidism: Summary statement from the Fourth International Workshop. *J Clin Endocrinol Metab* 2014;99(10):3561-3569. 2) Bilezikian JP, Bandeira L, Khan A, Cusano NE: Hyperparathyroidism. *Lancet* 2018;391(10116):168-178.

Item 52

ANSWER: C

Aortic regurgitation in an older adult may be due to a congenital bicuspid aortic valve, which often is accompanied by aortic stenosis. Rheumatic aortic valvular disease may also cause aortic regurgitation, which is the most common cause in the developing world but less common in the United States.

The hallmark murmur of aortic regurgitation in either case is a "blowing" decrescendo diastolic murmur along the tract from the aortic valve (upper right sternal border) down to the lower left sternal border, where it is loudest. It is best heard with the patient sitting, leaning forward, and holding his or her breath in expiration.

Both bicuspid aortic valve and rheumatic valve disease may also be associated with aortic stenosis. The typical murmur of aortic stenosis is a mid- to long crescendo/decrescendo systolic murmur, loudest at the right upper sternal border, and often radiating to the carotid arteries. An S₃ gallop may also be present in decompensating aortic regurgitation, due to the associated left ventricular dilatation, but this is a secondary finding in later stages.

A harsh holosystolic murmur at the lower left sternal border radiating to the axilla is characteristic of mitral valve regurgitation, another potential condition found in rheumatic valvular disease. A pericardial friction rub is the principal auscultatory finding in acute pericarditis.

Ref: Jameson JL, Fauci AS, Kasper DL, et al (eds): *Harrison's Principles of Internal Medicine*, ed 20. McGraw-Hill, 2018, pp 240-248.

Item 53**ANSWER: D**

This patient has a classic presentation for Lyme disease. Lyme disease is transmitted by a tick bite, but not all patients remember being bitten by a tick. The classic erythema migrans lesion appears a couple of weeks after the tick bite. The first-line treatment for Lyme disease is either amoxicillin or doxycycline. Macrolides can be used if patients have true allergies to β -lactams and doxycycline, but they are less effective. This patient is not exhibiting the respiratory symptoms typically associated with adenovirus. Ehrlichiosis and Rocky Mountain spotted fever typically present with headaches and fevers but not with an erythema migrans rash. Although influenza should be considered in the differential diagnosis, it would not present with an erythema migrans rash.

Ref: Wormser GP, Dattwyler RJ, Shapiro ED, et al: The clinical assessment, treatment, and prevention of Lyme disease, human granulocytic anaplasmosis, and babesiosis: Clinical practice guidelines by the Infectious Diseases Society of America. *Clin Infect Dis* 2006;43(9):1089-1134. 2) Shapiro ED: Clinical practice. Lyme disease. *N Engl J Med* 2014;370(18):1724-1731.

Item 54**ANSWER: D**

According to the National Asthma Education and Prevention Program and the CDC, influenza vaccination is an important part of asthma care. Influenza and pneumonia can be more serious for patients with asthma. Asthma is the most common medical condition in patients hospitalized with influenza. Both adults and children with asthma are more likely to develop pneumonia with influenza. Influenza vaccination has been associated with reduced oral corticosteroid use in asthma exacerbations and reduced severity-adjusted asthma exacerbations. Pneumococcal vaccine is also recommended but there is little data to show improved patient-oriented outcomes for asthma patients vaccinated against pneumococcal disease.

Unless the patient has new symptoms, there is no indication for allergy testing. This patient's Asthma Control Test score indicates good control, so there is no reason to add an additional control test such as the Asthma Therapy Assessment Questionnaire. An increase in fluticasone propionate/salmeterol to 500/50 μ g twice daily is not indicated when asthma is well controlled. This patient had spirometry performed 6 months ago, so spirometry is not indicated at this time.

Ref: *Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma*. National Asthma Education and Prevention Program, 2007. 2) Influenza (flu): Flu and people with asthma. Centers for Disease Control and Prevention, National Center for Immunization and Respiratory Diseases, reviewed 2019.

Item 55**ANSWER: A**

Oral iron supplements, including ferrous fumarate, ferrous gluconate, and ferrous sulfate, are generally ineffective when used by hemodialysis patients and are only modestly effective when used by patients with non-dialysis-dependent chronic kidney disease. The one exception is ferric citrate, which is highly efficacious in all patients with chronic kidney disease. Intravenous iron preparations such as iron dextran are similarly effective in both groups and are considered the gold standard for the treatment of iron deficiency in patients on chronic hemodialysis.

Ref: Fishbane S, Block GA, Loram L, et al: Effects of ferric citrate in patients with nondialysis-dependent CKD and iron deficiency anemia. *J Am Soc Nephrol* 2017;28(6):1851-1858. 2) Fishbane S, Spinowitz B: Update on anemia in ESRD and earlier stages of CKD: Core curriculum 2018. *Am J Kidney Dis* 2018;71(3):423-435.

Item 56**ANSWER: B**

This patient presents with symptoms of a benign essential tremor. This is a postural symmetric tremor that is most often noted in the hands and wrists. A positive family history is often present. The diagnosis can be made clinically and a trial of β -blockers is warranted, especially since this patient is having significant interference in daily and social activities. A resting tremor would suggest parkinsonism, which warrants treatment with a dopaminergic agent. Young patients presenting with a tremor should be evaluated for Wilson's disease, with ceruloplasmin and urinary copper excretion testing. MRI of the brain would be warranted for a cerebellar tremor, which would manifest as a postural intention tremor.

Ref: Crawford P, Zimmerman EE: Tremor: Sorting through the differential diagnosis. *Am Fam Physician* 2018;97(3):180-186.

Item 57**ANSWER: B**

The Welcome to Medicare preventive visit, also known as an Initial Preventive Physical Examination (IPPE), is a one-time service that can be provided within the first year of a patient's enrollment in Medicare Part B. Medicare Part B covers provider visits and outpatient services such as laboratory testing. Beneficiaries are automatically enrolled in Part A when they apply to Medicare, which provides coverage for hospital-based and hospice care. Because Part A does not typically carry a monthly premium, some working older adults who continue to have insurance through their employer may opt to obtain Part A only, and wait on Part B coverage, which does have a monthly premium. Medicare Part D is prescription drug coverage.

Ref: Initial preventive physical examination. *Medical Learning Network Booklet*. Centers for Medicare and Medicaid Services, 2018.

Item 58**ANSWER: D**

The Ottawa knee rule is a validated tool that decreases unnecessary radiography in patients with a knee injury. According to the Ottawa knee rule, a radiograph should be obtained if any of the following are present:

- age ≥ 55 years
- isolated tenderness of the patella
- tenderness of the head of the fibula
- inability to flex the knee to 90°
- or the inability to bear weight for four steps both immediately after the injury and at the time of the examination

A radiograph would be indicated for this patient based on his age.

Anti-inflammatory medication may be an appropriate strategy for acute pain treatment, but this patient meets the criteria for a radiograph, which should be done first to rule out a fracture. A corticosteroid injection may be a consideration for treatment of chronic knee pain, generally in the setting of osteoarthritis, but would not be recommended in the setting of acute, undifferentiated pain. Knee braces can be useful with certain causes of knee pain, such as medial unloading knee braces for medial knee osteoarthritis, but the use of a knee brace in this situation without a diagnosis would not be warranted. MRI could be appropriate later in the workup, but the first step should be a radiograph.

Ref: Bunt CW, Jonas CE, Chang JG: Knee pain in adults and adolescents: The initial evaluation. *Am Fam Physician* 2018;98(9):576-585. 2) Sprouse RA, McLaughlin AM, Harris GD: Braces and splints for common musculoskeletal conditions. *Am Fam Physician* 2018;98(10):570-576.

Item 59**ANSWER: B**

This patient does not have any obvious metabolic or psychiatric explanations for her palpitations, raising the clinical suspicion for an underlying cardiac cause. Reassurance without further investigation of a possible cardiac cause would be inappropriate. Given that her symptoms are occurring daily, a 24-hour Holter monitor would be the most appropriate next step in the evaluation. If her symptoms occurred less frequently, a 30-day cardiac event monitor, which stores data after being activated, could be used. An exercise stress test would be indicated as the next step if her symptoms were exertional. Transthoracic echocardiography would be indicated as the next step if there were a clinical suspicion for structural heart disease based on a previous history of cardiac disease or worrisome signs and symptoms such as dyspnea, crackles, lower extremity edema, or elevated jugular venous pressure.

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

Item 60

ANSWER: A

There is no evidence from randomized, controlled trials to show that treating asymptomatic individuals, with or without risk factors for airflow obstruction, prevents future respiratory symptoms or reduces subsequent declines in lung function. Partly for this reason, the U.S. Preventive Services Task Force and joint guidelines issued by the American College of Physicians, American College of Chest Physicians, American Thoracic Society, and European Respiratory Society recommend against screening for COPD in asymptomatic adults. Regardless of the results of this patient's spirometry testing, treatment should not be initiated in the absence of symptoms. A long-acting anticholinergic, a long-acting β -agonist, an inhaled corticosteroid, and combination therapy with a corticosteroid and long acting β -agonist would not be recommended for this patient.

Ref: Qaseem A, Wilt TJ, Weinberger SE, et al: Diagnosis and management of stable chronic obstructive pulmonary disease: A clinical practice guideline update from the American College of Physicians, American College of Chest Physicians, American Thoracic Society, and European Respiratory Society. *Ann Intern Med* 2011;155(3):179-191. 2) *Final Recommendation Statement: Chronic Obstructive Pulmonary Disease: Screening*. US Preventive Services Task Force, 2016.

Item 61

ANSWER: E

Attention deficit/hyperactivity disorder (ADHD) is a common neurodevelopmental disorder in children and adolescents. Approximately 30% of children carry the diagnosis into adulthood. Individuals with ADHD should be screened for coexisting psychiatric disorders because they are at a higher risk for problems such as anxiety and depression and are more likely than the general population to have substance use disorders. The *DSM-5* criteria for the diagnosis of adult ADHD require symptoms to have been present before age 12. Inattention often persists into adulthood, while hyperactivity and impulsivity usually improve with time. Compared to children with ADHD, hyperactivity in adults often presents as talkativeness, irritability, and restlessness. Along with behavioral strategies, stimulants have been found to be effective for treatment of adult ADHD. Although there are no age restrictions for the use of stimulants, adults should have their blood pressure and heart rate monitored during use to monitor for potential cardiac complications.

Ref: American Psychiatric Association: *Diagnostic and Statistical Manual of Mental Disorders*, ed 5. American Psychiatric Association, 2013, pp 59-66. 2) Castells X, Blanco-Silvente L, Cunill R: Amphetamines for attention deficit hyperactivity disorder (ADHD) in adults. *Cochrane Database Syst Rev* 2018;(8):CD007813. 3) Attention deficit hyperactivity disorder: Diagnosis and management. National Institute for Health and Care Excellence (NICE), updated 2019. 4) Baird D, Hoffman A: Use of amphetamines for attention-deficit/hyperactivity disorder in adults. *Am Fam Physician* 2019;100(5):278-279.

Item 62

ANSWER: D

Both polymyalgia rheumatica (PMR) and giant cell arteritis are chronic inflammatory diseases. PMR is the most common chronic inflammatory condition in older adults. Giant cell arteritis is common in patients with PMR.

Giant cell arteritis can affect any medium or large artery, particularly the extracranial carotid branches. The temporal artery is commonly involved, and the ophthalmic artery may also be affected. This can result in neuro-ophthalmic complications, including permanent blindness. For this reason giant cell arteritis is considered a medical emergency and it is essential for family physicians to evaluate any patient with PMR for giant cell arteritis.

Antineutrophil cytoplasmic antibody-associated vasculitis, polyarteritis nodosa, Takayasu arteritis, and granulomatosis with polyangiitis (formerly called Wegener's granulomatosis) are not uniquely associated with PMR.

Ref: Caylor TL, Perkins A: Recognition and management of polymyalgia rheumatica and giant cell arteritis. *Am Fam Physician* 2013;88(10):676-684. 2) Rinden T, Miller E, Nasr R: Giant cell arteritis: An updated review of an old disease. *Cleve Clin J Med* 2019;86(7):465-472.

Item 63

ANSWER: A

The Choosing Wisely campaign recommends checking only carcinoembryonic antigen (CEA) levels following curative treatment for colorectal cancer (SOR C). No routine laboratory studies such as a CBC or liver function tests should be ordered for follow-up.

Ref: El-Shami K, Oeffinger KC, Erb NL, et al: American Cancer Society colorectal cancer survivorship care guidelines. *CA Cancer J Clin* 2015;65(6):428-455. 2) Burgers K, Moore C, Bednash L: Care of the colorectal cancer survivor. *Am Fam Physician* 2018;97(5):331-336.

Item 64

ANSWER: A

Patients who participate in long-term lifestyle intervention programs such as the CDC's National Diabetes Prevention Program have an approximately 30% reduction in progression to type 2 diabetes. These programs promote weight loss of 7% of body weight and encourage physical activity with a weekly goal of 150 minutes of moderate-intensity exercise. Because an estimated 1 in 3 adults in the United States has prediabetes (diagnosed by a fasting glucose level of 100–125 mg/dL, a hemoglobin A_{1c} of 5.7%–6.4%, or a 2-hour plasma glucose level of 140–199 mg/dL), interventions to reduce progression to full diabetes are vital. Weight loss of 5% of body weight alone is not as effective as a comprehensive prevention program.

Metformin is also effective in reducing the progression to diabetes, but it is not as effective as lifestyle intervention programs for most patients. While α -glucosidase inhibitors have been shown to reduce the incidence of diabetes in patients with prediabetes, they are not as effective as metformin, which can reduce the progression by 18%. There is good evidence that liraglutide leads to weight loss and the lowering of blood glucose, but it has not been found to be as effective as lifestyle intervention programs or metformin in reducing progression to diabetes.

Ref: Koenigsberg MR, Corliss J: Diabetes self-management: Facilitating lifestyle change. *Am Fam Physician* 2017;96(6):362-370. 2) Carris NW, Magness RR, Labovitz AJ: Prevention of diabetes mellitus in patients with prediabetes. *Am J Cardiol* 2019;123(3):507-512. 3) American Diabetes Association: 3. Prevention or delay of type 2 diabetes: Standards of Medical Care in Diabetes–2020. *Diabetes Care* 2020;43(Suppl 1):S32-S36.

Item 65

ANSWER: C

When considering food allergens, patients should specifically be asked about foods that most commonly precipitate an IgE response. While any food might cause an allergic reaction, skin testing has limited positive predictive value, but can be helpful in the evaluation of a patient with an immediate reaction to food. A negative allergy test with a negative oral challenge has a good negative predictive value. Testing should be performed in an allergist's office in case there is an anaphylactic response. Testing should focus on foods that make up the majority of food allergens, including cow's milk, eggs, soy, fish, shellfish, tree nuts, wheat, and peanuts (level of evidence C). Beef, black beans, onions, and watermelon are not among the most common food allergens.

Ref: Chang K, Guarderas JC: Allergy testing: Common questions and answers. *Am Fam Physician* 2018;98(1):34-39.

Item 66

ANSWER: D

Smoking during pregnancy increases the risk for fetal growth restriction. The U.S. Preventive Services Task Force identified evidence that tobacco cessation increases infant birth weight and decreases the risk for preterm delivery. There is no evidence that tobacco cessation in pregnant women decreases the risk for cesarean delivery, the risk for preeclampsia, or the need for epidural anesthesia.

Ref: Fan T, Blitz J: Behavioral and pharmacotherapy interventions for tobacco smoking cessation in adults, including pregnant women. *Am Fam Physician* 2016;93(10):861-862.

Item 67

ANSWER: A

Pulmonary aspergillosis comprises a spectrum of clinical disease, from invasive, often cavity-forming disease in critically ill and profoundly immunosuppressed patients to allergic bronchopulmonary aspergillosis. This case of poorly controlled asthma associated with eosinophilia and bronchiectasis is typical of allergic bronchopulmonary aspergillosis. *Aspergillus* IgE titers are recommended as initial testing in patients with suspected allergic bronchopulmonary aspergillosis. Antifungal treatment can improve outcomes in these cases.

Coccidioides immitis and *Histoplasma* typically cause more systemic symptoms such as muscle and joint pain, rather than wheezing. *Coccidioides immitis* is present in the desert regions of the U.S. southwest and *Histoplasma* is endemic to the Mississippi and Ohio River valleys of the Midwest and the South. *Mycobacterium tuberculosis* is less common in the United States, and this patient's symptoms and findings are not typical of active tuberculosis. *Pneumocystis jiroveci* causes pneumonia but is rare in patients who are not overtly immunosuppressed.

Ref: Kosmidis C, Denning DW: The clinical spectrum of pulmonary aspergillosis. *Thorax* 2015;70(3):270-277.

Item 68

ANSWER: C

This patient has de Quervain's tenosynovitis, which is caused by inflammatory changes in the extensor pollicis brevis and the abductor pollicis longus or their tendon sheaths. It should be suspected when a patient presents with insidious pain in the radial wrist at the base of the thumb. Some patients may report a history of new repetitive use of the hand. It is more common in women, especially new mothers who are repeatedly picking up their children. The Finkelstein test, which involves making a fist over the thumb and moving the hand into ulnar deviation, has good sensitivity and specificity and is usually sufficient to make the diagnosis.

Arthritis of the first carpometacarpal joint typically involves pain with axial compression of the carpometacarpal joint. Carpal tunnel syndrome is produced by compression of the median nerve at the wrist. Affected patients report numbness, tingling, and pain in the hand, which often worsens at night or after use of the hand. While patients with de Quervain's tenosynovitis may have tenderness around the soft tissues of the anatomic snuffbox, deep tenderness in the snuffbox would be more concerning for an underlying scaphoid fracture. This patient does not have a history of falling onto an outstretched hand, which is usually the mechanism of injury. Ulnar nerve entrapment causes ulnar arm pain and numbness in the fourth and fifth fingers.

Ref: Shehab R, Mirabelli MH: Evaluation and diagnosis of wrist pain: A case-based approach. *Am Fam Physician* 2013;87(8):568-573.

Item 69

ANSWER: C

Delayed puberty in girls is defined as the absence of breast development by age 13. Typically, menarche starts 2.5 years after the onset of breast development, with an average age of 12.5 years (normal range 9–15 years). In girls with otherwise normal sexual development, the absence of menarche by 15 years of age should prompt an evaluation for primary amenorrhea.

Ref: Klein DA, Emerick JE, Sylvester JE, Vogt KS: Disorders of puberty: An approach to diagnosis and management. *Am Fam Physician* 2017;96(9):590-599.

Item 70**ANSWER: E**

High-quality placebo-controlled studies have demonstrated a decreased time to clearance of kidney stones with the use of α -blockers, including tamsulosin. For stones 6–10 mm in size, the mean time to clearance was reduced by almost 6 days. Furosemide is a loop diuretic and can increase calcium excretion, which is associated with an increased risk for kidney stones. Hydrochlorothiazide is a calcium-sparing diuretic, leading to increases in serum calcium and decreased excretion of calcium into the urine. Hydrochlorothiazide would decrease the risk of recurrence of calcium kidney stones but would not hasten stone passage. Oxybutynin and sildenafil have not been shown to hasten stone passage.

Ref: Campschroer T, Zhu X, Vernooij RW, Lock MT: α -Blockers as medical expulsive therapy for ureteral stones. *Cochrane Database Syst Rev* 2018;(4):CD008509. 2) Krishnan K, Halajian EB, Guthmann RA, Nashelsky J: α -Blockers for nephrolithiasis. *Am Fam Physician* 2019;100(11):710-712. 3) Fontenelle LF, Sarti TD: Kidney stones: Treatment and prevention. *Am Fam Physician* 2019;99(8):490-496.

Item 71**ANSWER: C**

The ACCOMPLISH trial demonstrated that an ACE inhibitor (ACEI) in combination with a calcium channel blocker (CCB) reduced both fatal and nonfatal cardiovascular events in patients with diabetes mellitus and hypertension. The benefit of an ACEI and a CCB for reducing cardiovascular events was greater than that of an ACEI and a thiazide diuretic. Evidence has shown that combination therapy for most patients should include a CCB, an ACEI or angiotensin receptor blocker (ARB), or a thiazide diuretic (SOR A). The American College of Cardiology/American Heart Association guidelines recommend against centrally acting medications such as α -blockers for first-line therapy. Combining ACEIs and ARBs is not recommended, as the risk of side effects such as hyperkalemia outweighs the benefits. Loop diuretics are not considered first-line antihypertensive agents.

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

Item 72**ANSWER: B**

This patient's radiograph shows a large right pneumothorax. Initial management includes administration of 100% humidified oxygen. Definitive therapy includes reducing the pleural dead space and thereby improving oxygenation, using either needle thoracentesis or chest tube placement. When the pneumothorax is small (<15% of the hemithorax) or when the patient is asymptomatic, supplemental oxygen and observation are usually adequate. Supplemental oxygen not only helps with the hypoxia, it also produces up to a fourfold increase in pleural reabsorption of the air in the pneumothorax. Nebulized albuterol and ipratropium play a role in managing dyspnea in acute exacerbations of COPD and are not likely to relieve the dyspnea from a pneumothorax (SOR B).

Ref: Savitsky E, Oh SS, Lee JM: The evolving epidemiology and management of spontaneous pneumothorax. *JAMA* 2018;320(14):1441-1443.

Item 73**ANSWER: D**

Frostbite is a freezing injury that occurs when initial cooling causes vasoconstriction and localized ischemia. Continued cold exposure leads to ice crystal formation, which causes cellular lysis, electrolyte abnormalities, and microvascular occlusion. Rewarming creates an inflammatory response. Ibuprofen is the most appropriate agent for the treatment of frostbite until the wounds heal or surgery is performed (SOR C). Acetazolamide can cause frostbite at high altitudes. Amitriptyline is used to treat the pain of immersion foot (also called trench foot), which is a nonfreezing injury that happens when the foot is exposed to prolonged wet conditions above 0°C (32°F). Antibiotics are indicated if open or dirty wounds are present (SOR B). tPA has a role in treating patients with frostbite, but it is used only to decrease the risk of amputation when rewarming patients with grade 3, grade 4, or deep frostbite (SOR B).

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

Item 74**ANSWER: D**

Mirtazapine, an antidepressant, is associated with weight gain. Lisinopril and naproxen are weight neutral. Bupropion and metformin may promote weight loss.

Ref: Tsai AG, Bessesen DH: Obesity. *Ann Intern Med* 2019;170(5):ITC33-ITC48.

Item 75**ANSWER: A**

Medical testing prior to cataract surgery does not improve outcomes and is not recommended. A prothrombin time and INR determination, a CBC, a resting EKG, and 2D echocardiography would not be appropriate prior to this patient's cataract surgery.

Ref: Pelletier AL, Rojas-Roldan L, Coffin J: Vision loss in older adults. *Am Fam Physician* 2016;94(3):219-226.

Item 76**ANSWER: B**

This patient has subclinical hyperthyroidism caused by Graves disease. A positive anti-thyrotropin-receptor (thyroid-stimulating immunoglobulin) antibody result is virtually diagnostic of Graves disease. Central hypothyroidism is associated with a low TSH level and low T₃ and T₄ levels. Iodine deficiency is associated with goiter and hypothyroidism. Nodular thyroid disease is unlikely given the imaging results. Treatment of this patient's mild Graves disease is probably indicated, given her age and cardiac symptoms.

Ref: Biondi B, Cooper DS: Subclinical hyperthyroidism. *N Engl J Med* 2018;378(25):2411-2419.

Item 77**ANSWER: B**

Increasing shoulder pain that is hard to localize and decreased range of motion are the hallmark findings for adhesive capsulitis, also known as frozen shoulder. The underlying pathology is contraction of the glenohumeral capsule. It is an idiopathic condition but has an increased prevalence in patients with diabetes mellitus and hypothyroidism. Adhesive capsulitis is often self-limited but can persist for years in some patients. Nonsurgical treatment options include physical therapy, oral or intra-articular corticosteroids, acupuncture, and hydrodilatation.

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

Item 78**ANSWER: A**

The Advisory Committee on Immunization Practices recommends Tdap vaccination during each pregnancy, regardless of the time interval since the last booster, primarily to confer immunity against pertussis to the infant. For that reason administration of the vaccine is recommended between 27 and 36 weeks gestation to maximize the concentration of pertussis antibody transferred to the fetus. Postpartum vaccination of the mother with Tdap does not provide as much protection as vaccination of the mother during pregnancy. Newborns should not receive Tdap but should begin pertussis immunization at 2 months of age with the first dose of DTaP. There is no recommendation to vaccinate infants earlier to reduce the risk of vertical transmission. Family members and close contacts should be vaccinated against pertussis at least 2 weeks prior to contact with the infant, but this strategy alone is less effective than maternal immunization. Good hand hygiene is important when caring for an infant, but on its own is not an effective strategy to reduce the risk of pertussis transmission.

Ref: Pregnancy and whooping cough: For healthcare professionals: Vaccinating pregnant patients. Centers for Disease Control and Prevention, reviewed 2017.

Item 79**ANSWER: A**

A diagnosis of COPD is established by an FEV₁/FVC that is consistent with obstruction and is not significantly reversible with bronchodilator treatment. The American Thoracic Society/European Respiratory Society guidelines define reversibility as an improvement of more than 12% in adults. This patient's FEV₁/FVC increased by more than that with bronchodilation, so her results are most consistent with asthma. Spirometry is not used to diagnose interstitial lung disease or pulmonary hypertension. Interstitial lung disease is diagnosed using high-resolution CT. Echocardiography is the recommended first step in the evaluation of suspected pulmonary hypertension, but confirmation by right heart catheterization is often required.

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

Item 80**ANSWER: B**

An AST/ALT ratio > 2 is highly suggestive of alcoholic liver disease. Acute viral hepatitis usually presents with AST and ALT levels > 25 times the upper limit of normal. Cholestasis is unlikely to be the cause in a patient with normal alkaline phosphatase and bilirubin levels. Although nonalcoholic fatty liver disease is the most common cause of asymptomatic elevated liver transaminase levels in the United States, it is usually associated with an AST/ALT ratio < 1 .

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

Item 81**ANSWER: E**

Spironolactone has antiandrogenic properties and may cause gynecomastia in approximately 9% of male users. Stopping the medication typically leads to regression of the gynecomastia within 3 months. Amlodipine, hydrochlorothiazide, liraglutide, and pioglitazone do not have antiandrogenic properties and are not associated with gynecomastia.

Ref: Dickson G: Gynecomastia. *Am Fam Physician* 2012;85(7):716-722. 2) Jameson JL, Fauci AS, Kasper DL, et al (eds): *Harrison's Principles of Internal Medicine*, ed 20. McGraw-Hill, 2018, p 2834.

Item 82**ANSWER: A**

This patient presents with ischemic cardiomyopathy associated with heart failure with reduced ejection fraction and New York Heart Association (NYHA) class II symptoms. He is taking appropriate medical therapy, including dual antiplatelet agents, a high-intensity statin, a β -blocker, an aldosterone antagonist, and an angiotensin receptor-neprilysin inhibitor. Sacubitril/valsartan is superior to an ACE inhibitor in patients such as this (SOR A). SGLT2 inhibitors such as empagliflozin, unlike DPP-4 inhibitors such as sitagliptin, have been associated with improved symptoms and lower rates of cardiovascular death in patients with heart failure (SOR A).

An implantable cardiac defibrillator (ICD) is indicated to decrease sudden cardiac death in a patient with heart failure treated with guideline-directed medical therapy who has a left ventricular ejection fraction (LVEF) $\leq 30\%$ with NYHA class I symptoms or an LVEF $\leq 35\%$ with NYHA class II–III symptoms (SOR A). However, the patient must be at least 40 days out from a myocardial infarction and at least 90 days out from revascularization. The patient in this case should have repeat echocardiography to reassess his LVEF before he is referred for ICD placement.

Ref: Al-Khatib SM, Stevenson WG, Ackerman MJ, et al: 2017 AHA/ACC/HRS guideline for management of patients with ventricular arrhythmias and the prevention of sudden cardiac death. *Circulation* 2018;138(13):e272-e391. 2) Beaser AD, Cifu AS, Nayak HM: Primary prevention of sudden cardiac death. *JAMA* 2019;322(2):161-162.

Item 83**ANSWER: C**

The differential diagnosis for acute nonradicular low back pain is broad and should include osteoarthritis, discitis, myofascial pain, and vertebral compression fracture, among other possibilities. This patient's age and comorbidities, as well as the examination and normal laboratory findings, make vertebral compression fracture a likely possibility. The most appropriate next step is to proceed with conservative pain management with scheduled acetaminophen and topical lidocaine patches. While denosumab may be appropriate management in the future if this patient's workup reveals osteoporosis, it is not indicated for initial pain management. NSAIDs such as ketorolac should be avoided in patients with significant chronic kidney disease. Long-acting opioids are not recommended for initial treatment of acute pain. Significant controversy persists regarding the use of percutaneous vertebral augmentation (vertebroplasty or kyphoplasty) for vertebral fractures, in large part because two randomized, controlled trials suggested no benefit to the procedures over placebo. The American Academy of Orthopaedic Surgeons recommends that procedural intervention only be considered if initial conservative management fails (SOR C).

Ref: McCarthy J, Davis A: Diagnosis and management of vertebral compression fractures. *Am Fam Physician* 2016;94(1):44-50.

Item 84**ANSWER: C**

Informed consent for medical care requires that the physician provide patients with accurate information about the risks and benefits of a given treatment course. It also requires that the patient has medical decision-making capacity. In general, medical decision-making capacity is individual to each treatment decision. It is not usually necessary for a physician to determine if a patient is competent to make all decisions, only whether they have the capacity to make the current medical decision. Determining capacity involves assessing a patient's understanding of the benefits, risks, and alternatives to the proposed treatment and their appreciation of those benefits and risks. The physician should also recognize whether the patient showed reasoning in making their decision and that they are able to communicate their decision. Patients' beliefs, values, and personal wishes are certainly important in medical decision-making but simply listing those does not demonstrate capacity. It is not necessary to determine the baseline intelligence level of a patient when determining their capacity for medical decision-making, as the decision itself is assessed as described above, not solely on their underlying intelligence. Assessing patients' fears about a medical decision is valuable but not a direct component of determining capacity.

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

Item 85

ANSWER: C

According to the CDC, all individuals between 13 and 64 years of age should be tested at least once for HIV. Although bacterial vaginosis is more common in women who have sex with women (WSW), screening is not recommended by the CDC. Screening for *Chlamydia trachomatis* and gonorrhea is appropriate for women younger than 25 years of age and for women at risk, including those with new partners, multiple partners, or a new partner with a sexually transmitted infection. This patient is >25 years of age and does not have any additional risk factors. The U.S. Preventive Services Task Force recommends screening for cervical cancer with cytology every 3 years or cytology and HPV co-testing every 5 years for women 30–65 years of age. This patient's Papanicolaou test was normal 2 years ago. Annual syphilis screening is appropriate for men who have sex with men but is not indicated for WSW.

Ref: Screening recommendations and considerations referenced in treatment guidelines and original sources. Centers for Disease Control and Prevention, reviewed 2015. 2) Knight DA, Jarrett D: Preventive health care for women who have sex with women. *Am Fam Physician* 2017;95(5):314-321.

Item 86

ANSWER: D

This patient presents with adult-onset, severe and persistent, non-atopic asthma and aspirin sensitivity. This type of asthma is defined as intrinsic asthma and affects approximately 10% of patients with asthma. Patients with intrinsic asthma commonly also have nasal polyps. Allergic rhinitis and eczema are both associated with atopy and patients with these conditions would also have positive skin tests for inhalant allergens and elevated IgE levels. While aspergillosis is associated with chronic sinusitis and nasal polyps, skin tests and IgE levels would also be positive. Obesity is an independent risk factor for asthma but is not specifically related to intrinsic asthma.

Ref: Jameson JL, Fauci AS, Kasper DL, et al (eds): *Harrison's Principles of Internal Medicine*, ed 20. McGraw-Hill, 2018, pp 1532-1537, 1957-1969.

Item 87

ANSWER: D

The incidence of type 2 diabetes continues to rise in the United States, including in women of childbearing age. Type 2 diabetes complicates 1%–2% of pregnancies in the United States. Tight glycemic control (hemoglobin A_{1c} <6.5%) is recommended during pregnancy, especially in the preconception period and the first trimester if possible. Risks of uncontrolled diabetes in pregnancy include preeclampsia, congenital defects, preterm delivery, macrosomia, and stillbirth. Insulin is the safest medication for glycemic control in pregnant patients, with requirements to achieve glycemic targets typically varying over the course of a pregnancy. After an initial increase in insulin requirements through week 9 of pregnancy, they often decline in weeks 9–16 before rising again in weeks 16–37. Beyond week 37 insulin requirements may again start to decline. Immediately after delivery of the placenta women become exquisitely sensitive to insulin, and insulin requirements may drop as low as 50% of pre-pregnancy needs. Patients with type 2 diabetes who were not taking insulin prior to pregnancy typically no longer require insulin.

Metformin is safe in breastfeeding women and should be restarted in this patient who did well on it prior to pregnancy. No information is available regarding the safety of liraglutide while breastfeeding. Until more data becomes available it should be used with caution and is not the preferred agent in this patient.

Ref: Alexopoulos A, Blair R, Peters AL: Management of preexisting diabetes in pregnancy: A review. *JAMA* 2019;321(18):1811–1819. 2) American Diabetes Association: 14. Management of diabetes in pregnancy: *Standards of Medical Care in Diabetes—2020. Diabetes Care* 2020;43(Suppl 1):S183-S192. 3) Drugs and Lactation Database (LactMed) Bethesda (MD): Liraglutide. National Library of Medicine (US), updated 2020.

Item 88

ANSWER: B

As a result of an effective screening program in a disease with a precancerous phase amenable to identification and treatment, cervical cancer declined in both incidence (rate of disease diagnosis) and mortality (rate of death from a specific cause) between 1975 and 2015. The incidence of breast cancer has risen over time as mammography screening has become widespread. Mortality from breast cancer has declined over time, although there is some debate as to whether this is related to screening or improved treatments. Hodgkin's lymphoma incidence has remained stable over time, suggesting no change to the causes of this cancer, but mortality has declined considerably as treatments have improved. Lung cancer incidence and mortality both increased in the 1970s and 1980s before they began to decline, mirroring the rise and fall of the most potent risk factor for lung cancer, which is cigarette smoking. Prostate cancer saw a steep rise in incidence with the rollout of screening with PSA testing in the early 1990s. The incidence has since declined, as has mortality from prostate cancer.

Ref: Welch HG, Kramer BS, Black WC: Epidemiologic signatures in cancer. *N Engl J Med* 2019;381(14):1378-1386.

Item 89

ANSWER: E

Cardiac resynchronization therapy is strongly recommended for patients with symptomatic heart failure, an ejection fraction <35%, and a left bundle branch block with a QRS interval >150 msec. Amiodarone is an antiarrhythmic and would not be indicated for this patient. Ivabradine, a sinoatrial node modulator, is used in patients with symptomatic heart failure as an add-on therapy to decrease the heart rate. It is indicated in patients with a heart rate >70 beats/min despite β -blockade. Sacubitril/valsartan is contraindicated in patients with a history of angioedema. Sinoatrial node ablation is indicated for some patients with sinus node dysfunction.

Ref: Brink D: Heart failure treatment: Keeping up with best practices. *J Fam Pract* 2018;67(1):18-26.

Item 90**ANSWER: E**

ACE inhibitors and angiotensin receptor blockers are associated with decreased progression of diabetic kidney disease. Unless otherwise contraindicated, patients with diabetes should be taking one of these agents. Amlodipine, chlorthalidone, labetalol, and spironolactone are not directly associated with decreased progression of diabetic kidney disease, but they all may contribute to a decrease in progression due to long-term control of blood pressure.

Ref: McGrath K, Edi R: Diabetic kidney disease: Diagnosis, treatment, and prevention. *Am Fam Physician* 2019;99(12):751-759.

Item 91**ANSWER: D**

According to the CDC, Infectious Diseases Society of America, and American Thoracic Society, an interferon-gamma release assay (IGRA) is recommended for individuals who are 5 years of age or older who are likely infected with *Mycobacterium tuberculosis* (TB), have a low to intermediate risk of disease progression, and either have a history of bacille Calmette-Guérin (BCG) vaccination or are unlikely to return to have their tuberculin skin test (TST) read (SOR B). A TST is an acceptable alternative if an IGRA is not available, is too costly, or is too burdensome. While testing is not recommended in persons at low risk for tuberculosis, it may be required by law or credentialing bodies. A chest radiograph would be indicated in suspected cases of currently or previously active pulmonary TB.

Ref: Lewisohn DM, Leonard MK, LoBue PA, et al: Official American Thoracic Society/Infectious Diseases Society of America/Centers for Disease Control and Prevention clinical practice guidelines: Diagnosis of tuberculosis in adults and children. *Clin Infect Dis* 2017;64(2):111-115. 2) Hauk L: Tuberculosis: Guidelines for diagnosis from the ATS, IDSA, and CDC. *Am Fam Physician* 2018;97(1):56-58.

Item 92**ANSWER: A**

Treatment of chronic wounds is a common clinical challenge in primary care. This case represents a venous stasis ulceration rather than a diabetic foot wound or pressure ulcer. When treating a wound, the treating physician should optimize factors that promote healing, including nutrition, smoking cessation, and blood glucose control. Local wound care should emphasize treating any infection, debriding devitalized tissue, avoiding ongoing pressure or shear force, and maintaining a clean and appropriately moist healing environment.

Compression hose and bandages have been shown to improve healing times in venous stasis ulcers (SOR B). Wet-to-dry dressings or specialized dressings such as hydrogel or skin substitutes such as dermal matrix dressings have not been consistently shown to decrease healing times. Prescription diabetic footwear may be an important part of offloading diabetic foot wounds, but it is not relevant to a wound on the lower leg.

Ref: O'Meara S, Cullum N, Nelson EA, Dumville JC: Compression for venous leg ulcers. *Cochrane Database Syst Rev* 2012;(11):CD000265. 2) Jones RE, Foster DS, Longaker MT: Management of chronic wounds—2018. *JAMA* 2018;320(14):1481-1482.

Item 93

ANSWER: C

The two cardinal symptoms of depression are depressed mood and anhedonia. These are the two criteria in the Patient Health Questionnaire–2 (PHQ-2) screening instrument for depression. A positive result on the PHQ-2 should prompt further evaluation, including questions about other symptoms such as energy level, appetite changes, sleep disturbance, psychomotor changes, and suicidality.

Ref: Maurer DM, Raymond TJ, Davis BN: Depression: Screening and diagnosis. *Am Fam Physician* 2018;98(8):508-515.

Item 94

ANSWER: D

Celiac disease affects about 10% of first degree relatives of a person with celiac disease and a heightened suspicion should be maintained in this higher-than-average risk group. Many patients are asymptomatic or only minimally symptomatic. Several serologic tests are available for initial screening, and should be followed by a small bowel biopsy for confirmation. IgA tTG antibody testing is currently the test of choice and should be paired with serum total IgA levels, as IgA deficiency is 10–15 times more common in patients with celiac disease than in the general population.

Because only up to 10% of first degree relatives are affected, committing this patient to a lifelong dietary restriction without confirmatory testing may be unnecessary. Antigliadin antibody testing has low sensitivity and specificity. Endomysial antibody testing has higher specificity and sensitivity, but it is very costly. An initial esophagogastroduodenoscopy is likely too invasive and expensive for screening purposes in this patient.

Ref: Pelkowski TD, Viera AJ: Celiac disease: Diagnosis and management. *Am Fam Physician* 2014;89(2):99-105. 2) Seehusen DA: Comparative accuracy of diagnostic tests for celiac disease. *Am Fam Physician* 2017;95(11):726-728.

Item 95

ANSWER: A

In this scenario trauma is a consideration due to the patient's history of falling. However, with a history of fever > 38.5°C (101.3°F) it is appropriate to order a CBC, erythrocyte sedimentation rate (ESR), and C-reactive protein (CRP) level as the next step in the evaluation.

An oral temperature $>38.5^{\circ}\text{C}$, refusal to bear weight on the affected leg, an ESR >40 mm/hr, a peripheral WBC count $>12,000/\text{mm}^3$, or a CRP level >20 mg/L should raise suspicion for septic arthritis (SOR C). Septic arthritis of the hip should be suspected in this patient.

As the evaluation progresses, joint aspiration may be considered to evaluate for septic arthritis or transient synovitis. MRI may also be appropriate as the evaluation progresses after a CBC, ESR, and CRP level. Ultrasonography and bone scintigraphy would not be a consideration at this time. For hip effusions in children, ultrasonography is recommended over plain radiography, but it does not differentiate between sterile, purulent, and hemorrhagic effusions.

Ref: Naranje S, Kelly DM, Sawyer JR: A systematic approach to the evaluation of a limping child. *Am Fam Physician* 2015;92(10):908-916.

Item 96

ANSWER: D

This patient is male, over the age of 65, and smoked in the past, so he meets the criteria for one-time screening for an abdominal aortic aneurysm (AAA) recommended by the U.S. Preventive Services Task Force (USPSTF) (B recommendation). This screening is associated with decreased AAA-related mortality. The USPSTF found insufficient evidence for screening asymptomatic adults for cardiovascular disease with an ankle-brachial index, high-sensitivity C-reactive protein level, or coronary artery calcium score. Screening asymptomatic individuals with echocardiography is not recommended at this time.

Ref: US Preventive Services Task Force, Curry SJ, Krist AH, et al: Risk assessment for cardiovascular disease with nontraditional risk factors: US Preventive Services Task Force recommendation statement. *JAMA* 2018;320(3):272-280.

Item 97

ANSWER: D

Because of successful vaccination programs rubella has nearly been eliminated from the United States, but it is still common in other countries. Susceptible individuals can still become ill while traveling abroad. According to the CDC, women known to be pregnant or attempting to become pregnant should not receive a live-virus vaccine such as MMR. In a pregnant patient with an equivocal rubella titer it should not be assumed that the patient has protective immunity, and the patient should be offered booster vaccination after delivery. It is also recommended that women should not become pregnant for 4 weeks after receiving MMR vaccine.

Ref: Vaccines and preventable diseases: Routine measles, mumps, and rubella vaccination. Centers for Disease Control and Prevention, reviewed 2019.

Item 98

ANSWER: D

It is recommended that all infants should be given 400 IU of vitamin D because of generally decreased sun exposure in today's living situations. Additional water consumption can decrease milk intake and cause electrolyte disturbances. Fluoride supplementation and the introduction of cereal are not recommended until 6 months of age.

Ref: American Academy of Pediatrics: Breastfeeding and the use of human milk: Section on Breastfeeding. *Pediatrics* 2012;129(3):e827-e841. 2) Golden NH, Abrams SA; Committee on Nutrition: Optimizing bone health in children and adolescents. *Pediatrics* 2014;134(4):e1229-1243.

Item 99

ANSWER: B

Hypercalcemia is a commonly encountered laboratory abnormality. It is important for family physicians to be aware of common medications that can cause elevated calcium levels. Of the options listed, lithium is the only medication that can cause high calcium levels. In addition, thiazide diuretics, excluding aldosterone receptor antagonists such as spironolactone, often cause elevated calcium levels. Hypercalcemia is not a side effect of alendronate, omeprazole, sertraline, or spironolactone.

Ref: Minisola S, Pepe J, Piemonte S, Cipriani C: The diagnosis and management of hypercalcaemia. *BMJ* 2015;350:h2723.

Item 100

ANSWER: B

Use of simple graphical representations and other visual aids can greatly enhance a patient's comprehension of numbers. One useful tool is expressing ratios as an icon array in which a shape is repeated a specific number of times to represent the denominator and some of the shapes are shaded in to represent the numerator. Other techniques include using absolute risk instead of relative risk, using frequencies instead of percentages, and framing outcomes in both positive and negative terms.

Ref: The SHARE approach: Communicating numbers to your patients: A reference guide for health care providers. Agency for Healthcare Research and Quality, 2014.

Item 101

ANSWER: C

This patient has resistant hypertension as defined by persistent uncontrolled hypertension despite the use of three adequate antihypertensives, including a diuretic. She has multiple risk factors for atherosclerotic disease, and a rise in her creatinine level after the addition of an ACE inhibitor suggests renovascular hypertension. An imaging procedure to evaluate for the presence of renovascular hypertension, such as MR angiography of the renal arteries, is indicated.

Measurement of plasma free metanephrines is part of the workup for suspected pheochromocytoma. Low-dose dexamethasone suppression testing is useful for the diagnosis of Cushing syndrome. Polysomnography is the standard diagnostic test for obstructive sleep apnea, a leading cause of secondary hypertension.

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

Item 102

ANSWER: B

Frequently patients taking oral medications for the treatment of diabetes mellitus need to be switched to insulin while hospitalized. There are formulas to calculate the total daily dose based on weight, renal function, insulin resistance, and other factors. The recommended regimen is half of the calculated total daily dose given as long-acting insulin such as glargine to provide basal insulin and half given as short-acting insulin such as lispro to provide prandial insulin. The short-acting insulin is divided into thirds to be given with each meal.

The American Diabetes Association (ADA) recommends an insulin regimen with a basal and a prandial component for non-critically ill patients in the hospital with good nutritional intake. A correction component can be added to this regimen. The ADA strongly discourages the use of only a sliding scale insulin regimen. The reactive nature of sliding scale does not control glucose levels well and does not address the basal insulin needs of patients.

Ref: Kodner C, Anderson L, Pohlgeers K: Glucose management in hospitalized patients. *Am Fam Physician* 2017;96(10):648-654. 2) American Diabetes Association: 15. Diabetes care in the hospital: *Standards of Medical Care in Diabetes-2020. Diabetes Care* 2020;43(Suppl 1):S193-S202.

Item 103

ANSWER: E

The goals for treatment of this patient's COPD should include prevention of or a reduction in hospitalizations, a decrease in dyspnea, slowing progression of the disease, and a decrease in mortality. Disease severity is categorized by spirometry results, the severity of symptoms such as cough and dyspnea, and the number of exacerbations, including those requiring hospitalization. Classifying patients into Global Initiative for Chronic Obstructive Lung Disease (GOLD) groups A through D helps guide treatment initiation and modification over time.

The initial treatment for patients in GOLD group A is a short- or long-acting bronchodilator. Patients in GOLD group B should begin treatment with a single long-acting muscarinic antagonist (LAMA) or a long-acting β -agonist (LABA). A LAMA is the initial recommendation for patients in GOLD group C, although a combination inhaled corticosteroid plus a LABA can be considered for treating persistent exacerbations. Individuals classified in GOLD group D can begin treatment with a LAMA or a combination of an inhaled corticosteroid plus a LABA.

Ref: Gentry S, Gentry B: Chronic obstructive pulmonary disease: Diagnosis and management. *Am Fam Physician* 2017;95(7):433-441. 2) Yawn B, Kim V: COPD in primary care: Key considerations for optimized management: Treatment options for stable chronic obstructive pulmonary disease: Current recommendations and unmet needs. *J Fam Pract* 2018;67(2 Suppl):S28-S37.

Item 104

ANSWER: B

This patient presents with symptoms consistent with right benign paroxysmal positional vertigo (BPPV) and torsional, upbeating nystagmus provoked by the Dix-Hallpike maneuver. Diagnostic criteria include both patient history and physical examination findings. Symptoms suggesting BPPV include an acute onset of brief episodic vertigo triggered by positional changes relative to gravity. In the 2017 clinical practice guidelines on BPPV, the American Academy of Otolaryngology–Head and Neck Surgery Foundation strongly recommended accurate diagnosis of posterior semicircular canal BPPV by performing the Dix-Hallpike maneuver (B recommendation). The guidelines also strongly recommend treatment with a canalith repositioning procedure (A recommendation).

Positional restrictions, particularly postprocedural restrictions, are not recommended due to insufficient evidence (A recommendation). Vestibular testing should also be avoided in patients who meet diagnostic criteria for BPPV and who do not have other vestibular symptoms such as hearing loss or tinnitus (C recommendation). Vestibular suppressant medication such as antihistamines and benzodiazepines should be avoided due to potential risks and lack of evidence to suggest that these medications are as effective as repositioning procedures (B recommendation). Radiographic imaging such as MRI of the brain or CT of the head should not be obtained in patients who meet diagnostic criteria for BPPV and who do not have other signs or symptoms of neurologic pathology (C recommendation).

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

Item 105

ANSWER: E

Historically, clavicular fractures tended to be managed conservatively because it was thought that most of these fractures heal well. However, studies have shown that completely displaced fractures (displacement greater than one bone width) have a 30% rate of unsatisfactory outcomes when managed conservatively. Referral for evaluation for surgical fixation should be considered in all patients with complete displacement, especially when there is comminution or significant shortening (>18 mm in men and >14 mm in women). Splinting, a sling, closed reduction, and casting would not be appropriate in this case.

Ref: Eifff MP, Hatch R: *Fracture Management for Primary Care*, ed 3. Elsevier Saunders, 2018, pp 175-186.

Item 106**ANSWER: B**

An anal fissure is a longitudinal tear in the anoderm that occurs most often midline. The initial treatment is sitz baths and increased fiber intake. If there is no improvement, botulinum toxin is indicated. Topical nitroglycerin and diltiazem may also be used. Neither β -blocker injections nor corticosteroid injections are indicated. Lidocaine would relieve pain but not promote healing. Rubber band ligation is indicated for the treatment of internal hemorrhoids.

Ref: Fargo MV, Latimer KM: Evaluation and management of common anorectal conditions. *Am Fam Physician* 2012;85(6):624-630. 2) Dykstra MA, Buie WD: Anal fissures. *CMAJ* 2019;191(26):E737.

Item 107**ANSWER: C**

The three cardinal symptoms of aortic stenosis are angina, dyspnea, and presyncope or syncope. Once these events occur, the natural history of the disease changes dramatically. The risk for death increases from <1% per year to 2% per month, such that 75% of symptomatic patients die within 3 years unless they receive a valve replacement. Headache, palpitations, edema of the lower extremities, and a grade 2/6 ejection systolic murmur radiating to the aorta are not indicative of severe aortic stenosis.

Ref: Bakaeen FG, Rosengart TK, Carabello BA: Aortic stenosis. *Ann Intern Med* 2017;166(1):ITC1-ITC16.

Item 108**ANSWER: C**

Hidradenitis suppurativa, or acne inversa, is a chronic folliculitis affecting intertriginous areas, causing deep scarring and affecting quality of life. Patients should also be screened for depression. Hidradenitis suppurativa usually occurs between 18 and 39 years of age and affects females and African-Americans more often. Risk factors include family history, smoking, and obesity. Hidradenitis suppurativa is associated with several other comorbidities, including Crohn's disease and diabetes mellitus. Clinical features range from mild inflammatory nodules to widespread abscesses, sinus tracts, and scarring, affecting different parts of the body. Lesions occur most commonly in the axillae, but gluteal folds, the groin, the perianal area, and the perineum can also be affected. The nodules are painful and may vary in size (0.5–2 cm) and last days to months. The abscesses are typically sterile with purulent, malodorous drainage. The Hurley classification system defines the different stages (stage I–III) and treatment is based on the current stage, which ranges from topical treatment with clindamycin to combinations of topical and oral antibiotics and use of biologics. This patient presents with the typical features of hidradenitis suppurativa, including its depth and a chronic and recurrent course.

Acne conglobata affects mainly the back, face, chest, and neck in men. Cutaneous Crohn's disease involves perianal lesions with fistulous tracts past the dentate line, which this patient does not have. A pilonidal cyst usually contains hair and skin debris and is typically located near the tailbone. A primary bacterial abscess does not feature accompanying nodules and is superficial rather than deep, and is nonchronic in nature.

Ref: Wipperman J, Bragg DA, Litzner B: Hidradenitis suppurativa: Rapid evidence review. *Am Fam Physician* 2019;100(9):562-569.

Item 109

ANSWER: E

Based on current CDC guidelines, this patient should receive the recombinant herpes zoster vaccine. It is the preferred vaccine for the prevention of herpes zoster due to much higher efficacy than the live zoster vaccine. The live vaccine is considered a second-line option and should not be administered before the age of 60. HPV vaccine is not indicated in this age group (>45 years). Pneumococcal polysaccharide vaccine (PPSV23) is recommended for adults ≥65 years of age. Patients who are 65 and older can discuss with their physician whether they should receive pneumococcal conjugate vaccine (PCV13). Immunocompromised patients may receive both pneumococcal vaccines prior to age 50.

Ref: Freedman MS, Hunter P, Ault K, Kroger A: Advisory Committee on Immunization Practices Recommended immunization schedule for adults aged 19 years or older—United States, 2020. *MMWR Morb Mortal Wkly Rep* 2020;69(5):133-135.

Item 110

ANSWER: C

Most adults with generalized anxiety disorder (GAD) should be offered drug therapy if nondrug therapies are ineffective or if the patient is not interested in them. SSRIs and SNRIs are recommended as first-line drug therapies because of their tolerability and efficacy compared with other drug therapies. Of the options listed, the SNRI duloxetine would be most appropriate for the treatment of this patient's GAD. Alprazolam may be helpful for short-term treatment of anxiety but not as a long-term treatment. Buspirone, imipramine, and quetiapine are not indicated as initial therapy.

Ref: DeMartini J, Patel G, Fancher TL: Generalized anxiety disorder. *Ann Intern Med* 2019;170(7):ITC49-ITC64.

Item 111**ANSWER: C**

Thyroid nodules ≥ 1 cm that are solid or have suspicious features require a fine-needle aspiration biopsy to rule out malignancy. Fine-needle aspiration should not be performed on nodules < 1 cm. The evaluation of a single thyroid nodule does not call for testing of antithyroid antibody titers. If the patient had a low TSH level then a radionuclide thyroid uptake scan (nuclear medicine thyroid scan) is indicated to look for a toxic nodule. These hyperfunctioning nodules are seldom malignant. Surgical nodule excision is not indicated since needle aspiration is diagnostic. Repeat ultrasonography in 6 months is not indicated because this would not change management.

Ref: Soh S, Aw T: Laboratory testing in thyroid conditions – Pitfalls and clinical utility. *Ann Lab Med* 2019;39:3-14. 2) Kant R, Davis A, Verma V: Thyroid nodules: Advances in evaluation and management. *Am Fam Physician* 2020;102(5):298-304. 3) Singh Ospina N, Iniguez-Ariza NM, Castro MR: Thyroid nodules: Diagnostic evaluation based on thyroid cancer risk assessment. *BMJ* 2020;368:16670.

Item 112**ANSWER: E**

Recommendations for the treatment of back pain often include ice, targeted exercises, oral analgesics, and spinal manipulation. Although there is some evidence that certain modalities are better than placebo, there is very little evidence to show that one modality is superior to another in relieving back pain or shortening the course of the pain. There is some evidence that spinal manipulation is superior to sham manipulation.

Ref: Smith MS, Olivas J, Smith K: Manipulative therapies: What works. *Am Fam Physician* 2019;99(4):248-252.

Item 113**ANSWER: A**

According to American College of Cardiology/American Heart Association guidelines, first-line agents for antihypertensive drug therapy include thiazide diuretics, calcium channel blockers, ACE inhibitors, or angiotensin receptor blockers. In the largest head-to-head comparison of first-step drug therapy for hypertension, the thiazide-type diuretic chlorthalidone was superior to the calcium channel blocker amlodipine and the ACE inhibitor lisinopril in preventing heart failure. Thiazides increase serum uric acid and the risk of gouty attacks, so they should be used with caution in patients with a history of gout. The presence of a reduced ejection fraction or chronic kidney disease does not preclude the use of a thiazide diuretic, although progressive kidney disease or concomitant use of loop diuretics does increase the risk of electrolyte abnormalities. Furthermore, thiazide diuretics are ineffective in patients with severe renal disease (stage 4 or stage 5). Hypothyroidism is not a contraindication to the use of thiazide diuretics. The potential for cross reactivity between antibiotic sulfonamides and non-antibiotic sulfonamides is extremely low and may be nonexistent.

Ref: Whelton PK, Carey RM, Aronow WS, et al: 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA guideline for the prevention, detection, evaluation, and management of high blood pressure in adults: A report of the American College of Cardiology/American Heart Association Task Force on clinical practice guidelines. *Hypertension* 2018;71(6):e13-e115.

Item 114**ANSWER: D**

The recommended HPV vaccine series includes two or three doses depending on the age of initiation. Two doses of HPV vaccine are recommended for children and adolescents who start the series before 15 years of age. The second dose should be administered 6–12 months after the initial dose. If the patient is 15 years or older at vaccine initiation, then a three-dose series would be indicated at 0, 1–2, and 6 months. In this case, neither child has received HPV vaccine previously, so the 11-year-old needs a two-dose HPV vaccine series and the 17-year-old needs three doses. Although the optimal timing for HPV vaccination is before the initiation of sexual activity, it can still provide protection if administered after a patient has become sexually active. It is unlikely that this 17-year-old patient was exposed to all HPV serotypes and therefore could still receive significant benefit. There is no need to limit the administration of HPV vaccine based on testing for sexually transmitted infections.

Ref: Meites E, Kempe A, Markowitz LE: Use of a 2-dose schedule for human papillomavirus vaccination - Updated recommendations of the Advisory Committee on Immunization Practices. *MMWR Morb Mortal Wkly Rep* 2016;65(49):1405-1408. 2) HPV (ACIP) vaccine recommendations. Centers for Disease Control and Prevention, reviewed 2016. 3) Human papillomavirus (HPV): For healthcare professionals. Centers for Disease Control and Prevention, reviewed 2019.

Item 115**ANSWER: D**

All patients taking more than 50 morphine milligram equivalents (MMEs) daily of chronically prescribed opioids should also be prescribed naloxone in case of overdose. Naloxone is an opioid antagonist that displaces opioids from their receptors and reverses the effects. Benzodiazepines such as clonazepam increase the risk of overdose. Clonidine has been used to treat symptoms of opiate withdrawal. Methadone is a full opioid agonist used in opioid use disorder or to treat chronic pain. Naltrexone is an opioid antagonist that must be refrigerated and administered by trained medical staff.

Ref: Dowell D, Haegerich TM, Chou R: CDC guideline for prescribing opioids for chronic pain—United States, 2016. *MMWR Recomm Rep* 2016;65(1):1-49. 2) Coffa D, Snyder H: Opioid use disorder: Medical treatment options. *Am Fam Physician* 2019;100(7):416-425.

Item 116**ANSWER: A**

Patients with moderate to severe COPD should be evaluated periodically for hypoxemia to determine the need for long-term oxygen therapy. In a Cochrane review of six randomized, controlled trials, oxygen therapy improved survival in select patients with COPD and severe resting hypoxemia (a resting arterial partial pressure of oxygen <55 mm Hg or an oxygen saturation ≤88%).

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

Item 117**ANSWER: C**

It is important to provide influenza vaccine to as many individuals as possible. Patients with an egg allergy can receive any form of the influenza vaccine. Patients who have an angioedema reaction to egg products should receive the vaccine in an office setting. Testing for specific responses to egg allergens is not recommended prior to giving the vaccine.

Ref: Flu vaccine and people with egg allergies. Centers for Disease Control and Prevention, reviewed 2017. 2) Seasonal flu shot. Centers for Disease Control and Prevention, reviewed 2020.

Item 118**ANSWER: C**

This patient has previously unrecognized compensated hepatic cirrhosis. While the diagnosis of cirrhosis should be confirmed and assessed by methods such as transient elastography, the family physician should recognize this as presumed cirrhosis based on the splenomegaly and laboratory findings.

NSAIDs such as ibuprofen should be avoided in patients with cirrhosis due to the risk of renal insufficiency (SOR B). While toxic to the liver at high doses, acetaminophen can be safely used for analgesia in cirrhotic patients, though many hepatologists recommend limiting dosing to 2 g daily (SOR C). Statins can be safely used in compensated cirrhosis and may improve steatosis (SOR A). Lisinopril and metformin can also be used safely, hypertension should not be overtreated as cirrhosis progresses to a decompensated state.

Ref: Ge PS, Runyon BA: Treatment of patients with cirrhosis. *N Engl J Med* 2016;375(8):767-777.

Item 119**ANSWER: E**

Visual hallucinations are associated with Parkinson's disease, and are seen with Parkinson's dementia, which is a type of Lewy body dementia. The combination of auditory and visual hallucinations is associated with schizophrenia. Hypnagogic and hypnopompic hallucinations are associated with sleep disorders.

Ref: Ramar K, Olsen EJ: Management of common sleep disorders. *Am Fam Physician* 2013;88(4):231-238. 2) Griswold KS, Del Regno PA, Berger RC: Recognition and differential diagnosis of psychosis in primary care. *Am Fam Physician* 2015;91(12):856-863. 3) 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 120**ANSWER: E**

Scaphoid fractures have a high risk for nonunion because the blood supply arises distally from branches of the radial artery. The proximal pole of the scaphoid is entirely dependent on this distal blood supply. To improve healing and decrease the risk of nonunion and avascular necrosis, displaced fractures should be treated with surgical fixation. Nondisplaced fractures of the distal third of the scaphoid may be treated with a short arm thumb spica cast for 4–6 weeks. Middle and proximal fractures should be treated with a long arm thumb spica cast for 6 weeks, followed by a short arm thumb spica cast.

Ref: Townsend CM Jr, Beauchamp RD, Evers BM, Mattox KL: *Sabiston Textbook of Surgery: The Biological Basis of Modern Surgical Practice*, ed 20. Elsevier, 2017, pp 1975-2026. 2) Eiff MP, Hatch R: *Fracture Management for Primary Care*, ed 3. Elsevier Saunders, 2018, pp 84-92.

Item 121**ANSWER: D**

This patient most likely has benign idiopathic hirsutism. It is estimated that approximately 50% of women with mild hirsutism have idiopathic hirsutism. In the absence of other worrisome findings on the history or examination, such as a rapid onset, virilization, or a high degree of hirsutism, the most appropriate next step is a trial of pharmacologic therapy, using oral contraceptive pills as the first-line agent if the patient does not desire pregnancy. A minimum 6-month trial is needed because of the length of the hair growth cycle. An early morning total testosterone level, a full hormonal workup, and transvaginal ultrasonography would be appropriate if there were other signs and symptoms of hyperandrogenism on the history or examination.

Ref: Matheson E, Bain J: Hirsutism in women. *Am Fam Physician* 2019;100(3):168-175.

Item 122**ANSWER: B**

Permethrin 1% shampoo is recommended as first-line treatment for head lice. Lindane should not be used because of neurotoxicity. Pyrethrum 0.3%/piperonyl butoxide 4% shampoo, ivermectin 0.5% lotion, and malathion 0.5% lotion are alternative treatments but should not be used unless two treatments with permethrin are unsuccessful.

Ref: Gunning K, Kiraly B, Pippitt K: Lice and scabies: Treatment update. *Am Fam Physician* 2019;99(10):635-642.

Item 123**ANSWER: B**

This patient has a hypertensive urgency, defined as symptomatic acute severe hypertension without evidence of acute end-organ injury. Hypertensive urgencies may be managed in the ambulatory setting. Emergent intravenous treatment at the hospital is not indicated. This patient should be treated with an oral agent with a fairly rapid onset of action, such as clonidine, labetalol, captopril, or prazosin. Topical nitroglycerin is also an option. Nifedipine may cause unpredictable blood pressure reduction and should be avoided. The patient may be discharged to resume his usual medications after his symptoms have improved and his blood pressure is below 160–180/110 mm Hg, with follow-up within a week.

Ref: Peixoto AJ: Acute severe hypertension. *N Engl J Med* 2019;381(19):1843-1852.

Item 124**ANSWER: D**

Current U.S. Preventive Services Task Force guidelines for breast cancer screening recommend biennial screening mammography for women ages 50–75 (B recommendation). Biennial screening mammography can be considered for women age 40–49 after discussing the risks and benefits with the patient (C recommendation).

Ref: Campos-Outcalt D: 8 USPSTF recommendations FPs need to know about. *J Fam Pract* 2016;65(5):338-341. 2) *Final Recommendation Statement: Breast Cancer: Screening*. US Preventive Services Task Force, 2016.

Item 125**ANSWER: B**

A recent Cochrane review revealed that a low-salt diet consistently lowers blood pressure in patients with chronic kidney disease (CKD). Current evidence is lacking as to whether a low-salt diet leads to decreased mortality or an increased time to dialysis. A low-salt diet has also been shown to decrease proteinuria in patients with CKD.

Ref: McMahon EJ, Campbell KL, Bauer JD, Mudge DW: Altered dietary salt intake for people with chronic kidney disease. *Cochrane Database Syst Rev* 2015;(2):CD010070.

Item 126**ANSWER: E**

This patient exhibits classic symptoms and signs of proximal muscle (shoulder and hip girdle musculature) weakness but not distal muscle weakness. Of the conditions listed, various types of myositis, including polymyositis, are associated with proximal but not distal or bulbar (lower cranial nerves) weakness. Patients with proximal muscle weakness have difficulty walking up or down steps, or they exhibit weakness with overhead lifting or other activities requiring the upper arm and shoulder musculature.

Fluoroquinolone use is associated with tendinopathy that may also cause distal rather than proximal muscle weakness. Frailty syndrome is associated with loss of muscle mass and patients exhibit a gradually slowing gait, usually combined proximal and distal muscle weakness, falls, and diminished grip strength. Guillain-Barré syndrome develops fairly rapidly, in a matter of days, and weakness begins distally, then progresses proximally (ascending paralysis), and is also associated with respiratory muscle and bulbar involvement. The neuromuscular manifestations of multiple sclerosis are widely varied, have a gradual onset, are most often unilateral, and usually include bulbar and/or sensory involvement.

Ref: Larson ST, Wilbur J: Muscle weakness in adults: Evaluation and differential diagnosis. *Am Fam Physician* 2020;101(2):95-108.

Item 127

ANSWER: A

Idiopathic pulmonary fibrosis occurs most often in male former smokers over the age of 60. For patients with newly diagnosed interstitial lung disease (ILD) with suspected idiopathic pulmonary fibrosis, the American Thoracic Society recommends taking a detailed history of medication use and environmental exposures over the patient's lifetime. In an observational study of 1084 patients, 47% were identified as having hypersensitivity pneumonitis on a detailed assessment of new-onset ILD with an unknown cause. Laboratory testing for connective tissue disease is also recommended. Antibiotics would be appropriate to treat a bacterial infection. Furosemide is used to treat heart failure. An inhaled short-acting β -agonist and pulmonary rehabilitation would not be appropriate at this time.

Ref: Raghu G, Remy-Jardin M, Myers JL, et al: Diagnosis of idiopathic pulmonary fibrosis. An official ATS/ERS/JRS/ALAT Clinical Practice Guideline. *Am J Respir Crit Care Med* 2018;198(5):e44-e68.

Item 128

ANSWER: A

In a clinical trial of patients with sickle cell disease, those taking hydroxyurea had two fewer severe vaso-occlusive pain crises per year, and they also had a decreased need for blood transfusions. Hydroxyurea is also the only medication that has been shown to prevent acute chest syndrome (ACS) in sickle cell disease, with a number needed to treat of 6 to prevent an episode of ACS over a 21-month period. Hydroxyurea therapy has traditionally been recommended for patients who have three or more severe vaso-occlusive pain crises per year, or for those who have daily pain that affects their quality of life. However, given the risk-to-benefit profile of the medication, current guidelines now recommend offering hydroxyurea to reduce complication rates for all patients older than 9 months of age with sickle cell anemia (SOR B).

Oral penicillin prophylaxis to prevent pneumococcal sepsis is indicated for young children (typically up until age 5), not young adults. Similarly, transcranial Doppler ultrasonography to screen for stroke is performed in children and adolescents. This adult patient, who has no headache or other worrisome symptoms, does not require screening. This patient does not have daily pain or pain on the majority of days, so he does not need daily long-acting opioid therapy. Blood transfusions in asymptomatic patients can lead to iron overload in patients with sickle cell disease. There is no consensus regarding the hemoglobin level that should automatically prompt a blood transfusion in these patients.

Ref: National Heart, Lung, and Blood Institute Expert Panel. Evidence-based management of sickle cell disease. Expert panel report, 2014. 2) Yawn BP, John-Sowah J: Management of sickle cell disease: Recommendations from the 2014 Expert Panel Report. *Am Fam Physician* 2015;92(12):1069-1076.

Item 129

ANSWER: C

A copper-containing IUD may be placed at any time during the menstrual cycle and does not require the use of backup contraception. If oral contraceptives are started the day of the appointment, then backup contraception is needed for the first week. If oral contraceptives will be started with the next menstrual cycle, then backup contraception is needed until the pills are started. Backup contraception is needed if a hormonal implant is placed more than 5 days from the start of the last menstrual period, and if a levonorgestrel IUD is placed more than 7 days from the start of the last menstrual period.

Ref: Curtis KM, Peipert JF: Long-acting reversible contraception. *N Engl J Med* 2017;376(5):461-468.

Item 130

ANSWER: D

After treatment for a *Helicobacter pylori* infection it is essential to document clearance of the infection. This is typically done with a stool antigen test or a urea breath test performed 1 month after the completion of antibiotic therapy. If the patient is taking a proton pump inhibitor it should be discontinued prior to the test. *H. pylori* IgG or IgM levels and gastric biopsies are not appropriate for documenting clearance of *H. pylori* infection.

Ref: Crowe SE: *Helicobacter pylori* infection. *N Engl J Med* 2019;380(12):1158-1165.

Item 131

ANSWER: D

The clinical findings on examination, including symmetric polyarthritis, thrombocytopenia, positive antinuclear antibodies (ANAs), and pleural effusion, meet the American College of Rheumatology criteria for a diagnosis of systemic lupus erythematosus (SLE). The rash and the patient's neuropsychiatric history may also factor into the diagnosis, but they are not described specifically in this case. A positive ANA is sensitive but not specific for SLE. Although additional laboratory testing may not be needed to confirm SLE in this case due to classic clinical findings, low complement levels help confirm SLE and may be helpful because the ANA is only mildly elevated.

Elevated anticyclic citrullinated peptide antibodies help confirm a diagnosis of rheumatoid arthritis. Anti-smooth muscle antibodies are used to confirm autoimmune hepatitis, which can also cause an elevated ANA. Anti-centromere antibodies, a subset of ANAs, are more closely associated with systemic sclerosis. A positive HLA-B27 test is associated with the seronegative spondyloarthropathies, such as psoriatic arthritis.

Ref: Lam NC, Ghetu MV, Bieniek ML: Systemic lupus erythematosus: Primary care approach to diagnosis and management. *Am Fam Physician* 2016;94(4):284-294.

Item 132

ANSWER: E

Carpal tunnel syndrome (CTS) results in pressure on the median nerve as it passes through the volar wrist to the palm. Sensory symptoms include paresthesias (tingling, burning), numbness, and/or pain, and these symptoms occur before motor weakness. The sensory distribution of the median nerve is to the thumb, index finger, and long finger, and the radial half of the ring (fourth) finger. The median nerve's motor function is thumb adduction, and CTS can result in thenar eminence atrophy and weakness of thumb adduction if untreated. Morning stiffness in the fingers is associated with inflammatory arthritis rather than CTS. Numbness on the dorsum of the hand is often associated with de Quervain's tenosynovitis. Cubital tunnel syndrome usually presents with numbness and tingling along the ulnar border of the forearm and hand, as well as the ring and little fingers.

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

Item 133

ANSWER: E

Treatment of substance abuse disorders is multifactorial and should address the needs of the whole person. Evidence-based treatment modalities range from school- and parent-based interventions to medication-assisted treatment. Of the options listed, only naltrexone can be used for both alcohol and opioid use disorders. Acamprosate and disulfiram are used for alcohol use disorder, bupropion is used for nicotine use disorder, and methadone is used for opioid use disorder (SOR C).

Ref: Kulak JA, Griswold KS: Adolescent substance use and misuse: Recognition and management. *Am Fam Physician* 2019;99(11):689-696.

Item 134**ANSWER: C**

Family physicians serving as team physicians for school-aged athletes are often asked to evaluate heat-related illnesses. It is important to differentiate mild and serious heat-related conditions to help protect athletes. Heat-related muscle cramps are common and self-limited, and players may resume activity upon resolution of symptoms. Measurement of the patient's temperature is not indicated in this scenario. Malaise, significant fatigue, and presyncope are symptoms of heat exhaustion, which does require prolonged removal from play, along with monitoring of the patient's temperature and mental status.

Ref: Gauer R, Meyers BK: Heat-related illnesses. *Am Fam Physician* 2019;99(8):482-489.

Item 135**ANSWER: C**

Of the patients listed, only the patient with a transcatheter-implanted aortic valve is at increased risk of infective endocarditis (IE) associated with dental procedures. Any patient with a history of valve repair or replacement that involves prosthetic material is at increased risk for IE, but even those with significant valvular disease do not benefit from prophylaxis. Certain patients with congenital heart disease should also receive prophylaxis, but an isolated atrial septal defect is not associated with an increased risk of IE after dental procedures.

Ref: Prophylaxis against infective endocarditis: Antimicrobial prophylaxis against infective endocarditis in adults and children undergoing interventional procedures. National Institute for Health and Care Excellence, 2016. 2) Matiasz R, Rigolin VH: 2017 focused update for management of patients with valvular heart disease: Summary of new recommendations. *J Am Heart Assoc* 2018;7(1):e007596.

Item 136**ANSWER: B**

Trigger finger is a common reason for referral to a hand surgeon. Risks factors for this condition include trauma, overuse, diabetes mellitus, and carpal tunnel syndrome. It is much more common in women than in men and the average age of onset is 58. Trigger finger develops when there is scarring and inflammation of the A1 pulley, the first of a five-pulley system in the hand. Stenosis of the A1 canal or nodules on the tendon can produce locking, cracking, and pain when the digit is flexed. The most cost-effective treatment strategy is the use of corticosteroid injections. The success rate is 57% after the initial injection and 86% following the second injection within a 6-month time frame. When the problem is mild, NSAIDs and splinting may be effective. Physical therapy and surgical correction are not indicated for this patient.

Ref: Foster ZJ, Voss TT, Hatch J, Frimodig A: Corticosteroid injection for common musculoskeletal conditions. *Am Fam Physician* 2015;92(8):694-699. 2) Brozovich N, Agrawal D, Reddy G: A critical appraisal of adult trigger finger: Pathophysiology, treatment, and future outlook. *Plast Reconstr Surg Glob Open* 2019;7(8):e2360.

Item 137**ANSWER: B**

Procalcitonin is a biomarker for the presence of severe bacterial infections such as pneumonia and sepsis. Its utility in clinical decision-making is reducing unnecessary antibiotic use, which reduces antibiotic resistance. Its use in guiding treatment is associated with reduced mortality (SOR A) and with fewer antibiotic treatment days and fewer antibiotic complications (SOR B). Procalcitonin levels are not useful in assessing nutritional status, ruling out pulmonary embolism, early identification of the syndrome of inappropriate secretion of antidiuretic hormone, or identifying acute respiratory distress syndrome.

Ref: Kaysin A, Viera AJ: Community-acquired pneumonia in adults: Diagnosis and management. *Am Fam Physician* 2016;94(9):698-706. 2) Jonas CE, Cimino F, Hulsopple C: Procalcitonin to guide antibiotic therapy in acute respiratory infections. *Am Fam Physician* 2018;98(1):20-21.

Item 138**ANSWER: B**

This clinical case is consistent with Addison's disease, or adrenal insufficiency. This case is most likely the result of autoimmune disease, given the concurrent vitiligo, but it may also be idiopathic or secondary to cancers such as lymphoma or infections such as tuberculosis. Adrenal insufficiency is suggested by a low morning cortisol level, but the test of choice to confirm this diagnosis is the ACTH stimulation test.

17-Hydroxyprogesterone deficiency causes congenital adrenal hyperplasia, which typically presents in childhood. This test is part of newborn screening in the United States. Acquired 17-hydroxyprogesterone deficiency can present in adulthood as adrenal insufficiency but a low 17-hydroxyprogesterone level does not confirm adrenal insufficiency. Late night salivary cortisol is an initial test for corticosteroid excess (Cushing syndrome) and the dexamethasone suppression test is used to confirm that disorder. Renin and aldosterone levels can be helpful to characterize mineralocorticoid deficiency but they are not diagnostic.

Ref: Michels A, Michels N: Addison disease: Early detection and treatment principles. *Am Fam Physician* 2014;89(7):563-568. 2) Bornstein SR, Allolio B, Arlt W, et al: Diagnosis and treatment of primary adrenal insufficiency: An Endocrine Society clinical practice guideline. *J Clin Endocrinol Metab* 2016;101(2):364-389. 3) Ralston SH, Penman ID, Strachan MWJ, Hobson RP (eds): *Davidson's Principles and Practice of Medicine*, ed 23. Elsevier, 2018, pp 629-689.

Item 139**ANSWER: A**

Erythema ab igne is characterized by reticular brown hyperpigmented skin changes at the site of exposure to heat, which this patient has developed due to regular use of a heating pad. Exposure to excess heat and humidity can predispose an individual to this condition. Henoch-Schönlein purpura is a leukocytoclastic vasculitis and is characterized by palpable purpuric lesions on the lower extremities and buttocks, usually sparing the trunk. It may be preceded by a streptococcal or viral upper respiratory infection. Idiopathic guttate hypomelanosis consists of 2- to 5-mm white spots with sharply demarcated borders on sun-exposed areas of the arms and legs. Tinea versicolor is a fungal infection that is characterized by white, pink, or brown circular macules most commonly located on the upper trunk.

Ref: Habib TP: *Clinical Dermatology: A Color Guide to Diagnosis and Therapy*, ed 6. Elsevier, 2016, pp 530, 735, 776, 783.

Item 140

ANSWER: B

The CDC recommends that all adults 18 years of age or older receive a one-time screening for hepatitis C virus (HCV). Persons with risk factors for HCV exposure should be screened periodically, based on risk level. If the anti-HCV antibody screen is positive, then a qualitative HCV RNA test is the next step (SOR C). Prior to initiating treatment, a quantitative HCV RNA and genotype testing is necessary (SOR A). In addition, assessing the degree of fibrosis will provide information regarding the urgency of treatment. Percutaneous liver biopsy is generally the preferred evaluation after obtaining quantitative and genotype results, all of which can guide treatment decisions.

Ref: Wilkins T, Akhtar M, Gititu E, et al: Diagnosis and management of hepatitis C. *Am Fam Physician* 2015;91(12):835-842. 2) National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention: Hepatitis C information: Testing recommendations for hepatitis C virus infection. Centers for Disease Control and Prevention, reviewed 2020.

Item 141

ANSWER: A

Four widely recognized principles of medical ethics include respect for autonomy, beneficence, nonmaleficence, and justice. Respect for patient autonomy is central to medical ethics and to the doctor-patient relationship. Physicians should involve patients in health care decisions commensurate with the patient's capacity to understand and make decisions. Even when a condition affects a patient's decision-making capacity, the patient may be able to participate in some aspects of the decision-making process. Competence (or incompetence) is a legal term, which can be used to refer to a patient being granted autonomy or not. Harm and safety are not ethical principles, but are related to the principle of nonmaleficence, or "do no harm." The principle of justice addresses the question of who ought to receive the benefits of an intervention and/or bear its burdens. An injustice occurs when a person who is entitled to a benefit is denied without good reason or when some burden is imposed unduly.

Ref: Gillon R: Medical ethics: Four principles plus attention to scope. *BMJ* 1994;309(6948):184-188. 2) Beauchamp T, Childress J: *Principles of Biomedical Ethics*: Marking its fortieth anniversary. *Am J Bioeth* 2019;19(11):9-12. 3) Informed consent & shared decision making: Decisions for adult patients who lack capacity: Opinion E-2.1.2. American Medical Association Code of Medical Ethics.

Item 142**ANSWER: A**

Hundreds of thousands of Americans have undergone bariatric surgery, and family physicians are often asked to provide long-term postoperative management. Many bariatric surgery procedures create a small stomach pouch. Dietary compliance is essential to minimize feeding intolerance symptoms such as postprandial nausea, emesis, and diarrhea. Post bariatric surgery diet recommendations typically include the following:

- Avoid fluid 15 minutes before and after meals. Fluids with meals will move food more quickly through the pouch and decrease the feeling of fullness.
- Avoid carbonated beverages entirely.
- Eat three small protein-rich meals and one or two snacks daily. Lower fat diets are not typically recommended.
- Whole grains and fibrous vegetables often exacerbate symptoms so there is no need to increase these foods.

Ref: Virji A, Murr MM: Caring for patients after bariatric surgery. *Am Fam Physician* 2006;73(8):1403-1408. 2) Schroeder R, Harrison TD, McGraw SL: Treatment of adult obesity with bariatric surgery. *Am Fam Physician* 2016;93(1):31-37. 3) Ebell MH: Bariatric surgery improves quality of life and results in more weight loss than intensive medical therapy. *Am Fam Physician* 2017;95(12):805.

Item 143**ANSWER: E**

A systematic review found that arthroscopic procedures for degenerative meniscal tears in middle-aged adults with little or no arthritis do not significantly improve long-term pain or function compared to conservative management consisting of physical therapy and a standardized exercise program. No studies have compared conservative management to intra-articular injections of corticosteroids or hylan GF 20 for managing degenerative meniscal tears, either alone or when combined with conservative management.

Ref: Khan M, Evaniew N, Bedi A, et al: Arthroscopic surgery for degenerative tears of the meniscus: A systematic review and meta-analysis. *CMAJ* 2014;186(14):1057-1064. 2) Ebell MH: No long-term benefit of arthroscopic surgery for meniscal tears in middle-aged persons. *Am Fam Physician* 2015;91(9):643.

Item 144**ANSWER: A**

The STOP-Bang questionnaire is a screening tool to help identify patients with obstructive sleep apnea. In the questionnaire S = snoring, T = tiredness, O = observed apnea, P = high blood pressure, B = BMI >35 kg/m², A = age >50 years, N = neck circumference >40 cm, and G = male gender. For each question, answering “yes” scores 1, answering “no” scores 0, and the total score can range from 0 to 8, with a higher score indicating a higher probability of obstructive sleep apnea. Pulse rate, resting oxygen saturation, smoking status, and waist circumference are not components of the STOP-Bang questionnaire.

Ref: Chung F, Abdullah HR, Liao P: STOP-Bang questionnaire: A practical approach to screen for obstructive sleep apnea. *Chest* 2016;149(3):631-638.

Item 145**ANSWER: E**

This patient meets the criteria for conduct disorder, which is a psychiatric syndrome occurring in childhood and adolescence. Aggression toward people or animals, deceitfulness, theft, destruction of property, and serious violations of rules are characteristic symptoms. Risk factors include poverty in childhood, male sex, exposure to sexual or physical abuse, and domestic violence. The *DSM-5* specifies that at least 3 of 15 criteria should have been present in the past 12 months for a formal diagnosis. The treatment is multifaceted. Psychosocial interventions are recommended as the first-line treatment (C evidence rating). The FDA has not approved medications for the treatment of conduct disorder unless they are indicated for concurrent attention-deficit/hyperactivity disorder (ADHD). The FDA recommends considering risperidone as a short-term treatment for explosive anger or severe aggression after comorbid ADHD is treated. Carbamazepine, haloperidol, lithium, and quetiapine would not be appropriate treatments for this patient's conduct disorder.

Ref: Lillig M: Conduct disorder: Recognition and management. *Am Fam Physician* 2018;98(10):584-592.

Item 146**ANSWER: B**

This patient has symptoms and laboratory findings consistent with iron deficiency. Because she is premenopausal, excessive menstrual bleeding is a possible etiology, as is insufficient iron intake, given her strict vegan diet. The best first step is to replace her iron stores with an oral replacement. Although a hemoglobin level should be rechecked in 3 months, this should happen after the initiation of iron therapy. Intravenous iron infusion is reserved for patients who cannot tolerate oral therapy. This patient does not require a blood transfusion at this time. If she does not respond to iron therapy, and common causes such as dietary restriction and menstrual bleeding are excluded, then she should be referred for colonoscopy to search for a gastrointestinal cause of blood loss.

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) Jimenez K, Kulnigg-Dabsch S, Gasche C: Management of iron deficiency anemia. *Gastroenterol Hepatol (N Y)* 2015;11(4):241-250.

Item 147**ANSWER: E**

Trimethoprim/sulfamethoxazole is one of the antimicrobials most likely to increase the INR of a patient taking warfarin. If trimethoprim/sulfamethoxazole is used in a patient on warfarin, reducing the warfarin dosage by 25%–40% is recommended, with close monitoring of the INR. The patient's INR should be checked within 3–5 days of starting or stopping any antimicrobial.

First generation cephalosporins such as cephalexin, fourth generation cephalosporins, clindamycin, and penicillin G have a lower likelihood of affecting the INR. Rifampin decreases the INR and the warfarin dosage should be increased if rifampin is started. Other antimicrobials that significantly affect the INR include metronidazole and fluconazole. Azithromycin, ciprofloxacin, clarithromycin, and levofloxacin may impact the INR with a variable patient-specific effect.

Ref: Carpenter M, Berry H, Pelletier AL: Clinically relevant drug-drug interactions in primary care. *Am Fam Physician* 2019;99(9):558-564.

Item 148

ANSWER: C

Early and consistent dental care in infants has been shown to reduce the rate of early childhood caries. The American Academy of Pediatric Dentistry recommends the use of low-fluoride toothpaste for tooth cleaning, starting with newly erupted teeth. According to the CDC, dental caries is one of the most prevalent chronic conditions among children in the United States. Dental caries can start soon after eruption of the first teeth. Brushing an infant's teeth twice daily with a "smear" of fluoridated toothpaste is recommended. Fluoridated toothpaste has been found to be safe and effective for infants' teeth. The use of fluoride in toothpaste is more effective for the prevention of caries than wiping or brushing the teeth with water. A daily fluoride supplement is not appropriate for this patient because the family's local water source already contains fluoride. Topical sealants are intended for molar teeth, not incisors.

Ref: Perinatal and infant oral health care. American Academy of Pediatric Dentistry, revised 2016. 2) Stephens MB, Wiedemer JP, Kushner GM: Dental problems in primary care. *Am Fam Physician* 2018;98(11):654-660.

Item 149

ANSWER: D

Erythrasma is a superficial infection caused by *Corynebacterium minutissimum*. It presents as small, red-brown macules that may coalesce into larger patches with sharp borders. It fluoresces coral red on Wood's lamp examination. Cutaneous erythrasma is treated with erythromycin (topical, twice daily until the rash resolves, or oral, 250 mg four times daily for 2 weeks). Topical clindamycin, Whitfield ointment, and antibiotic soaps may also be beneficial. Triamcinolone cream, hydrocortisone cream, nystatin cream, and oral antifungals are not effective treatments for this bacterial infection.

Ref: Kalra MG, Higgins KE, Kinney BS: Intertrigo and secondary skin infections. *Am Fam Physician* 2014;89(7):569-573.

Item 150**ANSWER: B**

Achalasia is associated with the loss of ganglion cells in the esophageal wall, which leads to the loss of normal esophageal peristalsis and failure of relaxation of the lower esophageal sphincter (LES). Incomplete LES relaxation is highly specific for achalasia. Ineffective esophageal motility is demonstrated by an inability to generate an effective swallow $\geq 50\%$ of the time during motility testing. Hypercontractile esophagus, also known as jackhammer esophagus, leads to high-pressure contractions in the esophagus but normal LES functioning. Diffuse esophageal spasm leads to increased premature contractions of the esophagus with normal functioning of the LES. Esophageal webs are mechanical obstructions unrelated to achalasia.

Ref: Kahrilas PJ, Bredenoord AJ, Fox M, et al: The Chicago classification of esophageal motility disorders, v3.0. *Neurogastroenterol Motil* 2015;27(2):160-174. 2) Goldman L, Schafer AI (eds): *Goldman-Cecil Medicine*, ed 25. Elsevier Saunders, 2016, pp 903-904.

Item 151**ANSWER: E**

Plantar fasciitis is the most common cause of heel pain in adults. It is characterized by stabbing pain over the anteromedial plantar aspect of the heel. It is usually worse with ambulation after a period of inactivity, such as the first steps of the day. Paresthesias are uncommon. Burning over the inferomedial aspect of the calcaneus is more characteristic of medial calcaneal nerve entrapment. Pain with resisted flexion of the great toe is more characteristic of flexor hallucis longus tenosynovitis. Paresthesia in the plantar aspect of the foot is more characteristic of tarsal tunnel syndrome. Swelling and pain in the retrocalcaneal region is more characteristic of retrocalcaneal bursitis.

Ref: Trojjan T, Tucker AK: Plantar fasciitis. *Am Fam Physician* 2019;99(12):744-750.

Item 152**ANSWER: B**

The use of anticholinergic medications and other sedatives has been prospectively linked to an increased risk of dementia. Treatment of overactive bladder and depression could include anticholinergics, which can be inadvertently combined with over-the-counter medications such as chlorpheniramine. Alternative medications should be considered for older patients when possible. There is no association between the use of anticholinergic agents and cirrhosis, Parkinson's disease, peripheral vascular disease, or pulmonary fibrosis.

Ref: Gray SL, Anderson ML, Dublin S, et al: Cumulative use of strong anticholinergics and incident dementia: A prospective cohort study. *JAMA Intern Med* 2015;175(3):401-407. 2) Chatterjee S, Bali V, Carnahan RM, et al: Anticholinergic medication use and risk of dementia among elderly nursing home residents with depression. *Am J Geriatr Psychiatry* 2016;24(6):485-495.

Item 153**ANSWER: B**

Amblyopia is one of the most common causes of vision abnormalities in children, and early detection and treatment can help prevent vision loss. The U.S. Preventive Services Task Force recommends vision screening for all children at least once between 3 and 5 years of age to detect the presence of amblyopia or its risk factors (B recommendation).

Ref: McConaghy JR, McGuirk R: Amblyopia: Detection and treatment. *Am Fam Physician* 2019;100(12):745-750.

Item 154**ANSWER: C**

This patient has been on menopausal hormone therapy for an extended period of time. A discussion about cessation is warranted, as it is common practice to use hormones for the shortest duration possible. The American College of Obstetricians and Gynecologists does not recommend discontinuation based on age or duration of treatment alone, however, recommending instead that the patient history and symptoms be taken into account. Tapering hormones versus abrupt discontinuation of hormones is not well studied, and patients can do well with either plan. Vaginal estrogen should be used with similar cautions as oral estrogen and is primarily indicated for genitourinary symptoms of menopause, so switching from oral estrogen to vaginal estrogen would not be indicated in this case. Menopausal hormone therapy does decrease the risk for hip fractures, but the American Academy of Family Physicians, like the U.S. Preventive Services Task Force, does not recommend using hormone therapy for prevention of chronic conditions, so the patient's bone density should not be a consideration.

Ref: ACOG Committee Opinion No. 565: Hormone therapy and heart disease. *Obstet Gynecol* 2013;121(6):1407-1410. 2) Hill DA, Crider M, Hill SR: Hormone therapy and other treatments for symptoms of menopause. *Am Fam Physician* 2016;94(11):884-889. 3) *Final Recommendation Statement: Hormone Therapy in Postmenopausal Women: Primary Prevention of Chronic Conditions*. US Preventive Services Task Force, 2017.

Item 155**ANSWER: A**

The U.S. Preventive Services Task Force, the American College of Physicians, the American College of Cardiology, and the American Academy of Family Physicians recommend against cardiac screening with stress testing in low-risk asymptomatic individuals, so an exercise EKG, exercise echocardiography, an exercise sestamibi stress test, and dobutamine stress echocardiography would not be recommended for this patient. Cardiovascular screening tests in asymptomatic patients have a low yield and may produce many false positives, leading to costly and potentially harmful invasive procedures. Many patients ask for this type of screening, but explaining current guidelines may help them understand why they should not be screened.

Ref: Roth AR, Lazris A, Ganatra S: Overuse of cardiac testing. *Am Fam Physician* 2018;98(10):561-563.

Item 156**ANSWER: B**

This patient has a young child who has been diagnosed with influenza, and she has two factors that place her in the high-risk category for complications from influenza: pregnancy and asthma. Pregnancy is an indication for influenza vaccine, not a reason to avoid it. In addition to influenza vaccine now, she should begin a 2-week course of chemoprophylaxis to allow time for the vaccine to become effective. The safety record for oseltamivir in pregnancy is good, and it is the preferred choice in this situation. Baloxavir marboxil has not been approved for chemoprophylaxis and should be avoided in pregnancy. Peramivir is an intravenous formulation that is used in hospitalized patients with severe influenza. Amantadine and rimantadine are not active against influenza B, and most influenza A strains are resistant. Zanamivir should be avoided in patients with asthma.

Ref: Gaitonde DY, Moore FC, Morgan MK: Influenza: Diagnosis and treatment. *Am Fam Physician* 2019;100(12):751-758.

Item 157**ANSWER: E**

Hyperthyroidism is a common condition with a generally favorable prognosis. However, it is important to remember that life-threatening complications such as thyrotoxicosis, also known as thyroid storm, can occur. Symptoms of thyroid storm include fever, central nervous system dysfunction, gastrointestinal or liver dysfunction, and cardiovascular complications such as tachycardia and heart failure. The diagnosis is made using the Burch-Wartofsky Point Scale, which produces a total score based on the presence or absence of various diagnostic criteria. In this case, the patient has a score of 45, which is highly suggestive of thyroid storm. This acute, life-threatening condition typically requires care in an intensive-care unit. It would therefore be inappropriate to start treatment with an agent such as methimazole prior to hospitalization. While a thyroid receptor antibody test may be useful in identifying the cause of the condition it should not delay hospitalization. A radioactive iodine uptake test is also useful for identifying the underlying cause of hyperthyroidism but should be avoided until the thyroid storm has resolved. This patient requires hospitalization, so a referral to endocrinology would not be most appropriate at this time.

Ref: Vaidya B, Pearce SH: Diagnosis and management of thyrotoxicosis. *BMJ* 2014;349:g5128. 2) Kravets I: Hyperthyroidism: Diagnosis and treatment. *Am Fam Physician* 2016;93(5):363-370.

Item 158**ANSWER: B**

Evaluation of uncomplicated concussions does not require imaging. When a more severe injury is evident, the modality of choice is CT. Plain radiographs have minimal utility in the evaluation of head trauma. MRI is most appropriate for evaluation of prolonged symptoms. Functional MRI is still a research tool for evaluating brain injuries.

Ref: Scorza KA, Cole W: Current concepts in concussion: Initial evaluation and management. *Am Fam Physician* 2019;99(7):426-434.

Item 159**ANSWER: B**

This patient presents with his first recurrence of *Clostridioides (Clostridium) difficile* infection, which was previously treated with vancomycin. Initial episodes can be treated with vancomycin (strong recommendation, high quality of evidence), fidaxomicin (strong recommendation, high quality of evidence), or metronidazole if the other two treatments are unavailable (weak recommendation, high quality of evidence). However, fidaxomicin is recommended for recurrent infection if vancomycin was prescribed for the initial episode (weak recommendation, moderate quality of evidence). If available, a prolonged tapered course of vancomycin could be used if a 10-day course was prescribed initially (weak recommendation, low quality of evidence). Vancomycin is only recommended for a first recurrent episode if metronidazole was used initially (weak recommendation, low quality of evidence). Metronidazole is not recommended for recurrent episodes. Probiotic administration is not recommended due to insufficient data. Fecal microbiota transplantation is only recommended for a second or subsequent recurrent infection (strong recommendation, moderate quality of evidence).

Ref: McDonald LC, Gerding DN, Johnson S, et al: Clinical practice guidelines for *Clostridium difficile* infection in adults and children: 2017 update by the Infectious Diseases Society of America (IDSA) and Society for Healthcare Epidemiology of America (SHEA). *Clin Infect Dis* 2018;66(7):e1-e48.

Item 160**ANSWER: E**

According to the Agency for Healthcare Research and Quality's 2018 guidelines, cognitive-behavioral therapy (CBT), either exposure or mixed treatment, has the best evidence of effectiveness in the treatment of posttraumatic stress disorder (PTSD) (SOR A). CBT focused on either artificial exposures or real-life exposures reduces PTSD and depression symptoms. Artificial exposures can be imagined, written, or virtual reality. Mixed modalities such as cognitive restructuring, exposure-guided imagery, and mindfulness training also reduce PTSD and depression symptoms. Other types of cognitive therapy also have evidence of effectiveness, but the study results are less precise.

The SSRIs fluoxetine and paroxetine and the SNRI venlafaxine have moderate evidence to support their use in the treatment of PTSD (SOR B). The guidelines recommend against the use of amitriptyline, atypical antipsychotics, and topiramate. Benzodiazepines are not recommended in the treatment of PTSD.

Ref: Hoffman V, Middleton JC, Feltner C, et al: Psychological and pharmacological treatments for adults with posttraumatic stress disorder: A systematic review update. Comparative Effectiveness Review no. 207. Agency for Healthcare Research and Quality, 2018, AHRQ Publication No. 18-EHC011-EF. 2) Saguil A: Psychological and pharmacologic treatments for adults with PTSD. *Am Fam Physician* 2019;99(9):577-583.

Item 161**ANSWER: A**

This patient has a minimally displaced oblique right fifth proximal phalanx shaft fracture. Lesser toe fractures such as this typically can be managed conservatively with buddy taping and a rigid-sole shoe. Because this patient has already tried buddy taping, it is appropriate to have him use a rigid-sole shoe. Pneumatic braces can be used for some nondisplaced tuberosity avulsion fractures. Metatarsal shaft fractures are often initially treated with a posterior splint and then transitioned to a walking cast. Referral to an orthopedic surgeon is typically limited to patients with a high-risk fracture such as a displaced Jones fracture, or to patients who are highly competitive athletes.

Ref: Bica D, Sprouse RA, Armen J: Diagnosis and management of common foot fractures. *Am Fam Physician* 2016;93(3):183-191.

Item 162**ANSWER: B**

Title VI of the Civil Rights Act requires a trained interpreter to be offered for patients with limited English proficiency (SOR C). Failure to offer this service is considered discriminatory and illegal. Relying on family, friends, or bilingual staff increases medication errors, unnecessary testing, and the risk of malpractice, and decreases compliance with recommendations. When using a medical interpreter, the physician should address the patient directly to avoid confusion (SOR C).

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

Item 163**ANSWER: A**

This patient is demonstrating early symptoms of possible sepsis. The tachycardia, elevated temperature, and elevated WBC count meet three of the four criteria for systemic inflammatory response syndrome. If an infection is documented the patient would meet the criteria for sepsis. Early recognition and intervention are key to reducing mortality from sepsis. In this patient the hypoperfusion and confusion in the setting of recent surgery should raise suspicion for possible sepsis. The first step in resuscitation is to ensure adequate oxygenation, and this patient is already receiving supplemental oxygen, which has improved his oxygenation.

An infusion of vasopressors is indicated when adequate fluid resuscitation fails to improve organ perfusion and normalize mean arterial pressures. Blood cultures will be important to guide definitive management, but fluid resuscitation is a more immediate priority. While patients with recent knee replacements are at risk for deep vein thrombosis and pulmonary embolism, initial fluid resuscitation and stabilization are more important and should not be delayed in order to perform CT angiography.

Ref: Gauer RL: Early recognition and management of sepsis in adults: The first six hours. *Am Fam Physician* 2013;88(1):44-53.
2) Rhodes A, Evans LE, Alhazzani W, Levy MM, et al: Surviving Sepsis Campaign: International guidelines for management of sepsis and septic shock: 2016. *Intensive Care Med* 2017;43(3):304-377.

Item 164

ANSWER: C

Hypertension in children is defined as a blood pressure ≥ 95 th percentile for age, sex, and height on three separate office visits. The goal for treatment should be to lower the systolic and diastolic blood pressures below the 90th percentile for age, sex, and height. Once children are over 13 years of age, the target should be a blood pressure $< 130/80$ mm Hg.

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):pii:e20171904.

Item 165

ANSWER: E

Hair thinning on the crown of the head with the presence of small, wispy hairs among the regular hair is characteristic of female pattern hair loss (FPHL). A family history of similar issues is often present but not necessary for the diagnosis.

Topical minoxidil is the mainstay of treatment for FPHL (SOR A). It is available in a 2% solution or 5% foam for women (the 5% solution is indicated only for men). Treatment for FPHL as well as the male equivalent, androgenic alopecia, must be continued long term. With treatment there is often an initial period of increased hair loss. Regrowth is noticeable around 6 months. Discontinuation of treatment results in loss of regrown hair.

There is no clear association between hormone status and FPHL. Removal of this patient's levonorgestrel IUD is unlikely to affect hair loss. Spironolactone has also been used for FPHL but evidence is lacking regarding its effectiveness. Finasteride is approved by the FDA only for males with hair loss. There is a high risk of teratogenicity with its use. It has been used in women but evidence of efficacy is minimal.

Ref: Vary JC: Selected disorders of skin appendages—acne, alopecia, hyperhidrosis. *Med Clin North Am* 2015;99(6):1195-1211. 2) Phillips TG, Slomiany WP, Allison R: Hair loss: Common causes and treatment. *Am Fam Physician* 2017;96(6):371-378. 3) Goren A, Naccarato T: Minoxidil in the treatment of androgenetic alopecia. *Dermatol Ther* 2018;31(5):e12686.

Item 166**ANSWER: D**

Ruling out life-threatening causes of pleuritic chest pain is the most important consideration in a pleurisy evaluation. A full history and complete physical examination with vital signs should be performed (SOR C). Tachycardia, tachypnea, hypotension, fever, or respiratory distress should raise concerns. Chest radiography should be performed if the cause of the pain is unclear (SOR C). If no red flags are raised on examination and a chest radiograph is clear, a trial of NSAIDs should be started (SOR B). NSAIDs are preferred to narcotic medications as they do not suppress respiratory drive and do not have the risk of addiction and abuse. If a life-threatening cause is suspected from the history and physical examination, then further diagnostic testing is indicated.

Ref: Kass SM, Williams PM, Reamy BV: Pleurisy. *Am Fam Physician* 2007;75(9):1357-1364. 2) Reamy BV, Williams PM, Odom MR: Pleuritic chest pain: Sorting through the differential diagnosis. *Am Fam Physician* 2017;96(5):306-312.

Item 167**ANSWER: E**

This patient presents with the classic symptoms of patellofemoral pain syndrome. The pain is in the anterior knee and increases during weight-bearing activities when the knee is flexed, as well as with prolonged sitting and descending stairs. Iliotibial band syndrome usually involves lateral pain and tenderness over the lateral femoral condyle. Osgood-Schlatter disease occurs in adolescents and is characterized by tenderness and swelling over the patellar tendon insertion at the tibial tubercle. Both osteochondritis dissecans and patellofemoral osteoarthritis would show abnormal findings on plain film radiographs.

Ref: Gaitonde DY, Ericksen A, Robbins RC: Patellofemoral pain syndrome. *Am Fam Physician* 2019;99(2):88-94.

Item 168**ANSWER: C**

There is high-quality evidence from randomized, controlled trials that a moderate-intensity statin should be initiated for all patients age 40–75 years with diabetes mellitus regardless of their calculated 10-year atherosclerotic cardiovascular disease (ASCVD) risk. There is not strong evidence supporting the use of statins before age 40 in patients with diabetes unless their LDL-cholesterol level is very high. The ASCVD risk score is valid for patients over 40 years of age and cannot be calculated before then.

Ref: Hoover LE: Cholesterol management: ACC/AHA updates guideline. *Am Fam Physician* 2019;99(9):589-591.

Item 169**ANSWER: A**

Ramadan is a holy month during which Muslims fast from dawn until sunset. It is an obligation for all healthy adult Muslims. The Quran does exempt the sick from fasting, but many ill people will still fast. Recommendations in the literature include risk stratification criteria to determine whether fasting is safe for patients with diabetes mellitus. Generally, patients with well controlled type 2 diabetes can safely fast with adjustments in their medications; however, it is thought that fasting is unsafe for patients with type 1 diabetes. Fasting can increase the risk of severe hypoglycemia as well as hyperglycemia and ketoacidosis if medications are withheld.

Ref: Khalife T, Pettit JM, Weiss BD: Caring for Muslim patients who fast during Ramadan. *Am Fam Physician* 2015;91(9):640-642.

Item 170**ANSWER: C**

In the event of anaphylaxis, epinephrine should be given in the mid-outer aspect of the thigh (anterolateral aspect of the vastus lateralis, mid-muscle belly). Epinephrine is more quickly absorbed and produces higher tissue and plasma levels when injected in the vastus lateralis than in other muscles. It should not be injected subcutaneously.

Ref: LoVerde D, Iweala OI, Eginli A, Krishnaswamy G: Anaphylaxis. *Chest* 2018;153(2):528-543.

Item 171**ANSWER: A**

In patients with peripheral artery disease (PAD), cilostazol, a phosphodiesterase inhibitor with antiplatelet and vasodilatory properties, increases the maximal walking distance on a treadmill by approximately 25% compared with placebo. The side effects include tachycardia, diarrhea, and increased bleeding tendency, and it is contraindicated in patients with heart failure or a low ejection fraction. A supervised exercise program is also an important component of a comprehensive approach to PAD. In one trial a supervised exercise program resulted in an increase of 2.1 minutes of mean peak walking time at 6 months.

Clopidogrel is an antiplatelet agent that has been shown to be slightly more effective than aspirin in reducing the risk of a composite outcome of ischemic stroke, myocardial infarction, or death from vascular causes. Dual antiplatelet therapy can be considered to reduce the risk of cardiovascular events though it carries an increased risk of bleeding. Warfarin has no evidence of benefit in PAD and adds to bleeding risk. Statins are associated with a lower risk of cardiovascular events in patients with PAD. Ezetimibe has no evidence of additional benefit.

ACE inhibitors appear to be the preferred blood pressure agent for patients with PAD given the findings of the HOPE trial, in which ramipril resulted in a lower risk of adverse cardiovascular outcomes compared to placebo over 5 years of follow-up. Blood pressure targets are not clear in PAD but this patient's blood pressure is already <120/75 mm Hg and she is unlikely to benefit from additional blood pressure lowering. Intensifying therapy for this patient's type 2 diabetes by adding liraglutide also has no evidence of benefit for PAD.

Ref: Kullo IJ, Rooke TW: Peripheral artery disease. *N Engl J Med* 2016;374(9):861-871.

Item 172

ANSWER: A

This patient has hand-foot-and-mouth disease frequently caused by enterovirus 71 or coxsackievirus A16. It is most common in children under 5 years of age and occurs most often in the fall and spring. It is characterized by painful maculopapular or papulovesicular lesions on the hands and feet, and in the oral cavity. Lesions can also appear on the genitals, trunk, or cheek. Management includes symptomatic treatment of pain and oral hydration. Antibiotics and antiviral treatment are not recommended. Laboratory testing is not appropriate for this condition.

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

Item 173

ANSWER: D

Evidence shows that antibiotic therapy alone may be a viable treatment option for patients with uncomplicated appendicitis. A meta-analysis of five randomized, controlled trials found that antibiotic treatment resulted in decreased complications, less need for pain medication, and less sick leave or disability compared with initial appendectomy. However, recurrence rates requiring surgery within a year may be as high as 40% compared to a less than 10% risk of repeat surgery in those who have an appendectomy.

Ref: Mason RJ, Moazzez A, Sohn H, Katkhouda N: Meta-analysis of randomized trials comparing antibiotic therapy with appendectomy for acute uncomplicated (no abscess or phlegmon) appendicitis. *Surg Infect (Larchmt)* 2012;13(2):74-84. 2) Salminen P, Paajanen H, Rautio T, et al: Antibiotic therapy vs appendectomy for treatment of uncomplicated acute appendicitis: The APPAC randomized clinical trial. *JAMA* 2015;313(23):2340-2348. 3) Snyder MJ, Guthrie M, Cagle S: Acute appendicitis: Efficient diagnosis and management. *Am Fam Physician* 2018; 98(1):25-33.

Item 174**ANSWER: C**

Although persons who inject drugs are at high risk for a variety of pulmonary infectious diseases, this patient's presentation, including the relatively slow development of symptoms, is most consistent with pulmonary foreign body granulomas. These result from the injection of crushed pills, talc, or other foreign substances, which are then deposited in the vasculature of the lungs. Adenocarcinoma is not as likely given the patient's age and nonsmoking history. Branching hyphae would be seen in aspergillosis but this patient does not have fevers or malaise. Caseating granulomas are seen in tuberculosis, which is less likely given the absence of fever and hemoptysis. Noncaseating granulomas, seen in sarcoidosis, would not be more likely in this patient than in the general population.

Ref: Staloch DA, Hedley JS: Pulmonary foreign-body granulomatosis. *N Engl J Med* 2017;377(13):1273. 2) Visconti AJ, Sell J, Greenblatt AD: Primary care for persons who inject drugs. *Am Fam Physician* 2019;99(2):109-116.

Item 175**ANSWER: A**

This patient presents with an external hordeolum or sty. Warm, damp compresses for 10 minutes four times a day would be the best initial management. Topical erythromycin ointment and topical hydrocortisone cream are not indicated for treatment of a sty. Although staphylococci are commonly involved in this process, antibiotics are not recommended unless there is evidence of adjoining cellulitis. Warm compresses allow for spontaneous drainage and resolution. Anti-inflammatory medications are not recommended for hordeolum externum management, however they could become necessary if it becomes a chalazion. If the hordeolum has not resolved in about 1 week, incision may be necessary.

Ref: Carlisle RT, Digiovanni J: Differential diagnosis of the swollen red eyelid. *Am Fam Physician* 2015;92(2):106-112. 2) Boyd K: Chalazia and sty treatment. American Academy of Ophthalmology, 2019.

Item 176**ANSWER: D**

The stages of change model includes precontemplation, contemplation, preparation, action, and maintenance. Identifying which stage a patient is in can help guide physicians in counseling strategies. The goal is to move the patient toward taking action.

This patient is in the precontemplation stage. He has no interest in changing and is opposed to quitting smoking. At this stage it is best to use the motivational interviewing technique of asking permission before presenting information and if given permission to share it in a neutral manner. Motivational interviewing has been shown to be useful in primary care for helping patients to reduce weight, blood pressure, and alcohol use (SOR A). Emphasizing the consequences of smoking or asking to schedule a follow-up visit to focus on smoking cessation may increase resistance and may also reduce patient openness to physician input at this stage.

Ref: Searight HR: Counseling patients in primary care: Evidence-based strategies. *Am Fam Physician* 2018;98(12):719-728.

Item 177

ANSWER: A

This patient has findings most consistent with anemia of chronic disease, also known as anemia of inflammation. This condition is thought to be primarily a disorder of iron distribution in response to systemic inflammation, which also biases hematopoiesis toward myeloid cell production rather than erythropoiesis and shortens the erythrocyte lifespan. Anemia of chronic disease is a normocytic and normochromic anemia. Iron studies typically show evidence of iron restriction without systemic iron deficiency. A common challenge in diagnosis is when true iron deficiency coexists with anemia of chronic disease.

This patient's normal WBC and platelet counts make bone marrow suppression less likely. The normal haptoglobin level and low reticulocyte count are not consistent with hemolysis. She has a normocytic rather than microcytic anemia and her ferritin level is elevated. These two factors make iron deficiency less likely despite her low serum iron level. The low normal transferrin level is also consistent with anemia of chronic disease rather than iron deficiency. Her normal vitamin B₁₂ level makes a deficiency unlikely. Her history of a chronic foot ulcer and elevated inflammatory markers (ferritin and platelets) are consistent with anemia of chronic disease.

Ref: Ganz T: Anemia of inflammation. *N Engl J Med* 2019;381(12):1148-1157.

Item 178

ANSWER: B

Nursemaid's elbow is a common injury in young children, often occurring with sudden upward traction on the arm that subluxes the radial head. Patients typically report acute elbow pain. Many children hold the elbow partially flexed and pronated and decline to move the elbow. A clinical diagnosis is made when the history and examination are typical for the condition, as is the case here. Manual reduction in the office is the initial treatment and succeeds more than 70% of the time. Splinting is not a first-line treatment. Imaging and referral are not indicated before attempting reduction.

Ref: Krul M, van der Wouden JC, Kruithof EJ, et al: Manipulative interventions for reducing pulled elbow in young children. *Cochrane Database Syst Rev* 2017;(7):CD007759. 2) Spiegel R, Kleist S: Hyperpronation method for reduction of nursemaid's elbow. *Am Fam Physician* 2018;97(10):online.

Item 179

ANSWER: A

Bronchiolitis is a common lower respiratory tract infection in young children and infants. Respiratory syncytial virus (RSV) is the most common cause. Supportive care with hydration and maintenance of oxygen saturation is important in the treatment of RSV bronchiolitis. Infants with respiratory rates >60/min are often unable to manage oral hydration due to the risk of aspiration. In these cases, intravenous or nasogastric feeds are acceptable. An oxygen saturation >90% is sufficient in RSV bronchiolitis and use of supplemental oxygen to achieve higher levels of oxygen saturation may prolong hospital stays. There is no clear advantage to deep nasal suctioning, which may also be associated with prolonged hospital stays. Routine nasal suctioning is indicated, however. Bronchodilators are not recommended in the treatment of RSV (level of evidence A). Antibiotics are only indicated with a confirmed bacterial co-infection (level of evidence B). Systemic corticosteroids have shown no benefit in the treatment of bronchiolitis.

Ref: AAP releases practice guideline on diagnosis, management, and prevention of bronchiolitis. *Am Fam Physician* 2015;91(8):578-580. 2) Smith DK, Seales S, Budzik C: Respiratory syncytial virus bronchiolitis in children. *Am Fam Physician* 2017;95(2):94-99.

Item 180

ANSWER: B

The U.S. Preventive Services Task Force recommends screening for intimate partner violence for women of reproductive age, with referral to support services for those with a positive screen (B recommendation). In asymptomatic adults the current evidence is insufficient to recommend screening for illicit drug use, skin cancer, or vitamin D deficiency.

Ref: US Preventive Services Task Force: *Published Recommendations*. USPSTF website.

Item 181**ANSWER: D**

The Dietary Approaches to Stop Hypertension (DASH) and Mediterranean diets have the best overall evidence for the primary prevention of cardiovascular disease (SOR A), and they should be regularly recommended to patients seeking to improve their risk. Other increasingly common dietary trends, such as the ketogenic diet, do not have a significant evidence base to support clear recommendations. The ketogenic diet has a strong evidence base in treatment-resistant pediatric epilepsy but not for the prevention of cardiovascular disease. Several studies have suggested that skipping breakfast may increase the risk of cardiovascular disease. The U.S. Preventive Services Task Force recommends against β -carotene supplementation, due to increased risk of harm (D recommendation). There is now high-quality evidence (SOR A) that omega-3 fatty acid supplementation has no effect on cardiovascular disease.

Ref: *Final Recommendation Statement: Vitamin Supplementation to Prevent Cancer and CVD: Preventive Medication.* US Preventive Services Task Force, 2014. 2) Lanier JB, Bury DC, Richardson SW: Diet and physical activity for cardiovascular disease prevention. *Am Fam Physician* 2016;93(11):919-924. 3) Rogers TS, Seehusen DA: Omega-3 fatty acids and cardiovascular disease. *Am Fam Physician* 2018;97(9):562-564. 4) Ofori-Asenso R, Owen AJ, Liew D: Skipping breakfast and the risk of cardiovascular disease and death: A systematic review of prospective cohort studies in primary prevention settings. *J Cardiovasc Dev Dis* 2019;6(3):pii:E30.

Item 182**ANSWER: A**

In patients with mild diverticulitis, outpatient management with rest and oral fluids 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: Wilkins T, Embry K, George R: Diagnosis and management of acute diverticulitis. *Am Fam Physician* 2013;87(9):612-620. 2) Young-Fadok TM. Diverticulitis. *N Engl J Med* 2018;379(17):1635-1642.

Item 183**ANSWER: E**

According to guidelines from the American College of Cardiology, American Heart Association, and Heart Rhythm Society, the evaluation of patients with syncope should include a thorough history and physical examination, as well as an EKG. Further studies would be indicated if the cause of syncope is unclear.

Ref: Shen WK, Sheldon RS, Benditt DG, et al: 2017 ACC/AHA/HRS guideline for the evaluation and management of patients with syncope: A report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines and the Heart Rhythm Society. *Circulation* 2017;136(5):e60-e122.

Item 184**ANSWER: D**

Opioid use may cause numerous adverse reactions, including drowsiness, pruritus, nausea, and constipation. In addition to these well known side effects, chronic opioid use can lead to hypogonadism through inhibition of gonadotropin-releasing hormone and an increase in prolactin. A recently published study found that long-term opioid users were nearly twice as likely to be diagnosed with hypogonadism as short-term opioid users. Given the large number of opioid users in the United States, prescribers should be aware of this adverse effect and screen for hypogonadism when appropriate. None of the other medications in this patient's regimen, including acetaminophen, cyclobenzaprine, meloxicam, and pregabalin, are the likely cause of his decreased libido.

Ref: Baillargeon J, Raji MA, Urban RJ, et al: Opioid-induced hypogonadism in the United States. *Mayo Clin Proc Innov Qual Outcomes* 2019;3(3):276-284.

Item 185**ANSWER: C**

Ovarian incidentalomas are very common, and appropriate management depends upon the size and appearance of the incidentaloma as well as the menopausal status of the patient. The Society of Radiologists in Ultrasound states that simple cysts ≤ 5 cm in premenopausal women and simple cysts ≤ 3 cm in postmenopausal women are considered normal and do not require follow-up. The American College of Radiology recommends that immediate ultrasonography be performed in the evaluation of simple-appearing cysts that are incompletely characterized by CT and are > 5 cm in premenopausal women or > 3 cm in postmenopausal women. This patient's cyst appears benign, but further evaluation is recommended due to the large size. CA-125 levels have low sensitivity and specificity in premenopausal women and would not be indicated in this case. The initial imaging of choice is pelvic ultrasonography, so MRI of the pelvis is not necessary. Referral to a gynecologic oncologist is not indicated because there is no current evidence to suggest malignancy.

Ref: Hitzeman N, Cotton E: Incidentalomas: Initial management. *Am Fam Physician* 2014;90(11):784-789. 2) Patel MD, Ascher SM, Horrow MM, et al: Management of incidental adnexal findings on CT and MRI: A White Paper of the ACR Incidental Findings Committee. *J Am Coll Radiol* 2020;17(2):248-254.

Item 186**ANSWER: E**

This patient's symptoms are consistent with bicipital tendinitis, which causes pain with abduction and external rotation of the arm, and tenderness of the bicipital groove with palpation. Resisted supination of the hand with the elbow flexed to 90° is the Yergason test, and anterior shoulder pain with this maneuver is consistent with bicipital tendinitis. Anterior shoulder pain with cross adduction of the arm is more consistent with acromioclavicular arthritis. Axial compression of the slightly flexed neck is the Spurling test for cervical radiculopathy. Extension of the elbow would activate the triceps, and internal rotation of the shoulder with the elbow flexed would result in less activation of the biceps than resisted supination.

Ref: Churgay CA: Diagnosis and treatment of biceps tendinitis and tendinosis. *Am Fam Physician* 2009;80(5):470-476. 2) Jameson JL, Fauci AS, Kasper DL, et al (eds): *Harrison's Principles of Internal Medicine*, ed 20. McGraw-Hill, 2018, p 2647.

Item 187**ANSWER: C**

In randomized, controlled trials, gabapentin has demonstrated benefit for treating a refractory chronic cough after 4 weeks of treatment (SOR C). Chronic cough may be due to a hypersensitivity of the cough reflex, either centrally or peripherally. Cyclobenzaprine, duloxetine, lorazepam, and propranolol have not proven to be beneficial in reducing or eliminating chronic cough.

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

Item 188**ANSWER: C**

This patient presents with a history consistent with typical atrioventricular nodal reentrant tachycardia, which is the most common type of supraventricular tachycardia (SVT). She is also using "pill-in-the-pocket" treatment, which is effective for infrequent SVT. Because the symptoms are episodic and the tachycardia is paroxysmal, patients generally present with normal examination and EKG findings. Further evaluation with event monitoring may identify a narrow-complex tachycardia with P waves hidden within the QRS complex or identified early after it. Most patients with SVT have structurally normal hearts.

An elevated Generalized Anxiety Disorder-7 (GAD-7) score is consistent with a diagnosis of generalized anxiety disorder (GAD). However, GAD is a common misdiagnosis in patients with SVT, particularly females. While hyperthyroidism is associated with tachycardia, hypothyroidism usually is not. Mitral valve prolapse is not specifically associated with SVT. Carotid atherosclerosis is not associated with SVT either, but knowledge of its presence may help determine treatment.

Ref: Helton MR: Diagnosis and management of common types of supraventricular tachycardia. *Am Fam Physician* 2015;92(9):793-802.

Item 189**ANSWER: C**

An acute red eye is a common presentation in primary care and it is critical to differentiate serious causes from benign causes. Episcleritis is a self-limited condition that can be idiopathic and presents with mild discomfort and focal hyperemia. Conjunctivitis is typically associated with a discharge that is clear in viral cases and mucopurulent in bacterial cases. Iritis is associated with significant pain, a poorly reactive pupil, diminished vision, and photophobia. This patient does not have changes in visual acuity, photophobia, or severe pain as seen in keratitis, which would also cause an abnormal fluorescein stain showing corneal ulceration.

Ref: Cronau H, Kankanala RR, Mauger T: Diagnosis and management of red eye in primary care. *Am Fam Physician* 2010;81(2):137-144. 2) Pflipsen M, Massaquoi M, Wolf S: Evaluation of the painful eye. *Am Fam Physician* 2016;93(12):991-998. 3) Goldman L, Schafer AI (eds): *Goldman's Cecil Medicine*, ed 25. Elsevier Saunders, 2016, pp 2556-2568.

Item 190**ANSWER: B**

Children who have a simple febrile seizure and appear neurologically intact do not require routine testing except to determine the source of their fever (SOR C). This child has signs of possible pneumonia so a chest radiograph would be warranted to look for the source of infection that triggered the fever.

Routine laboratory testing is not indicated in the workup of simple febrile seizures. There is a low risk that these children will have low sodium or glucose levels, and this would not predict seizure recurrence. Routine neuroimaging such as MRI is not recommended for febrile seizures. Electroencephalography is not useful for predicting the recurrence of simple febrile seizures and would not be indicated in the workup of these seizures. A lumbar puncture is indicated only in cases where the child has neurologic findings suggestive of meningitis, but that is not the case for this child.

Ref: Patel N, Ram D, Swiderska N, et al: Febrile seizures. *BMJ* 2015;351:h4240. 2) Smith DK, Sadler KP, Benedum M: Febrile seizures: Risks, evaluation, and prognosis. *Am Fam Physician* 2019;99(7):445-450.

Item 191**ANSWER: A**

Standing independently is an expected developmental milestone for a 12-month-old child. Identifying at least two body parts, using three words other than names, scribbling spontaneously, and building a three-cube tower are expected milestones for older children.

Ref: Hagan JF Jr, Shaw JS, Duncan PM (eds): *Bright Futures: Guidelines for Health Supervision of Infants, Children and Adolescents*, ed 4. American Academy of Pediatrics, 2017.

Item 192**ANSWER: C**

This patient has a clenched-fist bite wound. Without antibiotics these wounds have a high rate of infection, and irrigation alone is not sufficient. Because this patient has a superficial wound with no evidence of tendon involvement or functional compromise, he does not require parenteral antibiotics and can be managed as an outpatient. These wounds should be allowed to heal by secondary intention, so suturing is not appropriate.

Ref: Stevens DL, Bisno AL, Chambers HF, et al: Practice guidelines for the diagnosis and management of skin and soft tissue infections: 2014 Update by the Infectious Diseases Society of America. *Clin Infect Dis* 2014;59(2):e10-e52. 2) Rerucha CM, Ewing JT, Oppenlander KE, Cowan WC: Acute hand infections. *Am Fam Physician* 2019;99(4):228-236.

Item 193**ANSWER: D**

Approximately 10%–15% of adults will experience a temporomandibular disorder (TMD). TMD represents a spectrum of illnesses frequently seen and readily treatable by family physicians. This multifactorial disorder is consistently associated with other pain conditions such as fibromyalgia, as in this case. Patients typically present with facial pain, jaw pain, headache, or ear pain. The symptoms are generally associated with jaw movement such as chewing. Physical examination findings can be broad but often include pain with palpation of the temporomandibular joint, or pain and/or spasm of the muscles of mastication. Giant cell arteritis should be included in the differential diagnosis but is typically seen in patients over age 50 and is often associated with other findings such as jaw claudication, visual symptoms, and palpable abnormalities over the temporal artery. Salivary stones can involve pain in a similar region, such as the parotid gland, but this is often an intermittent pain triggered only by eating. Tenderness or swelling over the gland itself may be seen. Sinusitis would usually present with nasal congestion, maxillary sinus tenderness, mucus, and fever. While trigeminal neuralgia may have a similar distribution of pain, this is typically reported as a brief attack of intense, sharp pain often produced by specific stimuli.

Ref: Unwin B, Williams CM, Gilliland W: Polymyalgia rheumatica and giant cell arteritis. *Am Fam Physician* 2006;74(9):1547-1554. 2) Wilson KF, Meier JD, Ward PD: Salivary gland disorders. *Am Fam Physician* 2014;89(11):882-888. 3) Gauer RL, Semidey MJ: Diagnosis and treatment of temporomandibular disorders. *Am Fam Physician* 2015;91(6):378-386. 4) Stephens MB, Wiedemer JP, Kushner GM: Dental problems in primary care. *Am Fam Physician* 2018;98(11):654-660.

Item 194**ANSWER: A**

Safe and effective options to treat cough in young children include nasal saline irrigation, a menthol rub, and honey (in children 12 months of age or older). Codeine should no longer be used for cough in anyone under 18 years of age. Over-the-counter cough and cold medications are not recommended for children under 4 years of age due to the lack of evidence of benefit and the significant side effects. Ibuprofen has not been shown to be effective for cough.

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

Item 195**ANSWER: B**

Hypertrophic cardiomyopathy is the most common primary cardiomyopathy and is defined by left ventricular hypertrophy (primarily septal thickening) without cardiac dilation that may cause left ventricular outflow obstruction. It is a potential cause of sudden cardiac death. Many patients are asymptomatic and may potentially only be diagnosed by auscultation of a systolic murmur on examination that increases in intensity during Valsalva maneuvers.

The other listed cardiomyopathies are not associated with the classic murmur of hypertrophic cardiomyopathy, but instead are associated with signs of heart failure. Dilated cardiomyopathy is defined by enlargement of the ventricles, systolic dysfunction, and normal left ventricular wall thickness that can result in symptoms of heart failure. Peripartum myopathy is defined by left ventricular dysfunction presenting at the end of pregnancy or in the first few months after delivery. Restrictive cardiomyopathy is defined by increased myocardial stiffness that impairs ventricular filling while normal systolic function is maintained and it may present with signs of right-sided heart failure. Takotsubo cardiomyopathy is defined as the sudden onset of left ventricular dysfunction in response to extreme stress and often presents with symptoms mirroring that of acute coronary syndrome.

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

Item 196**ANSWER: B**

The measurement of vitamin D levels is recommended only for patients with decreased kidney function, various skeletal diseases, or hypercalcemia (SOR C). Vitamin D deficiency is common in patients with chronic kidney disease, and it is associated with cardiovascular morbidity and mortality in those patients. However, good-quality evidence is lacking regarding the effect of vitamin D supplementation in these patients. There is no recommendation for screening the general population for vitamin D deficiency (SOR B), nor should routine vitamin D supplementation be recommended for community-dwelling adults (SOR A). Vitamin D supplementation has not been found to improve depression, osteoarthritis, chronic pain, or fatigue (SOR A). Meta-analyses have found no relationship between vitamin D deficiency and falls, fractures, or mortality.

Ref: *Final Recommendation Statement: Vitamin D Deficiency: Screening*. US Preventive Services Task Force, 2014. 2) *Final Recommendation Statement: Falls Prevention in Community-Dwelling Older Adults: Interventions*. US Preventive Services Task Force, 2018.

Item 197**ANSWER: A**

Although an uncommon cancer, pancreatic cancer is the third most common cause of cancer death in the United States. The incidence is rising, and it is estimated that it may soon become the second-leading cause of cancer deaths. In an asymptomatic patient with no family history of pancreatic cancer or inherited genetic syndromes, the U.S. Preventive Services Task Force recommends against screening for pancreatic cancer (D recommendation).

Ref: *Final Recommendation Statement: Pancreatic Cancer: Screening*. US Preventive Services Task Force, 2019.

Item 198**ANSWER: D**

Pearly papules are a benign, normal anatomic variant and are not sexually transmitted. They are dome-shaped, skin-colored papules 1–4 mm in size with a ring-like distribution around the corona of the glans penis. Angiokeratomas are red or blue papules that are well circumscribed and 1–6 mm in size. Genital warts are soft, raised masses that can be pearly and smooth or have a rough, cauliflower-like appearance, and are not confined to the penile corona. Lichen nitidus consists of discrete, hypopigmented, 1-mm papules that are not confined to the corona and can also occur on the upper extremities and abdomen. Squamous cell carcinoma may be endophytic (ulcerated) or exophytic (thickened skin or wart-like growths that can progress to a large, irregularly shaped, fungating mass).

Ref: Teichman JMH, Mannas M, Elston DM: Noninfectious penile lesions. *Am Fam Physician* 2018;97(2):102-110.

Item 199**ANSWER: A**

Glucocorticoid use is the most common cause of secondary osteoporosis. Glucocorticoids increase bone resorption early, so addressing the issue at the start of treatment is vital in preventing fractures. The use of glucocorticoids is associated with an increased risk of fracture in the first 6 months.

A bone density test should be performed shortly after starting corticosteroid treatment (SOR C). The fracture risk can then be calculated using the FRAX assessment tool. If the risk of major osteoporotic fracture is sufficiently elevated, then treatment is recommended. One caveat is that the FRAX score should be adjusted upward if the prednisone dosage is >7.5 mg daily.

Calcium alone has not been shown to reduce the risk of fracture in osteoporosis. Calcium and vitamin D together have been shown to prevent decreases in bone mineral density with low-dose prednisone use but the effect with high doses is unknown. If a patient has an increased fracture risk, oral bisphosphonates should be started. It is not recommended that they be used empirically to reduce the risk of fracture.

Ref: Buckley L, Humphrey MB: Glucocorticoid-induced osteoporosis. *N Engl J Med* 2018;379(26):2547-2556. 2) Adami G, Rahn EJ, Saag KG: Glucocorticoid-induced osteoporosis: From clinical trials to clinical practice. *Ther Adv Musculoskeletal Dis* 2019;11:1759720X19876468.

Item 200

ANSWER: A

The CRB-65 (confusion, respiratory rate, blood pressure, 65 years of age) rule is a validated tool for risk stratification in the primary care setting. It can be used to determine who is a good candidate for outpatient treatment of community-acquired pneumonia. Patients are given 1 point for each of the following signs or symptoms: new-onset confusion, a respiratory rate $> 30/\text{min}$, a blood pressure < 90 mm Hg systolic or < 60 mm Hg diastolic, and an age of 65 years or older. Patients with 0 points, such as this patient, are at low risk and can be managed in the outpatient setting unless there are other significant comorbidities or social factors that make outpatient treatment contraindicated. Patients with a score of 1–2 are at moderate risk and should be hospitalized in most cases. Patients with a score of 3–4 are at high risk and should be considered for hospitalization in an intensive-care unit.

Ref: Bauer TT, Ewig S, Marre R, et al: CRB-65 predicts death from community-acquired pneumonia. *J Intern Med* 2006;260(1):93-101. 2) Ebell MH: Community-acquired pneumonia: Determining safe treatment in the outpatient setting. *Am Fam Physician* 2019;99(12):768-769.