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Jo-Ann Releguiz ■ Beverly Cornel-Avendano



Physical Diagnosis

PreTest[®] Self-Assessment and Review

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Physical Diagnosis

PreTest® Self-Assessment and Review

Fourth Edition

JO-ANN RETEGUIZ, M.D.

Assistant Professor of Medicine
Medicine Clerkship Director
UMDNJ–New Jersey Medical School
Newark, New Jersey

BEVERLY CORNEL-AVENDAÑO, M.D.

Attending Physician
Division of Gastroenterology
Bayshore Community Hospital
Holmdel, New Jersey

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DEDICATION

To Mom, Dad, Lizzie, Jeff, and Christopher for loving and supporting me. To my godmother, Fela, for always believing in me. To Grandma Rosie for guiding me.

To my brother, Don, for sharing those magical and memorable growing-up years. To my husband, Gary, and son, John Andrew, who are endless sources of joy in my life.

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INTRODUCTION

A good doctor must be able to solve problems by performing a careful history and physical examination. This skill is learned and mastered at the bedside. If you understand the normal and abnormal characteristics of each organ system, you will recognize the pattern of the syndrome and reach the correct diagnosis. Skills in physical diagnosis are instrumental if you desire to become an astute and competent physician.

The purpose of this book is to provide medical students and physicians with a comprehensive and convenient method for review and self-assessment of their pattern recognition skills in physical diagnosis. The 500 brand-new questions cover the most relevant and pertinent topics in medicine.

The questions have been designed to parallel the format and degree of difficulty of the questions contained in medical school physical diagnosis courses as well as the United States Licensing Examination (USMLE) Step 1 and Step 2 examinations. Students and physicians preparing for the OSCE or the CSA will find this book to be an excellent resource. This will be a true test of your mastery of physical diagnosis from beginning to end. Each chapter of the book is based on a specific organ system so students can assess and target their specific weaknesses and strengths. There is a new section on important miscellaneous subjects, such as geriatrics, infectious diseases, obstetrics and gynecology, and pediatrics.

Each question in this book is accompanied by an answer that contains a thorough explanation of the question's learning objectives and a specific page reference to a current textbook or journal article. All high-yield information in the explanations is bolded for easy reference and access. A special high-yield facts section filled with meaningful mnemonics is included in the back of the book for quick review before examinations. A current and useful bibliography that lists all the sources used in this book follows the last chapter.

Perhaps the most effective way to use this book is to allow yourself one minute to answer each question in a given chapter; as you proceed, indicate your answer beside each question. By following this suggestion, you will be approximating the time limits imposed by the board examinations.

When you have finished answering the questions in a chapter, you should then spend as much time as you need verifying your answers by

carefully reading the explanations. Although you should pay special attention to the explanations for the questions you answered incorrectly, you should read every single explanation. Even a question you answer effortlessly is followed with a unique collection of physical diagnosis pearls. Each question and explanation has several important learning objectives, and we have designed the explanations to reinforce and supplement the information tested by the questions. If, after reading the explanations for a given chapter, you feel you need more information about the material covered, you should consult and study the reference indicated.

It is our hope that after completion of this book you will be better able to recognize and understand the clinical characteristics of many important medical syndromes. You are on the road to becoming a master diagnostician if you take the appropriate history and skillfully perform the proper physical examination. Good luck with physical diagnosis at the bedside!

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REVIEWERS

Faculty Reviewers

Victor Chang, M.D.
Assistant Professor of Medicine
Division of Hematology and Oncology
UMDNJ–New Jersey Medical School
Newark, New Jersey
Patrick Foye, M.D.
Assistant Professor of Physical
Medicine and Rehabilitation
UMDNJ–New Jersey Medical School
Newark, New Jersey
Marilyn A. Miller, M.D.
Associate Professor of Medicine
Division of Nephrology and
Hypertension
Director, Internal Medicine Residency
Program
UMDNJ–New Jersey Medical School
Newark, New Jersey
Ruby Rivera, M.D.
Assistant Professor of Pediatrics
Division of Pediatric Emergency
Medicine
Montefiore Medical Center
Albert Einstein College of Medicine
Bronx, New York

George Saviano, M.D.
Clinical Assistant Professor of
Medicine
Division of Cardiology
UMDNJ–Robert Wood Johnson
Medical School
New Brunswick, New Jersey
Naomi Schlesinger, M.D.
Assistant Professor of Medicine
Division of Allergy, Immunology, and
Rheumatology
UMDNJ–New Jersey Medical School
Newark, New Jersey
Christina Xenachis, M.D.
Attending Physician,
Division of Endocrinology
Bayshore Community Hospital
Holmdel, New Jersey

Resident Reviewers

Kenneth A. Becker, M.D.
Resident, Department of Medicine
Division of Dermatology
UMDNJ–New Jersey Medical School
Newark, New Jersey

xiv Acknowledgments

Lydia Estanislao, M.D.
Chief Resident
Department of Neurology
UMDNJ–New Jersey Medical School
Newark, New Jersey

Student Reviewers

Rashida E. McCain
UMDNJ–New Jersey Medical School
Newark, New Jersey
Class of 2001

Pratibhasri Vardhana
UMDNJ–New Jersey Medical School
Newark, New Jersey
Class of 2001
Steven G. Werdehoff
University of South Alabama
College of Medicine
Mobile, Alabama
Class of 2000

GENERAL PRINCIPLES OF DISEASE

Questions

DIRECTIONS: Each of the numbered items or incomplete statements in this section is followed by answers or by completion of the statements. Select the **one** lettered answer or completion that is **best** in each case.

1. Which of the following is the most important first step in the diagnostic and treatment process?
 - a. A thorough history and physical examination
 - b. Blood work
 - c. Urinalysis
 - d. Electrocardiogram
 - e. Radiographic imaging
 - f. Invasive procedures
2. Which of the following is the most accurate method of obtaining a temperature in the pediatric population?
 - a. Use a rectal thermometer placed in the rectum for 2 min to record a rectal temperature
 - b. Use an oral thermometer under the tongue to record an oral temperature
 - c. Record an axillary temperature
 - d. Use an oral thermometer above the tongue to record an oral temperature
 - e. Use a rectal thermometer placed in the rectum for 1 min to record a rectal temperature
3. Which of the following best describes a pulse amplitude of two plus (2+)?
 - a. A diminished, barely palpable pulse
 - b. An expected pulse
 - c. A full and increased pulse
 - d. A bounding pulse
 - e. An absent pulse
4. Which of the following statements is true concerning the measurement of blood pressure?
 - a. The bladder should encircle approximately 80% of the circumference of the limb
 - b. A cuff that is too small will give an artificially low reading
 - c. Readings from two arms generally vary by more than 20 mm Hg in a normal patient
 - d. It is not necessary to fully deflate the cuff before repeating a measurement
 - e. The pressure at which Korotkoff sounds disappear should be read as the systolic blood pressure

2 Physical Diagnosis

- 5.** A 21-year-old man presents to your office for a preemployment physical examination. He is 6 ft 3 in. tall and weighs 70 kg. Heart examination is remarkable for a midsystolic click and a grade 2 systolic murmur that increases with Valsalva maneuver. The patient has an arm span that exceeds his height and has long, slender fingers. The thumb sign (Steinberg sign) is positive. Which of the following is the most likely diagnosis?
- Lesch-Nyhan syndrome
 - Turner syndrome
 - Ehlers-Danlos syndrome
 - Marfan syndrome
 - Noonan syndrome
- 6.** A nursing home patient is transferred to the hospital for possible dehydration after several days of vomiting and diarrhea due to a recent viral syndrome. Which of the following best defines orthostatic changes from volume depletion?
- The systolic blood pressure in the erect position is 5 mm Hg higher than the systolic blood pressure in the recumbent position
 - The systolic blood pressure in the erect position is 20 mm Hg higher than the systolic blood pressure in the recumbent position
 - The heart rate in the erect position is 5 beats/min higher than the heart rate in the recumbent position
 - The systolic blood pressure in the erect position is 20 mm Hg lower than the systolic blood pressure in the recumbent position
 - The diastolic blood pressure is 10 mm Hg higher in the erect position than the diastolic blood pressure in the recumbent position

- 7.** A 29-year-old woman was an unbelted passenger in a motor vehicle accident. On arrival to the hospital, the paramedics inform you that she opens her eyes in response to verbal stimuli. She is incoherent and withdraws from painful stimuli. Which of the following is the patient's calculated Glasgow Coma Scale (GCS)?
- 15
 - 3
 - 9
 - 5
 - 12
- 8.** A 59-year-old patient presents with fever and agitation. On physical examination, his temperature is 103.2°F. His respirations are 26/min, pulse 126/min, and blood pressure is 100/70 mm Hg. He appears to be warm and flushed. A Swan-Ganz catheter is inserted that demonstrates an increased cardiac output, a decreased peripheral vascular resistance (vasodilation), and a normal pulmonary capillary wedge pressure (PCWP). The patient's urine gram stain reveals pyuria and gram-negative rods. Which of the following is the most likely diagnosis?
- Late septic shock
 - Early septic shock
 - Cardiogenic shock
 - Hypovolemic shock
 - Neurogenic shock
- 9.** Which of the following is most likely to cause muscle atrophy?
- Hypotonia of the muscle
 - Overuse of the muscle
 - Motor nerve loss of the muscle
 - Tetany of the muscle
 - Dystrophin deficiency of muscle
- 10.** Which of the following fractures is most likely to cause hypovolemic shock and life-threatening blood loss?
- Femur
 - Spine
 - Tibia
 - Radius
 - Pelvis
- 11.** Which of the following best describes a partial disruption of a ligament?
- Fracture
 - First-degree sprain
 - Second-degree sprain
 - Third-degree sprain

4 Physical Diagnosis

- 12.** A 47-year-old woman is referred to your office for treatment of stage 2 hypertension. Which of the following best describes the criteria for moderate or stage 2 hypertension?
- A systolic blood pressure reading of 155 mm Hg
 - A systolic blood pressure reading of 190 mm Hg
 - A diastolic blood pressure reading of 95 mm Hg
 - A diastolic blood pressure reading of 105 mm Hg
 - A diastolic blood pressure reading of 115 mm Hg
- 13.** A woman presents with a pathologic process that involves the hip joint. She does not complain of hip pain, however, and points to another area of the body as the site of the pain. Which of the following is the most likely site of pain even though the hip is involved?
- Knee
 - Groin
 - Buttock
 - Greater trochanter
 - Calf
- 14.** Which of the following is the most sensitive part of an examiner's hand when assessing for vibration?
- Fingertips
 - Palmar surface of the finger pads
 - Wrist area
 - Ulnar surface of the hand
 - Radial surface of the hand
- 15.** Which of the following cranial nerves is tested with stimulation of the anterior two-thirds of the tongue with sugar or salt while the tongue is protruded?
- Ophthalmic branch of the trigeminal nerve
 - Vagus nerve
 - Facial nerve
 - Maxillary branch of the maxillary nerve
 - Mandibular branch of the trigeminal nerve
- 16.** Which of the following is the most appropriate description of a muscle power grade or strength of three plus (3+)?
- Muscle able to move joint against gravity with full resistance
 - Muscle unable to move joint with gravity eliminated
 - Muscle unable to overcome resistance other than gravity
 - Muscle unable to move joint; palpable contraction of muscle
 - Muscle able to move joint against gravity and some resistance

17. A 45-year-old woman presents to the emergency room with altered mental status. On physical examination, her temperature is 102°F, pulse is 120/min, and respirations are 24/min. She has increased fremitus and bronchial breath sounds at the left base. Neurologic exam reveals no focal deficits, but the patient is disoriented to place and time. Chest radiograph confirms the diagnosis of pneumonia. The patient's PaCO₂ is 30 mm Hg. Which of the following best categorizes this patient's illness?

- The patient has bacteremia
- The patient has systemic inflammatory response syndrome (SIRS)
- The patient has sepsis
- The patient has severe sepsis
- The patient has septic shock
- The patient has sepsis-induced hypotension
- The patient has multiple organ dysfunction syndrome (MODS)

18. Which of the following is the best description of grade two plus (2+) edema?

- Detectable finger distortion after release disappears in 10 s; 4 mm deep
- Detectable finger distortion after release disappears in 1 min; 6 mm deep
- Detectable finger distortion after release disappears in 2–5 min; 8 mm deep
- Slight pitting with no finger distortion after release; 2 mm deep

19. A 28-year-old woman is brought to the emergency room in a coma. Her respiratory rate is 6/min and shallow. Blood pressure is 90/60 mm Hg, heart rate is 50/min, and temperature is 96°F. Her pupils are pinpoint but reactive to light and accommodation. She has no focal neurologic deficits. Which of the following is the most likely diagnosis?

- Carbon monoxide poisoning
- Opiate overdose
- Ethylene glycol poisoning
- Methanol poisoning
- Mercury poisoning

20. A 41-year-old man presents to the emergency room complaining of itchiness and difficulty breathing. He states his symptoms started after attending a party where he ate some fish and peanuts. On physical examination, the patient is anxious, tachypneic, and tachycardic. He has urticaria over his chest, neck, and extremities. Lung examination reveals inspiratory and expiratory wheezes. Heart examination is normal. Which of the following is the most likely diagnosis?

- a. Angioedema
- b. Exacerbation of asthma
- c. Pulmonary embolus
- d. Toxic shock syndrome
- e. Allergic reaction

21. A 16-year-old student has recurrent episodes of facial swelling without urticaria. Family history reveals that two siblings and both parents have similar symptoms. Which of the following is the most likely diagnosis?

- a. Familial C1 inhibitor deficiency
- b. Cystic fibrosis
- c. Exacerbation of asthma
- d. Acquired C1 inhibitor deficiency
- e. Serum sickness

22. A 6-year-old girl with spina bifida is admitted to the intensive care unit because of rapidly progressive swelling of her lips, wheezing, and stridor. She had been playing with balloons at a birthday party. Which of the following is the most likely diagnosis?

- a. Food anaphylaxis
- b. Latex anaphylaxis
- c. Severe drug allergy
- d. Exercise-related anaphylaxis
- e. Idiopathic anaphylaxis

23. A 23-year-old Japanese man attends a party where he drinks three glasses of wine. In a short period of time, he develops facial erythema and experiences severe facial flushing. Which of the following is the most likely diagnosis?

- a. Alcohol dehydrogenase deficiency
- b. Glucuronyl transferase deficiency
- c. Aldehyde dehydrogenase deficiency
- d. Angioedema
- e. Photosensitivity reaction

- 24.** A 46-year-old man presents to your office because of the recent onset of blackouts. He has no past medical history and admits to smoking cigarettes and drinking beer socially. His blackouts usually occur on weekends when he is out with his friends relaxing at the neighborhood bar. The patient has recently divorced. Which of the following is the best next diagnostic step in this patient?
- CAGE questionnaire
 - Liver function tests
 - Percussion of the liver for hepatomegaly
 - Mini-mental status examination
 - Check for macrocytic anemia
- 25.** A 36-year-old woman, accompanied by her attentive husband, presents to the emergency room complaining of right wrist pain. She states she fell down a flight of stairs and is concerned the wrist may be fractured. On physical examination, the wrist has minimal swelling and is nontender with a full range of motion. There is a bruise over the right forearm above the wrist, which appears to be several days old. Which of the following is the most likely diagnosis?
- Recurrent falls
 - Alcohol intoxication
 - Opiate use
 - Benzodiazepam abuse
 - Domestic violence victim
- 26.** A 22-year-old man develops shortness of breath and difficulty breathing while mountain climbing at an altitude of 12,000 ft. His temperature is 97°F. He has a blood pressure of 120/80 mm Hg, respirations of 24/min, and a heart rate of 114/min. He has retinal hemorrhages on funduscopy exam. He has no heart murmur. Bilateral crackles are audible on lung examination. Which of the following is the most likely diagnosis?
- Carbon monoxide poisoning
 - Acute mountain sickness
 - Hypothermia
 - Exhaustion
 - Dehydration
- 27.** A 47-year-old man admits that he has a problem with cigarettes. He is committed to stopping smoking and has come to your office to seek help. Which of the following best describes the stage of behavior change in this addicted patient?
- Precontemplation
 - Contemplation
 - Preparation
 - Action
 - Maintenance
 - Termination

- 28.** A 17-year-old high school student presents to your office with a 6-mo history of menstrual irregularities. She has no past medical history and does not smoke cigarettes, drink alcohol, or use illicit drugs. She is not sexually active. Her menarche was at the age of 12 years. The patient is 66 in. tall and has weighed 115 lb for nearly 3 years. Mouth examination reveals dental enamel erosion. She has enlarged parotid glands bilaterally. Examination of the extremities reveals scars on the dorsal surfaces of the hands. Which of the following is the most likely diagnosis?
- Bulimia
 - Premature menopause
 - Substance dependence
 - Anorexia nervosa
 - Personality disorder
- 29.** Which of the following statements is true regarding body mass index (BMI)?
- Overweight is defined as a BMI of 20–24 kg/m²
 - Obesity is defined as a BMI of 25–29.9 kg/m²
 - Morbid obesity is defined as a BMI of 25–29.9 kg/m²
 - Moderate malnutrition is defined as a BMI of 18.5–24.9 kg/m²
 - Normal BMI is defined as 18.5–24.9 kg/m²
- 30.** Which of the following best describes the degree of extension of fourth-degree burns?
- Into the reticular layer of the dermis
 - Into the papillary layer of the dermis
 - Into the epidermis
 - Into the subcutaneous fat, muscle, and bone
 - Into the deep layer of the dermis
- 31.** Paramedics bring a 41-year-old man to the emergency room. He is complaining of headache, dizziness, nausea, and abdominal pain. The paramedics state that the patient's apartment had a coal furnace. His blood pressure is 110/70 mm Hg, respirations are 20/min, and pulse is 100/min. The patient has a "cherry red" appearance most noticeable around the lips and nail beds. Neurologic examination reveals a disoriented and confused man without focal deficits. Oxygen saturation by pulse oximetry is normal. Which of the following is the most likely diagnosis?
- Drug overdose
 - Carbon monoxide poisoning
 - Alcohol intoxication
 - Methemoglobinemia
 - Dysbarism

- 32.** A 34-year-old woman presents with left-sided chest pain for 8 mo. She describes the pain as being sharp, intermittent, and associated with palpitations, dizziness, trembling, nausea, paresthesias, and diaphoresis. She experiences 3 episodes per week. The episodes last 15 min each and may occur at rest or with exertion. The episodes are unpredictable and the patient often feels as if she is going to die because of the chest pain. The patient does not smoke cigarettes, drink alcohol, or use drugs. She has no family history of heart disease. Her blood pressure and pulse are normal. Physical examination is normal. Electrocardiogram is normal. Which of the following is the most likely diagnosis?
- Acute myocardial infarction (AMI)
 - Unstable angina
 - Mitral valve prolapse (MVP)
 - Panic disorder
 - Malingering
 - Hyperthyroidism
 - Posttraumatic stress disorder (PTSD)
- 33.** Which of the following physical examination findings may be seen in patients with dehydration?
- Capillary refill of 4 s
 - Capillary refill of 1 s
 - Hypertension
 - Bradycardia
 - Increased skin turgor
- 34.** A 51-year-old homeless man presents to the emergency room in wintertime complaining of numbness of his feet. Physical examination of the feet reveals erythema, edema, and the presence of several clear blisters. Peripheral pulses are palpable. Which of the following is the most likely diagnosis?
- Frostnip
 - First-degree frostbite injury
 - Second-degree frostbite injury
 - Third-degree frostbite injury
 - Fourth-degree frostbite injury
- 35.** A 66-year-old nursing home resident was recently started on haloperidol for behavioral problems. One week later the patient develops a temperature of 104.5°F and is transferred to the hospital. The patient is awake but not responsive. His heart rate is 110/min, respiratory rate is 24/min, and he is diaphoretic. Neurologic examination reveals a rigid muscle tone and catatonia. Which of the following is the most likely diagnosis?
- Tardive dyskinesia
 - Neuroleptic malignant syndrome
 - Acute schizophrenia
 - Dystonic reaction
 - Drug-induced parkinsonism

DIRECTIONS: Each set of matching items in this section consists of a list of lettered options followed by several numbered items. For each numbered item, select the appropriate lettered option(s). Each lettered option may be selected once, more than once, or not at all. **Each item will state the number of options to select. Choose exactly this number.**

Items 36–37

For each patient with an allergic reaction, choose the most likely type of allergic reaction.

- a. Type I allergic reaction
- b. Type II allergic reaction
- c. Type III allergic reaction
- d. Type IV allergic reaction

36. A 26-year-old graduate student presents with a photosensitive cutaneous facial rash after starting a 2-wk course of tetracycline. **(CHOOSE 1 ALLERGIC REACTION)**

37. A 61-year-old woman develops hemolysis and thrombocytopenia after receiving a blood transfusion prior to elective surgery. **(CHOOSE 1 ALLERGIC REACTION)**

Items 38–41

For each patient with head trauma, choose the most likely diagnosis.

- a. Cerebellar tonsillar herniation
- b. Uncal herniation
- c. Basilar skull fracture
- d. Subdural hematoma
- e. Epidural hematoma
- f. Cerebral concussion
- g. Postconcussion syndrome
- h. Contusion

38. A 49-year-old man presents after a fall from a platform that is 15 ft high. On physical examination, the patient has blood in the soft tissue overlying the left mastoid bone and has cerebrospinal fluid (CSF) otorrhea. **(CHOOSE 1 DIAGNOSIS)**

39. A woman survives a motor vehicle accident and is alert, oriented, and neurologically intact on arrival to the emergency room. Within 1 hour, she becomes less arousable and expires while being transported to the radiology department for imaging studies. **(CHOOSE 1 DIAGNOSIS)**

40. A 9-year-old boy falls off a skateboard and strikes his head. He momentarily loses consciousness but subsequently has no neurologic deficit and appears fine. He complains of a slight headache. **(CHOOSE 1 DIAGNOSIS)**

41. A 55-year-old man is the victim of a mugging in which he was hit on the head repeatedly with a baseball bat. On arrival to the emergency room, his right pupil is dilated and nonreactive. The patient rapidly progresses to coma and expires. **(CHOOSE 1 DIAGNOSIS)**

Items 42–44

For each of the following metabolic disturbances, choose the most likely associated odor.

- a. Fruity odor
- b. Bitter almond odor
- c. Burned-rope odor
- d. Rotten eggs odor
- e. Garlic odor
- f. Camphor odor

42. Cyanide poisoning **(CHOOSE 1 ODOR)**

43. Diabetic coma **(CHOOSE 1 ODOR)**

44. Arsenic ingestion **(CHOOSE 1 ODOR)**

For each patient with an abnormal level of consciousness, choose the most appropriate description of the level of consciousness.

- a. Confusion
- b. Lethargy
- c. Delirium
- d. Stupor
- e. Decorticate
- f. Decerebrate

45. A 67-year-old man, who has recently been resuscitated after a motor vehicle accident, is arousable for short periods of time to visual, verbal, or painful stimuli. He responds by moving slowly or by moaning. **(CHOOSE 1 DESCRIPTION)**

46. A 73-year-old woman is admitted to the cardiac unit for elective placement of a pacemaker. While in the hospital, she becomes confused and experiences hallucinations. She has a diminished attention span, is anxious, and reacts inappropriately to stimuli. **(CHOOSE 1 DESCRIPTION)**

47. A patient with urosepsis presents drowsy and falls asleep several times during the physical examination. Once aroused, the patient is cooperative and responds to questions and commands appropriately. **(CHOOSE 1 DESCRIPTION)**

GENERAL PRINCIPLES OF DISEASE

Answers

1. The answer is a. (*Seidel, 4/e, p 1.*) A thorough history and physical examination is the core of the diagnostic and treatment process. Any further assessment with blood work and the other tests listed must be integrated with the initial information compiled in the history and physical examination. The **H&P** is always the most important first step in any diagnostic and treatment process.

2. The answer is a. (*Sapira, p 101.*) Measurement of **axillary** temperature alleviates the need to insert a thermometer into the mouth or rectum in a child who is anxious or uncooperative. Axillary temperature is **0.5°C lower** than oral or rectal temperature; however, the thermometer must be properly positioned in the axilla for at least 2 min to obtain an accurate reading. Even so, **rectal** temperature measurements remain the most accurate of the three methods. Rectal temperature readings are **0.5°C higher** than oral temperature readings. Regardless of the method used, the thermometer should be left in the axilla or rectum or under the tongue for at least 90 sec prior to obtaining a recording. An oral temperature of **100.2°F** (37.9°C) is considered a fever.

3. The answer is b. (*Seidel, 4/e, p 449.*) The amplitude of the pulse is described on a scale of **0 to 4**:

4 = Bounding

3 = Full and increased

2 = Expected (i.e., like the pulse of a 25-year-old)

1 = Diminished and barely palpable

0 = Absent or nonpalpable

4. The answer is a. (*Seidel, 4/e, p 57.*) A cuff that is too small will give an artificially high reading, and the opposite is true of a cuff that is too wide. Thus, it is important to choose a cuff that is appropriate for the size of the

patient's limb. The cuff should be fully deflated prior to a second measurement in order to prevent vascular congestion, which could result in an inaccurate reading. In a normal patient, readings between the two arms rarely vary by more than 10 mm Hg. The pressure at which Korotkoff sounds disappear is read as the diastolic, not systolic, pressure.

5. The answer is d. (Fauci, 14/e, pp 2120, 2192–2193. Goldman, 21/e, p 1102.) Persons with **Marfan syndrome** have arm spans that are greater than their height and above-average crown-to-heel height. Joints are hyperextensible and patients have long, spiderlike, slender fingers (**arachnodactyly**). The **Steinberg sign or thumb sign** is positive when the fingers are clenched over the thumb and the thumb protrudes beyond the ulnar margin of the hand. Patients often have a high-arched palate, kyphoscoliosis, subluxation of the lens, and a murmur of mitral valve prolapse. Aortic regurgitation and dissection of the aorta may complicate Marfan syndrome. Patients with **Lesch-Nyhan syndrome** (X-linked disorder) present with self-mutilation, choreoathetosis, spasticity, gout, and mental retardation. Patients with gonadal dysgenesis or **Turner syndrome** are 45,X; the syndrome is characterized by primary amenorrhea, short stature, webbed neck with a low posterior hairline, and multiple congenital abnormalities. Patients with **Ehlers-Danlos syndrome** (EDS) present with hyperelasticity of the skin ("**rubber man**" syndrome) and hypermobile joints. **Noonan syndrome** is an autosomal dominant disorder characterized by webbed neck, short stature, and congenital heart disease. Patients have normal karyotypes and normal gonads.

6. The answer is d. (Fauci, 14/e, p 2372. Sapia, pp 89–90.) Postural or **orthostatic hypotension** refers to hypotension in the erect position relative to the recumbent position; causes include volume depletion, autonomic dysfunction, and certain antihypertensive medications. Criteria for diagnosis include a postural decrease from the recumbent position to the standing position of at least 20 mm Hg in systolic or 10 mm Hg in diastolic blood pressure or a pulse increase of 20 beats/min.

7. The answer is c. (Seidel, 4/e, pp 88–89.) The **Glasgow Coma Scale** (GCS) is often used to quantify consciousness and assess cerebral cortex and brainstem function by assessing the patient's verbal response, motor response, and eye opening response to stimuli. It may be repeated at inter-

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vals to detect improvement or deterioration and is now widely used in coma assessment. The minimum score is 3 and the maximum score is 15. Three behaviors are assessed in the GCS:

Eye Opening Response	Verbal Response	Motor Response
4 = Spontaneous	5 = Oriented	6 = Obeys commands
3 = To verbal stimuli	4 = Confused	5 = Localizes pain
2 = To pain	3 = Inappropriate words	4 = Withdraws from pain
1 = None	2 = Incoherent	3 = Flexion to pain or decorticate
	1 = None	2 = Extension to pain or decerebrate
		1 = None

8. The answer is b. (*Tintinalli, 5/e, pp 229–250.*) The **early** phase of **septic shock** is characterized by vasodilation resulting in a warm, flushed patient with a normal or elevated cardiac output. Fever, agitation, or confusion is often present. In **late** septic shock, patients become obtunded with decreased cardiac output and hypotension that is not reversible by volume replacement. Patients with **cardiogenic shock** have signs of pulmonary vascular congestion (jugular venous distention, S₃ gallop, bilateral lung crackles), increased PCWP, and decreased cardiac output. **Neurogenic shock** follows a spinal cord injury (warm skin, bradycardia, neurologic deficits), and **hypovolemic shock** is characterized by a physical examination consistent with volume depletion (tachycardia; hypotension; cool, clammy skin; and poor capillary refill) and a PCWP that is decreased. A **mnemonic to remember the causes of shock is SHOCK**: Sepsis, Hypovolemia, Other (i.e., Addison's disease), CNS (neurogenic), and **K**ardiac causes.

9. The answer is c. (*Fauci, 14/e, p 120.*) Disuse, loss of innervation, and muscle destruction are common causes of muscle atrophy. **Tetany** is the result of peripheral nerve hyperexcitability characterized by contractions of the distal muscles of the hand (carpal spasm). It is often caused by hypocalcemia, hypomagnesemia, or alkalosis. **Hypotonia** is a floppy extremity seen with cerebellar disease or severe peripheral nerve disorders. **Duchenne**

muscular dystrophy is an X-linked muscle disorder due to the absence of dystrophin, and persons will have **pseudohypertrophy**.

10. The answer is e. (*Tintinalli, 5/e, p 1807.*) The greatest amount of blood loss generally occurs in fractures of the pelvis (retroperitoneal hemorrhage), followed by those of the femur and spine. Patients with pelvic fractures should be evaluated for hypovolemic shock. Common manifestations include tachycardia, hypotension, oliguria, a clouded sensorium, and cool extremities.

11. The answer is c. (*Tintinalli, 5/e, p 1827.*) A **fracture** is a break or disruption in the continuity of bone. A **sprain** is an injury to a ligament and may be classified as being:

First-degree = Microscopic tears and minimal swelling

Second-degree = Partial disruption, significant swelling, and difficulty bearing weight

Third-degree = Complete disruption, ecchymosis, swelling, and inability to bear weight

12. The answer is d. (*Fauci, 14/e, p 203.*) The classification of blood pressure is based on the average of two or more readings.

Category of BP	Systolic BP (mm Hg)	Diastolic BP (mm Hg)
Normal	<130	<85
High normal	130–139	85–89
Stage 1 (mild)	140–159	90–99
Stage 2 (moderate)	160–169	100–109
Stage 3 (severe)	180–209	110–119
Stage 4 (very severe)	≥210	≥120

13. The answer is b. (*Sapira, p 424.*) Patients often present complaining of pain in an area other than the site of the pathologic process. For this reason, the “chief complaint” is often misleading. Pain originating at the hip joint is most often perceived in the groin area, followed by the buttock or posterior aspect of the greater trochanter. Occasionally, pain may be referred to the ipsilateral knee.

14. The answer is d. (*Seidel, 4/e, p 52.*) The palmar surfaces of the fingers are most sensitive to texture, size, position, consistency, crepitus, fluid, and masses. This is why the palm is used for light (1 cm) and deep (4 cm) palpation. The ulnar surface of the hand is best for vibration and the radial surface of the hand is best to determine temperature.

15. The answer is c. (*Seidel, 4/e, p 777.*) The facial nerve (cranial nerve VII) mediates taste (salty and sweet) on the anterior two-thirds of the tongue. The glossopharyngeal nerve (cranial nerve IX) mediates taste (bitter and sour) on the posterior one-third of the tongue.

16. The answer is c. (*Seidel, 4/e, p 707.*) A commonly accepted means of grading muscle strength is as follows:

Grade 0: No evidence of contractility

Grade 1: Muscle function reveals slight contractility but no movement

Grade 2: Muscle has full range of motion with gravity eliminated

Grade 3: Muscle has full range of motion against gravity

Grade 4: Muscle has full range of motion against gravity with some resistance

Grade 5: Muscle has full range of motion against gravity with full resistance

17. The answer is d. (*Tintinalli, 5/e, p 229.*) **Bacteremia** is the presence of bacteria in blood culture bottles. **SIRS** is not a diagnosis but a response to a variety of clinical situations (i.e., infection, burns, trauma, pancreatitis) and is characterized by two or more of the following: (1) temperature of $>100.5^{\circ}\text{F}$ or $<97^{\circ}\text{F}$, (2) heart rate of $>90/\text{min}$, (3) respiratory rate of $>20/\text{min}$, (4) Pa

CO_2 of <32 mm Hg, (5) white blood cell count of $>12,000/\text{cu mm}$ or $<4,000/\text{cu mm}$ or $>10\%$ immature (band) forms. **Sepsis** is a systemic response to infection manifested by two of the five described conditions of SIRS. **Severe sepsis** is sepsis associated with organ dysfunction, hypoperfusion, or hypotension (i.e., lactic acidosis, oliguria, altered mental status). **Septic shock** is sepsis-induced hypotension despite adequate fluid resuscitation. **Sepsis-induced hypotension** is a systolic blood pressure of <90 mm Hg or a reduction of >40 mm Hg from baseline in the absence of other causes to explain the hypotension. **MODS** is the presence of altered organ dysfunction in an acutely ill patient such that homeostasis cannot be maintained without intervention.

18. The answer is a. (*Seidel, 4/e, p 458.*) The severity of edema is characterized by a grading system, which is as follows:

1+: Slight pitting edema (2 mm deep) with no distortion upon release of finger

2+: A 4-mm-deep pit whose detectable distortion disappears in 10–15 s

3+: A 6-mm-deep pit that lasts more than 1 min upon release of finger

4+: An 8-mm-deep pit that lasts 2–5 min upon release of finger

19. The answer is b. (*Fauci, 14/e, pp 2533, 2566–2567. Tintinalli, 5/e, pp 1191–1192.*) Accidental **overdose** of opiates may occur in drug addicts; patients present with pinpoint pupils, hypothermia, bradycardia, hypotension, and shallow breathing. Treatment involves the immediate reversal of the opiates with naloxone. During withdrawal, patients experience yawning, diaphoresis, rhinorrhea, restlessness, anxiety, muscular twitching, vomiting, diarrhea, hypertension, tachycardia, and tachypnea. **Methanol** (methyl alcohol or wood alcohol) is found in “moonshine”; patients present with blindness. **Ethylene glycol** is found in antifreeze and leads to seizures and coma. Patients develop oxalate crystals in the urine, and deposition may result in renal failure. Both methanol and ethylene glycol overdoses are treated with ethanol to prevent the formation of formic acid (toxic). Patients with **carbon monoxide** poisoning appear “cherry red” but are hypoxemic. Patients with mercury poisoning (found in thermometers, dental amalgams, and batteries) develop acrodynia (pink disease due to flushing and desquamation) and neurologic, gastrointestinal, and renal problems.

20. The answer is e. (*Fauci, 14/e, pp 1862–1866.*) **Anaphylaxis** may occur several minutes after the introduction of a specific antigen; presenting symptoms may include pruritus, urticaria, angioedema, abdominal pain, nausea, vomiting, diarrhea, respiratory distress, and shock. This life-threatening emergency requires immediate treatment with epinephrine (for alpha- and beta-adrenergic effects resulting in vasoconstriction), antihistamines, beta agonist inhaled treatments for bronchospasm, oxygen, steroids, and vascular and ventilatory support when required. **Angioedema** may appear, with or without urticaria, and occurs at the mucosal surfaces of the upper respiratory tract. It is characterized by a nonpitting edema of the subcutaneous tissues, and patients are at risk for death due to airway obstruction from laryngeal edema.

21. The answer is a. (*Fauci, 14/e, pp 424, 1864–1866.*) **Hereditary angioedema** is an autosomal dominant disease due to a deficiency of C1 inhibitor (C1INH). The family history and the lack of urticaria suggest the diagnosis. **Acquired C1 inhibitor deficiency** has the same clinical manifestations as the inherited form but is associated with lymphoproliferative disorders and lacks the family history. **Serum sickness** is due to the deposition of drug-antibody complexes causing complement activation and subsequent urticaria, arthralgias, lymphadenopathy, glomerulonephritis, and cerebritis. Most cases of serum sickness are due to penicillin. Asthma and cystic fibrosis are not associated with facial swelling.

22. The answer is b. (*Kutty, 3/e, p 53.*) **Latex anaphylaxis** occurs in patients with spina bifida or with congenital urologic defects who have undergone repetitive surgeries. Other groups at risk include employees of rubber manufacturers and health care workers. The diagnosis is confirmed by prick skin testing for IgE to latex or by radioallergosorbent test (RAST) assay. Patients with latex-induced anaphylaxis must avoid latex during surgical procedures and live in a latex-free environment.

23. The answer is c. (*Fauci, 14/e, p 2503.*) Fifty percent of Chinese and Japanese lack aldehyde dehydrogenase (ALDH) and develop facial flushing and erythema after ingestion of alcohol. The lack of this enzyme results in accumulation of acetaldehyde after ingestion of alcohol.

24. The answer is a. (*Goldman, 21/e, pp 52–53.*) Although LFTs, macrocytic red blood cell changes, and hepatomegaly are good tests to use to establish whether the patient has complications of alcoholism, the CAGE questionnaire is the best screening tool for alcohol dependence. If patients respond “yes” to more than one answer, alcoholism is likely.

There are four **CAGE** questions:

1. Have you felt the need to **C**ut down on your drinking?
2. Have you ever felt **A**nnoyed by criticisms of your drinking?
3. Have you ever felt **G**uilty about your drinking?
4. Have you ever needed an **E**ye-opener in the morning?

25. The answer is e. (*Fauci, 14/e, pp 2501–2502.*) The patient most likely is a victim of domestic violence. Patients may present to a physician with a

poorly explained injury, an obvious injury, or a subtle pain-related complaint (headache, chest pain, or abdominal pain). One in five patients presenting to a primary care practice are involved in a relationship where abuse exists, and all physicians should screen for this problem.

The **SAFE** questionnaire may be used to screen for domestic violence:

S = Do you feel **Safe** or **Stressed** in a relationship?

A = Have you ever been **Abused** or **Afraid** in a relationship?

F = Are your **Friends** and **Family** aware of your relationship problem?

E = Do you have an **Emergency** plan if needed?

26. The answer is b. (*Tintinalli, 5/e, pp 1261–1268.*) **High altitude sickness** can occur at altitudes greater than 9,500 ft, and mountain climbers at extreme altitudes (over 18,000 ft) are susceptible to hypoxemia and physiologic deterioration. Allowing sufficient time to acclimate and avoiding rapid ascent may prevent acute mountain sickness (AMS). AMS is characterized by headache, breathlessness, nausea, vomiting, weakness, and lassitude, but may progress to ataxia, altered mental status, pulmonary edema, cerebral edema, and coma. Funduscopy examination may reveal retinal hemorrhages and venous tortuosity. Descent is the definitive treatment for all forms of AMS. **Hypothermia** is defined as core body temperature of less than 95°F (35°C).

27. The answer is c. (*Kutty, 3/e, p 95.*) There are **six stages of behavior change** in addicted personalities:

Precontemplation = Denies problem; no intention of changing

Contemplation = Acknowledges problem; seriously thinks about solving it

Preparation = Committed to action; needs to plan

Action = Modifies behavior and surroundings

Maintenance = At risk for relapse if not committed

Termination = No continuing effort needed; addiction no longer a threat

28. The answer is a. (*Goldman, 21/e, pp 1152–1153.*) The patient most likely has **bulimia** (more common than anorexia nervosa). Patients typically maintain their normal body weight by induced vomiting or the use of laxatives or diuretics. Patients present with dental enamel erosion, excessive dental caries, parotid enlargement, and scars on the dorsal surfaces of the hands from the vomiting. Electrolytes may reveal abnormalities from

chronic use of laxatives, diuretics, and enemas. Patients with **anorexia nervosa** present below their ideal body weight. Characteristics of anorexia nervosa include cold intolerance, emaciated appearance, hypothermia, hypotension, and bradycardia. Irregularities in the menstrual cycle may be a presenting sign in both bulimia and anorexia nervosa.

29. The answer is e. (*Fauci, 14/e, pp 449–450, 459.*) Assessment of BMI [weight in kg divided by height in m² or **weight in pounds divided by (height in inches)² × 703.1**] is useful in assessing both over- and under-nutrition. It is a useful measure to predict the risk of certain diseases associated with obesity. For example, non-insulin-dependent diabetes mellitus (NIDDM) is nonexistent in persons with a BMI below 22 kg/m².

Normal BMI is defined as 18.5–24.9 kg/m²

Overweight is a BMI of 25–29.9 kg/m²

Obesity is a BMI of 30–39.9 kg/m²

Morbid obesity is a BMI of >40 kg/m²

Mild malnutrition is defined as a BMI of 17–18.4 kg/m²

Moderate malnutrition is a BMI of 16–16.9 kg/m²

Severe malnutrition is a BMI of <16.0 kg/m²

30. The answer is d. (*Tintinalli, 5/e, p 1282.*) A **first-degree** burn involves the epidermis. **Second-degree** burns may be superficial (papillary layer) partial thickness and deep (reticular layer) partial thickness. **Third-degree** burns are full-thickness burns that involve the entire thickness of the skin. **Fourth-degree** burns extend through the skin to subcutaneous fat, muscle, and bone. **The rule of 9's is often used to calculate burn surface area in adults: 9% for each arm and the head and 18% for each leg and each side of the torso.**

31. The answer is b. (*Tintinalli, 5/e, p 1302. Fauci, 14/e, pp 2533, 2538.*) Gasoline engines, paint removers, and the incomplete combustion of wood, coal, or natural gas produce **carbon monoxide** (CO). It binds preferentially to hemoglobin and decreases the release of oxygen to tissues. It is especially important to exclude this poisoning in the winter due to the furnaces used in heating. Patients develop a “**cherry red**” appearance, headache, dizziness, confusion, visual field defects, blindness, nausea, abdominal pain, syncope, chest pain, heart arrhythmias, seizures, and coma. Pulse oximetry reveals a

falsely elevated saturation; therefore, the diagnosis must be confirmed by determining the actual carboxyhemoglobin fraction in an arterial blood gas. **Methemoglobinemia** (from chemicals, antimalarials, and sulfonamides) results in cyanosis that is unresponsive to oxygen. Patients have chocolate-colored blood, a gray appearance, and a falsely normal saturation.

32. The answer is d. (*Fauci, 14/e, p 2486.*) The patient has no risk factors for coronary artery disease, such as family history or tobacco or cocaine use, and her ECG is normal. Hyperthyroidism is unlikely without tachycardia and other physical examination findings. A click and murmur are often found on heart auscultation in patients with MVP. The patient has no previous traumatic event in her life to have caused PTSD. The patient has symptomatology consistent with panic disorder. **Four of five criteria are needed for the diagnosis of panic disorder: PANIC = Palpitations, Abdominal pain, Nausea, Increased perspiration, and Chest pain, Chills, or Choking.**

33. The answer is a. (*Seidel, 4/e, pp 190, 847.*) Normal **capillary refill** (pinching the nail bed until the skin blanches, then counting the seconds for the color to return) is <2 s. A capillary refill time of >2 s implies poor perfusion. **Skin turgor** is evaluated by pinching the skin and allowing it to return to its original state. Normally, the skin bounces back quickly. **Tenting** or decreased skin turgor implies malnutrition or dehydration. Other signs of dehydration include hypotension, tachycardia, and diminished peripheral pulses.

34. The answer is c. (*Tintinalli, 5/e, pp 1228–1229.*) **Frostnip** is a superficial freeze injury that causes no tissue loss. Patients complain of some discomfort and the involved area is pale; rewarming quickly reverses the symptoms. **First-degree frostbite** is characterized by partial skin freezing, erythema, edema, no blisters, and desquamation several days later. **Second-degree frostbite** is characterized by full-thickness skin freezing, erythema, edema, and the presence of clear blisters. Patients complain of throbbing and numbness. **Third-degree frostbite** injuries are characterized by damage that extends into the subdermal plexis. The skin is blue or gray and there are hemorrhagic blisters. Patients complain of burning, shooting pains, and the feeling that the involved area feels like “a block of wood.” Prognosis is poor. **Fourth-degree frostbite** injuries extend into the subcutaneous tissue, muscle, and bone. There is typically no edema and

the skin is mottled and cyanotic; eventually these injuries form a mummified eschar.

35. The answer is b. (*Fauci, 14/e, p 2361.*) **Neuroleptic malignant syndrome** is a complication of neuroleptic medications (especially haloperidol). Patients present with hyperthermia, rigidity, catatonia, labile blood pressure, autonomic dysfunction, tachycardia, and tachypnea. It usually occurs within 30 days of starting the neuroleptic drug but may occur at any time during medication use. **Tardive dyskinesia** is a common complication of neuroleptics; patients present with choreoathetoid movements of the face and mouth (“lip smacking”). **Dystonic reaction** may also complicate neuroleptic use; patients present with torticollis, rigidity of the back muscles, carpopedal spasm, blepharospasm, or chorea. Symptoms usually resolve with anticholinergic medication. **Drug-induced parkinsonism** may be due to dopamine antagonists (i.e., reserpine, phenothiazines, or butyrophenones). Although the etiology for all of these neuroleptic complications is unclear, dopamine antagonism probably plays some role in all of these disorders.

36–37. The answers are 36-d and 37-b. (*Kutty, 4/e, pp 56–60.*) **Type I** allergic reactions cause urticaria and anaphylaxis and are seen with penicillin, insulin, sulfonamides, morphine, and contrast media. **Type II** allergic reactions are due to transfusions (ABO mismatch) or use of medications (quinidine, heparin, phenacetin, sulfonamides) and typically cause hemolysis, thrombocytopenia, and nephritis. **Type III** allergic reactions are seen with penicillin, propylthiouracil, hydralazine, and procainamide and cause serum sickness. **Type IV** allergic reactions are seen with tetracyclines, nitrofurantoin, neomycin, parabens, and sulfonamides. These medications cause a contact dermatitis, pulmonary fibrosis, photosensitivity, and toxic epidermal necrolysis.

38–41. The answers are 38-c, 39-e, 40-f, 41-b. (*Fauci, 14/e, pp 2390–2393.*) Patients with **basilar skull fracture** may present with the **Battle sign** (subcutaneous blood over the mastoid due to fracture of the petrous bone) and “**raccoon eyes**” (subcutaneous blood around the eyes due to fractures through the cranial fossa). These fractures are associated with **CSF otorrhea** and **CSF rhinorrhea**. Patients with **epidural hematoma** typically present after a lucid period. These are arterial hemor-

rhages from tears of the middle meningeal artery from temporal bone fractures, and death occurs if the bleeding is not controlled. They appear as **convEx** (Epidural = **EE**) hyperdensities on CT scan. **Subdural hematomas** are venous hemorrhages; patients may present with headache, confusion, and hemiparesis. An SDH appears as a **concave** hyperdensity on CT scan. A **concussion** is a temporary impairment of cerebral function without structural cerebral damage. **Postconcussion syndrome** follows a concussion; patients complain of personality changes, dizziness, and headache. A contusion is due to bruising of the brain tissue and may be “**coup**” (at the site of impact) or “**contracoup**” (at the opposite side of the impact). **Uncal herniation** causes compression of cranial nerve III and results in a “**blown pupil**” (dilated and nonreactive). **Cerebellar tonsillar herniation** results in compression of the pons and medulla; patients present with severe hypertension, dizziness, ataxia, drowsiness, weakness, spasticity, and, if left untreated, coma and death.

42–44. The answers are 42-b, 43-a, 44-e. (*Seidel, 4/e, p 851.*) Cyanide poisoning is associated with a bitter almond odor and diabetic acidosis is associated with a fruity odor. Arsenic ingestion and parathion poisoning are associated with a garlic odor. Marijuana odor is that of burned rope and rotten egg odor is associated with poisoning due to hydrogen sulfide mercaptans. The odor of camphor is associated with ingestion of naphthalene (mothballs).

45–47. The answers are 45-d, 46-c, 47-b. (*Seidel, 4/e, p 83.*) Stuporous patients are arousable for short periods of time to visual, verbal, or painful stimuli. They often moan or have slow motor movements to stimuli. Delirious patients are confused and hallucinate. They are anxious and demonstrate motor and sensory excitement. Lethargic patients are drowsy and fall asleep easily but, once aroused, respond appropriately. Confused patients have poor memory, a decreased attention span, and inappropriate response to questions. Comatose patients are neither aware nor awake. Decerebrate patients **Extend (EE)** to painful stimuli and decorticate patients flex to painful stimuli.

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THE SYSTEMS

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DERMATOLOGY

Questions

DIRECTIONS: Each of the numbered items or incomplete statements in this section is followed by answers or by completion of the statements. Select the **one** lettered answer or completion that is **best** in each case.

48. A 10-year-old girl presents with multiple pigmented macules on the vermilion border of her lower lip. The dark brown lesions are 2–5 mm in size and are arranged in a cluster. The patient's older brother has similar lesions. The patient complains of recurrent bouts of abdominal pain. Which of the following is the most likely diagnosis?

- a. Gardner syndrome
- b. Herpes simplex virus infection
- c. Freckles
- d. Peutz-Jeghers syndrome
- e. Hand-foot-and-mouth disease

49. A 16-year-old student with a history of herpetic gingivostomatitis develops a generalized and symmetric rash. The lesions are 1–2 cm in diameter and look like round patches. They consist of two concentric rings surrounding a central disk. The rash is burning and pruritic. A few erosive lesions are visible in the oral mucosa. Which of the following is the most likely diagnosis?

- a. Erythema multiforme
- b. Secondary syphilis
- c. Systemic lupus erythematosus
- d. Pemphigus vulgaris
- e. Urticaria

50. A 17-year-old patient presents with severe pruritus that is worse at night. Upon examination of the skin, areas of excoriated papules are observed in the interdigital area. Family members report similar symptoms. Which of the following is the most likely diagnosis?

- a. Scabies
- b. Cutaneous larva migrans
- c. Contact dermatitis
- d. Dermatitis herpetiformis
- e. Impetigo

51. A 35-year-old woman who had been camping in Wisconsin 2 wk ago develops an erythematous rash on her inner thigh. The macular lesion is 10 cm in diameter and had a distinct red border with central clearing. Two days ago, a second similar lesion developed. The patient reports no fever, chills, or other symptoms. She has no medical problems or allergies and takes no medications. She does not recall any spider or tick bites. The rest of the physical examination is normal. Which of the following is the most likely diagnosis?

- a. Brown recluse spider bite
- b. *Borrelia burgdorferi* infection
- c. *Bartonella henselae* infection
- d. *Mycobacterium marinum* infection
- e. *Rickettsia rickettsii* infection

52. A 31-year-old man presents to the emergency room 3 days after undergoing a hernia repair operation. He is febrile and hypotensive. The symptoms began with the sudden onset of a diffuse, maculopapular rash that was pruritic and erythematous. On cutaneous examination, the erythroderma involves the palms and soles and is beginning to desquamate. The patient has no other illnesses and takes no medications. Which of the following is the most likely diagnosis?

- a. Toxic epidermal necrolysis
- b. Toxic shock syndrome
- c. Necrotizing fasciitis
- d. Scarlet fever
- e. Cellulitis

53. A 6-year-old child presents complaining of patchy hair loss on the back of the scalp. Examination reveals well-demarcated areas of erythema and scaling, and although there are still some hairs in the area, they are extremely short and broken in appearance. Which of the following is the most likely diagnosis?

- a. Androgenic hair loss
- b. Psoriasis of the scalp
- c. Seborrheic dermatitis
- d. Tinea capitis
- e. Carbuncle

- 54.** A 37-year-old man who works in a fish market presents with a burning pain in his right hand for 1 wk. Physical examination reveals a large, violaceous plaque on his finger. Gram stain reveals no organism. Which of the following is the most likely diagnosis?
- Erythrasma
 - Ecthyma
 - Erysipelas
 - Erysipeloid
 - Nummular eczema
- 55.** Five days after going on a nature walk, a 13-year-old boy develops well-demarcated, erythematous plaques and vesicles over his arms and face. The plaques are arranged in a linear fashion and are crusting. The boy has some facial edema. He has no history of fever or chills but complains of pruritus. Which of the following is the most likely diagnosis?
- Rubeola
 - Atopic dermatitis
 - Acute contact dermatitis
 - Impetigo
 - Erythema infectiosum
- 56.** A 6-year-old child presents with flesh-colored papules on the hand that are not pruritic. Examination reveals lesions that are approximately 4 mm in diameter with central umbilication. A halo is seen around those lesions undergoing regression. Which of the following is the most likely diagnosis?
- Verruca vulgaris
 - Molluscum contagiosum
 - Keratoacanthoma
 - Herpetic whitlow
 - Hemangioma
- 57.** A 42-year-old man presents with blisters and erosions of his hands for 6 mo. He has noticed excessive hair growth on his temple lateral to his eyebrows. On physical examination of the skin, vesicles, bullae, and milia are visible on the dorsa of the hands. The patient complains of generalized malaise but has no other symptoms. Which of the following is the most likely diagnosis?
- Porphyria cutanea tarda
 - Acute intermittent porphyria
 - Variegate porphyria
 - Pemphigus
 - Tinea versicolor
 - Pemphigoid

58. A 59-year-old man has fine, scaly plaques over his abdomen that have been recurrent for 15 years. Several skin biopsies have been nondiagnostic (lymphocytic epidermal infiltrate) and the lesions respond poorly to topical steroids. The rest of the physical examination is remarkable for a small axillary lymph node. Which of the following is the most likely diagnosis?

- a. Lichen planus
- b. Pityriasis rosea
- c. Mycosis fungoides
- d. Kaposi's sarcoma
- e. Seborrheic keratosis

DIRECTIONS: Each set of matching items in this section consists of a list of lettered options followed by several numbered items. For each numbered item, select the appropriate lettered option(s). Each lettered option may be selected once, more than once, or not at all. **Each item will state the number of options to select. Choose exactly this number.**

Items 59–61

For each patient with skin abnormalities, choose the most appropriate diagnosis.

- a. Discoid lupus
- b. Melasma
- c. Acne vulgaris
- d. Red man syndrome
- e. Spider angioma
- f. Petechiae
- g. Rosacea
- h. Ecchymoses
- i. Purpura
- j. Telangiectasia

59. A 15-year-old presents with inflammatory papules, pustules, and crusting on the forehead and cheeks. **(CHOOSE 1 DIAGNOSIS)**

60. A 51-year-old woman presents with pustules and papules around the central parts of her face. She complains of facial flushing after drinking alcohol or hot fluids. **(CHOOSE 1 DIAGNOSIS)**

61. A 22-year-old woman in her fifth month of pregnancy presents with well-demarcated, hyperpigmented macules on her cheek, nose, and forehead. **(CHOOSE 1 DIAGNOSIS)**

Items 62–64

For each patient with ulcer formation, choose the most appropriate diagnosis.

- a. Venous ulcer
- b. Arterial ulcer
- c. Neuropathic ulcer
- d. Aphthous ulcer
- e. Pressure ulcer

62. A 64-year-old patient with a history of previous strokes is chronically bedridden. Her nutritional intake is poor and she has fecal and urinary incontinence. She complains of pain in her lower back and has a low-grade fever. **(CHOOSE 1 DIAGNOSIS)**

63. A 67-year-old woman presents with a long history of aching and swelling of her legs relieved by elevation. Over the last several weeks, she has developed two blue-red, irregular, punched-out patches over the medial malleolus of her left leg. **(CHOOSE 1 DIAGNOSIS)**

64. A 55-year-old diabetic patient presents with complaints of a painful right leg when walking and at rest. The pain is worse at night and improves with dependency. His distal leg is porcelain white and cool to the touch. No dorsalis pedis pulse is palpable. A sharply demarcated, punched-out ulcer is visible over the supramalleolar area. **(CHOOSE 1 DIAGNOSIS)**

Items 65–69

For each patient with abnormal nail findings, choose the most likely disorder associated with the nail finding.

- a. Hepatic cirrhosis
- b. Iron-deficiency anemia
- c. Chronic renal failure
- d. Nephrotic syndrome
- e. Wilson's disease
- f. Severe stress
- g. Psoriasis
- h. Addison's disease
- i. Congestive heart failure
- j. Endocarditis
- k. Arsenic intoxication
- l. Antimalarial drugs

65. Koilonychia **(CHOOSE 1 DISORDER)**

66. Muehrcke's nails **(CHOOSE 1 DISORDER)**

67. Blue nails **(CHOOSE 2 DISORDERS)**

68. Beau's lines **(CHOOSE 1 DISORDER)**

69. Brown nails **(CHOOSE 2 DISORDERS)**

Items 70–71

For each patient with skin abnormalities, choose the most likely vitamin deficiency.

- a. Zinc deficiency
- b. Niacin deficiency
- c. Vitamin C deficiency

70. A 71-year-old woman presents with ecchymoses and perifollicular hemorrhage on her legs in a "saddle" distribution (how a rider would touch the saddle). She is edentulous with bleeding gums and is anemic. She lives alone and eats a diet of no added fruits or vegetables. **(CHOOSE 1 VITAMIN DEFICIENCY)**

71. A bottle-fed infant presents with the triad of acral dermatitis, alopecia, and diarrhea. (**CHOOSE 1 VITAMIN DEFICIENCY**)

Items 72–73

For each patient with skin abnormalities, choose the most appropriate lymphoma.

- a. Adult T-cell leukemia/lymphoma
- b. Sezary syndrome (cutaneous T-cell lymphoma)
- c. Cutaneous B-cell lymphoma

72. A 65-year-old man presents with intractable pruritus and diffuse erythroderma. He has generalized lymphadenopathy and leukocytosis. Examination of the buffy coat smear reveals abnormal circulating T cells. (**CHOOSE 1 LYMPHOMA**)

73. A 57-year-old woman presents with a large, red, nodular lesion on her abdomen. She had lymphadenopathy and hepatosplenomegaly. Her leukocyte count is over 500,000/ μ l and her serum calcium level is elevated. (**CHOOSE 1 LYMPHOMA**)

Items 74–76

For each patient with skin abnormalities, choose the most likely disorder.

- a. Superficial spreading melanoma
- b. Basal cell carcinoma
- c. Squamous cell carcinoma
- d. Bowen's disease
- e. Actinic keratoses
- f. Seborrheic keratoses
- g. Leukoplakia
- h. Erythroplasia of Queyrat

74. A 50-year-old construction worker presents with a slow-growing eroded papule on his lower lip. He has a history of leukoplakia and was a heavy smoker. He has a small, tender supraclavicular node. (**CHOOSE 1 DISORDER**)

75. A 46-year-old man presents with a large, well-demarcated, erythematous, glistening plaque on his glans penis. (**CHOOSE 1 DISORDER**)

76. A 42-year-old man presents with a single, shiny, red nodule on his nose that appears to glisten and shine. (**CHOOSE 1 DISORDER**)

DERMATOLOGY

Answers

48. The answer is d. (*Fitzpatrick, 3/e, pp 516–518, 788.*) The most likely diagnosis in this patient is Peutz-Jeghers syndrome (PJS). This is an autosomal dominant polyposis characterized by multiple small macules (lentiginos) on the lips and oral membranes. Abdominal symptoms occur because of multiple benign hamartomatous polyps in the small and large bowel and in the stomach. Freckles (ephelides) are lighter lesions due to increased epidermal pigment in the distribution of sun-exposed areas. Gardner's syndrome is an autosomal dominant disease characterized by facial cysts and adenomatous polyps in the small and large intestines. Herpes simplex virus is characterized by painful vesicles, which are grouped and confluent. Hand-foot-and-mouth disease is a highly contagious systemic infection caused by coxsackievirus A16 and characterized by ulcerative oral lesions and a vesicular exanthem on the distal extremities.

49. The answer is a. (*Fitzpatrick, 3/e, pp 314–318, 332–335, 401–405, 877–882.*) **Erythema multiforme (EM) minor** due to the herpes infection is the most likely diagnosis in this patient. The lesions of EM are classically target lesions; they are burning and pruritic. They are generalized and often involve the oral mucosa. Etiologies of **EM major** include drugs such as phenytoin, sulfonamides, barbiturates, and allopurinol. Finger pressure in the vicinity of a lesion in EM major leads to a sheetlike removal of the epidermis (**Nikolsky sign**). Pemphigus vulgaris is a chronic, bullous, autoimmune disease usually seen in middle-aged adults. The Nikolsky sign is positive in pemphigus vulgaris. **Secondary syphilis** appears 2–6 mo after a primary infection and consists of round to oval, maculopapular lesions 0.5–1.0 cm in diameter. The eruptions typically involve the palms and soles. Secondary syphilis lesions that are flat and soft with a predilection for the mouth, perineum, and perianal areas are called **condylomata lata**. The skin lesions of systemic lupus erythematosus (SLE) range from the classic butterfly malar rash to the discoid plaques of chronic cutaneous lupus erythematosus (CCLE). Urticaria is characterized by pruritic wheals typically lasting several hours.

50. The answer is a. (Lynch, 3/e, pp 67–68, 122–126, 138–140, 320–324.)

The history is classic for scabies. Scabies is an infestation by the mite *Sarcoptes scabiei* that is spread by skin-to-skin contact. Although there are few skin findings on physical examination, patients usually complain of intense pruritus. Contact dermatitis is unlikely in this location and cutaneous larva migrans (most commonly from *Ancylostoma brasiliense* due to the dog and cat hookworm) typically has large, erythematous, serpiginous tracks. **Dermatitis herpetiformis** is associated with a gluten-sensitive enteropathy and is characterized by tiny papules, vesicles, and urticarial wheals. **Impetigo** is an infectious skin disease due to either *Staphylococcus aureus* or *Streptococcus pyogenes* seen typically on the face and characterized by discrete vesicles that rupture to form a yellowish crust.

51. The answer is b. (Fitzpatrick, 3/e, pp 671, 678–687, 762–765.) The rash described in the patient is **erythema migrans (EM)**, the early pathognomonic eruption of **Lyme disease**, a spirochetal infection transmitted to humans by the bite of an infected ixodid deer tick. Most cases in the United States involve the northeast or north central areas of the country. The rash typically occurs 1–2 wk after the bite, but less than 20% of patients recall a bite. *Rickettsia rickettsii*, transmitted by the dog or wood ticks, is the etiologic agent of **Rocky Mountain spotted fever**. The characteristic maculopapular rash begins peripherally and often involves the palms and soles. *Bartonella henselae* (formerly *Rochalimaea henselae*) is the etiologic agent responsible for cat-scratch disease (CSD). *Mycobacterium marinum* infections follow a traumatic inoculation in aquariums and swimming pools. The bite of the brown recluse spider (*Loxosceles*) begins as an area of erythema. In some cases, the bite progresses to become a painful bulla and deep necrotic ulcer.

52. The answer is b. (Fitzpatrick, 3/e, pp 590–595, 630–647.) **Toxic shock syndrome (TSS)** is the most likely diagnosis in this patient. This disease is a toxin-mediated multisystem infection caused by *Staphylococcus aureus*. Risk factors for TSS include surgical wounds, nasal packs, burns, skin ulcers, postpartum infections, eye injuries, and use of vaginal tampons. The rash is typically generalized and macular and involves the mucous membranes. Desquamation of the epithelium of the palms and soles and subsequent multisystem failure occur in TSS. **Cellulitis** is an acute infection of the dermal and subcutaneous tissues characterized by

erythema, warmth, and tenderness of the skin at the site of the entry of the bacteria. **Necrotizing fasciitis** begins as a painful induration of the underlying soft tissues with rapid development of an eschar and necrotic mass. **Scarlet fever** is seen in children and is due to an exotoxin-producing strain of group A *Streptococcus*. It has a characteristic confluent (scarlatiniform) erythema, which begins centrally, spreads to the extremities, and then desquamates. **Toxic epidermal necrolysis (TEN)** is a mucocutaneous, primarily drug-induced eruption characterized by a generalized erythema and exfoliation that may lead to multisystem failure. Drugs that have been implicated include sulfa derivatives, allopurinol, and hydantoin. TEN is a more severe variant of **Stevens-Johnson syndrome (SJS)** and begins 1–3 wk after drug exposure.

53. The answer is d. (Fitzpatrick, 3/e, pp 22, 72–74, 76–79, 610, 704–709. Sapira, p 121.) The history is most consistent with tinea capitis due to either *Trichophyton tonsurans* or *Microsporum canis*. It is usually seen in school-age children and may be transmitted from person to person. **Psoriasis** is a hereditary disorder characterized by scaling patches and plaques appearing in specific areas of the body, such as the scalp, elbows, lumbosacral region, and knees. The lesions are “salmon pink” with a silver-colored scale that on removal produces blood (**Auspitz sign**). The **Koebner phenomenon** (with trauma, the lesion jumps to a new location) is also elicited in patients with psoriasis. **Seborrheic dermatitis** is a common chronic dermatosis occurring in areas with active sebaceous glands (face, scalp, and body folds) and may occur either in infancy or in people over the age of 20. The eczematous plaques of seborrheic dermatitis are yellowish red and are often greasy with a sticky crust. Androgenic hair loss is a progressive hereditary bitemporal, frontal, or vertex balding that may begin any time after puberty. A **carbuncle** is a deep infectious collection of interconnecting abscesses (**furuncles**) arising from several hair follicles.

54. The answer is d. (Fitzpatrick, 3/e, pp 68, 604, 616, 618, 634.) **Erysipeloid** occurs in persons employed as handlers of fish, poultry, or dead meat. It is a slowly evolving, painful cellulitis due to the gram-positive organism *Erysipelothrix rhusiopathiae*. **Erysipelas** is a cellulitis due to group A β -hemolytic streptococci. **Ecthyma** is impetigo that extends into the dermis. **Erythrasma** is often seen in patients with diabetes and consists of large, well-demarcated macules affecting the intertriginous areas of the

body, especially the groin. The lesions are brownish-red and are due to *Corynebacterium minutissimum*, a gram-positive rod that is a part of normal skin flora. **Nummular eczema** is a chronic, pruritic dermatitis composed of plaques of papules and vesicles. The lesions are coin-shaped (nummular) and are common on the lower extremities of older men in the winter months when dryness of the skin is common. Nummular eczema is often associated with a history of atopy.

55. The answer is c. (*Fitzpatrick, 3/e, pp 48–54, 604–609, 784–787, 828.*) Contact dermatitis can be due to an allergen causing a type IV, cell-mediated, delayed hypersensitivity reaction. It may also be due to a non-allergen such as a chemical irritant. This patient presents with typical symptoms of acute contact dermatitis due to **poison ivy** resin. This results in sensitization within a week of exposure. Contact dermatitis due to poison ivy is usually pruritic, localized to one region, and often linear. **Impetigo** is an epidermal bacterial infection seen on the face characterized by vesicles that rupture and crust. Erythema infectiosum or **Fifth disease** is a childhood disease due to parvovirus B19 and is characterized by edematous, erythematous plaques on the cheeks (**“slapped cheek” disease**). Atopic dermatitis or eczema is an autosomal dominant pruritic inflammation with a predilection for the neck, face, flexor areas, feet, wrists, and hands. Usually there is a personal or family history of asthma, allergic rhinitis, or hay fever. **Rubeola (measles)** is a viral infection characterized by conjunctivitis and cough and a confluent erythematous maculopapular rash that spreads centrifugally. **Koplik spots** (bright red spots with blue-white specks in the center), which appear on the buccal mucosa opposite the premolar teeth, are pathognomonic for rubeola.

56. The answer is b. (*Fitzpatrick, 3/e, pp 149, 170, 766–767, 772–775, 797.*) The description of the skin lesions is most consistent with **molluscum contagiosum**. This is a self-limited viral infection due to a pox virus (molluscum contagiosum virus) seen in children, sexually active adults, and HIV-infected patients. These lesions characteristically have a central keratotic plug that gives them the appearance of being dimpled (umbilication). The lesions resolve spontaneously. Common **warts or verrucae vulgaris** are due to human papillomavirus (HPV). Warts are firm, hyperkeratotic, round papules that are 1–10 mm in diameter. They have no umbilication but have a predilection for sites of trauma including hands,

fingers, and knees. A **keratoacanthoma** is a skin-colored, isolated dome-shaped nodule with a central hyperkeratotic core usually found on the face. A **herpetic whitlow**, due to herpes simplex virus, consists of a painful group of vesicles on the volar finger. Capillary **hemangiomas** are bright red or purple nodules or plaques that develop at birth and spontaneously disappear by the fifth year.

57. The answer is a. (*Fitzpatrick, 3/e, pp 254, 406.*) **Porphyria cutanea tarda (PCT)** is a disease of adults and is found equally in males and females. Although the disease is often hereditary, drugs (estrogens including oral contraceptives, chloroquine, and alcohol), chemicals, and illnesses (hepatitis C virus) may induce PCT. It occurs gradually, with formation of tense bullae on the dorsae of the hands, feet, and nose and hypertrichosis. Eliciting an orange-red fluorescence in the urine with a **Wood's lamp** makes the diagnosis. Patients with **variegate porphyria** and **acute intermittent porphyria** have life-threatening attacks of abdominal pain and may present with a peripheral neuropathy or respiratory failure. **Pemphigus** is a serious autoimmune bullous disorder of the skin and mucous membranes that may be fatal without treatment. **Pemphigoid** is a chronic bullous autoimmune disorder seen mostly in patients older than 60 years. Mucous membrane involvement is less common in pemphigoid than pemphigus. **Tinea versicolor or pityriasis versicolor (PV)** is an asymptomatic dermatosis characterized by scaling macules with sharply margined borders distributed throughout the trunk. A **Wood's lamp** will demonstrate the presence of a fungal infection (green fluorescence).

58. The answer is c. (*Fitzpatrick, 3/e, pp 104, 166–168, 266–268, 544–547.*) **Mycosis fungoides** is also called cutaneous T-cell lymphoma (CTCL), a neoplastic disease of the helper T cells that first manifests in the skin but eventually spreads to the lymph nodes and internal organs. The scaly plaques of this disease disappear with sun exposure, mimicking psoriasis. Multiple biopsies and a careful examination for adenopathy are required to make the diagnosis. Lichen planus is an inflammatory dermatosis with unknown etiology that involves the skin and mucous membranes. **Pityriasis rosea** is seen in patients under the age of 40 and is more common in the spring and fall months. Its characteristic course begins with a single bright red “**herald**” or **primary patch**, usually on the trunk, followed by similar nonpruritic plaques distributed in a “**Christmas tree**”

pattern 1–2 wk later. The disorder is self-limited and remits within 6 wk. Seborrheic keratosis is a benign epithelial tumor seen in individuals over the age of 30. It typically appears as brown plaques, papules, or nodules with a “stuck-on” appearance and has a predilection for the face, trunk, and upper extremities. **Kaposi’s sarcoma (KS)** is a multisystem vascular neoplasm that may be seen in elderly males of eastern European heritage (Mediterranean and Ashkenazi Jewish) and predominantly arises in the legs. The papules and nodules of KS are usually violaceous. The disease is also seen in patients who are immunocompromised due to transplant, chemotherapy, or HIV and is thought to be due to herpesvirus type 8 (HHV-8).

59–61. The answers are 59-c, 60-g, 61-b. (*Fitzpatrick, 3/e, pp 2, 12, 300. Sapira, pp 108–110.*) **Acne** is an inflammation of the pilosebaceous units of the face and trunk occurring usually in adolescence. It manifests itself as comedones, papulopustules, or nodules and cysts. **Rosacea** is a chronic acneform disorder of the facial pilosebaceous units coupled with an increased reactivity of capillaries to heat leading to flushing and the formation of telangiectasia. **Melasma** is an acquired hyperpigmentation that occurs in sun-exposed areas, especially the face. It is common in women with brown and black skin color and may occur in pregnancy or with oral contraceptive use. **Discoid lupus** presents with facial plaques that may result in dyspigmentation and scarring. **Red man (neck) syndrome** is due to histamine release and occurs in patients who receive a rapid infusion of vancomycin. A **spider angioma** is a pulsatile arteriolar lesion that blanches with pressure and is seen in patients with cirrhosis (hyperestrogenism). **Petechiae** are hemorrhages <1 mm in size and **ecchymoses** are larger hemorrhages. **Purpura** is a general term for a collection of red blood cell deposition in the skin and when palpable represents antigen-antibody immune complex. A **telangiectasia** is a fine, irregular line due to a dilated capillary.

62–64. The answers are 62-e, 63-a, 64-b. (*Fitzpatrick, 3/e, pp 12, 486–488, 492–494.*) **Pressure ulcers** are common in patients who are chronically ill and bedridden. Risk factors for development of pressure ulcers include immobility, incontinence, poor nutritional status, and hypoalbuminemia. Sixty percent of pressure ulcers occur over the sacrum. Prevention is possible by turning of immobile patients (every 1–2 h) to pre-

vent skin compression and subsequent ischemic necrosis. **Venous ulcers** usually develop in the medial calf or over the malleolus (both lateral and medial). Minor trauma may precipitate venous ulcer formation. **Arterial ulcers** are typically painful at night and improve with dependency. Patients present with complaints of claudication. Arterial insufficiency may lead to atrophic skin changes (shiny and white) and loss of hair on the feet and legs. **Neuropathic ulcers** occur in diabetics; early symptoms may include paresthesias of the leg and foot. Trauma usually precedes the formation of the neuropathic ulcers of the toe, heel, or metatarsal areas. Aphthous ulcers are painful, gray-based ulcers with erythematous rims occurring in the oropharynx.

65–69. The answers are 65-b, 66-d, 67-e, 1, 68-f, 69-h, k. (*Fitzpatrick, 3/e, pp 496–503. Sapira, pp 130–133.*) White horizontal lines, separated by normal color, which remain immobile as the nail grows are called **Muehrcke’s nails**. They are seen in patients with severe hypoalbuminemia, such as in patients with nephrotic syndrome. **Blue nails** may be due to Wilson’s disease, hemochromatosis, and use of antimalarial drugs or exposure to silver nitrate. Times of severe stress may cause a temporary growth arrest and horizontal depressions across the nail plate that constitute **Beau’s lines**. **Koilonychia**, also called **spoon nails** (due to a thin and soft nail plate), is seen in iron-deficiency anemia and may be demonstrated when a drop of water on the nail does not roll off. Multiple **brown nails** occur with Addison’s disease, hemochromatosis, gold therapy, and arsenic intoxication. Other nail findings include **Terry’s nails** and **half-and-half nails** (related disorders), where the proximal nail is white and the distal nail is pink or brown, a nail abnormality seen in patients with cirrhosis, chronic renal failure, and congestive heart failure. **Pitting** of the nails is seen in psoriasis. **Splinter hemorrhages** are brown or red streaks in the midportion of the nail and may be seen in patients with endocarditis.

70–71. The answers are 70-c, 71-a. (*Fitzpatrick, 3/e, pp 440–444. Sapira, p 110.*) **Scurvy** or vitamin C deficiency is seen in infants under 1 year of age or in older adults. Perifollicular hemorrhage and areas of ecchymosis are common, especially on the back of the lower legs, arms, and inner thighs (“**saddle**” **distribution**). Older patients’ diets usually lack fruits and vegetables. Loose teeth and bleeding gums are seen with scurvy. Genetic zinc deficiency causes **acrodermatitis enteropathica** in infancy,

characterized by the classic triad of acral dermatitis, alopecia, and diarrhea. Adults may also develop zinc deficiency. Niacin deficiency is seen in alcoholic patients and causes **pellagra**, which is a **triad of dementia, diarrhea, and dermatitis**.

72–73. The answers are 72-b, 73-a. (*Fitzpatrick, 3/e, pp 540–553.*)

Sezary syndrome is a cutaneous T-cell lymphoma (also called **mycosis fungoides**) characterized by an erythroderma (a generalized erythema, scaling, and thickening of the skin) and leukocytosis. Abnormal circulating T cells (Sezary type) are seen on buffy coat. **Adult T-cell leukemia/lymphoma** is a neoplasm caused by the retrovirus human T-cell lymphotropic virus I (**HTLV-I**) and manifested by skin lesions, lymphadenopathy, hypercalcemia, lytic bone lesions, internal organ involvement, and abnormal lymphocytes on the peripheral blood smear (polylobulated lymphocytes). It is transmitted through blood products and through sexual intercourse and may occur 20 years after exposure. Skin lesions may be single, multiple, or generalized. Cutaneous B-cell lymphoma is a rare clonal proliferation of B-lymphocytes often associated with systemic B-cell lymphoma.

74–76. The answers are 74-c, 75-h, 76-b. (*Fitzpatrick, 3/e, pp 208–227, 238.*) Oral **leukoplakia** is a white, macular lesion found in the buccal mucosa. Predisposing factors include tobacco use, alcohol use, human papillomavirus, and syphilis. It may lead to squamous cell carcinoma. **Actinic (solar) keratoses** are dry, rough, adherent, scaly lesions occurring in sun-exposed areas of adults. These lesions are premalignant and may develop into squamous cell carcinoma. **Bowen's disease** or squamous cell carcinoma in situ is a solitary, well-demarcated plaque. When Bowen's disease occurs on the glans penis, it is called **erythroplasia of Queyrat**. Bowen's disease and erythroplasia of Queyrat may both lead to a fungating and ulcerating squamous cell carcinoma. **Seborrheic keratosis** is the most common benign epithelial tumor. **Basal cell carcinoma** (BCC) is the most common type of skin cancer. It is invasive and aggressive but rarely metastasizes. These lesions are usually round, firm, glistening (pearly), and shiny. Histologically, basal cell carcinomas have **palisading nuclei**. Superficial spreading **melanomas** (SSMs) have five cardinal features: **A**symmetry, **B**order that is irregular, **C**olor that is mottled and haphazard, **D**iameter that is large, and **E**nlargement/**E**levation (**ABCDE**).

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HEAD, EARS, EYES, NOSE, AND THROAT

Questions

DIRECTIONS: Each of the numbered items or incomplete statements in this section is followed by answers or by completion of the statements. Select the **one** lettered answer or completion that is **best** in each case.

77. A Weber test that lateralizes to the deaf ear with a Rinne test that is negative detects which kind of hearing loss?

- a. Conductive
- b. Sensorineural
- c. Electrical
- d. Hysterical
- e. Semantic

78. A 61-year-old man comes to your office complaining of a “popping” sensation in his left ear for nearly 2 wk. He also complains of decreased hearing. Recently, another physician treated him for an acute otitis media with antibiotics. Physical examination reveals a normal right ear canal and tympanic membrane. The left tympanic membrane is gray, retracted, and immobile. Which of the following is the most likely diagnosis?

- a. Otitis media with effusion
- b. Acute otitis media
- c. Mastoiditis
- d. Otitis externa
- e. Malignant otitis externa

79. A patient with decreased visual acuity as determined by a Snellen chart should have which of the following tests done to rule out a refraction error?

- a. Slit-lamp examination
- b. Pinhole test
- c. Pseudochromatic plate test
- d. Schiottz tonometry
- e. Visual field examination
- f. Amsler grid test
- g. Fluorescein stain

80. A 52-year-old man comes to your office complaining of an “itchy” feeling in his right ear. He has been trying to scratch the itchiness using a cotton swab applicator. He denies tinnitus or hearing loss. On physical examination, the patient is afebrile and complains of pain when the pinna is pulled for the examination. The ear canal is red and swollen with some areas of white debris. Because of the debris, you cannot visualize the tympanic membrane. There is no adenopathy. Which of the following is the most likely diagnosis?

- a. Otitis media
- b. Serous otitis
- c. Otitis externa
- d. Cerumen blockage
- e. Malignant otitis

81. Hypertrophied gums are most likely the result of which of the following?

- a. Hutchinson’s teeth
- b. Tetracycline administration
- c. Administration of diphenylhydantoin
- d. Overdose of fluoride
- e. Lead poisoning
- f. Bulimia

82. A 14-year-old boy presents to your office after being hit in the face by a soccer ball. He complains of left eye pain, and on physical examination you see blood in the anterior chamber. Pupils are equal and reactive to light and extraocular muscles are intact. Which of the following is the most likely diagnosis?

- a. Hyphema
- b. Esotropia
- c. Amblyopia
- d. Subconjunctival hemorrhage
- e. Strabismus

83. Which of the following is the common abbreviation for visual acuity of the right eye?

- a. VA OD
- b. VA OS
- c. VA OU
- d. VA US
- e. VA SD

- 84.** A 70-year-old man complains of the sudden onset of visual loss in his right eye accompanied by a headache. He has a history of hypertension and diabetes mellitus. On physical examination, visual acuity in the left eye is 20/20 while visual acuity in the right eye is 20/90. Fundoscopic exam shows the right disk to be pale and swollen with some hemorrhages. Which of the following is the most likely diagnosis?
- Diabetic retinopathy
 - Retinal vein occlusion
 - Retinal artery occlusion
 - Ischemic optic neuropathy
 - Hypertensive retinopathy
 - Retinal detachment
- 85.** The visual acuity of a patient is recorded to be 20/200. Which of the following best describes this measurement?
- The patient can read at 20 ft what the average person can read at 200 ft
 - The patient can read at 200 ft what the average person can read at 20 ft
 - The patient can read at 200 ft what the average person can read at 200 ft
 - The patient can read at 20 ft what the average person can read at 20 ft
- 86.** Which of the following is the most sensitive test for hearing loss?
- Use of a 512-Hz tuning fork
 - Use of a 1025-Hz tuning fork
 - Audioscope
 - Whispered voice test
 - Ticking watch test
- 87.** According to the cardinal positions of gaze, which of the following pairings of ocular muscles and actions is correct?
- Inferior oblique muscle—abduction and elevation
 - Lateral rectus muscle—adduction
 - Medial rectus—abduction and depression
 - Superior oblique muscle—adduction and depression
 - Superior rectus muscle—depression
- 88.** A 30-year-old man presents complaining of facial pain and nasal congestion with a yellow nasal discharge after an upper respiratory tract infection 10 days ago. The physical examination reveals a temperature of 100.8°F. The patient has maxillary sinus tenderness with palpation and the nasal mucosa is pale with some yellowish drainage. Clouding of the maxillary sinus is seen with transillumination. Which of the following is the most likely diagnosis?
- Acute sinusitis
 - Chronic sinusitis
 - Vincent's angina
 - Ludwig's angina
 - Orbital cellulitis

89. Which of the following is normal intraocular pressure?

- a. 25 mm Hg
- b. 30 mm Hg
- c. 35 mm Hg
- d. 20 mm Hg
- e. 40 mm Hg

90. A 32-year-old woman presents with a 2-day history of “the room spinning.” She states that this occurs when she suddenly moves her head from one position to another. She complains of nausea and vomiting accompanying the spinning sensation but has no other symptoms. On physical examination, she is afebrile and her tympanic membranes are bilaterally normal. Nystagmus to the left is produced when the patient is lying on her left side. Which of the following is the most likely diagnosis?

- a. Cerebellopontine tumor
- b. Viral labyrinthitis
- c. Benign paroxysmal positional vertigo
- d. Ménière’s disease
- e. Trismus

91. A 48-year-old man presents with the inability to move the right side of his mouth. On physical examination, the patient has difficulty raising his right eyebrow, puffing out his right cheek, and smiling using the right side of his mouth. His nasolabial fold on the right is absent. Blinking is sparse on the right compared to the left, but extraocular muscles are intact and pupils are equal and reactive. The patient’s tongue is midline. Which of the following is the most likely diagnosis?

- a. Paralysis of cranial nerve V
- b. Paralysis of cranial nerve VII
- c. Paralysis of cranial nerve XII
- d. Horner syndrome
- e. Pancoast tumor

92. A 71-year-old man complains of difficulty in seeing street signs when driving and some difficulty with vision when reading. The patient’s vision is 20/100 in his right eye and 20/80 in his left eye. The vision in either eye does not improve with the pinhole test. There is a dullness in the red reflex bilaterally and details of the fundi are difficult to see during fundusoscopic examination. Intraocular pressure is measured to be 15 mm Hg in both eyes. Which of the following is the most likely diagnosis?

- a. Glaucoma
- b. Macular degeneration
- c. Presbyopia
- d. Cataract
- e. Arcus senilis

93. A 27-year-old man presents with hoarseness for 6 mo. He has no other symptoms or complaints. He has no past medical history, takes no medications, and does not smoke cigarettes or drink alcohol. He uses no illicit drugs. He has been employed as a telephone operator for the last 8 mo. Which of the following is the most likely diagnosis?

- a. Postnasal drip syndrome
- b. Cancer of the larynx
- c. Reflux esophagitis
- d. Voice strain
- e. Kallman syndrome

94. A 58-year-old man presents with the complaint of sudden loss of vision in his right eye. The patient describes the loss of vision as being similar to someone pulling a cover over his right eye. Vision returned to the right eye after 10 min and the patient presently has no symptoms. Examination of the eye reveals Hollenhorst plaques. Which of the following is the most likely diagnosis?

- a. Scotoma
- b. Amaurosis fugax
- c. Wilson's disease
- d. Arcus senilis
- e. Band keratopathy
- f. Roth spots

95. A 21-year-old man presents with a sore throat. He also complains of dysphagia, odynophagia, and otalgia. His temperature is 102.5°F. The patient speaks with a "hot potato" voice and is drooling. Examination of the throat reveals a hypertrophied right tonsil that appears to be displaced inferiorly and medially. There is contralateral deflection of the uvula. The patient has trismus and cervical lymphadenopathy. Which of the following is the most likely diagnosis?

- a. Retropharyngeal abscess
- b. Peritonsillar abscess
- c. Exudative pharyngitis
- d. Cancer of the right tonsil
- e. Mononucleosis

DIRECTIONS: Each set of matching items in this section consists of a list of lettered options followed by several numbered items. For each numbered item, select the appropriate lettered option(s). Each lettered option may be selected once, more than once, or not at all. **Each item will state the number of options to select. Choose exactly this number.**

Items 96–98

For each patient with ear complaints, choose the most likely diagnosis.

- a. *Mycoplasma* infection
- b. Nasopharyngeal carcinoma
- c. Acoustic neuroma
- d. Cholesteatoma
- e. Ramsay Hunt syndrome

96. A 30-year-old woman complains of severe left ear pain. On physical examination, there is hemorrhagic blistering of the left eardrum. **(CHOOSE 1 DIAGNOSIS)**

97. A 47-year-old man complains of hearing loss and otorrhea. On physical examination, there is a perforation of the tympanic membrane. **(CHOOSE 1 DIAGNOSIS)**

98. A 51-year-old man complains of vertigo, hearing loss, and tinnitus of the left ear. **(CHOOSE 1 DIAGNOSIS)**

Items 99–100

For each patient with eye complaints, choose the most likely diagnosis.

- a. Adenoviral conjunctivitis
- b. Bacterial conjunctivitis
- c. Blepharitis
- d. Hordeolum
- e. Keratitis
- f. Iritis
- g. Allergic conjunctivitis

99. A 17-year-old student complains of bilateral red eyes with a watery discharge. Physical examination reveals some preauricular lymphadenopathy. **(CHOOSE 1 DIAGNOSIS)**

100. A 22-year-old man with a history of hilar adenopathy and lung disease presents with eye pain and photophobia. Eye exam reveals an irregular pupil and ciliary flush. **(CHOOSE 1 DIAGNOSIS)**

Items 101–102

For each patient with pupil abnormalities, choose the most appropriate pupillary description.

- a. Argyll Robertson pupil
- b. Adie tonic pupil
- c. Marcus Gunn pupil
- d. Anisocoria

101. A 59-year-old woman presents with a history of several untreated sexually transmitted diseases in the past. Pupils are small and irregular and do not respond to light but respond to accommodation. (CHOOSE 1 DESCRIPTION)

102. A 25-year-old woman presents with a hyperemic and swollen left optic disc. The swinging-flashlight test is positive. (CHOOSE 1 DESCRIPTION)

Items 103–105

For each patient with nystagmus, choose the most appropriate kind(s) of nystagmus.

- a. Up-beating nystagmus
- b. Down-beating nystagmus
- c. Nystagmus that disappears with convergence
- d. Rotary nystagmus
- e. Asymmetric lateral nystagmus
- f. End-point nystagmus
- g. Pendular nystagmus

103. A newborn has congenital nystagmus. (SELECT 1 KIND OF NYSTAGMUS)

104. A 19-year-old man presents for his precollege medical clearance and is found to have nystagmus when asked to gaze to the extreme far left. (SELECT 1 KIND OF NYSTAGMUS)

105. A 49-year-old man is ventilator-dependent and comatose following a motor vehicle accident. (SELECT 3 KINDS OF NYSTAGMUS)

HEAD, EARS, EYES, NOSE, AND THROAT

Answers

77. The answer is a. (*Sapira, pp 211–213.*) The Weber test is performed by placing the tuning fork on the midline vertex of the head. **In conductive hearing loss, the Weber lateralizes to the deaf ear, while in sensorineural hearing loss the Weber lateralizes to the better ear.** The Rinne test is performed by placing a 512-Hz tuning fork over the mastoid process. When the vibration is no longer heard via bone conduction, the tuning fork is placed near the ear to determine if the vibration is heard. If the vibration is heard, then air conduction is greater than bone conduction and the test is considered positive or normal. **If the vibration is not heard, then bone conduction is greater than air conduction and this negative Rinne test denotes conductive hearing loss. Sensorineural hearing loss occurs when a positive or normal Rinne test is complemented by a Weber test that lateralizes to the better ear.**

78. The answer is a. (*Ludman, pp 5–8.*) **Otitis media with effusion** may follow an episode of acute respiratory tract infection or acute otitis media. Symptoms include hearing loss, ear fullness, ear pain, dizziness, and tinnitus. The eardrum appears retracted or scarred and a clear fluid is visible in the middle ear. Pain and fever are usually absent in otitis media with effusion. Treatment measures are aimed at facilitating drainage of the effusion, and antibiotics are generally not necessary.

79. The answer is b. (*Berson, pp 10–24.*) A **pinhole test** allows only paraxial parallel light rays through and improves visual acuity if refractory errors are present (most commonly myopia). The **slit-lamp examination** is a direct visualization of the eye and its components. The **pseudochromatic plate test** detects color blindness, and **Schiotz tonometry** measures intraocular pressure. **Visual field testing** determines if the patient has any blind spots. The **Amsler grid test** screens for macular degeneration. **Fluorescein staining** is used to detect abrasions of the cornea. A cobalt blue

light is used to detect foreign bodies after the fluorescein is instilled into the affected eye.

80. The answer is c. (*Ludman, pp 4–6.*) **Otitis externa**, an infection of the external ear canal, may be due to trauma or water in the ear canal (“**swimmer’s ear**”). Either of these may lead to maceration of the epithelium and subsequent colonization by bacteria or fungi. Diabetic patients are especially at risk for this ear infection. Physical examination often reveals a tender, erythematous ear occluded with debris. Patients complain of pain when the examiner pulls on the pinna or tragus. The treatment is removal of the debris with antibiotic otic drops or the placement of a wick to facilitate drainage. **Malignant otitis** (often seen in diabetic patients and usually due to *Pseudomonas*) causes severe, unrelenting otorrhea and otalgia and a foul-smelling discharge. Malignant otitis requires the use of systemic antibiotics for nearly 2 mo. Patients with acute otitis media rarely complain of discomfort when the pinna is moved. **Cerumen blockage is the leading cause of conduction hearing loss.**

81. The answer is c. (*Fauci, 14/e, pp 424, 1029, 2566. Sapira, p 224.*) Use of the anticonvulsant diphenylhydantoin, or of the calcium channel blocker nifedipine, may cause fibrous hyperplasia of the gingiva, leading to hypertrophied gums. Tetracycline given to children or pregnant women causes enamel hypoplasia and discoloration of the teeth. Ingestion of large amounts of fluoride may cause mottling of the tooth enamel. **Lead poisoning** causes the formation of a black “**lead line**” in the gums. **Hutchinson’s teeth** are the congenital notched teeth of syphilis. Bulimia causes erosion of the enamel on the surfaces of the teeth due to frequent gastric acid exposure.

82. The answer is a. (*Berson, pp 77, 85, 90–95.*) A common sequela of blunt trauma to the eye is a **hyphema** (blood in the anterior chamber). This is caused by rupture of the small blood vessels lying close to the cornea. **Strabismus** is a misalignment of the eyes. **Esotropia** is a kind of strabismus in which one eye is deviated inward. **Amblyopia** (“**lazy eye**”) is loss of visual acuity in an otherwise healthy eye. This happens because the healthy eye closes to compensate for the deviating eye to avoid the discomfort of diplopia. This is treatable if discovered early. A **subconjunctival hemorrhage** (between the conjunctiva and sclera) causes the sudden appearance of a bright red spot.

83. The answer is a. (*Berson, p 3.*) Visual acuity is a measurement of the smallest object a person can identify at a specific distance from the eye. The common abbreviations used to discuss visual acuity are as follows:

VA = Visual acuity

OD = Oculus dexter or right eye

OS = Oculus sinister or left eye

OU = Oculus uterque or both eyes

84. The answer is d. (*Berson, pp 30–35, 121–122.*) **Ischemic optic neuropathy** usually occurs in patients with a history of diabetes or hypertension (underlying vascular disease). The disk is pale and swollen with splinter hemorrhages. This disorder is due to occlusion of the posterior ciliary arteries with subsequent production of edema. **Central artery occlusion** is sudden and painless. It is usually due to infarction from a thrombus or embolus and causes the retina to become pale. The thin tissue of the macula area appears like a “**cherry red spot.**” **Occlusion of the retinal vein** occurs from slow venous blood flow and thrombosis. The patient complains of a slowly progressive loss of vision. The fundoscopic image of retinal vein occlusion is so dramatic that it is often described as “**blood and thunder.**” In **retinal detachment**, the fundus appears elevated and often has folds. Patients complain of acute vision loss after noticing flashing lights, floaters, and then a shade over the eye. **Diabetic retinopathy** may be proliferative or nonproliferative. In **nonproliferative** (background) disease, retinal findings include microaneurysms, dot-and-blot hemorrhages, hard exudates, and macular edema. **Proliferative** diabetic retinopathy (neovascularization with the formation of fragile vessels) is a response to continuous retinal ischemia and is responsible for most of the blindness seen in diabetes mellitus. **Hypertensive retinopathy is classified by the Keith-Wagener-Barker classification:**

Grade 1: Arteriolar narrowing and copper wiring

Grade 2: Grade 1 changes and arteriovenous nicking

Grade 3: Grade 2 changes and hemorrhages and exudates

Grade 4: Grade 3 changes with the addition of papilledema

85. The answer is a. (*Seidel, 4/e, p 279.*) Visual acuity is recorded as a fraction in which the **numerator** is the distance the patient is from the chart (usually 20 ft) and the **denominator** is the distance at which the average person can read the same line (200 ft).

86. The answer is c. (Ludman, pp 12, 20.) Most tuning forks are low-frequency and the majority of hearing loss is above their frequencies. Variability among observers in the whispered voice test does not make this a reliable method to detect hearing loss. The **hand-held audioscope** has the best sensitivity of all testing measures.

87. The answer is d. (Seidel, 4/e, pp 285–287.) The medial muscle adducts, the lateral rectus muscle abducts, the superior rectus muscle elevates, the inferior rectus muscle depresses, the inferior oblique muscle adducts and elevates (**up and in**), and the superior oblique muscle adducts and depresses (**down and in**).

88. The answer is a. (Ludman, pp 33, 42–45.) **Acute sinusitis** is predominantly due to *Streptococcus pneumoniae*, *Haemophilus influenzae*, or *Moraxella catarrhalis* infection that occurs when the cleaning mechanism—namely, the ciliary activity through the sinuses into the nasal passages—fails. Patients often complain of headache, facial pain, nasal congestion, and purulent discharge. Facial pain is worsened with percussion of the affected sinus and cloudiness of the sinus may be seen with transillumination. CT films of the sinuses (air-fluid levels) are the best method of making a definitive diagnosis, but should only be done if the patient fails to respond to a 2-wk course of antibiotic therapy aimed at the common bacteria. **Chronic sinusitis** occurs after adequate treatment of an acute sinusitis has failed to eradicate the symptoms. Common organisms for chronic sinusitis include anaerobes and *S. aureus*. **Ludwig's angina** is a rare accumulation of pus in the floor of the mouth (cellulitis) and causes induration of the neck. **Orbital cellulitis** may follow ethmoid or maxillary sinusitis and causes the upper eyelid to become swollen, red, and tender. **Vincent's angina** is a necrotizing ulcerative gingivitis (trench mouth).

89. The answer is d. (Berson, p 17.) Normal intraocular pressure (IOP) is in the range of 10–21.5 mm Hg. IOP is determined by the outflow of aqueous humor from the eye; the greater the resistance to outflow, the higher the IOP. IOP is important in the diagnosis of glaucoma. A **Schiotz tonometer** is used to measure IOP.

90. The answer is c. (Ludman, pp 22–25. Kochar, pp 736–739. Sapira, p 416.) Vertigo is an illusion of movement and is most commonly due to **benign paroxysmal positional vertigo** (BPPV). Each attack lasts several

seconds and is provoked by head movements. It is caused by the detachment of calcium carbonate crystals from the affected side into the semicircular canal. The **Nylen-Bárány maneuver** (reproducing the vertigo by having the patient go from a sitting to supine position while quickly turning the head to the side) will reproduce the vertigo of BPPV. **Ménière's disease** (hydrops) is a disorder of endolymph control; patients often complain of vertigo and tinnitus and have sensorineural hearing loss. **Viral labyrinthitis** is due to a viral infection; patients present within weeks of the illness. The **cerebellopontine angle** may house tumors, such as **schwannomas (acoustic neuromas)**; patients complain of vertigo, tinnitus, hearing loss, and facial numbness and weakness as the tumor compresses on the adjacent cranial nerves (VII and VIII) and brainstem. **Trismus** or lockjaw is a sustained spasm of the jaw muscles and is seen in tetanus and other infectious diseases.

91. The answer is b. (*Ludman, pp 109–110. Seidel, 4/e, pp 301, 774–777.*) **Bell's palsy** or paralysis of cranial nerve VII (lower motor neuron) causes ipsilateral drooping of the mouth and facial muscles, an inability to close the ipsilateral eye, and difficulty eating and speaking (due to the mouth droop or weakness). Bell's palsy may be idiopathic or due to trauma, multiple sclerosis, or infections such as herpes zoster (**Ramsay Hunt syndrome**) and **Lyme disease**. **Horner syndrome** is caused by a lack of sympathetic innervation to one side of the face and neck. With loss of this innervation, the pupil becomes constricted, the eyelid droops, and there is loss of sweating on the ipsilateral side of sympathetic loss. A Horner syndrome is often secondary to a Pancoast tumor. Cranial nerve V controls the muscles of mastication and cranial nerve XII innervates the muscles of the tongue.

92. The answer is d. (*Berson, pp 40–49.*) A **cataract** is opacity of the lens; patients often present complaining of a disturbance in vision. When the lens has a cataract, the **red reflex** is diminished and it becomes difficult to see the fundus through the opacity. Patients with **macular degeneration** present with central vision loss, and **drusen bodies** (yellow-white lesions), retinal atrophy, and neovascularization are often found on funduscopic examination. **Presbyopia** is a decreased ability to focus on near objects (because of loss of accommodation) that occurs with aging. **Glaucoma** is an insidious disease, and symptoms occur late in the disease. Patients complain of peripheral vision loss (central vision is spared until late in the disease) and scotomas. Intraocular pressure is usually elevated.

93. The answer is d. (*Ludman, p 34. Sapira, p 218.*) Hoarseness may be due to edema or swelling of the larynx or vocal cords, or due to external compression of the larynx or the recurrent laryngeal nerve. Certain occupations, such as being a singer or telephone operator, place people at risk for **voice strain (chronic laryngitis)** due to overuse. Medications, such as inhaled corticosteroids, may contribute to the problem. **Viral laryngitis** is a common cause of laryngitis, but the patient would have other signs of a viral syndrome. Laryngeal carcinoma must be considered in patients with a history of heavy tobacco use. Reflux disease may cause hoarseness, but the patient would also complain of heartburn, nocturnal cough, chronic sore throat, and excess phlegm production. **Postnasal drip syndrome** leads to chronic throat clearing and physical examination reveals “cobblestoning” of the posterior pharynx. **Kallman syndrome** is bilateral loss of smell and may be seen with asthma, sarcoidosis, diabetes, chronic renal failure, cirrhosis, multiple sclerosis, and Parkinson’s disease. A **mnemonic for hoarseness is VINDICATE: V**ascular (thoracic aneurysm), **I**nflammation, **N**eoplasm, **D**egenerative (i.e., amyotrophic lateral sclerosis), **I**ntoxication (smoking, alcohol), **C**ongenital (laryngeal web), **A**llergies, **T**rauma, and **E**ndocrine (thyroiditis).

94. The answer is b. (*Berson, pp 31, 114.*) The patient is describing a **transient ischemic attack (TIA)**. These attacks occur suddenly and produce reversible unilateral visual loss or neurological deficit lasting less than 24 h. These attacks are most likely due to emboli that occlude a retinal artery and may be associated with cardiac thrombus (especially in patients with atrial fibrillation) and carotid atherosclerosis, either of which may be the source of the emboli. Auscultation of the carotid arteries may reveal a bruit and palpation of the pulse may reveal an irregularly irregular rhythm consistent with atrial fibrillation. Examination of the fundus reveals **Hollenhorst plaques**, which are cholesterol emboli lodged in the retinal artery. **Arcus senilis** is a yellow-white discoloration around the periphery of the cornea. In the elderly, this may be a normal finding, but it may be a marker for hyperlipidemia in younger patients. Wilson’s disease, due to abnormal copper metabolism and deposition, causes the formation of a brownish-green ring (**Kayser-Fleischer**) at or near the limbus (Descemet membrane). **Scotoma** is an area of reduced or absent vision within an intact visual field. **Band keratopathy** is found in patients who are hypercalcemic. It is a grayish band produced by deposition of calcium in the cornea. **Roth spots** are white-centered hemorrhages seen in patients with bacterial endocarditis.

95. The answer is b. (*Tintinalli, 5/e, pp 1556–1559.*) The patient has a **peritonsillar abscess**, which is an accumulation of pus between the tonsillar capsule and the superior constrictor muscle of the pharynx. Patients present with a “**hot potato**” voice, fever, cervical lymphadenopathy, trismus, and a displaced uvula due to a unilaterally enlarged tonsil. Patients complain of dysphagia, odynophagia, and otalgia. A **retropharyngeal abscess** is an infection of the deep spaces of the neck (from the base of the skull to the tracheal bifurcation); patients are often young children who present with fever, cervical lymphadenopathy, neck pain, neck swelling, torticollis (rotation to the affected side), difficulty breathing, and stridor. Patients with an **exudative pharyngitis** have fever, cervical lymphadenopathy, bilateral tonsillar enlargement, erythema, edema of the midline uvula, and discrete tonsillar exudate.

96–98. The answers are 96-a, 97-d, 98-c. (*Fauci, 14/e, p 2378.*) **Bullos myringitis** is associated with *Mycoplasma pneumoniae* infection but may be seen with viral infections as well. **Cholesteatomas** (sacs) are a complication of chronic otitis media and consist of keratinized squamous epithelium that has entered the middle ear through a perforation from the external canal. These form in relationship to a perforation and can become infected, leading to bone (ossicular chain) destruction. **Acoustic neuromas or schwannomas** arise from cranial nerve VIII (vestibular division), and their growth within the internal auditory canal produces tinnitus and hearing loss. **Ramsay Hunt syndrome** is due to herpes zoster (shingles) infection of the face that involves the seventh nerve and causes paralysis of the facial muscles.

99–100. The answers are 99-a, 100-f. (*Berson, pp 57–74.*) The most common cause of **red eye** is viral conjunctivitis due to **adenovirus**. This is a highly contagious keratoconjunctivitis usually accompanied by preauricular adenopathy. **Bacterial conjunctivitis** is usually associated with a purulent discharge but no adenopathy. Allergic insults may cause itching and watery discharge of the eyes, but usually the patient complains of hypersensitivity to a specific agent. **Iritis** (uveitis or iridocyclitis) is an inflammation of the iris and ciliary muscle. **It may be a systemic marker for ankylosing spondylitis, Reiter syndrome, or sarcoidosis.** The patient complains of eye pain and photophobia, and eye examination reveals a ciliary flush (engorgement of the deep pericorneal blood vessels, which is never seen in a superficial infection) and an irregular pupil. **Ker-**

atitis or corneal inflammation may be due to trauma, including overuse of contact lenses. Patients complain of diminished visual acuity, photophobia, and a sensation of a foreign body in the eye. They are at risk for further vision loss. A **hordeolum** is an infection (pustule) of the eyelid gland, usually due to *S. aureus*, which causes pain and swelling of the lid margin (**sty**). **Blepharitis** is a chronic inflammation of the eyelid margins that causes burning, itching, and irritation of the lids. Patients often complain of “sticky” eyelids upon awakening in the morning.

101–102. The answers are 101-a, 102-c. (*Berson, pp 28, 33. Sapira, p 130.*) **Argyll Robertson pupil** is usually miotic and almost always bilateral. The pupil does not react to light but will react to accommodation. It is suggestive of a neurosyphilis infection that affects the light reflex pathway. The description of a hyperemic and swollen disc is consistent with **optic neuritis**, which is an inflammation of the optic nerve sometimes seen in patients with multiple sclerosis. A **Marcus Gunn pupil** (afferent pupillary defect) requires the swinging-flashlight test. Bright light is moved from one eye to the other and pupillary reactions are observed. In lesions of the optic nerve, the brainstem center perceives the light as being brighter in the normal eye and the affected pupil will dilate continuously. An **Adie tonic pupil** is a dysfunction of the constrictor muscle in which the pupil does not respond to direct light or accommodation. Often, the patient has absent deep tendon reflexes. **Anisocoria** implies pupils of unequal size and is found in up to 20% of normal subjects.

103–105. The answers are 103-c, 104-f, 105-a, b, d. (*Sapira, p 161.*) **Nystagmus** is an abnormal involuntary rhythmic eye movement that may be induced by having the patient follow a rapid finger movement or can occur at rest. It consists of a **slow component** (vestibular) as the eye deviates in one direction followed by a **rapid corrective movement** (cerebral) in the opposite direction. Nystagmus is usually **named for the rapid component**. **End-point nystagmus** occurs when a person is asked to gaze too far laterally. **Asymmetric lateral nystagmus** occurs in only one direction of lateral gaze and is seen in patients with vestibular disease. **Up-beating, down-beating, and rotary nystagmus** are seen in patients with brainstem disease, and **congenital nystagmus** that typically disappears with convergence is seen in newborns. **Pendular nystagmus** is nystagmus in which the eye moves at equal speeds in both directions.

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RESPIRATORY SYSTEM

Questions

DIRECTIONS: Each of the numbered items or incomplete statements in this section is followed by answers or by completion of the statements. Select the **one** lettered answer or completion that is **best** in each case.

106. A 59-year-old woman presents complaining of a cough productive of sputum for nearly 10 years. Her cough occurs during the day and she produces sputum daily. The woman states that as a child, she had several episodes of pneumonia requiring hospital admissions and antibiotics. Several times a year, her sputum becomes purulent and she requires antibiotic therapy. She denies smoking cigarettes and has worked as a seamstress all of her life. On physical examination, the lungs are clear without wheezes, rhonchi, or crackles. A chest radiograph reveals “tram-track” markings at the bases. Which of the following is the most likely diagnosis?

- a. Asthma
- b. Cystic fibrosis
- c. Chronic bronchitis
- d. Emphysema
- e. Bronchiectasis

107. Which of the following is the proper sequence for examination of the lungs?

- a. Inspection, auscultation, percussion, and palpation
- b. Inspection, palpation, percussion, and auscultation
- c. Inspection, percussion, palpation, and auscultation
- d. Inspection, auscultation, palpation, and percussion
- e. Inspection, palpation, auscultation, and percussion

108. If a patient has significant right-sided lung disease, his or her preferred recumbent position would be which of the following?

- a. Right lateral decubitus position
- b. Left lateral decubitus position
- c. Prone position
- d. Supine position
- e. No preferred position

109. A healthy 50-year-old man presents with a 1-mo history of low-grade fever, exertional dyspnea, and cough productive of clear phlegm. He denies hemoptysis and hematuria. He has been prescribed two antibiotics for the symptoms without relief. He does not smoke cigarettes and works as an accountant. On physical examination, his temperature is 101.0°F and his lung examination is normal. A chest radiograph reveals bibasilar fibrosis and air space densities in the lower lobes. Which of the following is the most likely diagnosis?

- a. Bronchiolitis obliterans
- b. Sarcoidosis
- c. Allergic bronchopulmonary aspergillosis
- d. Wegener's granulomatosis
- e. Goodpasture syndrome

110. Which of the following is the most common cause of airway obstruction?

- a. Foreign body
- b. Trauma
- c. Edema
- d. Bleeding
- e. The tongue

111. A 39-year-old woman presents with the sudden onset of pleuritic chest pain and shortness of breath. She has been in good health until 3 days ago, when she noticed some swelling of her left lower extremity. She is not a smoker and denies any recent trauma. On physical examination, she is afebrile but has a respiratory rate of 32/min. Her heart rate is 120/min and her blood pressure is normal. An accentuated (loud) S₂ is heard on heart auscultation. The left lower extremity is swollen, tender to palpation, and erythematous. Dorsiflexion of the left foot (**Homan's sign**) causes severe calf discomfort. Lung examination and chest radiograph are normal. Arterial blood analysis on room air shows a PCO₂ of 30 mm Hg and a PO₂ of 58 mm Hg. Which of the following is the most appropriate next diagnostic step?

- a. Transesophageal echocardiogram
- b. Transthoracic echocardiogram
- c. Cardiac catheterization
- d. Ventilation/perfusion scan
- e. D-dimer assay

112. A 35-year-old woman presents with a 2-day history of cough productive of green-yellow sputum. She complains of fever, chills, and dyspnea. On physical examination, her temperature is 102.4°F and her respiratory rate is 26/min. Her blood pressure is 110/65 mm Hg and her heart rate is 125/min. Examination of the lungs reveals increased fremitus and dullness at the right posterior base. Crackles and bronchial breath sounds are audible at the right base and the patient demonstrates egophony and pectoriloquy in the area. Gram stain of the sputum reveals gram-positive cocci and numerous neutrophils. Which of the following is the most likely diagnosis?

- a. Right upper lobe pneumonia
- b. Right lower lobe pneumonia
- c. Right middle lobe pneumonia
- d. Right pleural effusion
- e. Right lower lobe atelectasis

113. A 34-year-old nursing student is referred to your office because of the onset of a recent cough productive of dark-colored sputum. She is febrile but does not appear ill. She has been able to continue working with her symptoms. Examination of the posterior thorax is normal but there is dullness at the anterior right hemithorax below the fifth rib. Crackles, as well as localized pectoriloquy, are audible over the same area. Which of the following is the most likely diagnosis?

- a. Right lower lobe pneumonia
- b. Left lower lobe pneumonia
- c. Right lower lobe atelectasis
- d. Right middle lobe pneumonia
- e. Right upper lobe pneumonia

114. A 14-year-old boy presents with a history of chronic sinusitis and frequent pneumonias. On physical examination, the patient has normal vital signs and is afebrile. He has mild frontal and maxillary sinus tenderness with palpation. Transillumination of the sinuses is normal. Heart sounds are best heard on the right side of the chest. The boy is coughing copious amounts of yellowish sputum. Which of the following is the most likely diagnosis?

- a. Cystic fibrosis
- b. Kartagener syndrome
- c. Pulmonary dysplasia
- d. Tuberculosis
- e. Pulmonary hypertension

115. A 30-year-old woman presents with the chief complaint of shortness of breath with minimal activity. In retrospect, she feels she has been dyspneic for at least 1 year but has now progressed to the point where she has difficulty climbing stairs and walking short distances. She denies fever, cough, or chest pain. On physical examination, the patient has jugular venous distension (JVD) and a palpable right ventricular lift. On heart auscultation, there is a loud S_2 and a systolic murmur that increases with inspiration. Lungs are clear. There is no clubbing. Which of the following is the most likely diagnosis?

- a. Sarcoidosis
- b. Coronary heart disease
- c. Idiopathic pulmonary fibrosis
- d. Primary pulmonary hypertension
- e. Systemic lupus erythematosus

116. A 54-year-old obese woman presents with the chief complaint of hemoptysis. She states that over the last day she has coughed up approximately 10 cc of blood-streaked sputum. She denies any fever, chills, chest pain, or shortness of breath. She does admit to a recent upper respiratory tract infection with cough and a copious amount of sputum production. She remembers similar episodes of cough with bloody sputum occurring after colds for the last several years. She smokes 1 pack of cigarettes per day since high school. Examinations of the pharynx and lungs are normal. Which of the following is the most likely diagnosis?

- a. Chronic bronchitis
- b. Tuberculosis
- c. Adenocarcinoma of the lung
- d. Congestive heart failure
- e. Pulmonary infarction

117. A 70-year-old man with a history of chronic obstructive pulmonary disease (COPD) presents complaining of worsening shortness of breath for the last several days. He is coughing large amounts of yellow-colored sputum and he is receiving no relief from his β -2-agonist and ipratropium aerosolized pumps. On physical examination, the patient's respiratory rate is 40/min and his heart rate is 110/min. His blood pressure is 150/85 mm Hg. The patient is afebrile. He is using his accessory muscles of respiration (sternocleidomastoids and intercostals) to assist in breathing. Lung examination reveals inspiratory and expiratory diffuse wheezing. Which of the following is the most likely diagnosis?

- Acute exacerbation of COPD
- α_1 antitrypsin deficiency
- Chronic bronchitis
- Exacerbation of asthma
- Pneumonia

118. Which of the following statements is true regarding vocal resonance?

- Bronchophony is defined as decreased loudness of the spoken word
- Bronchial breath sounds are normally heard at the lung bases
- Whispered pectoriloquy is characterized by decreased intensity of the spoken word
- Vesicular breath sounds are heard best over the trachea
- Egophony is characterized by increased intensity of the spoken word and the development of a nasal quality (*e* becomes *a*)

119. A man is stabbed and arrives to the emergency room within 30 min. You notice that the trachea is deviated away from the side of the chest with the puncture. The most likely lung finding on physical examination of the traumatized side is which of the following?

- Increased fremitus
- Increased breath sounds
- Dullness to percussion
- Hyperresonant percussion
- Wheezing
- Stridor

120. A 16-year-old high school student presents with the sudden onset of sharp right-sided chest pain associated with shortness of breath. He denies any history of trauma. On physical examination, the patient is afebrile with a respiratory rate of 28/min. His blood pressure is 100/70 mm Hg and his heart rate is 120/min. Neck examination reveals no tracheal deviation. On lung auscultation, the patient has decreased fremitus, hyperresonance, and diminished breath sounds over the right posterior hemithorax. Which of the following is the most likely diagnosis?

- a. Tension pneumothorax
- b. Secondary pneumothorax
- c. Pulmonary embolus
- d. Spontaneous pneumothorax
- e. Pneumonia

121. Which of the following disorders causes platypnea?

- a. Rendu-Osler-Weber disease
- b. Acute respiratory distress syndrome
- c. Status asthmaticus
- d. Tracheal stenosis
- e. Cystic fibrosis

122. A 66-year-old man presents with a scanty cough and pleuritic chest pain. He also complains of fever and watery diarrhea. He smokes one pack of cigarettes per day and lives in an apartment building that is undergoing renovation. He has no past medical history and takes no medications. Physical examination reveals a toxic-appearing man with a temperature of 103.2°F. His heart rate is 60/min. Chest auscultation reveals bilateral scattered crackles. Abdominal examination reveals diffuse tenderness. Laboratory results reveal hyponatremia, hypophosphatemia, elevated liver function tests, and thrombocytopenia. A chest radiograph reveals bilateral infiltrates. Which of the following is the most likely diagnosis in this patient?

- a. Pontiac fever
- b. Legionnaires' disease
- c. Influenza
- d. Tuberculosis
- e. Psittacosis

123. A 37-year-old woman was recently extubated after requiring a ventilator for 10 days for an exacerbation of her asthma. After the uncomplicated extubation, the patient complains of hoarseness and dyspnea. On physical examination, her lungs are clear with normal fremitus and dullness. There is no tracheal deviation and heart examination is normal. The patient's chest radiograph is normal. Which of the following is the most likely diagnosis?

- a. Oxygen toxicity
- b. Premature extubation
- c. Pneumonia
- d. Tracheal stenosis
- e. Aspiration pneumonia

124. Which of the following statements is true regarding normal tracheal anatomy and structure?

- a. The trachea is posterior to the esophagus
- b. The trachea is 4 cm long
- c. The trachea is 4 cm in diameter
- d. The trachea divides into right and left main stem bronchi below the sternal angle
- e. The trachea is to the right of the midline

125. Which of the following lung segments are susceptible to aspiration pneumonia?

- a. Medial segment of the right middle lobe
- b. Lateral segment of the right middle lobe
- c. Posterior segment of the right upper lobe
- d. Superior lingular segment of the left upper lobe
- e. Inferior lingular segment of the left upper lobe

126. A 65-year-old man presents with severe right-sided chest pain over several months. He has been a lifelong smoker and worked most of his life as a shipbuilder. On physical examination, the patient appears to be dyspneic at rest. Lung auscultation reveals scattered rhonchi anteriorly and posteriorly. The patient has clubbing. Chest radiograph reveals the lungs to have a "ground glass" appearance and bilateral pleural plaques with some areas of calcification and pleural thickening are evident. Which of the following is the most likely diagnosis?

- a. Byssinosis
- b. Berylliosis
- c. Silicosis
- d. Asbestosis
- e. Farmer's lung

127. A newborn has an Apgar score of 0 at 1 min and an Apgar score of 10 at 5 min. Which of the following statements is true regarding the Apgar score?

- a. It has good predictive value regarding the newborn's long-term outcome
- b. It has no predictive value regarding the newborn's long-term outcome
- c. It should be repeated a third time at 10 min
- d. It tells you very little about the infant's respiratory efforts

128. A 21-year-old man presents with a 2-mo history of anterior and posterior cervical lymphadenopathy. He denies recent illnesses, weight loss, and fever. His physical examination reveals scattered, non-tender 1-cm cervical nodes bilaterally. Lung, heart, and abdominal examinations are normal. Chest radiograph reveals bilateral hilar adenopathy. Which of the following is the most likely diagnosis?

- a. Pneumonia
- b. Sarcoidosis
- c. Bagassosis
- d. Loeffler syndrome
- e. Hamman-Rich syndrome

129. A 45-year-old woman presents with a 2-year history of non-productive cough. The cough is not associated with time of day or year and the patient denies any occupational or environmental exposures. She has never smoked cigarettes. She finds herself clearing her throat frequently during the day and night. She has no nasal discharge, heartburn, or cardiac symptoms. She denies fever, chest pain, or shortness of breath. She takes no medications. On physical examination, her nasopharynx reveals mucopurulent secretions and a cobblestone-appearing mucosa. Lung examination is normal. Chest radiograph is normal. Which of the following is the most likely diagnosis?

- a. Reflux disease
- b. Asthma
- c. Bronchitis
- d. Postnasal drip
- e. Use of ACE inhibitors
- f. Congestive heart failure

130. A 20-year-old college student presents with a 3-mo history of left-sided pleuritic chest pain, shortness of breath with exertion, and night sweats. He admits to a 10-lb weight loss over the last several months. He is a nonsmoker and does not use illicit drugs. He is heterosexual. He recalls a negative PPD when he started college 2 years ago. On physical examination, his temperature is 100.9°F and his respiratory rate is 24/min. Lung examination reveals decreased fremitus, dullness to percussion, and diminished breath sounds over the left posterior lung. A pleural friction rub is audible at the left lung base. Which of the following is the most likely diagnosis?

- a. Pneumonia
- b. Pneumothorax
- c. Pleural effusion
- d. Lung abscess
- e. Pulmonary nodule

131. A 26-year-old, sexually promiscuous intravenous drug abuser presents with fever and shortness of breath. He complains of dyspnea on exertion and some bilateral pleuritic chest pain. He admits to a recent 30-lb weight loss. On physical examination, heart rate is 124/min, respiratory rate is 28/min, blood pressure is 100/70 mm Hg, and temperature is 102.4°F. Pulse oximetry reveals a saturation of 85% on room air. Lung auscultation reveals scattered bilateral crackles posteriorly. Chest radiograph reveals bilateral interstitial infiltrates and no cardiomegaly. Which of the following is the most likely diagnosis?

- a. Pulmonary edema
- b. *Pneumocystis carinii* pneumonia
- c. Cytomegalovirus pneumonia
- d. Kaposi's sarcoma
- e. Varicella zoster pneumonia

132. A 22-year-old graduate student presents with a 2-wk history of a dry cough. Her symptoms include sore throat at the start of the illness, a low-grade fever, and generalized malaise. She is otherwise healthy and does not drink alcohol or smoke cigarettes. Several of her colleagues at school are ill with a similar illness. Physical examination reveals normal vital signs and lung examination reveals some crackles at the right midaxillary line. Which of the following is the most likely diagnosis?

- a. Pneumococcal pneumonia
- b. Mycoplasma pneumonia
- c. Aspiration pneumonia
- d. Primary pulmonary hypertension
- e. *Legionella* pneumonia

133. A 55-year-old man with emphysema will have which kind of respiratory pattern of breathing?

- a. Biot respiration
- b. Apneustic breathing
- c. Cheyne-Stokes respiration
- d. Rapid and shallow breathing
- e. Kussmaul breathing

134. A 22-year-old man is brought to the emergency room after being found unconscious in a swimming pool. The patient is mildly cyanotic. The blood pressure is 80/50 mm Hg, heart rate is 60/min, and respiratory rate is 26/minute. His core body temperature is 89°F. Pupils are 4 mm bilaterally and reactive. The patient is moving all extremities and responds appropriately to questions. Crackles are heard bilaterally on lung auscultation. Pulse oximetry reveals a saturation of 94% on 50% oxygen. Chest radiograph reveals bilateral perihilar infiltrates with a normalized heart. Which of the following is the most likely diagnosis?

- a. Fracture of the C5 vertebral body
- b. Fracture of the C7 vertebral body
- c. Congestive heart failure
- d. Noncardiogenic pulmonary edema
- e. Drowning

135. Clubbing of the fingers is associated with which of the following?

- a. Asthma
- b. Emphysema
- c. Bronchitis
- d. Tuberculosis
- e. Cystic fibrosis

136. A 60-year-old man presents to your office with an 80-pack-year history of cigarette smoking. He complains of some dyspnea on exertion. He has an asthenic body habitus and pursed-lip breathing. He has an increased anteroposterior thickness of the thorax. Lung examination reveals decreased fremitus, hyperresonance on percussion, and diminished breath sounds. Which of the following is the most likely diagnosis?

- a. Bronchiectasis
- b. Asthma
- c. Emphysema
- d. Pleural effusion
- e. Pneumonia

137. A 45-year-old alcoholic man with a history of blackouts when intoxicated presents with fever, chills, and cough productive of putrid, foul-smelling sputum. On physical examination the patient appears inebriated. He is febrile with a temperature of 103.2°F. Mouth examination reveals numerous dental caries and poor dental hygiene. Lung examination reveals normal fremitus, dullness, and auscultation. Which of the following is the most likely diagnosis?

- a. Spontaneous pneumothorax
- b. Bronchogenic carcinoma
- c. Lung abscess
- d. Pleural effusion
- e. Empyema

138. A patient arrives to the emergency room cyanotic with severe shortness of breath. The patient was found unconscious and face down in a swimming pool, and was intubated and then resuscitated by paramedics using advanced cardiac life support measures. On arrival, the patient has a blood pressure of 90/60 mm Hg, a heart rate of 120/min, and a respiratory rate of 28/min. There is no tracheal deviation. Lung auscultation reveals crackles anteriorly and posteriorly. Arterial blood gas reveals a P_{O_2} of 50 mm Hg on 100% oxygen. The chest radiograph reveals bilateral “white-out” of the lungs consistent with interstitial and alveolar infiltrates. There is no cardiomegaly. Which of the following is the most likely diagnosis?

- a. Acute respiratory distress syndrome
- b. Pulmonary contusion
- c. Pneumothorax
- d. Cardiogenic pulmonary edema
- e. Pulmonary infarction

139. Which of the following is true regarding auscultation of breath sounds?

- a. Vesicular breath sounds are high-pitched sounds
- b. Bronchial breath sounds are normally heard over the trachea
- c. Bronchovesicular breath sounds are normally heard over the lung periphery
- d. Bronchial breath sounds are low-pitched sounds
- e. Maximal intensity of the breath sounds is heard normally at the lung bases

140. A 6-year-old boy who had a mild respiratory tract infection for 2 days awakens in the middle of the night with shortness of breath and difficulty breathing, and his parents bring him to the emergency room. His respiratory rate is 36/min and his heart rate is 150/min. He has a prolonged expiratory phase when breathing. He is afebrile. Lung auscultation reveals high-pitched, squeaky, musical breath sounds in all lung fields during inspiration and expiration. Which of the following is the most likely diagnosis?

- a. Epiglottitis
- b. Asthma
- c. Croup
- d. Tonsillitis
- e. Pneumonia

141. A 19-year-old college student develops a positive purified protein derivative (PPD) skin test. The area of induration is 15 cm in diameter at 48 h. A PPD skin test done 4 years earlier was negative. The patient has no past medical history and does not know anyone with tuberculosis. She has not received the BCG (extract of *Mycobacterium bovis*) vaccine. She has no fever, chills, night sweats, weight loss, or respiratory symptoms. Which of the following statements best explains the PPD skin test results?

- a. The patient does not have tuberculosis
- b. The patient has never had tuberculosis in the past
- c. The positive reaction may be a false positive due to nontuberculosis mycobacteria
- d. The patient is not a candidate for isoniazid chemoprophylaxis
- e. The first positive test requires a booster PPD

DIRECTIONS: Each set of matching items in this section consists of a list of lettered options followed by several numbered items. For each numbered item, select the appropriate lettered option(s). Each lettered option may be selected once, more than once, or not at all. **Each item will state the number of options to select. Choose exactly this number.**

Items 142–144

For each area of the mediastinum, select masses found in that compartment of the mediastinum.

- a. Thymoma
- b. Teratoma
- c. Thyroid adenoma
- d. Parathyroid adenoma
- e. Bronchogenic cyst
- f. Pericardial cyst
- g. Neurogenic tumor
- h. Menigocele

142. Anterior mediastinum
(CHOOSE 4 MASSES)

143. Middle mediastinum
(CHOOSE 2 MASSES)

144. Posterior mediastinum
(CHOOSE 2 MASSES)

Items 145–146

For each chest description, choose the appropriate skeletal deformity.

- a. Pectus excavatum
- b. Kyphosis
- c. Barrel chest
- d. Pectus carinatum
- e. Lordosis

145. A 4-year-old boy has a marked depression of the sternum below the clavicular-manubrium junction. (CHOOSE 1 DEFORMITY)

146. A 9-year-old girl has a chest deformity in which the sternum protrudes from the thorax. (CHOOSE 1 DEFORMITY)

Items 147–148

For each patient with a sleep disturbance, choose the most appropriate disorder.

- a. Narcolepsy
- b. Depression
- c. Obstructive sleep apnea syndrome
- d. Obesity hypoventilation syndrome
- e. Cataplexy
- f. Somnambulism

147. A 35-year-old man complains of daytime sleepiness and disruptive snoring. He admits to falling asleep several times a day while at work. He does not smoke. He is 72 in. in height and weighs approximately 210 lb. **(CHOOSE 1 DISORDER)**

148. A morbidly obese woman is admitted to the intensive care unit after being found in bed with lethargy, cyanosis, and hypoxemia. **(CHOOSE 1 DISORDER)**

RESPIRATORY SYSTEM

Answers

106. The answer is e. (*Fauci, 14/e, pp 1445–1447. Goldman, 21/e, pp 405–406.*) **Bronchiectasis** is an acquired disease that causes abnormal dilatation of the bronchi leading to pooling of secretions in the airways and recurrent infections. Patients typically present with cough and with the production of purulent sputum. Lung auscultation may be normal or remarkable for wheezes, rhonchi, or crackles. Chest radiograph may be normal, but occasionally the damaged, dilated airways will appear as “tram tracks” or “ring shadows.” **Bronchiectasis** may be a sequela of foreign body aspiration, cystic fibrosis, rheumatic diseases (rheumatoid arthritis and Sjögren’s disease), pulmonary infections (tuberculosis, pertussis, *Mycoplasma*), AIDS, and allergic bronchopulmonary aspergillosis (ABPA).

107. The answer is b. (*Seidel, 4/e, pp 370–378.*) The proper sequence for examination of the lungs is:

Inspection for chest wall abnormalities, symmetry, and retractions

Palpation for fremitus and crepitus (“crinkly” sensation)

Percussion for dullness and diaphragmatic excursion

Auscultation of breath sounds

108. The answer is b. (*Sapira, p 81.*) The rule for the comfortable recumbent position in lung disease is “**good side down.**” This patient with right-sided lung disease will be lying in the left lateral decubitus position to maximize gas exchange in the good lung.

109. The answer is a. (*Fauci, 14/e, pp 1428, 1460–1465.*) Idiopathic bronchiolitis obliterans with organizing pneumonia (**BOOP**) is also called **cryptogenic organizing pneumonia**. It is a disorder of granulation tissue proliferation within the small ducts and airways. Usually, patients present with an acute illness followed by exertional dyspnea. Patients with **allergic bronchopulmonary aspergillosis (ABPA)** have asthma with wheezes on physical examination. Chest radiographs usually reveal transient, recurrent

infiltrates. **Wegener's granulomatosis** typically involves the upper airways (i.e., nasal ulcers, sinus infections), lungs, joints, and kidneys, and c-ANCA (antineutrophil cytoplasmic antibodies) is positive. **Goodpasture syndrome** causes glomerulonephritis and pulmonary hemorrhage, and patients have antibodies to renal and lung alveolar basement membranes.

110. The answer is e. (*Seidel, 4/e, p 845.*) The tongue may fall posteriorly to obstruct the oropharynx and is the major cause of airway obstruction. This may occur in patients with a decreased level of consciousness and may be corrected by utilizing the head tilt–chin lift maneuver.

111. The answer is d. (*Fauci, 14/e, pp 1469–1472. Tierney, 39/e, pp 323–326.*) The most frequent presenting clinical sign of **pulmonary embolus (PE)** is shortness of breath. Patients may also present with pleuritic chest pain, hemoptysis, and tachycardia. An excellent clue to the diagnosis of PE is deep venous thrombosis (DVT), but absence of signs of DVT does not exclude the diagnosis of PE. Embolus from a thrombus in the lower extremities (DVT) is the most common cause of PE. Common settings for PE include prolonged immobilization, use of oral contraceptives, obesity, recent surgery, burns, severe trauma, congestive heart failure, malignancy, pregnancy, sickle cell anemia, polycythemia, inherited deficiencies of the anticoagulating proteins (protein C, protein S, antithrombin III), and the Leiden factor V mutation. Chest radiograph in PE may be normal but may demonstrate a peripheral wedge-shaped density above the diaphragm (**Hampton's hump**), focal oligemia (**Westermark sign**), or abrupt occlusion of a vessel (**cutoff sign**). A loud S

S_2 is often heard in disorders that cause pulmonary hypertension, such as pulmonary embolism. The next best step in making the diagnosis would be to order a ventilation/perfusion (V/Q) scan. If the V/Q scan results are of low or indeterminate probability, the patient may need further studies, such as pulmonary arteriogram or venous ultrasonography of the lower extremity. **D-dimer assays** will result in future changes to existing diagnostic strategies for pulmonary embolism, but the marker is still in the investigative stages (the absence of this product is evidence against thromboembolism). **Helical (spiral) CT** scans are comparable to V/Q scans and may be the first step in diagnosing pulmonary embolus.

112. The answer is b. (*Fauci, 14/e, pp 1408, 1439.*) The patient described most likely has **community-acquired pneumonia (CAP)** due to *Streptococcus pneumoniae*. Other pathogens responsible for CAP include

Mycoplasma pneumoniae, viruses, and *Chlamydia pneumoniae*. In smokers even without documented chronic lung disease, *Haemophilus influenzae* must be considered. **Fremitus** refers to vibrations that are perceived in a tactile manner; these are increased in patients with consolidation from pneumonia. **Vocal fremitus** (bronchophony, egophony, bronchial breath sounds, and pectoriloquy), **increased dullness to percussion**, and fine crackles may be evident in patients with pneumonia. Areas of **atelectasis** have decreased fremitus, decreased breath sounds, and dullness to percussion. The trachea is shifted to the side of the atelectasis. A limited area of egophony is heard above the area of atelectasis.

113. The answer is d. (Seidel, 4/e, p 357.) The best areas to listen for **right middle lobe** findings would be: (1) the right anterior midclavicular line between the fifth and sixth ribs and (2) the right midaxillary line between the fourth and sixth ribs. **The right middle lobe is not heard posteriorly, and the lung examination is incomplete if physicians do not listen anteriorly or medially.**

114. The answer is b. (Fauci, 14/e, p 1446.) **Kartagener syndrome** is the inheritable disorder of dextrocardia, chronic sinusitis (with the formation of nasal polyps), and bronchiectasis. Patients may also present with **situs inversus**. The disorder is due to a defect that causes the cilia within the respiratory tract epithelium to become immotile. Cilia of the sperm are also affected.

115. The answer is d. (Fauci, 14/e, pp 1466–1468.) **Primary pulmonary hypertension (PPH)** is of unknown etiology and primarily affects women in their thirties or forties. The underlying problem in the disorder is a fixed increased resistance to pulmonary blood flow. Pulmonary function in PPH is usually normal, but the elevation in pulmonary artery pressure causes a decrease in cardiac output and eventually right ventricular failure. Patients become dyspneic and hypoxemic due to the mismatch of pulmonary ventilation and perfusion and the reduced cardiac output. Physical examination reveals signs of right ventricular hypertrophy, right- and left-sided heart failure, and tricuspid and pulmonic regurgitation. The mean survival for this disease is 2–3 years from the time of diagnosis.

116. The answer is a. (Fauci, 14/e, pp 1451–1455.) **Massive life-threatening hemoptysis** is >100 cc of blood in 24 h. The most common

cause for **nonmassive hemoptysis** (<30 cc/day) in smokers and non-smoking patients with a normal chest radiograph is bronchitis. **Chronic bronchitis** is characterized by excessive secretions manifested by a productive cough, often purulent or bloody, for 3 mo or more for 2 consecutive years in the absence of any other disease to explain the symptoms. Patients are often obese and cyanotic (“**blue bloater**”). The mnemonic is **BBB = Bronchitis/Blue Bloater**.

117. The answer is a. (*Fauci, 14/e, pp 1451–1455.*) **COPD** is defined as a condition where there is chronic obstruction to airflow due to chronic bronchitis or emphysema. An exacerbation of COPD occurs when the patient develops the acute onset of marked dyspnea and tachypnea requiring the use of accessory muscles that is unresponsive to medications. **α_1 antitrypsin deficiency** should be suspected in nonsmokers who present with COPD of the lung bases in their fifties without any predisposing history, such as occupational exposure to support the diagnosis. **α_1 antitrypsin deficiency** is rare in African Americans and Asian-Pacific islanders.

118. The answer is e. (*Seidel, 4/e, pp 377–383.*) **Egophony** is characterized by increased intensity of the spoken word upon auscultation and occurs with lung consolidation. **Whispered pectoriloquy** is a whispered voice that can be heard loudly and clearly through the stethoscope and occurs in areas of pulmonary consolidation. **Bronchophony** is increased loudness of spoken sounds in peripheral areas of consolidation. **Bronchial breath sounds** are normally heard over the trachea, **bronchovesicular breath sounds** over the main bronchi, and **vesicular breath sounds** over the lobes.

119. The answer is d. (*Fauci, 14/e, pp 1474–1475.*) The patient has a **tension pneumothorax**, which is evidenced by the trachea deviating away from the side of the traumatized lung. This occurs secondary to trauma or during mechanical ventilation. Breath sounds will be faint or distant, percussion will be hyperresonant, and fremitus will be decreased. The increased air on the affected side is in the pleural space, not in the lung. As an attempt is made to inflate the lung, air moves into the pleural space from the puncture site, resulting in a collapsed lung with a large pleural space. The contralateral lung is also at risk for collapse. Anytime the trachea is deviated from the involved side, it is considered a medical emergency and

the tension pneumothorax must be relieved or the patient will die from hypoxemia or inadequate cardiac output.

120. The answer is d. (*Fauci, 14/e, pp 1474–1475.*) The patient most likely has a **spontaneous pneumothorax**. This disorder affects tall, thin men and may be recurrent. It is thought to be due to the rupture of subpleural blebs in response to high negative intrapleural pressures. Physical examination often reveals unilateral chest expansion, **decreased fremitus, hyperresonance, and diminished breath sounds**. Patients with COPD, cystic fibrosis, *Pneumocystis carinii* pneumonia (PCP), and tuberculosis may have blebs and are at risk for secondary pneumothoraces.

121. The answer is a. (*Goldman, 21/e, p 1003. Sapira, p 81.*) Platypnea is the opposite of orthopnea. **Platypnea** is difficulty breathing when sitting up that is relieved in the recumbent position. This is often accompanied by **orthodeoxia**, which is a decrease in oxygen saturation in the erect position. Several disorders may rarely cause platypnea (pneumonia, multiple pulmonary emboli, pleural effusion, tuberculosis, and cirrhosis), but the physical finding is most associated with Rendu-Osler-Weber disease. This is a hereditary disorder that causes telangiectasias in the face, tongue, nose (patients often present with epistaxis), lip, gastrointestinal tract, lungs, and central nervous system. Patients have platypnea due to formation of pulmonary arteriovenous fistulas.

122. The answer is b. (*Fauci, 14/e, pp 950–952.*) The clinical presentation is most consistent with **Legionnaires' disease**. Patients are usually elderly, immunocompromised, or with chronic lung disease. Air conditioners, whirlpools, water-using machinery, and cooling towers have been linked to outbreaks of the disease. Clinical signs of the disease include fever, relative bradycardia, abdominal complaints, scanty cough, and laboratory abnormalities. Pontiac fever is an acute, self-limited, flulike illness due to *Legionella*, but it does not cause pneumonia. Psittacosis (*Chlamydia*) is pneumonia associated with the handling of birds.

123. The answer is d. (*Tintinalli, 5/e, p 1568.*) Tracheal stenosis may occur days after intubation and is a sequela of the balloon cuff of the tracheal tube pressing against the tracheal wall causing necrosis and scar tissue formation. Patients are typically hoarse and dyspneic.

124. The answer is d. (*Seidel, 4/e, pp 353–358, 363.*) The trachea is 2 cm in diameter and 10–11 cm long. It lies anterior to the esophagus and posterior to the isthmus of the thyroid gland. The trachea is a midline structure and divides into the right and left main stem bronchi at the level of T4 or T5 below the manubriosternal joint (angle of Louis).

125. The answer is c. (*Fauci, 14/e, p 994.*) The right main stem bronchus is wider, shorter, and vertically placed, and therefore the **posterior segment of the right upper lobe** (if the patient aspirated while supine) is anatomically susceptible to aspiration. The **superior segments of the right lower and left lower lobes** (if the patient is supine) are also susceptible to aspiration pneumonia. These three segments are often referred to as the **aspiration segments** of the lung. The **basilar segments of both lungs** are susceptible to aspiration if the patient aspirates while erect or sitting up.

126. The answer is d. (*Fauci, 14/e, pp 1429–1436.*) Persons in certain occupations, such as asbestos mining, shipbuilding, construction, insulation, automobile brake repair, pipe fitting, plumbing, electrical repair, and railroad engine repair are at risk for asbestos exposure. Even persons handling the clothes of the person exposed to asbestos are at risk for asbestosis (bystander exposure). **Asbestosis** means that the patient has developed pulmonary fibrosis, scarring (plaques), and calcification. Asbestosis is a bilateral disease that starts from the bottom of the thorax and works upward, so it is not uncommon for the diaphragm to be involved early on in the disease process. Patients with asbestosis are at risk not only for lung cancer and mesothelioma but also for pharyngeal, gastric, and colon cancers. This patient has clubbing and malignancy must be considered. **Farmer's lung** results from exposure to moldy hay containing spores. **Berylliosis** causes bilateral hilar adenopathy; patients have a history of occupational exposure to nuclear weapons, fluorescent lights, and ceramics. Patients who work as miners, sandblasters, stonecutters, or foundry or quarry workers are at risk for exposure to **silica**. The chest x-ray typically reveals the “**eggshell**” calcification of the hilar nodes. **Byssinosis** occurs with exposure to cotton, flax, and hemp.

127. The answer is b. (*Seidel, 4/e, p 385.*) The Apgar score has no predictive value regarding long-term outcome but tells you a great deal about the newborn's respiratory efforts. It is repeated a third time at 10 min only

if the score is poor at 5 min. The **Apgar** scoring system (a score of 0–10 is possible) is based on **APGAR** = **A**ppearance, **P**ulse, **G**rimace, **A**ctivity, and **R**espirations:

	0	1	2
Heart rate	Absent	<100/min	>100/min
Respiratory effort	Absent	Slow or irregular	Good
Muscle tone	Limp	Some flexion	Active motion
Response to catheter in nostril	None	Grimace	Cough/ sneeze
Color	Blue/Pale	Body pink/ extremities blue	All pink

128. The answer is b. (*Fauci, 14/e, pp 1427, 1923–1928.*) **Sarcoidosis** is a multisystemic disease of unknown cause. The histologic hallmark of the disease is noncaseating granulomas and the most common chest radiograph finding is that of bilateral hilar adenopathy. Lymphadenopathy is found in 70–90% of all patients with sarcoidosis. **Hamman-Rich syndrome** is also called idiopathic pulmonary fibrosis (IPF). It is as common as sarcoidosis but is found more in males than females; the usual age of onset is the fifth or sixth decade of life. Chest radiograph usually reveals fibrosis. **Bagassosis** is a hypersensitivity pneumonitis (HP) due exposure to sugar cane. **Loeffler syndrome** is a disorder of unknown etiology that causes an acute pneumonia with peripheral blood eosinophilia.

129. The answer is d. (*Fauci, 14/e, pp 194–197.*) The most common cause of **chronic cough** in adults is **postnasal drip** due to sinusitis or rhinitis (allergic, vasomotor, irritant, perennial nonallergic). Patients typically complain of having to clear their throats or a feeling of something dripping in the back of their throats. Physical examination reveals mucopurulent secretions and a **cobblestone** appearance to the mucosa. Asthma is more of an episodic disease with wheezing, but occasionally patients complain of only cough. Gastroesophageal reflux disease (**GERD**) must be considered in patients who complain of heartburn or regurgitation. Other causes of chronic cough include bronchitis, congestive heart failure, and use of angiotensin converting enzyme (ACE) inhibitors.

130. The answer is c. (Seidel, 4/e, pp 382, 392–393.) This patient has a **pleural effusion** most likely due to tuberculosis. Chest examination of a pleural effusion reveals **distant or absent breath sounds, a pleural friction rub, decreased fremitus, and flatness to percussion.** A **pleural friction rub** is a raspy, grating sound heard in both inspiration and expiration due to inflamed surfaces rubbing against each other. Occasionally, exaggerated bronchial breath sounds are audible at the area of the effusion.

131. The answer is b. (Seidel, 4/e, pp 396–398.) Based on the patient's risk factors for human immunodeficiency virus (HIV), ***Pneumocystis carinii* pneumonia (PCP)** is the most likely diagnosis in this patient, but PCP rarely presents with any physical examination findings that distinguish it from other pneumonias. The chest radiograph may reveal bilateral interstitial infiltrates, and patients are often hypoxemic. Congestive heart failure may present with a similar chest radiograph, but patients will have jugular venous distension (JVD) and an S

₃ gallop. Cytomegalovirus (CMV), varicella zoster, and Kaposi's sarcoma (due to herpes virus 8) are opportunistic infections seen in immunocompromised patients.

132. The answer is b. (Fauci, 14/e, pp 1437–1439.) **Pneumococcal pneumonia** is abrupt in onset, with fever, pleuritic chest pain, and purulent sputum production. In young, otherwise healthy patients who present with a localized pneumonia (in this case right middle lobe) of gradual onset accompanied by dry cough and a predominance of extrapulmonary symptoms (i.e., malaise, headache, diarrhea), the most likely diagnosis is **atypical pneumonia** due to *Chlamydia pneumoniae* or *Mycoplasma pneumoniae*. Patients often complain of a sore throat at the beginning of the illness and a protracted course of symptoms. Physical examination is often unimpressive compared to the radiograph findings. *Legionella pneumoniae* is an atypical organism, but patients usually have renal and hepatic abnormalities, hyponatremia, and mental status changes.

133. The answer is d. (Seidel, 14/e, pp 368–369.) In emphysema, there is destruction of alveolar septa and reduced elastic recoil. This causes collapse of the small airways and prolongs the expiratory phase of respiration. During the prolonged expiration, patients will “**purse**” **their lips** to avoid collapse of the small airways. The respiratory rate is increased by having a markedly shortened inspiratory interval. **Kussmaul respirations** are slow

and deep respirations to increase the tidal volume in patients with diabetic ketoacidosis. **Biot respirations** are seen in patients with increased intracranial pressure. These are irregular, unpredictable periods of apnea alternating with periods of noisy hyperventilation. **Cheyne-Stokes respiration** is a rhythmic, gradually changing pattern of apnea and hyperpnea that is cardiac or neurologic in origin. **Apneustic breathing** is characterized by a long period of inspiration or gasping with almost no expiratory phase.

134. The answer is d. (*Tintinalli, 5/e, pp 1278–1280.*) The definition of **drowning** is death from suffocation after submersion. Freshwater drowning in swimming pools is actually more common than saltwater drowning. The patient described has noncardiogenic pulmonary edema, which is a complication of **near-drowning** (a survivor after suffocation from submersion). This is a result of direct pulmonary injury, loss of surfactant, and contaminants in the water. Respiratory failure, severe hypothermia, and neurologic injury are the three most common threats to life after submersion.

135. The answer is e. (*Seidel, 4/e, p 184, 371.*) **Clubbing** is associated with cystic fibrosis, lung cancer, congenital heart disease, cirrhosis, colitis, and thyroid disease. Clubbing is due to the formation of new periosteal bone and the development of synovial effusions. Emphysema and asthma do not cause clubbing.

136. The answer is c. (*Fauci, 14/e, pp 1451–1455.*) The increased anteroposterior thickness of the thorax indicates the presence of a “**barrel**” **chest**, which in association with a smoking history and exertional dyspnea is a typical presentation of emphysema. **Pursed-lip breathing** is often a learned behavior that occurs with emphysema to prolong the expiratory phase of respiration and prevent sudden collapse of the small airways. Patients have an asthenic body habitus since energy expenditure is in excess of calorie intake. There is often hypertrophy of the accessory muscles of respiration. Breath sounds in emphysema are usually diminished and there is hyperresonance with percussion. Emphysema begins as a centriacinar process but eventually becomes panacinar, involving both the central and peripheral tissues.

137. The answer is c. (*Fauci, 14/e, pp 1437–1440.*) The signs and symptoms of **lung abscess** include a history of loss of consciousness due to

seizure, alcoholism, or illicit drug use. Patients complain of several days or weeks of malaise and fever while the abscess develops. Patients eventually complain of chills, cough, pleuritic chest pain, and cough productive of putrid sputum. Due to position at the time of loss of consciousness and to the anatomy of the lung, the lung segments most often involved in lung abscesses include the posterior segment of the right upper lobe (wide, short, and vertically placed) and the superior segments of both lower lobes. Patients with poor dental hygiene are prone to developing anaerobic infections if aspiration occurs.

138. The answer is a. (*Fauci, 14/e, pp 1483–1485.*) Acute respiratory distress syndrome (**ARDS**) can occur due to conditions unrelated to pulmonary disease, such as burns, transfusion, or trauma, but may also be due to sepsis and shock. ARDS is due to severe and widespread increased alveolar capillary permeability secondary to injury of the alveolar and capillary epithelium. This leads to the accumulation of protein-rich edematous fluid within the septal walls, followed by escape of the fluid into the alveolar spaces, where it coagulates to form hyaline membranes lining the alveoli. There is marked impairment of gas exchange that causes severe dyspnea, diffuse crackles, tachypnea, hypoxemia, and cyanosis. The cyanosis may be refractory to oxygen therapy. Chest radiograph reveals bilateral infiltrates.

139. The answer is b. (*Seidel, 4/e, pp 378–380.*) **Vesicular breath sounds** are low-pitched sounds (described as “breezy”) that are heard over the bronchioles and lesser bronchi. **Bronchovesicular breath sounds** (described as “air passing through a tube”) are medium-pitched sounds heard over the main bronchi. **Bronchial (tubular) breath sounds** are high-pitched, coarse, loud sounds heard over the trachea. Bronchial and bronchovesicular breath sounds should not be heard over peripheral lung tissue.

140. The answer is b. (*Fauci, 14/e, pp 1422–1423.*) **Asthma** is an airway disease characterized by a hyperreactive tracheobronchial tree that manifests physiologically as narrowing of the airway passages. The classic triad of symptoms is dyspnea, cough, and wheezing. Attacks are usually episodic and nocturnal and often follow exposure to specific allergens, exertion, viral infection, or emotional excitement. Wheezing is described as “whistling” and is typically heard in both inspiration and expiration. The

expiratory phase becomes prolonged and the patient develops tachypnea, tachycardia, and mild systolic hypertension. Accessory muscles of respiration (sternocleidomastoid and intercostals) may be used to improve breathing. If the asthma attack is severe, the patient will develop a **pulsus paradoxus** (an inspiratory drop in systolic blood pressure of more than 10 mm Hg). Patients with **epiglottitis** present with fever, drooling, and dysphagia; lung examination will be normal. Children with **croup** or laryngotracheobronchitis present with labored breathing and stridor, and use accessory muscles to assist breathing.

141. The answer is c. (*Fauci, 14/e, p 1013. Tierney, 39/e, pp 302–303.*) Patients with a positive PPD require isoniazid chemoprophylaxis. A positive PPD may mean that the patient currently has tuberculosis or may have had tuberculosis in the past. A PPD may be a false positive due to nontuberculosis mycobacterium. A **booster PPD** is placed in patients (typically over the age of 55) 1 wk after a negative PPD to “boost” a response. A negative “boost” implies the patient is anergic or uninfected. **A PPD skin test is classified as positive** by the American Thoracic Society and the Centers for Disease Control and Prevention (1994) according to the reaction size and patient population:

- ≥5 mm = HIV patients or HIV at-risk patients; close contacts of patients with active TB; persons with CXR showing healed TB
- ≥10 mm = Immigrants; intravenous drug abusers; medically underserved; residents of nursing homes, prisons, and mental institutions; persons with underlying disease
- ≥15 mm = All other persons

142–144. The answers are 142-a, b, c, d, 143-e, f, 144-g, h. (*Fauci, 14/e, p 1475.*) The area between the pleural sacs—the mediastinum—is divided anatomically into the anterior mediastinum, middle mediastinum, and posterior mediastinum. The most common masses found in the **anterior mediastinum** are the **four Ts** = Thymomas, Teratomas, Thyroid masses, and paraThyroid masses. Lymphomas may also be found in the anterior mediastinum. Masses in the **middle mediastinum** include enlarged lymph nodes, lymphomas, vascular masses, pleuropericardial cysts, and bronchogenic cysts. The **posterior mediastinum** is the likely area for neurogenic tumors, lymphomas, pheochromocytomas, myelomas, meningoceles, meningomyelocèles, gastroenteric cysts, and diverticula.

145–146. The answers are 145-a 146-d. (*Sapira, p 245.*) **Pectus excavatum or funnel breast** is a congenital, hereditary malformation characterized by depression of the sternum below the clavicular-manubrial junction with symmetric inward bending of the costal cartilages. This may affect pulmonary and heart function. **Pectus carinatum or pigeon breast** is a deformity where the sternum protrudes from the narrowed thorax. **Kyphosis** is posterior deviation of the spine. **Scoliosis** is lateral deviation of the spine. **Lordosis** is an exaggerated convex curvature of the lumbar spine.

147–148. The answers are 147-c 148-d. (*Fauci, 14/e, pp 1476–1483.*) The patient with **obstructive sleep apnea syndrome (OSAS)** presents complaining of disruptive snoring and daytime hypersomnolence. Obesity is a risk factor for OSAS, but many patients with OSAS are not obese. Patients have upper airway narrowing from enlarged soft tissues, and good respiratory effort occurs against the airway obstruction. Diagnosis is best made by overnight polysomnography to document the apneic periods (10–15 events per hour of sleep, each event > 10 s in duration). Obesity represents a mechanical load to the respiratory system, since excess weight reduces chest wall compliance. Patients with **obesity hypoventilation syndrome** demonstrate a decrease in central respiratory drive (no respiratory effort), especially during sleep (sleep-induced hypoventilation), since vital capacity is further reduced in the recumbent position. **Narcolepsy** is excessive daytime sleepiness associated with abnormalities in REM sleep. Narcoleptic sleep attacks are brief and may occur during sedentary periods or when the patient is driving, eating, or conversing. **Cataplexy** occurs when strong emotion (i.e., laughing or crying) precipitates sudden loss of muscle tone. **Somnambulism** is sleepwalking.

CARDIOVASCULAR SYSTEM

Questions

DIRECTIONS: Each of the numbered items or incomplete statements in this section is followed by answers or by completion of the statements. Select the **one** lettered answer or completion that is **best** in each case.

149. A 27-year-old woman presents with sharp chest pain that is worsened with inspiration and improved when bending forward. Pain is precipitated by breathing deeply or coughing and is relieved when the patient holds her breath. Heart examination reveals coarse, scratchy sounds heard in both systole and diastole that overlie the cardiac sounds. Electrocardiogram (ECG) reveals ST elevations diffusely and PR segment depressions. Which of the following is the most likely diagnosis?

- a. Acute myocardial infarction (AMI)
- b. Pulmonary embolus
- c. Costochondritis
- d. Benign pericarditis
- e. Mitral valve prolapse (MVP)

150. A split S_1 is most commonly caused by which of the following?

- a. Inspiration
- b. Expiration
- c. Atrial septal defect (ASD)
- d. Ventricular septal defect (VSD)
- e. Right bundle branch block (RBBB)

151. A loud S_1 (increased intensity) is heard in which of the following conditions?

- a. Mitral stenosis (MS)
- b. Mitral regurgitation (MR)
- c. Left bundle branch block (LBBB)
- d. Aortic insufficiency (AI)
- e. Tricuspid regurgitation (TR)

152. Patients with mitral valve prolapse are at risk for which of the following?

- a. Severe mitral regurgitation
- b. Myocardial infarction
- c. Pulmonary embolism
- d. Pulmonary hypertension
- e. Wall motion abnormalities

153. You are called to evaluate a 57-year-old man with pressure-like chest pain that occurred while he was shoveling the snow. The pain radiates to the jaw and medial aspect of the left arm. The patient denies dizziness, nausea, vomiting, or palpitations. He has a past medical history of hypertension and he smokes 2 packs of cigarettes per day. He has a brother who had a myocardial infarction that required balloon angioplasty when he was in his forties. The patient has recently been told to modify his diet because of a recently discovered high glucose and cholesterol level. On physical examination the patient appears pale and diaphoretic. Blood pressure is 160/100 mm Hg and pulse is 108/min. His extremities are cool. Heart examination reveals an S_4 gallop. Lungs are normal. Peripheral pulses are palpable and bilaterally equal. He has no peripheral edema. Which of the following is the most likely diagnosis?

- Right ventricular infarction
- Cardiogenic shock
- Acute myocardial infarction
- Congestive heart failure (CHF)
- Prinzmetal's angina

154. A 41-year-old intravenous drug abuser presents with shortness of breath and pleuritic chest pain. He is febrile with a temperature of 103.5°F. He has no skin lesions and funduscopic exam is negative. He has jugular venous distension that increases with compression of the liver. The liver is pulsatile. The jugular venous pulse shows a prominent v wave. The patient has splenomegaly. Heart auscultation reveals a holosystolic murmur heard best at the left lower sternal border. The murmur increases with inspiration (Müller maneuver). Which of the following is the most likely diagnosis?

- Bacterial endocarditis
- Pericarditis
- Rheumatic fever
- Mitral valve prolapse
- Pericardial effusion

155. Which of the following statements is true regarding grading of heart murmurs?

- Grade 1 murmurs are never audible
- Grade 2 murmurs are never audible
- Grade 3 murmurs are loud
- Grade 4 murmurs are loud obvious murmurs with a palpable thrill
- Grade 5 murmurs may be heard with the stethoscope completely off the chest

156. An 18-year-old woman presents with arthritis that is asymmetrical and involves more than three joints. The arthritis is migratory, affecting one joint for several days and improving, then affecting another joint. On physical examination, the patient has several subcutaneous nodules and her cardiac exam reveals an S_3 gallop. Which of the following is the most likely diagnosis?

- a. Lyme disease
- b. Endocarditis
- c. Rheumatoid arthritis
- d. Gout
- e. Rheumatic fever

157. A 37-year-old man presents to the emergency room after 3 days of feeling weak. He drinks alcohol daily but denies illicit drug use. He called the paramedics when he began to experience palpitations and lightheadedness with exertion. On physical examination, his blood pressure is 120/80 mm Hg and his pulse is irregularly irregular at a rate of 126/min. Electrocardiogram in this patient would most likely demonstrate which of the following?

- a. Sinus tachycardia
- b. Ventricular premature beats (VPCs)
- c. Atrial fibrillation (AF)
- d. Premature atrial contractions (PACs)
- e. Sinus arrhythmia

158. A 23-year-old student presents to your office for health clearance to play collegiate sports. He is asymptomatic and exercises daily. On physical examination, his blood pressure is 160/50 mm Hg and his pulse rate is 60/min. There is pulsus bisferiens. Heart examination reveals an early diastolic rumble at the apex and a blowing diastolic murmur at the left sternal border. Nail beds reveal a Quincke pulse. Which of the following is the most likely diagnosis?

- a. Cardiac tamponade
- b. Aortic insufficiency (AI)
- c. Mitral stenosis (MS)
- d. Atrial septal defect (ASD)
- e. Tetralogy of Fallot

159. While palpating the pulse of a patient, you note that the pulse wave has two peaks. You auscultate the heart and are certain that there is only one heartbeat for each two pulse waves. Which of the following best describes this finding?

- a. Pulsus alternans
- b. Dicrotic pulse
- c. Pulsus parvus et tardus
- d. Pulsus bigeminus
- e. Pulsus bisferiens

160. A 68-year-old woman with a history of hypertension and diabetes mellitus presents with shortness of breath. She denies chest pain and palpitations. Physical examination reveals a blood pressure of 130/60 mm Hg and a heart rate of 72/min. The patient's lungs are normal, and heart auscultation reveals an S₄ gallop. She has no JVD and no peripheral edema. Chest radiograph shows a normal-size heart and ECG shows left ventricular hypertrophy. Echocardiogram reveals concentric left ventricular hypertrophy with a hyperdynamic left ventricle. Which of the following is the most likely diagnosis?

- a. Systolic dysfunction
- b. Diastolic dysfunction
- c. Left heart failure
- d. Right heart failure
- e. Normal heart

161. Which of the following statements best describes a precordial thrill?

- a. It is a normal finding
- b. It accompanies most heart murmurs
- c. It only exists during systole
- d. It is a palpable murmur
- e. It is always a sign of congestive heart failure

162. A 30-year-old woman presents for a routine checkup. She has no complaints and denies previous medical problems. On heart examination, the patient has a loud S₁. She has a low-pitched mid-to-late diastolic murmur that is heard best at the apex. Immediately preceding the murmur is a loud extra sound. Which of the following is the most likely diagnosis?

- a. Mitral valve prolapse
- b. Mitral stenosis
- c. Ventricular septal defect
- d. Aortic insufficiency
- e. Atrial septal defect

163. A 16-year-old boy is referred to your practice for leg claudication. His right arm blood pressure is 150/110 mm Hg while his left leg blood pressure is 80/60 mm Hg. On auscultation, a systolic murmur best heard over the middle of the upper back is detected. You also find that the patient's femoral pulses are diminished when compared to his brachial pulses. Which of the following is the most likely diagnosis?

- a. Patent ductus arteriosus
- b. Ventricular septal defect
- c. Coarctation of the aorta
- d. Atrial septal defect
- e. Tetralogy of Fallot

164. A pericardial knock is heard in which of the following disorders?

- a. Pericardial effusion
- b. Pericardial tamponade
- c. Pericarditis
- d. Constrictive pericarditis
- e. Restrictive cardiomyopathy

165. The Kussmaul sign is seen in which of the following disorders?

- a. Cardiomyopathy
- b. Left ventricular infarction
- c. Right ventricular infarction
- d. Septal wall dysfunction
- e. Tricuspid regurgitation

166. A mother brings her 11-year-old son to your office because he easily becomes short of breath while running. She states that he does not seem to be able to play as long a period of time as his friends. The patient's blood pressure is 140/60 mm Hg and he has bounding peripheral pulses. On auscultation of the heart, you detect a harsh, loud continuous murmur heard best below the left clavicle. Which of the following is the most likely diagnosis?

- a. Cervical venous hum
- b. Hepatic venous hum
- c. Coarctation of the aorta
- d. Patent ductus arteriosus
- e. Mammary soufflé

167. A 54-year-old man with a 20-year history of chronic obstructive lung disease has a heave that is palpable at the lower left sternal border at the third, fourth, and fifth intercostal spaces. Which of the following best explains the etiology of the heave?

- a. It is probably a displaced point of maximum impulse (PMI)
- b. It means the patient has congestive heart failure
- c. It means that the patient has aortic stenosis
- d. It means the patient has right ventricular hypertrophy
- e. It means the patient has a pericardial effusion

168. A 64-year-old man with a history of hypertension presents with sharp midsternal chest pain that is intermittent and radiates to his back between his shoulder blades. Blood pressure is 170/110 mm Hg in his right arm and 90/60 mm Hg in his left arm. Heart auscultation reveals a diastolic murmur. He has a "tracheal tug" sign. ECG is normal. Chest radiograph reveals a widened mediastinum. Which of the following is the most likely diagnosis?

- a. Myocardial infarction
- b. Pulmonary embolus
- c. Aortic dissection
- d. Coarctation of the aorta
- e. Aortic stenosis

169. The *a* wave of the jugular venous pulse represents which of the following?

- a. Right ventricular contraction
- b. Right atrial contraction
- c. Passive atrial filling
- d. The open tricuspid valve
- e. Filling of the right ventricle

170. A 16-year old-boy is referred to your office for a blood pressure of 140/55 mm Hg. He has a well-healed surgical scar about 12 cm long over the medial aspect of his left thigh. On questioning he states that he acquired the scar four years ago by impaling his thigh on a large nail after falling. Auscultation of the scar reveals a bruit and there is a palpable thrill. Which of the following is the most likely diagnosis?

- a. Premature atherosclerosis
- b. Arteriovenous fistula
- c. Scar tissue compressing the femoral artery
- d. Congenital femoral artery bruit
- e. Patent ductus arteriosus

171. Standing increases which of the following murmurs?

- a. Mitral regurgitation (MR)
- b. Aortic insufficiency (AI)
- c. Tricuspid regurgitation (TR)
- d. Hypertrophic cardiomyopathy (HCM)
- e. Pulmonary stenosis (PS)

172. A 51-year-old man is involved in a motor vehicle accident. He was not wearing a seat belt and remembers striking the steering wheel during the collision. On arrival to the emergency room the patient is complaining of chest pain and shortness of breath. His blood pressure is 120/80 mm Hg but decreases to 90/50 mm Hg at the end of inspiration. He has JVD with distant heart sounds. Lung examination reveals normal breath sounds bilaterally. Which of the following is the most likely diagnosis?

- a. Aortic dissection
- b. Ruptured aorta
- c. Pneumothorax
- d. Congestive heart failure
- e. Cardiac tamponade

173. A 71-year-old man complains of occasional lower back pain. His blood pressure is 150/85 mm Hg and his pulse is 80/min. Cardiac examination reveals an S_4 gallop. Abdominal examination reveals a pulsatile mass approximately 5.0 cm in diameter palpable in the epigastric area. Peripheral pulses are normal. Which of the following is the most likely diagnosis?

- a. Abdominal aortic aneurysm
- b. Cancer of the proximal colon
- c. Peptic ulcer disease
- d. Chronic pancreatitis
- e. Lipoma of the abdominal wall

174. A 47-year-old man has been at home recovering from an anterior myocardial infarction that occurred 10 days ago. He presents to your office complaining of persistent chest pain that is worse on inspiration and that is different from his “heart attack” pain. The pain radiates to both clavicles. The pain is worse when the patient is lying down and improves with sitting up and leaning forward. The patient has a temperature of 101.2°F and a normal blood pressure. Heart auscultation reveals a pericardial rub. Lung examination is positive for dullness and diminished breath sounds at the right base. Chest radiograph reveals a small right-sided pleural effusion. Laboratory data reveal that the patient has a mild leukocytosis and an increased erythrocyte sedimentation rate (ESR). Which of the following is the most likely diagnosis?

- a. Extension of the myocardial infarction
- b. Unstable angina
- c. Prinzmetal’s angina
- d. Pulmonary embolus
- e. Post–myocardial infarction syndrome

175. Which of the following is true regarding the second heart sound (S_2)?

- a. It is best heard at the apex
- b. It is louder than S_1 at the apex
- c. It is normally made up of P_2 followed by A_2
- d. When split, it is always abnormal
- e. When it is split, the split may be increased by inspiration

176. Which of the following is true regarding the third heart sound (S_3)?

- a. It is a high-pitched sound
- b. It is a normal finding in the elderly
- c. It is heard in early systole
- d. It is associated with atrial dysfunction
- e. It is best heard at the apex of the heart

177. Which of the following is true regarding the fourth heart sound (S_4)?

- a. It is absent in patients with atrial fibrillation
- b. It is heard best at the base of the heart
- c. It is heard best with the diaphragm of the stethoscope
- d. It is never heard in patients with myocardial infarctions
- e. It is always a normal finding

178. Squatting has which of the following cardiovascular effects?

- a. It decreases ventricular filling
- b. It increases the murmur of aortic insufficiency
- c. It decreases the murmur of mitral regurgitation
- d. It decreases the murmur of ventricular septal defect
- e. It has the opposite effect of passive leg raising
- f. It has the same effect as amyl nitrite

179. Which of the following is the best systematic method of heart auscultation?

- a. Over the aortic valve, tricuspid valve, mitral valve, and pulmonic valve
- b. Over the tricuspid valve, aortic valve, mitral valve, and pulmonic valve
- c. Over the mitral valve, aortic valve, tricuspid valve, and pulmonic valve
- d. Over the aortic valve, pulmonic valve, tricuspid valve, and mitral valve
- e. Over the aortic valve, mitral valve, pulmonic valve, and tricuspid valve

DIRECTIONS: Each set of matching items in this section consists of a list of lettered options followed by several numbered items. For each numbered item, select the appropriate lettered option(s). Each lettered option may be selected once, more than once, or not at all. **Each item will state the number of options to select. Choose exactly this number.**

Items 180–182

For each splitting of the second heart sound, choose the appropriate etiologies.

- a. Right bundle branch block
- b. Left bundle branch block
- c. Aortic stenosis
- d. Atrial septal defect
- e. Pulmonic stenosis
- f. Mitral insufficiency
- g. Mitral stenosis

180. Causes a wide splitting of S_2 (CHOOSE 3 ETIOLOGIES)

181. Causes a fixed splitting of S_2 (CHOOSE 1 ETIOLOGY)

182. Causes reversed (paradoxical) splitting of S_2 (CHOOSE 2 ETIOLOGIES)

Items 183–184

For each pulse pressure, choose the associated disorders.

- a. Aortic stenosis
- b. Aortic insufficiency
- c. Pregnancy
- d. Patent ductus arteriosus
- e. Mitral regurgitation
- f. Pericardial tamponade
- g. Tricuspid regurgitation
- h. Hyperthyroidism
- i. Constrictive pericarditis

183. Wide pulse pressure (CHOOSE 5 DISORDERS)

184. Narrow pulse pressure (CHOOSE 3 DISORDERS)

Items 185–188

For each patient with a heart murmur, choose the most likely heart lesion responsible for the murmur.

- a. Aortic stenosis
- b. Mitral stenosis
- c. Aortic insufficiency
- d. Mitral regurgitation
- e. Pulmonic stenosis
- f. Pulmonic insufficiency
- g. Tricuspid regurgitation
- h. Tricuspid stenosis
- i. Hypertrophic cardiomyopathy
- j. Mitral valve prolapse
- k. Ventricular septal defect
- l. Atrial septal defect
- m. Idiopathic calcific aortic stenosis

185. A 50-year-old man presents with syncope while dancing at his high school reunion party. His blood pressure is normal but pulse pressure is narrow. Heart examination reveals a crescendo-decrescendo systolic murmur heard best at the 2nd left intercostal space (ICS) that radiates to the carotid artery. The patient has a soft S_2 heart sound. (CHOOSE 1 LESION)

186. A 19-year-old man presents after having a syncopal episode while playing in a college intramural basketball game. His father died suddenly at the age of 30. Physical examination reveals a rapid, brisk carotid upstroke. Heart examination reveals a holosystolic murmur heard best in the left sternal border. The murmur increases with Valsalva maneuver. (CHOOSE 1 LESION)

187. A 31-year-old woman with a long history of a heart murmur diagnosed by her pediatrician over 20 years ago wishes reassurance that the murmur is normal. On heart examination, S_1

S_2 is widely split and does not change with respiration. There is a crescendo-decrescendo systolic murmur heard best in the left 2nd intercostal space. (CHOOSE 1 LESION)

188. A 56-year-old man is 4 days post myocardial infarction. On heart auscultation, a new holosystolic murmur is heard that radiates to the right of the sternum. A thrill is palpable. (CHOOSE 1 LESION)

CARDIOVASCULAR SYSTEM

Answers

149. The answer is d. (*Seidel, 4/e, p 440. Fauci, 14/e, pp 1334–1335.*) The pericardium is a double-walled sac that protects the heart; inflammation and roughening of the sac may result in the formation of a **pericardial rub**. The sounds represent heart movement against the inflamed pericardium and are best heard with the diaphragm of the stethoscope placed at the left lower sternal border with the patient leaning forward. The scratchy nature of the **triphasic** sound represents systole and diastole of the ventricle and atrial systole. The ECG in pericarditis often reveals ST elevation and PR depression. The treatment for benign pericarditis is anti-inflammatory agents. The most common finding in MVP is a midsystolic click followed by a high-pitched late systolic crescendo-decrescendo murmur. The pain of costochondritis (**Tietze syndrome**) is often associated with swelling, erythema of the overlying skin, and tenderness on palpation of the involved costicartilages.

150. The answer is e. (*Fauci, 14/e, p 1234.*) S_1

S_1 consists of mitral valve closure followed by tricuspid closure. **Splitting of S_1** is seldom heard. In most cases, the valves close together and make a single sound, but if right ventricular contraction is delayed—as in the case of RBBB—closure of the tricuspid valve occurs long after the mitral valve has closed and a split S_1 occurs.

151. The answer is a. (*Fauci, 14/e, pp 1233–1234.*) The intensity of S_1 is influenced by the position of the mitral valve leaflets at the end of ventricular systole, the rate of the ventricular pressure pulse, the presence of disease of the mitral valve, and the amount of tissue, air, or fluid between the heart and the stethoscope. The wider the mitral valve leaflets are spread when the ventricle contracts, the louder S_1 will be. S_1 will be louder in conditions where there is increased atrioventricular flow, a shortened PR interval, or a shortened diastole. A **loud S_1** , as in MS, signifies a pliable valve that remains open at the onset of contraction because of elevated left atrial pressure. S_1 is **soft** in patients with MR.

152. The answer is a. (*Goldman, 21/e, p 334.*) Most patients with MVP have a benign course and complications are rare. Patients with thickened leaflets (<10%) may develop cerebral events, bacterial endocarditis, severe mitral regurgitation, and sudden death. Men are twice as likely as women to develop severe mitral regurgitation (MR).

153. The answer is c. (*Fauci, 14/e, pp 1352–1353, 1361, 1374.*) Myocardial infarction occurs when an atherosclerotic plaque ruptures or ulcerates. Patients having a myocardial infarction are typically anxious, restless, and uncomfortable secondary to the extreme pain. They may be demonstrating the **Levine sign** (clenching of the fist to demonstrate the severity of the pain). Risk factors for this patient include male gender, positive family history, hypertension, diabetes mellitus, tobacco use, and hyperlipidemia. ECG will show ST elevations and cardiac isoenzymes (troponin, CPK-MB fraction, and LDH) will be elevated. Patients with **Prinzmetal's angina** have recurrent attacks of chest pain at rest or while asleep (unstable angina) due to a focal spasm of an epicardial coronary artery. The diagnosis is confirmed by detecting the spasm after provocation during coronary arteriography. **Cardiogenic shock** is a form of severe left ventricular heart failure; patients are typically hypotensive. **Right ventricular infarction** is a complication of inferoposterior myocardial infarction; patients present with JVD, the Kussmaul sign, and hypotension. Diagnosis is made by a right-sided electrocardiogram in which the leads are placed to the right of the sternum instead of the left.

154. The answer is a. (*Fauci, 14/e, p 1234.*) The increased venous return of inspiration (the **Müller maneuver** is sucking in with the nares held closed) increases the murmurs of the right side of the heart, and expiration increases the murmurs of the left side of the heart. The murmur of **tricuspid regurgitation** is a holosystolic murmur heard best at the left lower sternal border that increases with inspiration. Other findings in tricuspid regurgitation include distended neck veins, prominent v waves, hepatomegaly, pulsatile liver, edema, and a positive hepatojugular reflex (pressure applied over the liver causes increased distension of the neck veins). Intravenous drug abusers are at risk for developing **acute endocarditis** of the tricuspid valve due to *Staphylococcus aureus* bacteria. Other signs of bacterial endocarditis include **splinter hemorrhages** (subungal streaks), **Roth spots** (oval retinal hemorrhages with a pale center),

Osler nodes (tender nodules on finger or toe pads), **Janeway lesions** (small hemorrhages on the palms and soles), clubbing, and splenomegaly. Rheumatic heart disease predisposes patients to endocarditis; the organism is often *Streptococcus viridans* and the **mitral valve** is most commonly involved. Mitral valve prolapse also predisposes patients to endocarditis.

155. The answer is d. (*Sapira, p 303.*) Murmurs are caused by turbulent blood flow and are graded (since 1933 using the Levine scale) based on intensity from grades 1 to 6:

Grade 1 murmurs are faint and just audible

Grade 2 murmurs are quiet but audible with a stethoscope

Grade 3 murmurs are not loud but are easily heard and should not be missed

Grade 4 murmurs are loud with a palpable thrill

Grade 5 murmurs are very loud and can be heard with the chest piece tilted

Grade 6 murmurs are heard with the stethoscope off the chest

156. The answer is e. (*Fauci, 14/e, pp 1309–1311. Sapira, p 435.*) Subcutaneous nodules may be seen in rheumatic fever, gout, rheumatoid arthritis, and syphilis. Rheumatic fever is due to group A streptococci and often presents with a migratory polyarthritis. Patients have a history of sore throat 2 wk prior to presentation. Rheumatic fever is often diagnosed using the **Jones minor = FEAR** (Fever, prolonged PR interval on Electrocardiogram, Arthralgia, blood results indicating an elevated acute phase Reactant) and **Jones major = CASES** (Carditis, migratory polyArthritis, Sydenham's chorea, Erythema marginatum, and Subcutaneous nodules) criteria (**FEAR CASES**). The diagnosis of rheumatic fever requires demonstration of previous streptococcal infection and either two major or one major and two minor criteria with evidence of previous group A streptococci. **Aschoff bodies** (histiocytes) are found histologically in rheumatic fever. The characteristic rash of Lyme disease is erythema migrans. A chronic arthritis may develop in up to 10% of untreated patients infected with *Borrelia burgdorferi*, but this arthritis is usually monoarticular or oligoarticular affecting the knees, ankles, hips, elbows, and wrists (large joints).

157. The answer is c. (*Fauci, 14/e, p 1264.*) **Atrial fibrillation** is a common dysrhythmia that can occur in normal people, especially during emotional stress, after surgery or exercise, in patients who have hyperthyroidism, in patients with underlying heart disease, or following an alcoholic binge (“**holiday heart syndrome**”). It may also be seen in patients with hypoxemia, hypercapnea, or some metabolic or hemodynamic disturbance. Chronic AF occurs in patients with cardiovascular disease, rheumatic heart disease, mitral valve disease, cardiomyopathy, ASD, thyroid disease, pulmonary embolus, and chronic lung disease. Whenever the pulse is found to be irregularly irregular, AF is almost always the diagnosis. A major complication of AF is formation of mural thrombi, which may embolize to cerebral vessels, causing stroke or transient ischemic attacks (TIAs).

158. The answer is b. (*Fauci, 14/e, pp 1320–1322.*) The patient has physical findings consistent with **aortic insufficiency (AI)**. Etiologies may include dissecting aorta, Marfan syndrome, bicuspid aortic valve, rheumatic heart disease, ankylosing spondylitis, endocarditis, and syphilis. Associated signs of AI include **pulsus bisferiens** (double wave pulse), the **de Musset sign** (head bobbing with the heartbeat), “**waterhammer pulse**” (a rapidly rising pulse), **Corrigan pulse** (collapsing pulse that follows rising pulse), the **Hill sign** (an increase of >20 mm Hg in femoral artery systolic BP compared to brachial artery BP), **Quincke pulse** (blanching of the root of the nail when pressure is applied to the tip), **capillary pulsations**, “**pistol shots**” (booming sound heard over the femoral arteries), and the **Duroziez sign** (bruit auscultated over the femoral artery when compressed). Patients with AI have a wide pulse pressure and a rumbling murmur of MS (**Austin Flint murmur**) heard at the apex.

159. The answer is e. (*Fauci, 14/e, p 1232.*) **Pulsus bisferiens** (bisferious pulse) is seen in AI and in hypertrophic cardiomyopathy (HCM). In the latter, the first wave or percussion wave is due to the rapid flow rate of initial contraction, and the second wave or tidal wave is due to the slower rate of continued contraction. The **dicrotic pulse** has two palpable pulses, but one is in systole and the other is in diastole. **Pulsus bigeminus** is an alteration in pulse amplitude that follows a ventricular premature beat. **Pulsus alternans** is a regular alternating pulse amplitude due to alternating left ventricular contractile force; it is usually seen with severe left ventricular

decompensation and cardiac tamponade. **Pulsus parvus et tardus** (“small and slow rising”) represents a delayed systolic peak due to obstruction to left ventricular ejection. It is seen in aortic stenosis (AS).

160. The answer is b. (*Goldman, 21/e, pp 211–213.*) *Systolic dysfunction* is an inability of the ventricle to contract normally (hypodynamic). Patients (especially older patients) with hypertension and diabetes mellitus are predisposed to **diastolic dysfunction** (an inability of the ventricle to relax for filling) and typically have an S

₄ gallop, elevated filling pressures, and a hyperdynamic (ejection fraction > 50%) ventricle. Patients with **left heart failure** present with pulmonary congestion (i.e., crackles) and patients with **right heart failure** present with JVD, an S₃ gallop, hepatomegaly, ascites, and peripheral edema.

161. The answer is d. (*Seidel, 4/e, pp 432–433.*) A **precordial thrill** is a palpable murmur that may accompany heart disease. It is always considered pathologic and may be felt during systole [i.e., AS, VSD, MR, patent ductus arteriosus (PDA), tetralogy of Fallot] or diastole (i.e., AI, MS). The presence of a thrill characterizes a murmur as at least grade 4 in intensity.

162. The answer is b. (*Seidel, 4/e, pp 467–471.*) **Mitral stenosis** (MS) is characterized by an opening snap just prior to a low-pitched, rumbling diastolic murmur. Aortic regurgitation is a high-pitched diastolic murmur. **MVP** consists of a midsystolic click with a late systolic murmur. **ASD** is a systolic murmur.

163. The answer is c. (*Seidel, 4/e, pp 476–478.*) **Coarctation of the aorta** is narrowing of the aorta usually just distal to the origin of the ductus arteriosus and subclavian artery. Patients may complain of epistaxis, headache, cold peripheral extremities, and claudication. Absent, delayed, or markedly diminished femoral pulses may also be found. The low arterial pressure in the legs in the face of hypertension in the arm is also a clue toward the diagnosis. Chest radiograph in coarctation shows **rib-notching** secondary to the dilated collateral arteries. **PDA** is associated with a loud, continuous murmur. **Tetralogy of Fallot** consists of VSD, pulmonic stenosis (PS), dextroposition of the aorta, and right ventricular hypertrophy (RVH).

164. The answer is d. (*Fauci, 14/e, p 1339.*) A **pericardial knock** is an early mid-diastolic sound and is due to **constrictive pericarditis**. The diagnosis is confirmed by showing a thickened pericardium on CT scan or MRI. The treatment is pericardiectomy. Constrictive pericarditis may be idiopathic (60% of cases) or due to tuberculosis, mediastinal irradiation, or cardiac surgery. **Restrictive cardiomyopathy** is the least common form of cardiomyopathy; potential etiologies include sarcoidosis, amyloidosis, and hemochromatosis. Often the patient with restrictive cardiomyopathy presents with other signs of the systemic illness.

165. The answer is c. (*Sapira, pp 360–361.*) The **Kussmaul sign** (inspiratory distension of the neck veins) is seen in right ventricular infarction, right heart failure, constrictive pericarditis, superior vena cava syndrome, and tricuspid stenosis. Inspiration normally generates a negative intrapleural pressure, which sucks blood into the heart. With certain diseases, there is impairment of right heart filling and blood cannot enter the heart, causing venous pressure to rise. In these patients, inspiration will cause a paradoxical rise in venous pressure (Kussmaul sign). The Kussmaul sign is never seen in uncomplicated cardiac tamponade. **Right ventricular infarction** is seen in up to 30% of inferior wall infarctions; patients usually present with hypotension and raised venous pressure (Kussmaul sign).

166. The answer is d. (*Goldman, 21/e, p 284. Sapira, pp 304–305.*) The ductus arteriosus, which is patent in the fetal circulation, may fail to close at birth. Patients with **PDA** may be asymptomatic or may complain of dyspnea, palpitations, and exercise intolerance. The pulse pressure is usually widened and pulses are bounding due to the runoff of blood through the ductus. The continuous “machinery” murmur of PDA is best heard in the 1st–2nd ICS below the left clavicle. Other continuous murmurs include the **cervical venous hum** (due to increased blood flow in the internal jugular vein; disappears with compression of the vein), the **hepatic venous hum** (disappears with compression of epigastrium), and the **mammary soufflé** (heard over the breast due to increased blood flow in pregnancy).

167. The answer is d. (*Sapira, p 285.*) The **left parasternal border at the third, fourth, and fifth intercostal spaces should be palpated for a right ventricular tap**, which is also called a **lift** or **heave**. It is a nondiagnostic finding and results from any etiology of right ventricular hypertrophy. **A heave that is palpable at the apex is consistent with LVH.**

168. The answer is c. (*Fauci, 14/e, pp 1395–1396.*) **Dissection of the aorta** occurs when the intima is interrupted so that blood enters the wall of the aorta and separates its layers, forming a second lumen. It is almost always fatal if left undiagnosed, but with prompt treatment most patients survive. Anything that weakens the media can lead to dissection, but hypertension is the most common risk factor. Aortic dissection is a major cause of morbidity and mortality in Marfan syndrome. Other etiologies of dissection include cystic medial necrosis (described in patients with bicuspid aortic valves), syphilis, Ehlers-Danlos syndrome, trauma, and bacterial infections. Patients often have murmurs due to aortic insufficiency. The treatment of dissection is to control the blood pressure and heart rate to prevent extension of the dissection. A **tracheal tug** is considered positive if the pulsating aorta is felt when the trachea is pulled upward.

169. The answer is b. (*Seidel, 4/e, p 421.*) The activity of the right side of the heart is transmitted normally through the jugular veins as a visualized pulse. The **a wave** is due to venous distension caused by atrial contraction. It is the most dominant wave, especially during inspiration. The *a* wave is not present during atrial fibrillation. Exaggerated *a* waves are called **canon waves** and are due to the right atrium contracting against increased resistance (i.e., PS, TS, complete heart block). The **c wave** of the venous pressure curve occurs as a result of ventricular contraction, which forces the TV back toward the atrium. For that reason it is simultaneous with the carotid pulse. If the TV is incompetent, the *c* wave will be increased. The **v wave** is the result of atrial filling while the AV valves are closed. The *v* wave becomes large with TR. The downward **x slope** is caused by atrial filling and the **y slope** is caused by the open TV and the rapid filling of the ventricle.

170. The answer is b. (*Seidel, 4/e, p 481.*) An acquired **arteriovenous fistula** may be diagnosed by the presence of a continuous murmur and a palpable thrill over an area of previous trauma. The large pulse pressure is an indication that a large portion of the cardiac output is bypassing the systemic vascular resistance through the fistula.

171. The answer is d. (*Fauci, 4/e, p 1234. Seidel, p 445.*) **Squatting to standing** and the **Valsalva maneuver** both decrease right ventricular filling and decrease venous return, thereby increasing the murmurs of hypertrophic cardiomyopathy (HCM) and MVP. Standing decreases venous return because of pooling of the blood in the lower extremities caused by

gravity. The Valsalva maneuver decreases cardiac output and increases heart rate. Standing decreases all other murmurs. MR murmurs are increased by **hand grip** (increases systemic vascular resistance), and right-sided heart murmurs are increased by **inspiration**.

172. The answer is e. (*Fauci, 14/e, pp 1336–1337.*) **Cardiac tamponade** is the accumulation of fluid in the pericardial sac in amounts sufficient to cause obstruction of blood flow back to the heart. Cardiac tamponade may follow trauma or surgery. It may be a complication of malignancy (i.e., lung, breast, lymphoma), chronic renal failure, or hypothyroidism. The patient has the classic signs of cardiac tamponade, including pulsus paradoxus, JVD, and distant heart sounds. Patients may also present with hypotension. ECG may show low voltage and pulsus alternans. Chest radiograph may show enlargement of the cardiac shadow. **Pulsus paradoxus** is an inspiratory drop (from expiration) in systolic blood pressure of >10 mm Hg (normal < 10 mm Hg). Pulsus paradoxus may also be seen in severe asthma and constrictive pericarditis.

173. The answer is a. (*Goldman, 21/e, p 354.*) **Abdominal aortic aneurysms (AAAs)** are usually due to atherosclerosis and >90% originate below the renal arteries. The aneurysms are typically asymptomatic until they rupture, but patients may complain of lower back or hypogastric pain. The aneurysms may be associated with emboli to the feet and kidneys. Normal diameter of the aorta is <2 cm. **When the diameter of the AAA is >4.5 cm, repair is generally suggested.** Risk of rupture is 1–2% over 5 years when the AAA is <5 cm, but 20–40% when the AAA reaches 6 cm in diameter. The best method of evaluating the AAA is by **ultrasound or CT scan**.

174. The answer is e. (*Fauci, 14/e, pp 1365–1366.*) Postmyocardial infarction syndrome or **Dressler syndrome** is an autoimmune complication of myocardial infarction. It occurs from 3 days to 6 wk after the infarction and usually responds quickly to salicylates. The fever, pericarditis, leukocytosis, elevated ESR, and pleural effusion are all part of the autoimmune process.

175. The answer is e. (*Seidel, 4/e, p 438.*) **S**

S₂ consists of closure of the aortic valve (**A₂**) followed by closure of the pulmonic valve (**P₂**). It is best heard at the base of the heart, where it is louder than **S₁**. Inspiration

(increases venous return and decreases thoracic pressure) increases the split of S_2 by two mechanisms. First, there is delayed pulmonic valve closure, which is due to prolonged right ventricular ejection time from increased stroke volume. Second, inspiration increases the compliance of the pulmonary vasculature and thereby decreases the return of blood to the left heart and shortens its ejection time by the same mechanism. Pulmonary hypertension and systemic hypertension cause a **loud S_2** ; calcific AS causes a **soft S_2** .

176. The answer is e. (*Seidel, 4/e, p 440.*) S_3 is a low-pitched sound that occurs early in diastole at the termination of the rapid filling phase. It may be found in normal children or persons with large cardiac outputs. If heard, it usually indicates ventricular decompensation. Low-pitched sounds are best heard with the bell of the stethoscope with the patient lying in the left lateral recumbent position. S_3 and S_4 gallops may be made louder by increasing venous return (raising leg) or increasing arterial pressure (hand grip).

177. The answer is a. (*Seidel, 4/e, p 438.*) S_4 is a low-pitched sound that occurs just prior to systole (presystolic) or before S_1 . It is associated with ventricular filling as a result of an effective atrial contraction. For this reason, it is absent in patients with atrial fibrillation. The incidence of S_4 increases with age, but the significance of this finding in the absence of heart disease remains controversial. It may be heard in patients with ischemia or heart injury. S_4 is best heard at the apex of the heart using the bell of the stethoscope.

178. The answer is b. (*Fauci, 14/e, p 1234.*) **Squatting and passive leg-raising** increase ventricular filling. Therefore, they increase blood flow through the heart and increase the murmurs of aortic insufficiency, ventricular septal defect, and mitral regurgitation. The hypotensive inhalation agent **amyl nitrite** decreases the murmurs of AI, VSD, and MR.

179. The answer is d. (*Seidel, 4/e, p 434.*) An easy mnemonic to remember systematic heart auscultation is **APT. M** (**A**ortic valve, **P**ulmonic valve, **T**ricuspid valve, and **M**itral valve).

180–182. The answers are 180-a, e, f, 181-d, 182-b, c. (*Seidel, 4/e, p 429.*) Normally, S_2 is split during inspiration. **Wide splitting of S_2** occurs

both in inspiration and expiration. Delayed closure of the pulmonic valve due to a right bundle branch block, pulmonic stenosis, or mitral regurgitation causes a wide splitting of S_2 . **Fixed splitting of S_2** is unaffected by respiration. It is due to ASD. **Paradoxical splitting of S_2** is caused by anything that delays A_2 or speeds up P_2 to the point where P_2 occurs prior to A_2 . For this reason, expiration, not inspiration, separates a paradoxical split by prolonging left ventricular ejection and shortening right ventricular ejection. The causes of a paradoxical split S_2 are left bundle branch block and aortic stenosis, both of which prolong left ventricular outflow.

183–184. The answers are 183-b, c, d, h, 184-a, f, i. (*Sapira, p 92.*)

Pulse pressure is calculated by subtracting systolic BP from diastolic BP. A **widened pulse pressure** (diastolic BP > 50% of systolic BP) is due to conditions associated with a high stroke volume, such as AI, PDA, fever, pregnancy, hyperthyroidism, beriberi, anemia, and Paget's disease. A **narrowed pulse pressure** (diastolic BP < 25% of systolic BP) suggests a low stroke volume and is seen in pericardial tamponade, constrictive pericarditis, AS, and tachycardia.

185–188. The answers are 185-a, 186-i, 187-l, 188-k. (*Fauci, 14/e, pp 1303–1304, 1317, 1330.*) Patients with **AS** may present with symptoms of angina, syncope, dyspnea, or congestive heart failure. The etiologies of AS include rheumatic fever and congenital bicuspid valve. **Idiopathic calcific AS is a common disorder in the elderly and may produce the murmur of AS, but it is usually a mild disorder and of no significance.** Hypertrophic obstructive cardiomyopathy (HOCM or HCM) is the most common cause of sudden cardiac death in young adults. Patients may be asymptomatic, and over half have a positive family history of sudden death. ASD is a common anomaly in adults; VSD may be a congenital anomaly or a complication of myocardial infarction. Both defects may cause a left-to-right shunt, which may lead to pulmonary hypertension (loud S

2) and pulmonary obstruction (**Eisenmenger syndrome**).

GASTROINTESTINAL SYSTEM

Questions

DIRECTIONS: Each of the numbered items or incomplete statements in this section is followed by answers or by completion of the statements. Select the **one** lettered answer or completion that is **best** in each case.

189. A 42-year-old woman presents to the emergency room complaining of the sudden onset of right upper abdominal pain. Her pain started after eating a hamburger for lunch. She is nauseated and vomited twice at home. She denies diarrhea. Her temperature is 102.2°F, blood pressure is 140/90 mm Hg, and pulse is 110/min. She appears anxious and distressed. She is not jaundiced. Abdominal examination reveals normal bowel sounds. While you are palpating under her right costal margin, the patient abruptly arrests her inspiration and pulls away because of sharp pain. Which of the following is the most appropriate next step in management?

- a. Abdominal radiograph
- b. Ultrasound of the abdomen
- c. HIDA scan
- d. MRI of the abdomen
- e. Upper endoscopy

190. A 16-year-old boy presents to the emergency room with a history of a football injury to the left flank earlier that day while at practice. He reports that at the time of the injury he only had the “wind knocked out of him” and he recovered in a few minutes. About 1 h later he began to experience pain in the left upper quadrant and left shoulder. He also feels dizzy and light-headed on standing. Physical examination demonstrates orthostatic changes in blood pressure and heart rate. Heart and lung examinations are normal. Abdominal auscultation reveals normal bowel sounds, but the patient complains of tenderness when palpating the left upper quadrant. Rectal exam is normal. Which of the following is the most likely diagnosis?

- a. Dislocation of the left shoulder
- b. Left rib fracture
- c. Left pneumothorax
- d. Ruptured spleen
- e. Contusion of the left kidney

191. Which of the following is the proper sequence for examination of the abdomen?

- a. Auscultation, percussion, inspection, palpation
- b. Auscultation, inspection, palpation, percussion
- c. Inspection, percussion, auscultation, palpation
- d. Inspection, auscultation, percussion, palpation
- e. Inspection, percussion, palpation, auscultation

192. A 40-year-old man presents to the emergency room complaining of severe abdominal pain that radiates to his back accompanied by several episodes of vomiting. He drinks alcohol daily. On physical examination, the patient is found on the stretcher lying in the fetal position. He is febrile and appears ill. The skin of his abdomen has an area of bluish periumbilical discoloration. There is no flank discoloration. Abdominal examination reveals decreased bowel sounds. The patient has severe midepigastic tenderness on palpation and complains of exquisite pain when your hands are abruptly withdrawn from his abdomen. Rectal examination is normal. Which of the following is the most likely diagnosis?

- a. Acute cholecystitis
- b. Pyelonephritis
- c. Necrotizing pancreatitis
- d. Chronic pancreatitis
- e. Diverticulitis
- f. Appendicitis

193. A 60-year-old man with a previous history of appendectomy 30 years ago presents to the emergency room complaining of abdominal pain. He describes the pain as colicky and crampy and feels it builds up, then improves on its own. He has vomited at least 10 times since the pain started this morning. He states that he has not had a bowel movement for 2 days and cannot recall the last time he passed flatus. The abdomen is slightly distended. Abdominal auscultation reveals high-pitched bowel sounds and peristaltic rushes. Percussion reveals a tympanic abdomen. The patient is diffusely tender with palpation but has no rebound tenderness. Rectal examination reveals the absence of stool. Which of the following is the most likely diagnosis?

- a. Cholecystitis
- b. Diverticulitis
- c. Pancreatitis
- d. Gastroenteritis
- e. Intestinal obstruction

194. Which of the following statements is true regarding the term “scaphoid” abdomen?

- a. An unremarkable abdomen should be called scaphoid
- b. It is a convex abdomen
- c. It is seen in patients who have ascites
- d. It is absent in obese patients
- e. It implies guarding
- f. It implies rigidity

195. Which of the following best describes the location of McBurney's point?

- a. In the midclavicular line just under the right costal margin
- b. At the midpoint of a line connecting the symphysis pubis and the anterior superior iliac spine
- c. Midway along the right inguinal ligament
- d. One-third of the way along a line drawn from the right anterior superior iliac spine to the umbilicus
- e. One centimeter to the right of the umbilicus

196. A 32-year-old man presents with severe abdominal pain, which he describes as sharp and diffuse. He does not drink alcohol or take any medications. He has a past medical history significant for peptic ulcer disease over 5 years ago. He has stable vital signs and has no orthostatic changes. You observe the patient to be lying very still on the emergency room stretcher. On physical examination, he has a rigid abdomen and decreased bowel sounds. He has localized left upper quadrant guarding and rebound tenderness. He has referred rebound tenderness on palpation of the right upper quadrant. Rectal examination is FOBT negative. Which of the following is the best method of confirming the diagnosis in this patient?

- a. Barium swallow
- b. Leukocytosis
- c. Upper endoscopy
- d. Abdominal radiograph
- e. Colonoscopy

197. A 74-year-old man presents with the abrupt onset of pain in the left lower abdomen, which has been progressively worsening over the last 2 days. He states that the pain is unremitting. He has some diarrhea but no nausea or vomiting. He has no dysuria or hematuria. His temperature is 102°F. Bowel sounds are decreased. The patient has involuntary guarding. There is tenderness and rebound tenderness when the left lower quadrant is palpated. The referred rebound test is positive. A fixed sausage-like mass is palpable in the area of tenderness. There is no costovertebral angle (CVA) tenderness. Rectal examination reveals brown stool, which is fecal occult blood test (FOBT) positive. Bloodwork demonstrates a leukocytosis. Which of the following is the most likely diagnosis?

- a. Colon cancer
- b. Diverticulitis
- c. Pancreatitis
- d. Pyelonephritis
- e. Appendicitis

198. Abdominal pain upon vibration (the heel jar test) is commonly known as which of the following?

- a. Markel sign
- b. Blumberg sign
- c. Rovsing sign
- d. Obturator sign
- e. Iliopsoas sign
- f. Courvoisier sign
- g. Dance sign

199. A 71-year-old woman with a history of chronic congestive heart failure presents to her family physician for a routine checkup. The physician notices that she has lost 20 lb since her last visit 6 mo ago. When questioned, the patient gives a history of intermittent periumbilical pain that begins 30 min after eating and lasts 2–3 h. She claims the pain is worse after large meals and so she has begun to eat less out of fear of precipitating the pain. Which of the following is the most likely diagnosis?

- a. Pancreatitis
- b. Intestinal ischemia
- c. Cholecystitis
- d. Small bowel obstruction
- e. Peptic ulcer disease

200. A patient with a long history of cirrhosis presents with asterixis. He is alert and oriented to person, place, and time. His breath is positive for fetor hepaticus. His abdomen is significant for caput medusae and a positive fluid wave. He has no focal neurologic deficit. His wife states that the patient is very functional at home but is moderately confused and drowsy. Which is the most likely stage of hepatic encephalopathy in this patient?

- a. Stage 1 hepatic encephalopathy
- b. Stage 2 hepatic encephalopathy
- c. Stage 3 hepatic encephalopathy
- d. Stage 4 hepatic encephalopathy

201. A 38-year-old man arrives at the emergency room with the chief complaint of hematemesis for 3 h. He does not drink alcohol and has no previous medical history. He spent the previous night vomiting approximately 10–12 times after eating some “bad chicken.” The patient is squirming on the stretcher and is retching. He is afebrile with a heart rate of 120/min and a blood pressure of 90/60 mm Hg. Abdominal exam is positive for diffuse tenderness, but the patient has no rigidity, guarding, or rebound tenderness. There is no hepatosplenomegaly. Rectal exam is negative for occult blood. A nasogastric tube is inserted and reveals bright red blood. Which of the following is the most likely diagnosis?

- a. Esophageal varices
- b. Mallory-Weiss tear
- c. Gastritis
- d. Peptic ulcer disease
- e. Boerhaave syndrome
- f. Dieulafoy lesion

202. A 24-year-old HIV-positive patient who has had AIDS for 3 years presents with painful swallowing and dysphagia to solids and liquids. He has no previous history of heartburn or reflux disease. His CD4 count is 41/ μ L and he recently required 3 wk of antibiotics for *Pneumocystis carinii* pneumonia. Examination of the pharynx reveals no oral thrush. Barium swallow demonstrates multiple nodular filling defects of various sizes that resemble a “cluster of grapes.” Which of the following is the most likely diagnosis?

- Candida* esophagitis
- Reflux disease
- Barrett’s esophagus
- Pneumocystis* esophagitis
- Achalasia
- Plummer-Vinson syndrome
- Schatzki ring

203. Which of the following statements is true regarding the liver?

- Macronodular cirrhosis is defined as liver nodules of <3 mm
- Micronodular cirrhosis is defined as liver nodules of >3 mm
- Normal liver size is 12 cm in the midclavicular line (MCL)
- Macronodular cirrhosis is most likely due to alcohol use
- Micronodular cirrhosis is most likely due to viral infection

204. A 70-year-old woman with a 25-year history of diabetes mellitus presents with early satiety, bloating, and nausea after meals. She has had previous surgery for gallbladder stones and appendicitis. Her diabetes is complicated by retinopathy and peripheral neuropathy. On physical examination, bowel sounds are normal. A succussion splash is audible. The abdomen is tympanic and there is no hepatosplenomegaly. There is no tenderness. Rectal examination is normal. Serum glucose is 310 mg/dL. Which of the following is the most likely diagnosis?

- Celiac sprue
- Whipple’s disease
- Gastroparesis
- Gluten-sensitive enteropathy
- Tropical sprue

205. Which of the following factors may cause a false-negative fecal occult blood test (FOBT) result?

- Vitamin C
- Turnips
- NSAIDs
- Red meat
- Aspirin
- Horseradish
- Poultry
- Fish

206. A 42-year-old morbidly obese woman complains of a non-productive cough for 8 mo. She denies abdominal discomfort after eating and has never “suffered” from heartburn. Rarely, she has regurgitation, and when she does it has a sour taste to it. Abdominal examination is normal. Rectal examination is FOBT negative. Which of the following is the most likely diagnosis?

- a. Carcinoma of the lung
- b. Gastroesophageal reflux disease
- c. Chronic obstructive lung disease
- d. Lactose deficiency
- e. Chronic cholestasis

207. A 16-year-old boy has had lifelong constipation. He requires suppositories and often enemas to initiate bowel movements. His abdomen is distended. Palpation reveals a tubular mass in the left lower quadrant. Rectal exam reveals no stool in the vault. Barium enema reveals a dilated colon above a normal-appearing rectum. Which of the following is the most likely diagnosis?

- a. Colon carcinoma
- b. Gardner syndrome
- c. Peutz-Jeghers syndrome
- d. Hirschsprung’s disease
- e. Volvulus

208. A 45-year-old patient presents with altered mental status. His wife states that over the last week her husband has been taking acetaminophen for some abdominal discomfort. He uses no illicit drugs but drinks 4–5 beers daily. Over the last 24 h, the patient has become progressively lethargic. Vital signs reveal a temperature of 97°F, a blood pressure of 100/70 mm Hg, a heart rate of 120/min, and a respiratory rate of 26/min. The patient is jaundiced with RUQ abdominal tenderness on palpation. He has no rebound tenderness or splenomegaly but has an enlarged liver. There is no ascites or peripheral edema. Heart and lung examinations are normal. The patient responds to painful stimuli and has asterixis. He has no focal neurologic deficit. Which of the following is the most likely diagnosis?

- a. Alcohol intoxication
- b. Alcohol withdrawal
- c. Delirium tremens
- d. Acetaminophen toxicity
- e. Wilson’s disease

209. A 19-year-old girl attending school in Massachusetts presents with the chief complaint of bloody diarrhea for 2 mo. She has abdominal discomfort and feels she has lost some weight. She also complains of tenesmus. Abdominal examination is normal. The rectal exam reveals stool containing blood and pus. Which of the following is the most likely diagnosis?

- a. Irritable bowel syndrome
- b. Ulcerative colitis
- c. Giardiasis
- d. Hemorrhoids
- e. Diverticulosis

210. A 50-year-old man has a 10-year history of chronic active hepatitis from the hepatitis C virus. He is brought to the emergency room because of cachexia and disturbed mental status. On physical examination, the patient has palmar erythema and clubbing. He is jaundiced with massive ascites. He has asterixis. Laboratory data reveals severe hypoalbuminemia and hyperbilirubinemia. Which of the following is the most likely diagnosis?

- a. Child's class A cirrhosis
- b. Child's class B cirrhosis
- c. Child's class C cirrhosis
- d. Child's class D cirrhosis
- e. Child's class E cirrhosis

211. A 44-year-old man with a history of peptic ulcer surgery presents with palpitations, tachycardia, lightheadedness, and diaphoresis after eating a meal. The symptoms typically begin 30 min after eating. Which of the following is the most likely diagnosis?

- a. Malabsorption
- b. Peptic ulcer recurrence
- c. Gastric carcinoma
- d. Gastritis
- e. Dumping syndrome
- f. Esophagitis

DIRECTIONS: Each set of matching items in this section consists of a list of lettered options followed by several numbered items. For each numbered item, select the appropriate lettered option(s). Each lettered option may be selected once, more than once, or not at all. **Each item will state the number of options to select. Choose exactly this number.**

Items 212–213

For each organ, choose the appropriate sound with percussion.

- a. Tympany
- b. Hyperresonance
- c. Dullness
- d. Flatness

212. Liver (**CHOOSE 1 SOUND**)

213. Stomach (**CHOOSE 1 SOUND**)

Items 214–216

For each patient with liver disease, choose the most likely viral etiology(ies).

- a. Hepatitis A
- b. Hepatitis B
- c. Hepatitis C
- d. Hepatitis D
- e. Hepatitis E
- f. Hepatitis G

214. A 47-year-old man presents with cirrhosis; he has no risk factors other than blood transfusions in 1980. (**CHOOSE 4 ETIOLOGIES**)

215. A 29-year-old woman returns from a recent trip to India. She received no immunizations prior to her trip. She develops jaundice and right upper quadrant pain. She has mild hepatomegaly. She has no history of blood transfusions and uses condoms during sexual intercourse. She is not an intravenous drug abuser. (**CHOOSE 2 ETIOLOGIES**)

216. A 21-year-old woman presents with jaundice and hepatomegaly. She has nausea, vomiting, and diarrhea. She recalls eating raw oysters 1–2 mo ago. She has not traveled recently and denies drug use or unprotected sexual intercourse. She has no history of blood transfusion. (**CHOOSE 1 ETIOLOGY**)

Items 217–218

For each description for detection of ascites, choose the appropriate named sign.

- a. Shifting dullness
- b. Fluid wave
- c. Puddle sign
- d. Bulging flanks

217. The patient is on all fours and the umbilicus is percussed for dullness. (CHOOSE 1 SIGN)

218. The border of dullness moves to the dependent side and tympany moves toward the top when the patient turns to the side from the supine position. (CHOOSE 1 SIGN)

Items 219–224

For each patient with liver disease, choose the most likely disorder.

- a. Hemochromatosis
- b. Primary biliary cirrhosis
- c. Sclerosing cholangitis
- d. Hepatocellular carcinoma
- e. Zollinger-Ellison syndrome
- f. Alcoholic hepatitis
- g. Wilson's disease
- h. α_1 antitrypsin deficiency
- i. Metastatic carcinoma of the liver
- j. Budd-Chiari syndrome

219. A 54-year-old woman presents with generalized pruritus that keeps her awake at night. Liver size by percussion in the midclavicular line is 17 cm. There is no splenomegaly. Serum alkaline phosphatase level is 3 times the normal value. (CHOOSE 1 DISORDER)

220. A 44-year-old man with a 20-year history of ulcerative colitis presents with fever and right upper quadrant pain. Physical examination reveals jaundice and RUQ tenderness with palpation. Endoscopic retrograde cholangiopancreatography (ERCP) shows multifocal strictures of the extrahepatic biliary tree. (CHOOSE 1 DISORDER)

221. A 41-year-old woman has a history of recurrent duodenal ulcer disease. She takes no medications and has no evidence of *Helicobacter pylori* infection. Her serum gastrin level is 800 pg/mL. (CHOOSE 1 DISORDER)

222. A 53-year-old alcoholic presents with mild RUQ tenderness and jaundice. Liver function tests reveal an elevated aspartate aminotransferase (AST) and alanine aminotransferase (ALT) level, but the AST is 2 times greater than the ALT. (CHOOSE 1 DISORDER)

223. A 39-year-old man presents with jaundice and ascites. He has a history of diabetes mellitus and was recently diagnosed as having heart disease. On physical examination, he has a bronze-like appearance to his skin, arthritic changes of the fingers, and testicular atrophy. (CHOOSE 1 DISORDER)

224. A 43-year-old man presents with cirrhosis. Slit-lamp examination reveals a yellow-brown ring in the limbus of the cornea. The patient has recently developed an unsteady gait, tremors, and involuntary chorea-like movements. **(CHOOSE 1 DISORDER)**

Items 225–226

For each patient with jaundice, choose the most likely liver disorder.

- a. Dubin-Johnson syndrome
- b. Rotor syndrome
- c. Crigler-Najjar type 1 syndrome
- d. Crigler-Najjar type 2 syndrome
- e. Gilbert syndrome

225. A 23-year-old man presents with mild, persistent jaundice. The serum bilirubin is always <5 mg/dL and is primarily unconjugated bilirubin. The jaundice is exacerbated by fasting, surgery, fever, infection, and alcohol ingestion. **(CHOOSE 1 DISORDER)**

226. A 17-year-old woman presents with moderate jaundice, which is primarily conjugated bilirubin. She develops jaundice during pregnancy and in times of illness. She has mild hepatomegaly. Liver biopsy reveals black pigment in the hepatocytes. **(CHOOSE 1 DISORDER)**

GASTROINTESTINAL SYSTEM

Answers

189. The answer is c. (*Tintinalli, 5/e, pp 576–578.*) The finding of abruptly arresting inspiration with palpation of the right upper quadrant (RUQ) is called the **Murphy sign**, and it is consistent with a diagnosis of cholecystitis. The liver and gallbladder (GB) move inferiorly as the diaphragm contracts on deep inspiration. The inferior movement of the diaphragm causes the inflamed gallbladder to become compressed against the inverted wall; the patient experiences sharp pain and abruptly halts inspiration. Cholecystitis risk factors are the **four Fs** (**F**at, **F**orty, **F**emale, and **F**ertile). Other risk factors include diabetes, a positive family history, and medications such as oral contraceptives. The most sensitive test for detecting gallstones is the **HIDA scan** (98% sensitive and 81% specific for cholecystitis). It shows obstruction of the cystic duct (the primary cause of cholecystitis). Plain films detect gallstones in 15% of cases. Abdominal ultrasound has a sensitivity of 67% and a specificity of 82% for detection of gallstones.

190. The answer is d. (*Tintinalli, 5/e, p 1621.*) The clinical picture is most consistent with a ruptured spleen. Intense pain in the left upper quadrant that radiates to the top of the left shoulder (**Kehr sign**) is due to diaphragmatic irritation by blood from the ruptured spleen. The spinal levels supplying most of the sensory fibers of the diaphragm (C3–C5 and the phrenic nerve) are the same levels as for some of the sensory supply to the shoulder. Therefore diaphragmatic irritation is sometimes perceived as shoulder pain. The blood loss from the spleen causes signs of shock, including hypotension and orthostatic changes.

191. The answer is d. (*Seidel, 4/e, p 529.*) It is necessary to auscultate the abdomen prior to percussion and palpation because percussion may alter the frequency and the intensity of bowel sounds. The absence of bowel sounds is not established unless no sounds are detected during 5 min of continuous

auscultation. Percussion is an important means of assessing the size and density of abdominal organs as well as detecting fluid or air in the abdomen.

192. The answer is c. (*Tintinalli, 5/e, pp 588–592.*) The patient most likely has **necrotizing pancreatitis**, which is a complication of **acute pancreatitis**. Other complications of pancreatitis include **pseudocyst, abscess, and phlegmon**. The periumbilical discoloration (**Cullen sign**) suggests a hemoperitoneum. Discoloration of the flanks would be a positive **Turner sign**. When the patient experiences pain as the hands of the examiner are abruptly withdrawn from the abdomen, he or she is said to have **rebound tenderness** (a sign of peritonitis). Decreased bowel sounds are another sign of peritonitis. Risk factors for acute pancreatitis include alcohol use, trauma, hyperlipidemia, gallstones, and medications. An abdominal radiograph in acute pancreatitis might show a **sentinel loop** (air-filled small intestine in the LUQ) and colon **cutoff sign** (air in the transverse colon). Patients with **chronic pancreatitis** present with bouts of abdominal pain and signs of pancreatic insufficiency (weight loss, steatorrhea, and diabetes). The abdominal radiograph in patients with chronic pancreatitis demonstrates **calcifications** in the pancreas (pathognomonic).

193. The answer is e. (*Tintinalli, 5/e, pp 539–541.*) The patient has a past medical history of appendectomy, which predisposes him to adhesions and **small bowel obstruction** (SBO). Other etiologies for SBO include incarcerated hernia, stricture, and malignancy. The high-pitched bowel sounds, the **peristaltic rushes**, and the **tympany** with percussion are physical findings when air is under pressure in viscera and intestinal fluid is present (i.e., obstruction). The hallmarks of intestinal obstruction are abdominal pain, distension, vomiting, and obstipation. Abdominal radiographs may reveal dilated loops of bowel in a **ladder-like pattern and air-fluid levels**. Large bowel obstruction (LBO) is due to malignancy, diverticulitis, and volvulus. **A mnemonic for abdominal distension is the six F's: Fat, Fluid, Food, Fetus, Feces, and Flatus.**

194. The answer is d. (*Sapira, p 371.*) **Scaphoid** refers to the normal boatlike appearance of the abdomen seen in thin patients. The costal margins, anterior iliac spines, and pubis represent the sides of the boat, while the bottom of the boat is represented by the abdominal wall, which appears sunken in the supine patient in response to gravity. An obese patient may

have a normal abdominal examination, but it will not be a scaphoid abdomen. Scaphoid denotes an unremarkable abdomen in a patient in whom an abnormal contour would be seen if present, whereas in an obese abdomen, an abnormal contour would be masked by the obesity.

195. The answer is d. (*Sapira, p 376.*) **McBurney's point** is the point on the abdomen that overlies the anatomic position of the appendix and is the site of maximum tenderness in a patient with appendicitis. McBurney described the point as being "between an inch and a half to two inches from the anterior spinous process of the ileum on a straight line drawn from the process to the umbilicus."

196. The answer is d. (*Seidel, 4/e, p 545. Tierney, 39/e, p 607.*) Guarding, rigidity, absent or diminished bowel sounds, rebound and referred rebound tenderness, and lying perfectly still are all signs of peritonitis. A plain film of the abdomen in this patient with a probable perforated ulcer might show free intraperitoneal air under the diaphragm (in up to 75% of patients). The free air establishes the diagnosis and no further studies are needed. Barium studies are contraindicated in perforation.

197. The answer is b. (*Sapira, p 374. Tintinalli, 5/e, pp 554–555.*) Complications of diverticular disease include diverticulitis and gastrointestinal bleeding. **Diverticulitis** is an acute inflammatory process caused by bacteria in a diverticulum (outpouching of the mucosa or submucosa). It may occur in up to 50% of patients with diverticulosis. The patient most likely has diverticulitis, which is usually **left-sided** since the diameter of the sigmoid colon is the smallest of the colon (higher wall tension and intraluminal pressure in this area are probably responsible for the diverticular formation). The palpable mass reflects adherent loops of bowel. **Peritonitis** often results in involuntary guarding (abdominal rigidity due to reflex muscle spasm from the peritoneal irritation). Decreased bowel sounds may be heard in peritonitis or in any condition that causes an ileus (absence of peristalsis). Tenderness upon abrupt withdrawal of the hand (**rebound tenderness or Blumberg sign**) occurs because when the abdominal wall passively springs back into place, it carries with it the inflamed peritoneum. The **referred rebound test** is conducted in the same way but in a location away from the area of tenderness. The patient will experience pain in the area of stated tenderness rather than the site where the test is performed.

198. The answer is a. (*Seidel, 4/e, p 551.*) The **Markel sign** (a maneuver to detect peritoneal irritation) is tested by the heel jar test; the patient stands on his or her toes, then allows his or her heels to hit the floor, thus jarring the body and causing abdominal pain in peritonitis. The **Rovsing sign** occurs when palpation of the LLQ causes pain in the RLQ. The **obturator sign** is pain occurring when the bent leg is rotated laterally and medially. The **iliopsoas sign** occurs when the patient tries to raise the leg up against the hand of the examiner pushing down against the leg above the knee. The **Markel sign, obturator sign, iliopsoas sign, and Rovsing sign are seen in appendicitis.** A patient with appendicitis may also have pain on rectal examination if the posterior appendix is involved. The **Courvoisier sign** is a palpable nontender gallbladder, which suggests neoplasm. The **Dance sign** is the absence of bowel sounds in the RLQ due to intussusception.

199. The answer is b. (*Fauci, 14/e, pp 1651–1653.*) **Intestinal ischemia** is the result of reduction of the blood supply to the intestine; clinical manifestations range from mild chronic symptoms to an acute catastrophic event causing rectal bleeding, peritonitis, and shock. This patient has mild intestinal ischemia characterized by the triad of postprandial pain, anorexia from fear of eating, and weight loss. The pain is typically intermittent; it occurs 30 min after eating and persists for up to 3 h. This is often referred to as abdominal angina. The diagnosis may be confirmed by angiography; embolectomy or surgery is required in selected cases. Patients with cardiac disease are at risk for intestinal ischemia.

200. The answer is b. (*Fauci, 14/e, p 1716.*) **Asterixis** is also referred to as “liver flap” or “flapping tremor.” It is a nonrhythmic, asymmetric lapse in a sustained position of an extremity. It is nonspecific for cirrhosis and may be seen in other metabolic derangements (i.e., renal disease and metabolic acidosis). **Fetor hepaticus** (due to mercaptans) is a musty odor of the breath and urine and is part of the encephalopathy. **Caput medusae** is the dilated abdominal veins seen in patients with portal hypertension. It is often helpful to stage the hepatic encephalopathy to follow the course of the illness:

Stage 1: Euphoria/depression, mild confusion, slurred speech, disordered sleep, \pm asterixis

Stage 2: Lethargy, moderate confusion, +asterixis

Stage 3: Marked confusion, incoherent speech, sleeping but arousable, +asterixis

Stage 4: Comatose, –asterixis

201. The answer is b. (*Fauci, 14/e, pp 1595–1596.*) **Mallory-Weiss tears** are longitudinal tears in the mucosa of the gastroesophageal junction due to prolonged and violent retching or vomiting. A bleeding peptic ulcer or gastritis can cause hematemesis, but usually, if the blood has been retained in the stomach, the digestive processes change the hemoglobin to a brown or black pigment commonly referred to as “**coffee ground**” **emesis**. Esophageal varices may cause gastrointestinal bleeding, but this patient has no history of alcoholism and no past history of liver disease. **Boerhaave syndrome** is a transmural tear of the esophagus that causes gastric contents to escape into the mediastinum, leading to severe mediastinal complications. **Dieulafoy lesion** is a large submucosal artery, which may rupture and cause massive bleeding.

202. The answer is a. (*Fauci, 14/e, pp 1590–1595.*) **Odynophagia** (painful swallowing) is the most common presenting symptom of infectious esophagitis. In an HIV-positive patient, *Candida albicans* (even without oral thrush) is the most common organism. Other organisms include cytomegalovirus and herpes simplex virus. Reflux disease may cause a non-infectious esophagitis, but it is less likely in this patient. **Barrett’s esophagus** (pre-malignant lesion for adenocarcinoma of the esophagus) is replacement of the squamous epithelium by columnar epithelium and may also result in esophagitis. **Achalasia** is failure of the lower esophageal sphincter to relax (motor disorder of smooth muscle); patients complain of dysphagia (difficulty swallowing) to liquids and solids. Patients with cancer typically present with dysphagia to solids, which progresses to liquids, accompanied by weight loss. Middle-aged women develop **Plummer-Vinson syndrome** (hypopharyngeal web); they present with dysphagia to solids and iron-deficiency anemia. **Schatzki ring** is a weblike constriction near the lower esophageal sphincter (LES) that produces dysphagia to solids. The first step in the workup of dysphagia is a barium swallow.

203. The answer is c. (*Seidel, 4/e, pp 532–533.*) **Normal liver span is 6–12 cm in the MCL and 4–8 cm in the midsternal line (MSL).** Micro-

nodular cirrhosis is typically uniform throughout the liver and the nodules are <3 mm in size. It is due to a metabolic insult such as alcohol use. The nodules of **macronodular cirrhosis**, which are less uniform, are >3 mm in size and are due to drugs or infection.

204. The answer is c. (Fauci, 14/e, pp 1626–1629. Sapira, p 273.) Diabetic patients, especially those with poor control, may develop delayed gastric emptying (autonomic dysfunction). Often patients will have a **succussion splash** (a splash is heard with the stethoscope when shaking the patient due to air-fluid level). Diagnosis is made by a gastric emptying study. Patients with **celiac sprue** (also called gluten-sensitive enteropathy) present with bloating, diarrhea, and excessive flatus. They typically have signs of malabsorption, such as hypoalbuminemia, iron-deficiency anemia, hypocholesterolemia, and decreased carotene level. The diagnosis is made by small bowel biopsy and the treatment is a wheat-free diet. **Whipple's disease** is a multisystemic disorder characterized by arthralgias, abdominal pain, fever, weight loss, lymphadenopathy, heart disease, and neurologic disease. Finding periodic acid–Schiff (PAS) positive-staining foamy macrophages in tissues makes the diagnosis, and treatment for this previously fatal disease is antibiotics (for *Tropheryma whippelii*). **Tropical sprue** often responds to antibiotics and may occur months or even years after a patient returns from the tropics.

205. The answer is a. (Fauci, 14/e, p 504. Tierney, 39/e, p 650.) Vitamin C may cause a **false-negative test**. The **false-positive** rate for **FOBT** is 1–5%, and patients must be told to abstain from ASA, NSAIDs, poultry, fish, red meat, and vegetables with peroxide activity (horseradish and turnips) for 72 h before testing.

206. The answer is b. (Fauci, 14/e, pp 1592–1593.) The risk factors for gastroesophageal reflux disease (**GERD**) include obesity, pregnancy, scleroderma, and diet (caffeine, alcohol, nicotine, chocolate, fatty foods). The most common etiology of GERD is transient lower esophageal sphincter (LES) relaxation, but it may also be due to hiatal hernia and acidic gastric contents. The sour taste of GERD is often referred to as “**water brash**.” A complication of GERD is Barrett's esophagus. Atypical symptoms of GERD may include asthma, chronic cough, chronic laryngitis, sore throat, and chest pain. **Peptic ulcer disease** (PUD) produces epigastric pain that typi-

cally improves with eating. Patients with **lactose intolerance** present with bloating, cramps, and diarrhea after ingesting a milk product.

207. The answer is d. (Fauci, 14/e, p 1649. Tintinalli, 5/e, p 847.)

Hirschsprung's disease (aganglionic megacolon) is a disorder characterized by the absence of enteric neurons in the submucosal and myenteric plexuses. The contracted segment of bowel is unable to relax and a mass may become palpable. Hirschsprung's disease may lead to megacolon, but resection of the affected bowel is curative. **Peutz-Jeghers syndrome** is autosomal dominant (AD) and is characterized by hamartomatous polyps in the small intestine and perioral melanin deposits. **Gardner syndrome** (also AD) is familial adenomatous polyposis syndrome. Gardner syndrome and Peutz-Jeghers syndrome are risk factors for colon cancer. **Volvulus** (malrotation that leads to gangrene) is usually seen in the first year of life; infants present with bilious vomiting, bloody stools, rigid and discolored abdomen, and shock.

208. The answer is d. (Goldman, 21/e, pp 51–54. Tintinalli, 5/e, pp 1125–1129.) This patient with underlying liver disease probably has **fulminant hepatitis from acetaminophen toxicity**. Because of his alcohol use, he has insufficient glutathione stores and induced P450 enzymatic activity and is at greater risk for developing toxicity. Patients who survive the complication of fulminant hepatic failure will begin to recover over the following week, but some require liver transplantation. A serum acetaminophen level should be sent and immediate treatment with N-acetylcysteine (NAC), which provides cysteine for glutathione synthesis, is indicated. Signs of **alcohol intoxication** include euphoria, dysarthria, ataxia, labile mood, lethargy, coma, respiratory depression, and death. Patients with **alcohol withdrawal** present with a hyperexcitable state (i.e., hypertension, tachycardia, flushing, sweating, and mydriasis) and have tremors, disordered perceptions, seizures, and delirium tremens (DTs). **Delirium tremens** occur 2–4 days after alcohol abstinence and are characterized by hallucinations, which may be dangerous, combative, and destructive.

209. The answer is b. (Fauci, 14/e, pp 1636–1640.) It is often difficult to clinically distinguish between **ulcerative colitis (UC)** and **Crohn's disease (CD)**. Patients with CD usually have less rectal bleeding and rarely have tenesmus. The barium enema showing involvement of the colon sup-

ports UC. Typically, patients with CD have skip lesions and rectal sparing. Patients with **irritable bowel syndrome** complain of abdominal pain with altered frequency or consistency of stool but have no weight loss or bleeding. More than half of patients with irritable bowel syndrome have psychiatric disorders. Patients with **diverticulosis** (saclike protrusions of the mucosa through the muscularis) are usually older and asymptomatic; hemorrhage occurs in a small percentage of patients. **Giardiasis** may be found in immunocompromised patients, day care workers, male homosexuals, individuals who drink from untreated water (hikers and campers), and international travelers (especially to Russia).

210. The answer is c. (*Fauci, 14/e, p 1705. Tierney 39/e, p 675.*) Patients with cirrhosis may have erythema of the palms, spider angiomas, decreased body hair, gynecomastia, testicular atrophy or menstrual irregularities, and parotid and lacrimal gland enlargement. Many of these changes are due to hormonal disturbances (the production of estrogen). Patients with cirrhosis may also have clubbing of the fingers. Portal hypertension may cause **caput medusae** (prominent abdominal vasculature), splenomegaly, and ascites. Patients may have jaundice and signs of hepatic encephalopathy (**asterixis**). Child's classification is a factor that determines survival in patients with end-stage liver disease; the patient described most likely has **Child's class C** cirrhosis (6-mo survival of 50%).

	Child A	Child B	Child C
Bilirubin	<2.0	2.0–3.0	>3.0
Albumin	>3.5	3.0–3.5	<3.0
Ascites	None	Easily controlled	Not controlled
Neurologic	None	Minimal	Advanced (coma)
Nutrition	Excellent	Good	“Wasting”

211. The answer is e. (*Fauci, 14/e, p 1608.*) Some patients with a history of ulcer surgery experience the **dumping syndrome** 30 min after eating. They present with palpitations, tachycardia, lightheadedness, and diaphoresis after eating a meal due to the rapid emptying of hyperosmolar gastric contents into the small intestine.

212–213. The answers are 212-c, 213-a. (*Seidel, 4/e, pp 531–533.*) **Tympany** is a drumlike sound heard over hollow organs, such as a gas-filled stomach or bowel. **Dullness to percussion** is a thudlike sound heard

over fluid or solid tissue, such as the liver. **Hyperresonance** (a sound whose pitch is somewhere between tympany and dullness) is heard over a hyperinflated area, such as an emphysematous lung or a pneumothorax. A **flat sound** is a very dull sound heard with percussion over muscle.

214–216. The answers are 214-b, c, d, f, 215-a, e, 216-a. (*Fauci, 14/e, pp 1684–1690.*) Hepatitis A, C, D, E, and G are all RNA viruses, while hepatitis B is a DNA virus. **Hepatitis A** (HAV) is almost exclusively transmitted via the fecal-oral route and is spread from person to person. Outbreaks have been traced to contaminated food, water, milk, and shellfish. **Hepatitis B** (HBV) is transmitted sexually, perinatally, and through blood products. **Hepatitis C** (HCV) is transmitted primarily via blood products. Perinatal transmission and sexual transmission of HCV is <5%. HCV is the most common cause of chronic hepatitis in the United States. **Hepatitis D** (HDV) is endemic in patients with HBV in the Mediterranean countries, but in the United States it is confined to blood products. HDV was probably introduced into the United States by intravenous drug abusers. **Hepatitis E** (HEV) resembles HAV (fecal-oral route) but is found primarily in India, Africa, Asia, and Central America. **Hepatitis G** (HGV) is bloodborne and its mode of transmission parallels that of HCV.

217–218. The answers are 217-c, 218-a. (*Seidel, 4/e, pp 543–545.*) **Shifting dullness** and a **positive fluid wave** are the best physical examination findings for diagnosing ascites. In patients with ascites, the border of dullness shifts (shifting dullness) to the dependent side (approaches the midline) as the fluid resettles with gravity when the patient rolls to the side. A “shock wave” (fluid wave) occurs when a sharp tap at one end of the abdomen is felt on the other side. The patient places his or her hand in the middle of the abdomen to stop the transmission through adipose tissue. Asking the patient to go into the uncomfortable position of being on all fours and percussing the umbilicus for dullness is the **puddle sign** (low sensitivity and specificity). **Bulging flanks** (flanks are pushed outward) are seen in obese patients as well as in patients with ascites.

219–224. The answers are 219-b, 220-c, 221-e, 222-f, 223-a, 224-g. (*Goldman, 21/e, pp 724, 801, 1130–1133.*) **Sclerosing cholangitis** is a complication of ulcerative colitis; patients have fibrosing inflammation of the intrahepatic and extrahepatic bile ducts that is best diagnosed by ERCP. Patients present with the **Charcot triad** of fever, jaundice, and RUQ pain.

The Charcot triad occurs in 70% of cases of acute cholangitis. The **Reynolds pentad** is the Charcot triad with shock and altered mental status. Sclerosing cholangitis is a life-threatening illness requiring emergency bile duct decompression. Patients with **primary biliary cirrhosis** (PBC) often present with generalized pruritus, asymptomatic cholestasis, or an isolated alkaline phosphatase level. It occurs most frequently in women, and antimitochondrial antibodies (AMAs) are present in over 90% of affected patients. **Wilson's disease** is diagnosed by a low ceruloplasmin level and **hemochromatosis** is diagnosed by an elevated serum iron level, an elevated ferritin level, and an elevated transferrin saturation (>55%). Patients with Wilson's disease have **Kayser-Fleischer rings** (yellow-brown) in the Descemet membrane and neurologic involvement. Patients with **hemochromatosis** present with suntan-like pigmentation, degenerative arthritis of the hands and fingers (proximal PIPs), impotence, amenorrhea, testicular atrophy, cardiac disease, liver disease, and glucose intolerance. **Zollinger-Ellison syndrome** should be considered in patients with a history of recurrent duodenal ulcer disease. Serum gastrin levels are typically elevated (>150 pg/mL). Gastrinomas may be single or multiple, and up to two-thirds are malignant. Twenty-five percent are associated with multiple endocrine neoplasia (MEN) type 1 and may be found in the pancreas or duodenum. **α_1 antitrypsin deficiency** is characterized by liver disease and emphysema. AST is elevated by twice as much as ALT in **alcoholic hepatitis** because alcohol inhibits ALT synthesis more than AST synthesis. **Budd-Chiari syndrome** is occlusion of the inferior vena cava or hepatic veins. **The most common malignancy of the liver is metastatic (in order of decreasing frequency: colon, pancreas, breast, and lung).** **225–226. The answers are 225-e, 226-a.** (*Fauci, 14/e, pp 1673–1675.*) **Gilbert's disease** is the most common cause of mild unconjugated hyperbilirubinemia. It is found in up to 10% of the population and is due to a partial deficiency of glucuronosyltransferase. Patients with **Dubin-Johnson syndrome** develop jaundice with stress, but it is primarily conjugated bilirubin. **Rotor syndrome** is similar to Dubin-Johnson syndrome, but in Dubin-Johnson syndrome there is black pigment in the hepatocytes and in Rotor syndrome there is no pigment. **Crigler-Najjar type 1** syndrome is severe (absence of glucuronosyltransferase), and patients typically have bilirubin levels of >20 mg/dL. **Crigler-Najjar type 2** syndrome is a relatively benign disorder due to partial deficiency of glucuronosyltransferase; patients present as adolescents with bilirubin levels of 6–20 mg/dL.

GENITOURINARY SYSTEM

Questions

DIRECTIONS: Each of the numbered items or incomplete statements in this section is followed by answers or by completion of the statements. Select the **one** lettered answer or completion that is **best** in each case.

227. A 24-year-old man presents with a painless testicular mass. He denies any past medical history and has no family history of cancer. He does not smoke, drink alcohol, or use illicit drugs. He recalls being kicked in the groin during karate practice 10 days ago. Physical examination reveals a 3-cm mass in the right scrotum that is hard and tender. The mass cannot be transilluminated. There is no lymphadenopathy. The serum α -fetoprotein level is elevated. Which of the following is the most likely diagnosis?

- a. Seminoma
- b. Nonseminoma
- c. Hematoma
- d. Leydig cell tumor
- e. Sertoli cell tumor
- f. Penile carcinoma
- g. Testicular lymphoma

228. An 18-year-old man presents with a mass in the right inguinal area. When the examining finger is inserted into the lower part of the scrotum and carried along the vas deferens into the inguinal canal to inspect for herniation, the mass (viscus) strikes the lateral aspect of the examining finger when the patient is asked to cough. When the right inguinal area over the internal ring is compressed, and the patient is asked to cough again, the examining finger does not sense any mass striking it. Which of the following statements is true?

- a. This type of hernia almost always resolves spontaneously before puberty
- b. If the hernial sac extends into the scrotum, then this is a true surgical emergency
- c. Inguinal hernias are more common in women than men
- d. The appendix may be found in the hernial sac
- e. This type of hernia is frequently present in elderly women

229. A 19-year-old student presents for a pre-college screening visit. On physical examination, the patient has a scant beard (he states he needs to shave only every other month) and gynecomastia. His testes are firm and measure <2 cm each. The patient states that he functions as a normal man sexually although he feels his libido is diminished compared to his friends. Which of the following is the most likely diagnosis?

- a. Turner syndrome
- b. Klinefelter syndrome
- c. Ambiguous genitalia
- d. Late puberty
- e. Normal male

230. A 22-year-old man presents 1 day after having been a restrained passenger in a moderate-speed motor vehicle accident (MVA). He states that his scrotum became discolored blue after the accident. He denies any trauma to the scrotum. On examination, the scrotum is bluish but the discoloration is gravity-dependent. Which of the following is the most likely diagnosis?

- a. Fournier's gangrene
- b. Testicular torsion
- c. Inguinal hernia
- d. Hematocele
- e. Hydrocele

231. A 48-year-old man presents with peripheral edema. He has been healthy and physically active all of his life. His family history is unremarkable. His blood pressure is normal. On physical examination, the patient is noted to have anasarca. Kidneys are not palpable. Urinalysis reveals a moderate amount of proteinuria and "grape clusters" are seen under light microscopy. Which of the following is the most likely diagnosis?

- a. Glomerulonephritis
- b. Rhabdomyolysis
- c. Nephrotic syndrome
- d. Acute interstitial nephritis
- e. Acute tubular necrosis

232. While examining the male genitalia, you are unable to retract the foreskin of an uncircumcised patient. There is no evidence of erythema. Which of the following is the most likely diagnosis?

- a. Balanitis
- b. Phimosis
- c. Escutcheon
- d. Smegma
- e. Priapism

233. A 34-year-old man complains of lumps in his scrotal skin. On physical examination, the lesions are small and mobile. An oily material can be extruded from the lesions. Which of the following is the most likely diagnosis?

- a. Scrotal rings
- b. Scrotal carcinoma
- c. Epidermoid cysts
- d. Molluscum contagiosum
- e. Condyloma acuminatum

234. A 41-year-old man complains of soft, raised, flesh-colored growths or projections on his glans penis, prepuce, and penile shaft. Several excisional biopsies are done to look for malignancy. Which of the following is the most likely diagnosis?

- a. Genital herpes
- b. Condyloma acuminatum
- c. Molluscum contagiosum
- d. Condylomata lata
- e. Peyronie's disease

235. A 21-year-old man who recently recovered from the mumps presents to the emergency room complaining of a swollen and painful left testicle. Physical examination reveals testicular tenderness. Which of the following is the most likely diagnosis?

- a. Orchitis
- b. Epididymitis
- c. Testicular tumor
- d. Varicocele
- e. Spermatocele

236. A 32-year-old woman is referred to the emergency room for renal failure that was discovered in a preemployment screening examination. The patient has a blood urea nitrogen (BUN) of 100 mg/dL and a serum creatinine of 8.4 mg/dL. Her only complaint is bilateral flank pain. Family history reveals that her mother and one sibling have renal failure and receive hemodialysis. Her mother has had a recent stroke. The patient's blood pressure is 170/100 mm Hg. Heart examination reveals a midsystolic click and murmur that increases with Valsalva maneuver. Kidneys are palpated bilaterally and are each 20 cm large. Which of the following is the most likely diagnosis?

- a. Horseshoe kidney
- b. Polycystic kidney disease
- c. Bilateral hydronephrosis
- d. Kidney carcinoma
- e. Medullary sponge kidney

237. Which of the following best characterizes the sensitivity of the digital rectal examination (DRE)?

- a. High for both rectal carcinoma and prostate cancer
- b. High for prostate cancer but low for appendicitis
- c. High for both appendicitis and prostate cancer
- d. Low for appendicitis, prostate cancer, and colon carcinoma
- e. Low for prostate cancer and high for rectal carcinoma

238. A 34-year-old firefighter presents to the emergency room complaining of the sudden onset of severe right-sided flank pain that radiates to the right groin and genitalia. He is unable to lie still on the stretcher of the emergency room. He denies any history of trauma. He denies any dysuria, frequency, nocturia, or fever. Examination of the genitalia is normal. Abdominal and rectal examinations are normal. There is positive right costovertebral angle (CVA) tenderness. Urinalysis reveals blood. Which of the following is the most likely diagnosis?

- a. Pyelonephritis
- b. Renal calculi
- c. Testicular torsion
- d. Strangulated hernia
- e. Acute prostatitis

239. Which of the following statements is true regarding the digital rectal examination (DRE) and serum prostate-specific antigen (PSA) in the detection of prostate cancer?

- a. The combined use of DRE and PSA affords a more complete evaluation than either test alone
- b. DRE is more sensitive than PSA
- c. Neither DRE nor PSA is effective
- d. Either DRE or PSA allows for complete evaluation
- e. PSA should not be used for detection of prostate cancer

240. A 10-year-old boy with no history of trauma presents to the emergency room with a 14 h history of a painful scrotum. Elevation of the scrotum does not relieve the pain. He is also complaining of nausea and vomiting. Examination reveals an enlarged, tender, erythematous scrotum that does not transilluminate. The testicle is in a transverse (horizontal) position. Cremasteric reflex is absent on the side of the swelling. Which of the following is the most likely diagnosis?

- a. Spermatocele
- b. Hydrocele
- c. Epididymitis
- d. Varicocele
- e. Testicular torsion

241. A 16-year-old uncircumcised teenager presents to the emergency room with severe penile pain. On physical examination, the foreskin is retracted to reveal an enlarged and bluish-colored glans penis. The patient complains of severe pain on attempting to reposition the foreskin. Which of the following is the most likely diagnosis?

- a. Hypospadias
- b. Balanitis
- c. Priapism
- d. Paraphimosis
- e. Phimosis
- f. Epispadias

242. A 49-year-old man with multiple myeloma presents with glucosuria, hypophosphatemia, hypokalemia, hypouricemia, aminoaciduria, and proteinuria. Further analysis of the electrolytes reveals the patient to have a metabolic acidosis. The urine pH is <5.5. Which of the following is the most likely diagnosis?

- a. Fanconi syndrome
- b. Type 1 renal tubular acidosis
- c. Distal renal tubular acidosis
- d. Type 4 renal tubular acidosis
- e. Kimmelstiel-Wilson disease

243. A 14-year-old boy complains of the gradual worsening of scrotal pain and swelling. He also complains of dysuria. On physical examination, the scrotum is edematous and erythematous. There is exquisite tenderness when palpating posterolaterally to the testicle. When you elevate the testicle, the scrotal pain is relieved. Which of the following is the most likely diagnosis?

- a. Orchitis
- b. Epididymitis
- c. Testicular torsion
- d. Varicocele
- e. Hydrocele

244. A 19-year-old woman presents with severe right-sided flank pain accompanied by fever, shaking chills, dysuria, and frequency. She is sexually active with one partner and always uses condoms. Her last menstrual period was 5 days ago. On physical examination, her temperature is 103.8°F and her heart rate is 120/min. Blood pressure and respirations are normal. Abdominal examination reveals suprapubic tenderness with palpation. The patient complains of pain when percussion is performed with the ulnar surface of the fist over the right costovertebral angle (CVA). Pelvic examination is normal. Which of the following is the most likely diagnosis?

- a. Diverticulitis
- b. Acute cystitis
- c. Renal calculi
- d. Pyelonephritis
- e. Appendicitis

245. A 15-year-old boy complains of worsening scrotal pain. On palpation of the scrotum, you find a pea-sized, tender mass at the upper pole of the testis. With transillumination, the mass appears as a “blue dot.” Which of the following is the most likely diagnosis?

- a. Testicular torsion
- b. Epididymitis
- c. Hernia with hydrocele
- d. Appendix testis torsion
- e. Orchitis with hydrocele

246. A 13-year-old boy is complaining of heaviness to his scrotum and some vague pain in the area that worsens with exertion. Palpation of the scrotum reveals a freely moveable, nontender, tubular mass (“bag of worms”) above the left testis. Which of the following is the most likely diagnosis?

- a. Orchitis
- b. Testicular torsion
- c. Epididymitis
- d. Varicocele
- e. Hydrocele

247. A 71-year-old man presents with a history of nocturia, frequency, and urgency about half the time. He states that for the last month he has had difficulty starting and maintaining his urine stream (has to push or strain) more than half of the time. He always feels like his bladder is not empty after urinating. On physical examination, the prostate gland is enlarged, nodular, and nontender. The PSA level is 2.7 ng/ml. Which of the following is the most likely diagnosis?

- a. Mild BPH
- b. Moderate BPH
- c. Severe BPH
- d. Prostate cancer
- e. Prostatitis

248. A 23-year-old man presents complaining of hematuria for 1 day. He has no other symptoms but states the hematuria started after he played in a fast-paced basketball game. He takes no medications and does not drink alcohol or use illicit drugs. He recalls having a sore throat yesterday but denies cough or fever. He takes no medications and has no family history of renal disease. Physical examination is normal. The rapid streptococcal antigen test is negative. The urinalysis reveals erythrocytes and erythrocyte casts. Which of the following is the most likely diagnosis?

- a. Bladder carcinoma
- b. IgA nephropathy
- c. Poststreptococcal glomerulonephritis
- d. Alport syndrome
- e. Minimal change disease

249. Which of the following is an indication for dialysis in a patient with end-stage renal disease?

- a. Heart rate of 105 beats/min
- b. Blood pressure of 150/100 mm Hg
- c. Fluid overload unresponsive to diuretics
- d. Pneumonia
- e. Cardiomegaly
- f. S₄ gallop

250. An 18-year-old woman presents to your office for a blood pressure check. The patient has a history of hypertension diagnosed by a previous physician who recently retired. The patient takes three antihypertensives and is compliant. Except for an occasional headache, she has no complaints. There is no family history of hypertension. Blood pressure is 145/90 mm Hg in both arms. Funduscopic examination reveals exudates and hemorrhages. Heart and lungs are normal. Abdominal examination reveals a systolic and diastolic bruit heard in the right midabdomen and through to the back. The remainder of the examination is normal. Which of the following is the most likely diagnosis?

- a. Pheochromocytoma
- b. Coarctation of the aorta
- c. Renal artery stenosis
- d. Hyperaldosteronism
- e. Cushing's disease

251. Which of the following is a risk factor for prostate carcinoma?

- a. Hispanic ethnicity
- b. Family history of prostate cancer
- c. Low dietary fat intake
- d. A diet high in selenium
- e. Having undergone an orchiectomy

252. A 41-year-old patient with a long history of schizophrenia presents with confusion and disorientation. His wife states that he drinks several liters of water daily. His blood pressure is 110/70 mm Hg, pulse is 104/min, respirations are 20/min, and temperature is 98.6°F. The patient has no orthostatic changes in blood pressure or pulse. Heart and lung examinations are normal. The neurologic exam reveals a dysarthric man who is oriented only to person. He has no focal neurologic deficits. Laboratory data reveals a serum sodium concentration of 105 meq/L and the diagnosis of primary polydipsia is made. The patient is admitted and the sodium is corrected to normal (135 meq/L) within 12 hours. While awaiting a psychiatry consult, the patient develops flaccid quadriplegia, then becomes comatose. Which of the following is the most likely diagnosis?

- a. Relapse into hyponatremia
- b. Acute schizophrenia
- c. New stroke
- d. Myocardial infarction
- e. Central pontine myelinolysis

253. Which of the following is most likely to cause hematuria?

- a. Femoral hernia
- b. Hydrocele
- c. Nephrotic syndrome
- d. Renal artery stenosis
- e. Cryoglobulinemia
- f. Renal tubular acidosis

DIRECTIONS: Each set of matching items in this section consists of a list of lettered options followed by several numbered items. For each numbered item, select the appropriate lettered option(s). Each lettered option may be selected once, more than once, or not at all. **Each item will state the number of options to select. Choose exactly this number.**

Items 254–255

For each patient with hematuria, choose the most likely diagnosis.

- a. Prostate cancer
- b. Renal cell carcinoma
- c. Bladder cancer
- d. Carcinoma of the ureter

254. A 55-year-old man presents with hematuria, flank pain, and fever. Physical examination reveals the presence of an abdominal mass. **(CHOOSE 1 DIAGNOSIS)**

255. A 57-year-old man with a history of smoking presents with hematuria. He has owned and operated a chain of dry cleaners for over 30 years. **(CHOOSE 1 DIAGNOSIS)**

GENITOURINARY SYSTEM

Answers

227. The answer is b. (Seidel, 4/e, pp 665–668. Tierney, 39/e, pp 1141–1142.) **Germ cell tumors** are the most common tumors in men between 20 and 35 years of age. A man who presents with a testicular mass and an **elevated serum α -fetoprotein (AFP) level** most likely has **non-seminomatous testicular cancer**. The elevated AFP implies yolk sac or nonseminomatous elements. Patients with **seminomas (more common than nonseminomas)** often have **elevations in human chorionic gonadotropin (hCG)**. All germ cell tumors, even if advanced, are curable with chemotherapy. Leydig and Sertoli cell tumors tend to produce estrogen, causing gynecomastia and impotence. Squamous cell carcinoma of the penis presents as a painful, nonhealing ulceration and is often found in uncircumcised men with poor hygiene. Testicular lymphoma is often bilateral. **Swellings containing serous fluid transilluminate; those containing blood and tissue do not.**

228. The answer is d. (Seidel, 4/e, pp 653–654, 659.) The digital examination described is consistent with an **indirect hernia** (a hernia that lies within the inguinal canal), which is the most common of all hernias. A **direct hernia** (a hernia through the posterior wall of the inguinal canal) is present if the viscus is felt medial to the external canal on digital examination. The appendix—or, for that matter, any visceral organ—may be found in a hernial sac. All hernias except **femoral hernias** are more common in males than females. Hernias become surgical emergencies if they become incarcerated and irreducible. When the circulation is compromised due to the incarceration, the hernia is strangulated.

229. The answer is b. (Fauci, 14/e, pp 2120–2121. Seidel, 5/e, pp 668–669.) **Klinefelter syndrome**, the most common (1 in 500) disorder of sexual differentiation, is associated with XXY chromosomal inheritance and is characterized by tall stature, hypogonadism or small scrotum with pea-sized testes (normal testes are 5 cm long), a female distribution of pubic hair, and gynecomastia. Newborns require prompt chromosomal studies if

born with ambiguous genitalia (small penis with hypospadias or enlarged clitoris). Patients with gonadal dysgenesis or **Turner syndrome** are 45,X0; the syndrome is characterized by primary amenorrhea, short stature, webbed neck, and multiple congenital abnormalities.

230. The answer is d. (*DeGowin, 6/e, p 589.*) The presence of a patent processus vaginalis allows communication of intraperitoneal contents with the scrotum. Clear intraperitoneal fluid can form a **hydrocele**. Purulent material from a ruptured appendix can cause a “hot” scrotum. **Fournier’s gangrene** is a polymicrobial infection of the subcutaneous tissues of the scrotum often seen in diabetic patients. Abdominal trauma, as from a car seat belt, can disrupt intraabdominal contents and the blood can migrate through a patent processus vaginalis. The scrotal blood will not transilluminate and will be gravity-dependent. There have been unusual cases of scrotal swelling due to meconium in the newborn and scrotal swelling due to migration of ventriculoperitoneal shunt tubing.

231. The answer is c. (*Tierney, 39/e, pp 892–913.*) **Anasarca** is generalized body edema that is often seen in the nephrotic syndrome. The **grape clusters** (lipid deposits or **oval fat bodies** in sloughed tubular epithelial cells) that appear under light microscopy appear as **Maltese crosses** under polarized light. One-third of patients with nephrotic syndrome have a systemic disease (i.e., diabetes mellitus, SLE), and two-thirds have either (1) membranous nephropathy due to hepatitis C, SLE, syphilis, or medications; (2) minimal change disease; (3) focal glomerular sclerosis (HIV or heroin use); or (4) membranoproliferative glomerulonephritis. Patients with glomerulonephritis present with a **nephritic syndrome (hypertension, hematuria, and edema)**. Patients with **acute interstitial nephritis** from drugs or infection usually present with rash, arthralgias, eosinophiluria, and eosinophilia. **Acute tubular necrosis (ATN)** typically occurs after an insult, such as ischemia or exposure to a nephrotoxin (i.e., contrast media, paraproteins in multiple myeloma, antibiotics). Myoglobinuria is a consequence of rhabdomyolysis that leads to ATN.

232. The answer is b. (*Seidel, 4/e, p 651.*) **Phimosis** is the condition in which the foreskin in an uncircumcised patient cannot be retracted; this may occur normally in the first 6 years of life. Phimosis is usually congenital but may be due to recurrent infections or balanoposthitis (inflamma-

tion of the glans penis and prepuce). **Balanitis** is inflammation of the glans penis and occurs only in uncircumcised persons. **Escutcheon** is the hair pattern associated with genitalia. **Smegma** is a white, cheeselike material that collects around the glans penis in an uncircumcised man. **Priapism** is a painful, prolonged penile erection, which most often occurs in patients with sickle cell disease, sickle cell trait, or leukemia.

233. The answer is c. (*Seidel, 4/e, p 652.*) Epidermoid or sebaceous cysts appear as small lumps in the scrotal skin, which may enlarge and discharge oily material. **Molluscum contagiosum** appears as pearly white, umbilicated, dome-shaped papules caused by a poxvirus. Condylomata acuminata are warts caused by the human papillomavirus (HPV).

234. The answer is b. (*Fauci, 14/e, pp 1098–1099. Seidel, 4/e, pp 662–664.*) The lesions of **condyloma acuminatum** or venereal warts are soft, flesh-colored (may also be pink or red) growths or projections that are found on various parts of the penis. The etiologic agent is human papillomavirus (HPV), which is associated with dysplasia (i.e., squamous cell carcinoma of the cervix, penis, anus, vagina, and vulva). Warts are sexually transmitted with an incubation period of 1–6 months. **Condylomata lata** are the soft, flat-topped, moist, pale nodules and papules of secondary syphilis that appear 2–6 months after the primary chancre. These contagious lesions may be seen anywhere on the body, including the palms and soles. **Peyronie's disease** is unilateral deviation of the penis caused by a fibrous band in the corpus cavernosum. It results in deviation (and often pain) of the penis during erection. Genital herpes is a sexually transmitted disease characterized by a painful group of vesicles on an erythematous base.

235. The answer is a. (*Seidel, 4/e, p 666.*) **Orchitis** is an uncommon occurrence except as a sequela of infection with mumps in young males. It is most often unilateral, and testicular atrophy occurs in 50% of cases. Testicular tumors are the most common neoplasms in men between the ages of 15 and 30 years. The tumors are nontender, are fixed to the testicle, and do not transilluminate.

236. The answer is b. (*Seidel, 4/e, p 517. Tierney, 39/e, pp 914–915.*) The kidneys normally extend from T12 to L3 (11 cm long). The right kidney is

lower than the left kidney due to the liver above it. **The left kidney is usually not palpable.** Bilateral large kidneys suggest polycystic kidney disease or bilateral hydronephrosis. **Polycystic kidney disease** (PKD) is the most common inherited disorder in the United States and may be autosomal dominant (ADPKD) due to a defect on the short arm of chromosome 16. Patients develop hypertension and renal cysts and often require dialysis or transplantation by the age of 40. Extrarenal manifestations of ADPKD include mitral valve prolapse, berry aneurysms of the circle of Willis, diverticulosis, diverticulitis, and liver cysts. **Medullary sponge kidney** is a benign condition seen in older patients (40–50) that almost never leads to renal failure. **Horseshoe kidney** is a kidney that can be palpated crossing the midline. Renal carcinoma often presents as a hard mass. Patients with bilateral hydronephrosis typically have signs of infection, such as fever, hematuria, and dysuria.

237. The answer is b. (*Seidel, 4/e, p 679. Fauci, 14/e, p 598.*) The sensitivity of **DRE** for prostate-related problems is high, and palpation of the prostate is an essential test for optimal detection of all stages of prostate cancer other than stage T1. The posterior surface of the lateral lobes, where cancer often begins, is easily palpated on DRE. The diagnostic yield for rectal carcinoma and appendicitis is low. Authorities do recommend **DRE in conjunction with PSA testing** as part of the periodic health examination in men over age 50 who are at average risk and in men over 40 at high risk for prostate cancer (African Americans).

238. The answer is b. (*Tierney, 39/e, pp 926, 929–933.*) **Renal colic** is severe episodic pain localized to the flank that often radiates to the groin and genitalia. It is often accompanied by nausea and vomiting. **Patients are often moving about (in contrast to an acute abdomen from peritonitis, where patients stay very still)** in an effort to find a more comfortable position. The most common composition of stones is **calcium oxalate** (radiopaque on abdominal film). Patients with **acute bacterial prostatitis** present with fever, dysuria, urgency, frequency, and pain (suprapubic, perineal, and sacral). Rectal examination reveals a warm and exquisitely tender prostate gland. Pyelonephritis is unlikely without fever or urinary symptoms. The normal genitalia examination makes the other choices unlikely.

239. The answer is a. (*Seidel, 4/e, p 679. Fauci, 14/e, pp 598–599.*) **Serum PSA**, although widely used as a screening test for adenocarcinoma

of the prostate, is not specific for cancer. The PSA measurement, however, is more reliable than DRE for detection of prostate cancer. The **combined use of PSA and DRE** affords a more complete evaluation for detecting prostate cancer. PSA levels of >10 ng/ml are considered high and results <4 ng/ml are considered normal. PSA results between 4 and 10 ng/ml are considered borderline. The higher the PSA level, the more likely the presence of prostate cancer, but PSA should not be considered specific for cancer. Patients with suspicious DRE/PSA results should have transrectal ultrasound (TRUS) of the prostate with biopsies.

240. The answer is e. (*Seidel, 4/e, pp 656, 667.*) The tunica vaginalis normally attaches the posterolateral surfaces of the testicle to the scrotum, thereby anchoring it and preventing rotation. When these attachments are missing, the testicle is free to rotate around the spermatic cord and the critical vascular pedicle. This is known as intravaginal **torsion** and is most common in patients between 10 and 20 years of age. Classically, the testicle will have a transverse lie within the scrotum, known as the bell-clapper relationship. The onset of pain is sudden and there are no urinary complaints. The pain may be accompanied by nausea and vomiting. Many feel that the initiating factor may be contraction of the cremaster muscle, since loss of the **cremasteric reflex** (normally the testicle and scrotum rise on the side where the inner thigh is stroked with a blunt instrument or finger) is almost invariably found in torsion.

241. The answer is d. (*Seidel, 4/e, p 661.*) **Paraphimosis** occurs when the foreskin cannot be returned to the extended position. It may lead to gangrene of the glans penis. **Phimosis** is the inability to retract the foreskin. **Hypospadias** is a congenital abnormality in which the urethra is situated on the ventral surface of the shaft of the penis. **Epispadias** is a congenital defect in which the urethral meatus appears on the dorsum of the penis.

242. The answer is a. (*Fauci, 14/e, pp 1566–1569.*) Fanconi syndrome is a generalized defect in proximal tubule transport involving amino acids, glucose, uric acid, potassium, phosphate, sodium, and bicarbonate. It may be secondary to multiple myeloma, amyloidosis, and heavy metal toxicity. **Fanconi syndrome is a type 2 (proximal) renal tubular acidosis (RTA).** **Type 1 RTA (distal)** causes a metabolic acidosis with an alkaline (>5.5)

urine pH. **RTA type 4** causes hyperkalemia and is due to inadequate aldosterone production from diabetes mellitus, sickle cell disease, obstructive uropathy, or medication use (heparin, nonsteroidal anti-inflammatory drugs, and ACE inhibitors). Diabetic patients may develop a specific kind of nephropathy (glomerulosclerosis) in which **Kimmelstiel-Wilson lesions** are found histologically (nodules that stain periodic acid–Schiff positive and are deposited in the periphery of the glomerulus).

243. The answer is b. (Seidel, 4/e, pp 654, 667.) The epididymis is located on the posterolateral surface of the testis and should be smooth, discrete, nontender, and larger cephalad. **Epididymitis** in children usually occurs in the preteen years and is thought to be secondary to reflux of sterile urine that causes an inflammatory reaction in the epididymis. A urinary tract infection is occasionally seen. There is tenderness of the posterolaterally positioned epididymis with a normal testicle palpated anteriorly. The **Prehn sign** is positive when the patient experiences relief from pain upon elevation of the testicle. This sign is not reliable, however, and testicular torsion must still be ruled out.

244. The answer is d. (Fauci, 14/e, pp 818–822.) The patient presents with **pyelonephritis**, which is an infection of the kidney and renal pelvis. It is characterized by flank pain, fever, dysuria, and frequency. Patients often experience suprapubic and **CVA tenderness**. Patients with **acute cystitis** may present with dysuria, frequency, urgency, and suprapubic tenderness, but typically the patient is afebrile and the physical examination is normal. The organisms responsible for urinary tract infections are **SEEK PP = *Serratia marcescens*, *Escherichia coli*, *Enterobacter cloacae*, *Klebsiella pneumoniae*, *Proteus mirabilis*, and *Pseudomonas aeruginosa*.**

245. The answer is d. (Tintinalli, 5/e, p 636.) The appendix testis and the appendix epididymis are embryonic ductal system remnants. The appendix epididymis is an irregularity on the cephalad surface of the epididymis. These two intrascrotal appendages may undergo torsion. The peak incidence of **torsion** occurs between the ages of 10 and 15 years. Onset of pain can be sudden or gradual and the infarcted appendage can often be seen as a **“blue dot”** on the superior pole of the testis. Transillumination highlights the appearance.

246. The answer is d. (Seidel, 4/e, p 666.) **Varicocele** is a collection of dilated veins of the pampiniform plexus. Compression of the left renal vein (**varicocele is most common on the left side**) at the level of the aorta causes venous stasis and reflux into the spermatic vein, causing the varicocele. Incidence is rare before the age of 8 years and is often seen during puberty. The dilated veins are more easily seen and palpated with the patient standing. Varicocele is associated with reduced fertility.

247. The answer is b. (Fauci, 14/e, pp 637–638.) The patient has an **American Urologic Association (AUA) symptom index score** of 17/35 or moderate benign prostatic hyperplasia (BPH). This score is based on a patient's 0–5 response to 7 questions (0 = not at all; 1 = less than one-fifth of the time; 2 = less than one-half of the time; 3 = one-half of the time; 4 = more than one-half of the time; 5 = almost always): **Over the last month, how often have you:**

1. Had a sensation of not emptying your bladder after urinating?
2. Had to urinate again less than 2 h after you finished urinating?
3. Stopped and started again several times when you urinated?
4. Found it difficult to postpone urination?
5. Had a weak urinary stream?
6. Had to push or strain to begin urination?
7. Had nocturia?

A score of 0–7 is mild BPH, 8–19 is moderate BPH, and 20–35 is severe BPH.

248. The answer is b. (Fauci, 14/e, p 1544.) **IgA nephropathy (Berger's)** is the most commonly encountered form of focal glomerulonephritis worldwide, and patients will often have microhematuria. It may follow an upper respiratory tract infection or physical exertion. **Bladder cancer** is a common cause of asymptomatic microhematuria but is usually found in patients over the age of 50. Risk factors for bladder neoplasia include aniline, rubber, other organic solvents, industrial dyes, and tobacco use. Minimal change disease almost always presents with severe proteinuria, and erythrocyte casts are not seen in rhabdomyolysis. Patients with **Alport syndrome** have the nephritic syndrome and hearing loss.

249. The answer is c. (*Fauci, 14/e, p 2529. Tierney, 39/e, p 901.*) Indications for dialysis are easily remembered with the vowel mnemonic of **A, E, I, O, U** or **Acidosis** (pH < 7.20), **E**lectrolyte abnormality (hyperkalemia), fluid **O**verload unresponsive to diuretics, and **U**remic symptoms (pericarditis, encephalopathy, or coagulopathy). The **I** in the mnemonic is a reminder that ingestion of certain drugs (barbiturates, bromide, chloral hydrate, ethanol, ethylene glycol, isopropyl alcohol, lithium, methanol, procainamide, theophylline, salicylates, and heavy metals) is treatable with dialysis.

250. The answer is c. (*Fauci, 14/e, pp 1559–1560.*) **Renal artery stenosis (RAS)** accounts for <5% of hypertension (HTN). The most common cause is atherosclerosis, but in young women the etiology is often **fibromuscular dysplasia**. Patients may present with a high-pitched **epigastric bruit**. A **positive captopril test** (renin values increase greatly after a dose of the angiotensin converting enzyme is given, because the drug magnifies the impairment in blood flow and in the glomerular filtration rate caused by the RAS) is an excellent screening procedure. The diagnosis is then confirmed with a digital subtraction renal arteriogram. Patients with **pheochromocytoma** often present with sudden episodes of hypertension, headache, profuse sweating, anxiety, and palpitations. The diagnosis is made by 24-h urine collection for catecholamines or catecholamine metabolites. Patients with HTN due to **coarctation of the aorta** present with delayed or absent femoral pulses and complain of claudication. Patients with **primary hyperaldosteronism** (Conn syndrome) (etiology is usually bilateral adrenal hyperplasia) present with HTN, fatigue, polyuria, and muscle weakness due to potassium depletion. **Cushing's disease** is characterized by central deposition of adipose tissue, muscle weakness, amenorrhea, impotence, psychiatric abnormalities, and HTN.

251. The answer is b. (*Goldman, 21/e, p 635.*) Definitive risk factors for **prostate cancer** include African American race and family history of prostate cancer. Potential risk factors for prostate cancer include a diet high in fat, a diet low in selenium, and, perhaps, having undergone a vasectomy.

252. The answer is e. (*Fauci, 14/e, pp 268–269, 2007.*) The patient presented with euvolemic hyponatremia secondary to primary polydipsia (compulsive water consumption). Since the hyponatremia developed gradually in the absence of neurologic symptoms (i.e., seizures), it should not

be corrected rapidly. The appropriate rate of correction should be 12 meq/24 h to prevent **central pontine myelinolysis** (CPM), which is an osmotically induced demyelination due to overly rapid correction of serum sodium. Patients develop paraplegia, quadriplegia, and coma.

253. The answer is e. (*Fauci, 14/e, p 261.*) An easy mnemonic to address hematuria is “**If your doctor does not know how to work up hematuria, you should SWITCH GPS.**”

S = Stones, sickle cell disease, sickle cell trait, scleroderma, SLE, sulfonamides

W = Wegener’s granulomatosis

I = Infections, instrumentation, iatrogenic, interstitial nephritis

T = Trauma, TB, tubulointerstitial disease, tumor, thrombocytopenic thrombotic purpura (TTP)

C = Cryoglobulinemia, cyclophosphamide

H = Hemolytic-uremic syndrome, hypercalciuria, hemophilia, Henoch-Schönlein purpura

G = Goodpasture’s disease, glomerulonephritis

P = Papillary necrosis, polycystic kidney disease, polyarteritis nodosa

S = Schistosomiasis, sponge disease (medullary sponge disease)

254–255. The answers are 254-b, 255-c. (*Fauci, 14/e, pp 592–596.*)

Ninety-five percent of tumors of the kidney are **renal cell carcinomas**. Patients present with hematuria and the presence of an abdominal mass. Causal factors have been implicated in the development of renal cell carcinoma, but cigarette smoking and obesity are the strongest associations. **Bladder cancer** is strongly associated with cigarette smoking and chemical compounds (aromatic hydrocarbons). Chimney sweepers and dry cleaners are also at risk for bladder cancer (up to 25% of all bladder cancer is occupationally related). Cancer of the ureter (transitional cell like the bladder) is associated with chronic phenacetin use, cigarette smoking, and hydrocarbon chemical exposure.

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ENDOCRINOLOGY

Questions

DIRECTIONS: Each of the numbered items or incomplete statements in this section is followed by answers or by completion of the statements. Select the **one** lettered answer or completion that is **best** in each case.

256. A 41-year-old woman with no previous medical problems presents with the chief complaint of generalized weakness. The patient states that she has been irritable lately and finds it difficult to concentrate at work. She has been amenorrheic for 12 mo and feels her symptoms might be related to early menopause. On physical examination, blood pressure is 160/90 mm Hg. The patient has a “moon face” and a “buffalo hump.” She is hirsute. Abdominal examination reveals purple striae. Her extremities appear to be atrophied. Her finger stick glucose is 210 mg/dL. Which of the following is the most likely diagnosis?

- a. Cushing syndrome
- b. Cushing’s disease
- c. Pseudo-Cushing state
- d. Polycystic ovary disease
- e. Normal menopause

257. A 42-year-old man presents to your office for a checkup. He has been in excellent health except for a recent diagnosis of mild hypertension and bilateral carpal tunnel syndrome. On physical examination, the patient is tall with large and doughy hands. His facial features are coarse and he has a prominent mandible with wide-spaced teeth. His voice is deep and he has macroglossia. Heart examination reveals the point of maximum impulse (PMI) to be displaced 2 cm laterally. Which of the following is the most likely diagnosis?

- a. Acromegaly
- b. Gigantism
- c. Hypothyroidism
- d. Familial prognathism
- e. Amyloidosis

258. Which of the following statements is true regarding palpation of the thyroid gland?

- a. The left lobe of the thyroid is 25% larger than the right lobe
- b. The consistency of the thyroid gland should be gritty and coarse
- c. The patient should never be examined from the front
- d. The thyroid gland should remain immobile with swallowing
- e. The patient should be positioned with the neck flexed slightly forward and laterally toward the side being examined

259. A 21-year-old woman presents to the emergency room with palpitations. Physical examination reveals an anxious and highly energetic patient. Her heart rate is 120 beats/min. She has bilateral proptosis (exophthalmos), stare, and lid retraction. Thyroid examination reveals diffuse enlargement with an audible bruit. The thyroid gland is nontender. The patient has weakness of her quadriceps muscles (needs help to rise from a chair) and has fine tremors. Which of the following is the most likely diagnosis?

- a. Graves' disease
- b. Hashimoto thyroiditis
- c. Plummer's disease
- d. Struma ovarii
- e. Subacute thyroiditis

260. A 52-year-old woman presents to her private physician with the chief complaint of hoarseness. She is a singer in her church choir and her friends noticed a voice change. Her past medical history is significant for heart arrhythmias, which are well controlled for 3 years with amiodarone. Physical examination reveals a woman with coarse hair and skin. Her fingernails are thick and her eyes appear puffy. The thyroid gland is normal and nontender. Her muscle strength is excellent, but the relaxation phase of her ankle reflex is prolonged. Which of the following is the most likely diagnosis?

- a. Cushing's disease
- b. Acromegaly
- c. de Quervain's disease
- d. Amiodarone-induced hypothyroidism
- e. Cretinism

261. A large pituitary tumor will usually cause which of the following kinds of visual field defects?

- a. Bitemporal hemianopsia
- b. Left homonymous hemianopsia
- c. Right homonymous hemianopsia
- d. Right homonymous inferior quadrantanopsia
- e. Left homonymous inferior quadrantanopsia

262. A 51-year-old patient is seen in your office several weeks after a parathyroidectomy for a parathyroid adenoma. She is complaining of paresthesias. Physical examination reveals contraction of the right facial muscles when you tap lightly over the right side of the patient's face. Which of the following is the most likely diagnosis?

- a. Hypokalemia
- b. Hypercalcemia
- c. Hyperkalemia
- d. Hypocalcemia
- e. Hyponatremia

263. A 21-year-old woman presents with a 6-cm, nontender mass located in the center of her neck. On physical examination the thyroid gland is normal in size and there are no bruits audible over the mass. She has no other symptoms or complaints. She does not smoke or drink alcohol. Which of the following is the most likely diagnosis?

- a. Brachial cleft cyst
- b. Thyroglossal ductal cyst
- c. Lipoma
- d. Carotid body tumor
- e. Laryngocele

264. A 37-year-old woman who recently emigrated from Central America presents with a 20-lb weight loss over the last month. She also complains of generalized weakness and occasional nausea. She has no past medical history and was in previous good health. On physical examination, the patient has increased skin pigmentation. She is afebrile. Her blood pressure is 90/60 mm Hg supine and 70/50 mm Hg standing. The rest of her physical examination is normal. Laboratory data reveals hyponatremia, hyperkalemia, and a metabolic acidosis. Which of the following is the most likely diagnosis?

- a. Sheehan syndrome
- b. Craniopharyngioma
- c. Addison's disease
- d. Empty sella syndrome
- e. Insulinoma
- f. Schmidt syndrome
- g. Pituitary apoplexy

265. A 49-year-old man presents with a compression fracture of his sixth thoracic vertebrae. He is a tobacco and alcohol user and takes diphenylhydantoin for a seizure disorder. Which of the following is the most likely diagnosis?

- a. Osteomalacia
- b. Premature osteoporosis
- c. Scleromalacia
- d. Paget's disease
- e. Multiple myeloma

266. Which of the following is the best physical examination finding to predict lower extremity complications in a patient with diabetes mellitus?

- a. The presence of tinea pedis
- b. Diminished pressure sensation in the soles
- c. Abnormal nail growth and lesions
- d. Loss of hair on the lower extremities
- e. Peripheral edema

267. A 22-year-old woman presents with the chief complaint of hirsutism. She has had irregular periods since menarche at the age of 13. She has an ideal body weight and her facies is normal. Physical examination reveals excess back and chest hair. Pelvic examination is normal. The luteinizing hormone (LH) value is elevated. Serum 17-OH progesterone concentrations are highly elevated. Which of the following is the most likely diagnosis?

- a. Cushing syndrome
- b. Congenital adrenal hyperplasia
- c. Adrenal tumor
- d. Idiopathic hirsutism
- e. Polycystic ovary disease

268. A 13-year-old boy is worried that he is growing breasts and complains that the breasts are often painful. He states that he has been growing taller this past year but has no other complaints. On physical examination, you note some acne on the patient's face. His testes and phallus are appropriate for his age and his scrotum is reddened with some thinning of the skin. He has fine, sparse pubic hair. Which of the following is the most likely diagnosis?

- a. Gonadal tumor
- b. Pituitary tumor
- c. Adrenal tumor
- d. Normal puberty
- e. Klinefelter syndrome

269. A 19-year-old collegiate football player is sent to your office by the team's coach because of occasional outbursts of anger and hostility. The patient has no past medical history and denies using tobacco, alcohol, or illicit drugs. Physical examination reveals a blood pressure of 140/90 mm Hg. The patient has gynecomastia and testicular atrophy. He states that his libido and sexual performance are adequate. Which of the following is the most likely diagnosis?

- a. Prolactinoma
- b. Kallman syndrome
- c. Anabolic steroid use
- d. Chronic cocaine use
- e. Diabetes mellitus

270. A 17-year-old woman presents with amenorrhea for 3 mo. She states she has had irregular periods since her menarche at the age of 12 years. Physical examination reveals a normal adolescent female. Breast examination reveals breast engorgement and tenderness. Pelvic examination is normal. The patient's prolactin level is elevated. Which of the following is the most likely diagnosis?

- a. Hypothyroidism
- b. Cushing syndrome
- c. Pregnancy
- d. Prolactinoma
- e. Premature menopause
- f. Congenital adrenal hyperplasia

271. A 46-year-old woman complains of headache, sweating, and diaphoresis that occur on a daily basis or sometimes twice a day while she is at work. She has gone to the company nurse during these episodes and was told that her blood pressure was elevated. Aside from that, the nurse could not find any other problem. Physical examination is normal, including blood pressure, which is 130/80 mm Hg. Which of the following is the most likely diagnosis?

- a. Carcinoid syndrome
- b. Thyroid storm
- c. Pheochromocytoma
- d. Syndrome X
- e. CHAOS

272. A simple goiter may lead to which of the following complications?

- a. Chronic obstructive lung disease
- b. Bilateral vocal cord paralysis
- c. Spinal cord compression
- d. Superior vena cava syndrome
- e. Trigeminal neuralgia

273. A 47-year-old woman presents to your office complaining of bone pain. She has a past medical history significant for peptic ulcer disease and pancreatitis. Routine laboratory studies reveal a serum calcium of 12.0 mg/dL (normal is <10.5 mg/dL) and hypophosphatemia. Which of the following is the most likely diagnosis?

- a. Underlying malignancy
- b. Vitamin D intoxication
- c. Familial hypocalciuric hypercalcemia
- d. Osteitis fibrosa cystica
- e. Primary hyperparathyroidism

274. A 15-year-old boy has noticed the descent of his scrotum. His penis has enlarged in length and he has developed curly, pigmented hair around the base of the penis. Which of the following would best describe his Tanner stage of development?

- a. Tanner stage 1
- b. Tanner stage 2
- c. Tanner stage 3
- d. Tanner stage 4
- e. Tanner stage 5

275. A 46-year-old woman with a 10-year history of insulin-requiring diabetes mellitus presents to the emergency room with nausea, vomiting, and abdominal pain. Family members state that the patient has recently been taking over-the-counter medications for an upper respiratory tract infection. The blood pressure is 90/60 mm Hg and the pulse is 120/min. The patient is lethargic but follows commands. Pupils are 3 mm bilaterally and reactive to light and accommodation. Abdominal examination reveals diffuse tenderness but no rebound tenderness. Neurologic examination reveals no focal deficits. Finger stick glucose is >800 mg/dL and arterial blood gas reveals a pH of 7.36. Which of the following is the most likely diagnosis?

- a. Hyperosmolar state
- b. Gestational diabetes
- c. Barbiturate overdose
- d. Impaired glucose tolerance
- e. Diabetic ketoacidosis

276. A 52-year-old woman with a 20-year history of insulin-dependent diabetes mellitus presents complaining of a rash that has developed on her legs and ankles. Physical examination reveals several oval-shaped plaques with demarcated borders and a glistening yellow surface located on the anterior surface of the legs and dorsum of the ankles. Which of the following is the most likely diagnosis?

- a. Peripheral neuropathy
- b. Amyotrophy
- c. Mononeuropathy
- d. Acanthosis nigricans
- e. Necrobiosis lipoidica diabetorum

277. A 24-year-old man is referred to your practice for elevated cholesterol level. The patient has a father and two siblings with high cholesterol levels on medications. His 31-year-old brother recently had a myocardial infarction. On physical examination, the patient has bilateral arcus senilis. His extremities are remarkable for diffuse and nodular thickenings of the Achilles tendon. Which of the following is the most likely diagnosis?

- a. Hypothyroidism
- b. Nephrotic syndrome
- c. Liver disease
- d. Type 2A hyperlipoproteinemia
- e. Type 3 dysbetalipoproteinemia

278. A 44-year-old woman with a 20-year history of poorly controlled diabetes mellitus presents with headache and unilateral proptosis. The patient is febrile and appears toxic. Her serum glucose level is 640 mg/dL. An urgent CT scan of the head reveals a retroorbital abscess and severe opacification of the frontal and ethmoid sinuses. Which of the following organisms is most likely responsible for this infection?

- a. *Cryptococcus neoformans*
- b. Mucormycosis
- c. *Mycobacterium tuberculosis*
- d. *Toxoplasma gondii*
- e. *Listeria monocytogenes*
- f. *Staphylococcus epidermis*

279. A 41-year-old woman presents with amenorrhea for 9 mo. She is found to have a prolactin-secreting pituitary adenoma. Laboratory data reveals a serum calcium level of 12.0 mg/dL and hypoglycemia (serum glucose of 49 mg/dL). Which of the following is the most likely diagnosis?

- a. MEN 1 syndrome
- b. MEN 2A syndrome
- c. MEN 2B syndrome
- d. Sipple syndrome

280. A 42-year-old nursing student presents to the emergency room with confusion, diaphoresis, and dizziness. She is tremulous and tachycardic. Her serum glucose level is found to be 20 mg/dL, and she responds immediately to intravenous dextrose infusion. The patient states that she has been eating well. After the hypoglycemia is corrected, the physical examination is normal. Bloodwork reveals that insulin levels are high but C-peptide level is low. The rest of the laboratory data is normal. Which of the following is the most likely diagnosis?

- a. Insulinoma
- b. Surreptitious insulin injection
- c. Hypopituitarism
- d. Adrenal insufficiency
- e. Glucagon deficiency

281. A 15-year-old girl has noticed that she has developed straight, barely pigmented hair along the medial border of her labia. Which of the following would best describe her Tanner stage of development?

- a. Tanner 1
- b. Tanner 2
- c. Tanner 3
- d. Tanner 4
- e. Tanner 5

282. A 49-year-old man with a 25-year history of diabetes mellitus presents with a painful right foot. He denies a history of trauma. On physical examination, the patient has loss of pain and vibration in both feet. His Achilles deep tendon reflexes are absent bilaterally. Peripheral pulses are palpable and there are no skin lesions. The right foot is erythematous with some edema. The patient's gait reveals a limp due to foot pain. Radiograph of the ankle reveals osteopenia and multiple fractures of the tarsal bones. Which of the following is the most likely diagnosis?

- a. Somogyi effect
- b. Dawn phenomenon
- c. Whipple triad
- d. Charcot joint
- e. MODY
- f. Charcot triad

283. A 60-year-old man is involved in a head-on motor vehicle accident and sustains significant head trauma. He is awake and oriented to person, place, and time but complains of dizziness. Physical examination reveals normal vital signs, no orthostasis, and no neurologic findings. Heart and lung exams are normal. Overnight in the surgical intensive care unit, the patient develops excessive thirst, polydipsia, and polyuria. He develops orthostatic changes on physical examination. His serum sodium rises to 160 meq/L (normal ≤ 145 meq/L) and his serum glucose is normal. Which of the following is the most likely diagnosis?

- a. Impaired glucose intolerance
- b. Nephrogenic diabetes insipidus
- c. Central diabetes insipidus
- d. Syndrome of inappropriate antidiuretic hormone secretion (SIADH)
- e. Iatrogenic saline infusion

DIRECTIONS: Each set of matching items in this section consists of a list of lettered options followed by several numbered items. For each numbered item, select the appropriate lettered option(s). Each lettered option may be selected once, more than once, or not at all. **Each item will state the number of options to select. Choose exactly this number.**

Items 284–285

For each man with erectile dysfunction (ED), select the most likely mechanism causing the symptoms.

- a. Neuropathic impotence
- b. Vascular impotence
- c. Psychogenic impotence
- d. Endocrine impotence
- e. Drug-induced impotence

284. A previously healthy 42-year-old man presents with impotence. He takes no medications and does not smoke, drink alcohol, or use illicit drugs. He attains nocturnal erections but is impotent with his sexual partner. **(CHOOSE 1 MECHANISM)**

285. A 53-year-old diabetic man with a history of gastroparesis and peripheral neuropathy presents with erectile dysfunction. He drinks alcohol daily. **(CHOOSE 2 MECHANISMS)**

ENDOCRINOLOGY

Answers

256. The answer is b. (*Tierney, 39/e, pp 1130–1133.*) **Cushing syndrome** occurs secondary to corticosteroid use, nonpituitary neoplasms (i.e., small cell carcinoma of the lung), adrenal adenomas, adrenal carcinomas, and bilateral adrenal nodular hyperplasia. **Cushing's disease** is hypercortisolism due to ACTH hypersecretion by the pituitary gland, usually because of a small (<1 cm), benign pituitary microadenoma. Symptoms include central obesity, striae, hirsutism, easy bruisability, proximal myopathy, osteoporosis, amenorrhea, hypertension, glucose intolerance, and hypokalemia. Urinary cortisol is a good screening test for Cushing syndrome. Alcoholic patients and depressed patients may have hypercortisolism (**pseudo-Cushing state**). **Polycystic ovary disease (Stein-Leventhal syndrome)** is a disorder that causes increased levels of testosterone, hirsutism, infertility, and menstrual irregularity.

257. The answer is a. (*Tierney, 39/e, pp 1088–1090.*) **Acromegaly** (hypersecretion of growth hormone after closure of the epiphyses) is almost always caused by a pituitary adenoma (benign 99% of the time). Patients present with tall stature, large hands, large feet, prominent mandible, prognathism, coarse facial features, wide tooth spacing, deep voice, macroglossia, and carpal tunnel syndrome. Patients may have headache, visual field defects, hypertrophy of the laryngeal tissue causing obstructive sleep apnea, hypertension, cardiomegaly, multiple skin tags, premalignant colonic polyps, and diabetes mellitus. **Gigantism** occurs before the closure of the epiphyses. **Amyloidosis** is a group of disorders characterized by infiltration of various organs (kidney, heart, intestine, endocrine) by protein fibrils. Patients with amyloidosis may have **macroglossia** and carpal tunnel syndrome. Macroglossia is also seen in hypothyroidism. Coarse features may run in families (familial prognathism).

258. The answer is e. (*Seidel, 4/e, pp 255–257.*) **Examination of the thyroid** may be done from the front or the back of the patient. Either way, the

patient should be positioned with the neck flexed slightly forward and laterally to the side being examined. The thyroid gland should rise freely with swallowing. The consistency of the thyroid should be smooth and pliable. Coarse or gritty tissue implies an inflammatory process. **The right lobe of the thyroid is 25% larger than the left lobe.**

259. The answer is a. (*Tierney, 39/e, pp 1106–1115.*) The patient most likely has **Graves' disease (Basedow's disease)**, which is the most common cause of thyrotoxicosis or hyperthyroidism. Other signs of Graves' disease are heat intolerance, menstrual irregularity, weight loss, and pretibial myxedema. Patients present between the ages of 20 and 40, and women are affected more than men. The disorder is due to antibodies that bind to the thyroid stimulating hormone (TSH) receptor, causing it to stimulate the thyroid gland to hyperfunction. **Plummer's disease** is an autonomous toxic adenomatous disease of the thyroid; patients do not present with ophthalmopathy or dermapathy. **Hashimoto thyroiditis or chronic lymphocytic thyroiditis** is a common autoimmune disease (positive antimicrosomal antibodies and antithyroid peroxidase antibodies) that causes hypothyroidism. Patients present with a diffuse, firm, nontender goiter. Patients with Hashimoto thyroiditis are susceptible to postpartum thyroiditis. **Struma ovarii** is thyroid tissue contained in a dermoid ovarian tumor. **Granulomatous or subacute (de Quervain's) thyroiditis** is due to release of preformed thyroglobulin and follows a viral infection; the thyroid gland is painful and tender to palpation. The treatment for subacute thyroiditis is aspirin or nonsteroidal anti-inflammatory agents.

260. The answer is d. (*Tierney, 39/e, pp 1104–1106.*) Symptoms of **hypothyroidism** include constipation, depression, edema, tongue thickening, cold intolerance, **Queen Anne sign** (missing lateral one-third of eyebrows), muscle cramps, weight gain, goiter, amenorrhea, galactorrhea, pleural effusion, pericardial effusion, cardiomegaly, bradycardia, hypothermia, hyponatremia, anemia, and hypertension. Patients are said to have "**hung-up**" reflexes (a prolonged relaxation phase). Amiodarone has high iodine content and causes hypothyroidism in 8% of patients. **Myxedema** is a rare complication of hypothyroidism; patients present with coma, severe hypotension, hypothermia, hypoventilation, and hypoxemia. Cretinism is congenital (infantile) hypothyroidism.

261. The answer is a. (*Fauci, 14/e, p 1990.*) A pituitary tumor may impinge on the optic chiasm. The temporal field fibers are damaged as they decussate at the optic chiasm and the result is a bitemporal hemianopsia.

262. The answer is d. (*Sapira, p 490.*) Tapping on cranial nerve VII as it exits the parotid gland will cause spasm or contraction of the facial muscles on the same side of the face that is being tapped in states of hypocalcemia (tetany). This is called the **Chvostek sign**. Clinical signs of hypocalcemia include paresthesias, neuromuscular irritability, and a prolonged QT interval on electrocardiogram. Hypocalcemia causes rickets in children and osteomalacia in adults. The clinical presentation of hypercalcemia consists of “**bones**” (fractures, osteitis fibrosa), “**stones**” (renal calculi), “**abdominal groans**” (anorexia, constipation, vomiting, peptic ulcers, pancreatitis), and “**psychic overtones**” (anxiety, depression, and insomnia). Patients with hypokalemia present with muscle weakness, muscle cramps, and flaccid paralysis. Hyperkalemia may lead to areflexia, flaccid paralysis, and electrocardiographic abnormalities such as peaked T waves, prolongation of the PR interval, widening of the QRS complex, and ventricular tachycardia.

263. The answer is b. (*Seidel, 4/e, pp 267–268.*) A **thyroglossal ductal cyst** is a midline neck structure and is a remnant of the passage of the thyroid gland from the base of the tongue into the neck. A carotid body tumor arises from the carotid body at the bifurcation of the common carotid artery. A lipoma is a fatty tumor that can be found anywhere in the subcutaneous tissue. A thyroid bruit, usually seen with Graves’ disease (hyperthyroidism), is turbulent blood flow heard with a stethoscope. A goiter is an enlarged thyroid gland. A **brachial cleft cyst** is a lateral neck structure, usually located near the upper third of the sternocleidomastoid muscle, and is a remnant of embryologic development. **Laryngoceles** are lateral neck swellings that increase in size with Valsalva maneuver.

264. The answer is c. (*Fauci, 14/e, pp 1988, 1997, 2051–2054.*) Ninety percent of the adrenal gland must be destroyed for **Addison’s disease** (hypoadrenalism) to develop; glucocorticoids, mineralocorticoids, and androgens are affected. Etiologies include tuberculosis, malignancy, sarcoidosis, trauma, histoplasmosis, hemochromatosis, amyloidosis, sepsis, cytomegalovirus infection, and medications (ketoconazole, rifampin, anticoagulants, and anti-convulsants). Patients without a clear etiology have idiopathic hypoadrenal-

ism. Symptoms include weakness, hypotension, anorexia, weight loss, and hyperpigmentation of the skin. Patients may have hyponatremia, hyperkalemia, and eosinophilia. Adults with **craniopharyngioma** present with headache, visual problems, papilledema, personality changes, and hypopituitarism. **Sheehan syndrome** is postpartum hemorrhage and necrosis of the pituitary gland. **Empty sella syndrome** occurs when CSF fills the sella space and flattens the pituitary gland, which continues to function normally. The disorder is seen in obese, hypertensive, multiparous women. Insulinoma causes hypoglycemia, which is often a feature of hypoadrenalism. **Schmidt syndrome** is the combination of Hashimoto thyroiditis with Addison's disease. **Pituitary apoplexy** occurs in <5% of patients with a pituitary macroadenoma (>1 cm); patients complain of headache, neck stiffness, fever, and visual disturbance and may present with acute adrenal insufficiency.

265. The answer is b. (*Fauci, 14/e, pp 1883–1884, 2250.*) **Premature osteoporosis** is not caused by menopause-induced estrogen deficiency and may be secondary to medication use (diphenylhydantoin, corticosteroids, heparin), hyperthyroidism, anorexia nervosa, malabsorptive disease, hyperparathyroidism, multiple myeloma, immobilization, tobacco use, and alcoholism. Patients have a reduced bone mass with a normal mineral matrix. **Osteomalacia** is a disorder with reduced mineralization of the matrix; patients need to be evaluated for vitamin D deficiency. **Scleromalacia** is an inflammatory disorder often seen in patients with rheumatoid arthritis associated with chemosis and scleral-conjunctival inflammation. Patients with **Paget's disease** (increased bone turnover with the formation of disorganized bone) present with pain, enlarging skull bones (increasing hat size and hearing loss), skeletal deformities (bowing of the lower extremities), and increased warmth of the skin overlying the tibias.

266. The answer is b. (*Seidel, 4/e, pp 789–790.*) Over 50% of patients with diabetes mellitus develop **neuropathy**; loss of pressure, pain, and temperature sensation compounded by reduced blood flow may lead to amputations. Patients require frequent foot examinations, good foot hygiene, supportive footwear, and a screening test for loss of pressure sensation using a standard **10-g nylon filament**. While the patient's eyes are closed, the monofilament is applied in a random pattern in several areas of the plantar surface for 1.5 s. Loss of sensation means the patient has no protective pain sensation to alert him or her to injury or skin breakdown.

267. The answer is b. (*Fauci, 14/e, pp 292–294.*) **Hirsutism** is growth of coarse, male-pattern hair in a woman. It is a sign of androgen excess and patients must be evaluated for ovarian or adrenal tumors. The **typical workup for hirsutism** includes a testosterone level, LH, follicle-stimulating hormone (FSH), 17-OH progesterone, and prolactin. The patient described most likely has **21-hydroxylase deficiency, which is the most common form of congenital adrenal hyperplasia**. The highly elevated 17-OH progesterone concentration (which will be even higher after stimulation with synthetic ACTH) supports the diagnosis. Cushing syndrome seems unlikely in a patient without cushingoid features (central obesity). Idiopathic hirsutism applies to patients who have normal adrenal glands and ovaries. Seventy percent of patients with **polycystic ovary disease** (PCOD) present with hirsutism. They have elevated serum testosterone levels and elevated LH values. Patients with PCOD have slightly elevated levels of 17-OH progesterone after ACTH stimulation. Medications such as bodybuilding steroids, minoxidil, cyclosporine, oral contraceptives, and phenytoin can cause hirsutism.

268. The answer is d. (*Fauci, 14/e, pp 2116–2118.*) **Gynecomastia** is seen in 50–60% of adolescent boys and usually occurs during Tanner stages 2 or 3. It is usually painful and may be unilateral or bilateral. It gradually appears and gradually disappears within 1 year of onset. Pubertal changes that occur during Tanner stages 2 and 3 include growth spurt, growth of testes and penis, spermathe, acne, axillary perspiration, and appearance of pubic hair. The boy in this case should be reassured and followed monthly. If the gynecomastia does not resolve, it will be necessary to rule out Klinefelter syndrome, adrenal tumors, gonadal tumors, hyperthyroidism, hepatic disorders, and the use of drugs, especially marijuana and bodybuilding steroids.

269. The answer is c. (*Fauci, 14/e, p 1976. Tierney, 39/e, p 1070.*) Patients may use **anabolic steroids** to improve athletic performance. The risks associated with use of these agents include mood swings, aggressiveness, paranoid delusions, psychosis, gynecomastia, infertility, testicular atrophy, hepatic tumors, peliosis hepatis, hypertension, and decreased HDL cholesterol levels. Patients with **prolactinomas** (pituitary tumors) generally present with galactorrhea, reduced libido, erectile dysfunction, amenorrhea, infertility, and visual field defects. Chronic cocaine use may

cause hyperprolactinemia. **Kallman syndrome** is characterized by cleft palate, impaired sense of smell, short 4th metacarpal bones, hypogonadism, and infertility.

270. The answer is c. (*Fauci, 14/e, p 2109.*) Pregnancy (secondary amenorrhea) must always be considered in any patient who presents with amenorrhea. It is normal for prolactin levels to be elevated during pregnancy.

271. The answer is c. (*Fauci, 14/e, pp 2057–2059.*) **Pheochromocytoma** is a life-threatening disease if left undiagnosed. Patients present with episodic symptoms of headache, sweating, and palpitations. Pheochromocytoma may be associated with von Recklinghausen syndrome, neurofibromatosis, and von Hippel-Lindau's disease. The diagnosis is made by 24-h urine for catecholamines and metanephrines. **Ten percent** of pheochromocytomas are bilateral and **10%** are extraadrenal. Increased levels of 5-HIAA are associated with **carcinoid syndrome** (facial flushing and diarrhea) from a tumor usually located in the lung or ileum. Patients with **thyroid storm** present with nausea, diarrhea, jaundice, fever, dyspnea, shortness of breath, diaphoresis, delirium, and tachycardia. The combination of diabetes mellitus, hypertension, obesity, insulin resistance, and dyslipidemia (increased VLDL, increased triglyceride, and decreased HDL) is called **syndrome X** or Coronary artery disease, Hypertension, Atherosclerosis, Obesity, and Stroke (**CHAOS**).

272. The answer is d. (*DeGowin, 6/e, pp 212–213.*) Simple goiter, if sufficiently large, may be accompanied by tracheal compression, esophageal compression, dysphagia, odynophagia, mediastinal obstruction, and superior vena cava syndrome. **Retrosternal goiter** may cause the mediastinal obstruction and superior vena cava syndrome.

273. The answer is e. (*Fauci, 14/e, pp 2227–2230.*) **Primary hyperparathyroidism is the most common cause of hypercalcemia in the outpatient setting.** It is seen more frequently in women than men and is usually due to one parathyroid adenoma (usually in the inferior lobe). Patients often have a history of hypophosphatemia, fatigue, hypertension, depression, peptic ulcer disease, pancreatitis, bone pain, hypercalciuria, and nephrolithiasis from calcium oxalate stones. **The most common cause**

of hypercalcemia in hospitalized patients is malignancy (i.e., breast, lung, multiple myeloma, head and neck, and renal cell) due to the secretion of PTH-related peptide (PTHrp). Patients with familial hypocalciuric hypercalcemia (FHH) have hypocalciuria, a positive family history, and no end organ damage. Other causes of hypercalcemia include sarcoidosis, mycobacteria, milk-alkali syndrome, and medications (i.e., thiazide diuretics). **Osteitis fibrosa cystica** (replacement by fibrous tissue) is the bone abnormality seen with hyperparathyroidism.

274. The answer is c. (*Seidel, 4/e, pp 120–121.*) There are five Tanner stages:

Tanner 1 = Young child penis, scrotum, and testes; no pubic hair

Tanner 2 = Enlargement of scrotum and testes; penis the same; scrotal skin becomes more red, thinner, and wrinkled; some straight pubic hair at base of penis

Tanner 3 = Enlargement of penis and testes; scrotum descends; dark, curly pubic hair

Tanner 4 = Further penile enlargement; increased pigmentation of scrotum; sculpturing of the glans; adult pubic hair but not beyond inguinal fold

Tanner 5 = Ample scrotum; penis reaches to bottom of scrotum; hair spreads to medial surface of thighs

275. The answer is a. (*Tierney, 39/e, pp 1152–1157.*) **Hyperosmolar hyperglycemic nonketotic state (HHNKS)** is seen in patients with NIDDM and is usually precipitated by an illness. The patient's residual insulin prevents lipolysis and ketogenesis. **Diabetic ketoacidosis (DKA)** is due to an absolute deficiency of insulin relative to the counter-regulatory hormones. The result is gluconeogenesis, ketogenesis, lipolysis, and decreased glucose uptake causing hyperglycemia and a metabolic acidosis. **Kussmaul respiration** is a respiration pattern of increased tidal volume seen in patients with metabolic acidosis (i.e., DKA). **Gestational diabetes** occurs in 3% of pregnancies; all women should be screened between the 24th and 28th wk of pregnancy. Complications of undiagnosed gestational diabetes include macrosomia and neonatal hypoglycemia. **Impaired glucose tolerance** is defined as a 2-h plasma glucose of 140–200 mg/dL after a glucose load of 75 g in a patient whose fasting blood glucose is normal.

Glucose intolerance is due to a combination of insulin resistance and impaired insulin secretion. Patients with barbiturate overdose generally present with hypoglycemia.

276. The answer is e. (*Tierney, 39/e, pp 1180–1183, 2136.*) The patient most likely has a rash seen in diabetic patients called **necrobiosis lipoidica diabetorum**. **Acanthosis nigricans** is a velvety, hyperpigmented, thickened skin lesion over the dorsum of the neck, axillae, and groin and often precedes the diagnosis of an endocrine (insulin-resistant) disorder. Patients with DM must be evaluated for both macrovascular and microvascular complications.

Macrovascular complications:

1. Coronary artery disease
2. Cerebral vascular disease
3. Peripheral vascular disease

Microvascular complications:

1. Retinopathy
2. Nephropathy
3. Neuropathy

Neuropathy in diabetic patients may be:

1. **Autonomic:** fixed tachycardia, inability of heart rate to increase when the patient stands, orthostatic hypotension, delayed gastric emptying, impotence, diarrhea, and bladder dysfunction
2. **Peripheral neuropathy:** stocking-glove pattern, absent ankle jerk, Charcot joint
3. **Mononeuropathy:** involvement in distribution of one or several nerves
4. **Amyotrophy:** muscle atrophy and asymmetric motor neuropathy

277. The answer is d. (*Fauci, 14/e, pp 2142–2145. Tierney, 39/e, p 1200.*) The most common type of familial hyperlipoproteinemia is **type 2A (elevated LDL)**. Heterozygous carriers present with a family history of coronary events and often have **tendon xanthomas**. Patients with type 3 dysbetalipoproteinemia (normal LDL with elevated IDL and VLDL) often present with palmar xanthomas and tuberous xanthomas. Hypothyroidism, diabetes mellitus, nephrotic syndrome, and liver disease are sec-

ondary causes of hyperlipidemia. **Arcus senilis** before the age of 40 is consistent with hyperlipidemia. Physicians should be able to calculate different cholesterol levels (mg/dL) using the following simple formulas:

1. **Total cholesterol = HDL + VLDL + LDL**
2. **VLDL = Triglycerides/5**
3. **LDL = Total cholesterol – HDL – [Triglycerides/5]**

278. The answer is b. (*Fauci, 14/e, p 1158.*) **Mucormycosis** is a rare fungal disease limited to persons with preexisting illness and may be seen in poorly controlled diabetic patients. Patients present with fever, nasal congestion, sinus pain, diplopia, and coma. Physical examination may reveal a necrotic nasal turbinate, reduced ocular motion, proptosis, and blindness. CT scan or MRI will reveal the extent of sinus involvement prior to surgery.

279. The answer is a. (*Tierney, 39/e, pp 1148–1149.*) The patient most likely has multiple endocrine neoplasia or **MEN 1 (Wermer syndrome)**, an autosomal dominant disorder, consisting of tumors of the **Pancreas, Pituitary, and Parathyroid gland (PPP)**. **MEN 2A (Sipple syndrome)** consists of **Pheochromocytoma, hyperParathyroidism, and medullary carcinoma of the Thyroid (PPT)**. Patients with **MEN 2B** syndrome present with **Pheochromocytoma, Neuromas, and medullary carcinoma of the Thyroid (PNT)**.

280. The answer is b. (*Fauci, 14/e, p 2083.*) The surreptitious injection of insulin is just as common as insulinoma. Patients have **low C-peptide levels with high insulin levels**. Factitious disease should be suspected when hypoglycemic symptoms appear in health professionals or in relatives of patients with diabetes mellitus. Patients with insulinoma have high levels of both C-peptide and insulin. Finding high levels of circulating insulin antibodies may help to make the diagnosis of factitious hypoglycemia.

281. The answer is b. (*Seidel, 4/e, pp 122–123.*) There are five stages of Tanner development:

Tanner 1 = No growth of pubic hair

Tanner 2 = Scarcely pigmented, straight pubic hair along medial border of labia

Tanner 3 = Sparse, dark, curly pubic hair on labia

Tanner 4 = Abundant coarse and curly pubic hair

Tanner 5 = Lateral triangular spreading of adult hair to medial surfaces of thighs

282. The answer is d. (*Fauci, 14/e, p 1953. Tierney, 39/e, pp 1177–1182, 1193.*) Diabetics with peripheral neuropathy are susceptible to developing a **Charcot joint**. The insensitivity of the feet predisposes the patient to multiple “silent” fractures causing a deformed joint. The **Somogyi effect** is nocturnal hypoglycemia, which stimulates a surge of counterregulatory hormones to produce a high fasting blood sugar in the morning. The **Dawn phenomenon** is morning hyperglycemia from reduced sensitivity to insulin in the morning hours evoked by spikes of growth hormone released during sleep. The **Whipple triad** is characteristic of hypoglycemia and consists of (1) hypoglycemic symptoms, (2) low fasting blood glucose, and (3) immediate recovery after administration of glucose. The Whipple triad is seen in any disorder that causes hypoglycemia (not only with insulinoma). Mature-onset diabetes of the young (**MODY**) is a rare autosomal dominant disorder characterized by impaired insulin secretion and the subsequent development of NIDDM in nonobese persons under the age of 25 years. The **Charcot triad** (fever, right upper quadrant pain, and jaundice) is seen in cholangitis.

283. The answer is c. (*Fauci, 14/e, pp 2004–2008.*) The man had trauma to his posterior pituitary stalk from the car accident resulting in **central diabetes insipidus** (DI) due to lack of vasopressin. The diagnosis may be made by raising the patient’s serum osmolality through water restriction, then observing the urine osmolality response to injected vasopressin. **Nephrogenic DI** will not respond to the stimulation by vasopressin. Patients with syndrome of inappropriate antidiuretic hormone secretion (SIADH) present with hyponatremia.

284–285. The answers are 284-c, 285-a, e. (*Fauci, 14/e, pp 287–289.*) **Nocturnal penile tumescence** occurs during REM sleep, and if the man gives a history of rigid erections under any circumstances, the most likely etiology of his ED is psychological (i.e., depression, disinterest, anxiety). In the patient with a history of neuropathy, further studies to evaluate impotence are not necessary. Patients with peripheral vascular disease should be

evaluated with a **penile/brachial index**. An index <0.06 suggests vascular impotence. Endocrine ED may be due to testicular failure (rare) or prolactinomas. Drugs that may cause impotence include antidepressants, anticholinergics, alcohol, methadone, heroin, tobacco, antihypertensives, and sedatives.

HEMATOLOGY AND ONCOLOGY

Questions

DIRECTIONS: Each of the numbered items or incomplete statements in this section is followed by answers or by completion of the statements. Select the **one** lettered answer or completion that is **best** in each case.

286. A 55-year-old man presents with bone pain that is aggravated by movement or weight-bearing. Physical examination is remarkable for pale conjunctiva. Laboratory results show a normocytic anemia and an increased serum globulin level. Peripheral blood smear is significant for rouleaux formation. Osteolytic bone lesions are seen on a radiograph of the pelvis. Bone scan is normal. Which of the following is the most likely diagnosis?

- Multiple myeloma
- Paget's disease
- Metastatic bone disease
- Monoclonal gammopathy of unknown significance (MGUS)
- Waldenström's macroglobulinemia

287. A 56-year-old African American man presents with a 15-lb weight loss over the last 6 wk. He states that food "gets stuck" in the middle of his chest. Initially, the patient had difficulty swallowing solids, but the symptoms have since progressed to the point where he has similar problems when swallowing liquids. He also complains of odynophagia. He denies hoarseness. He is a smoker and admits to heavily drinking alcohol. Physical examination reveals a left fixed supraclavicular node. Which of the following is the most likely diagnosis?

- Achalasia
- Squamous cell carcinoma of the esophagus
- Adenocarcinoma of the esophagus
- Esophageal stricture
- Schatzki's ring

288. A 27-year-old man who is in excellent health presents for a routine physical examination. Family history reveals that the patient's mother died of colon cancer at the age of 40 years and a brother, who is 36 years old, was recently diagnosed with colon cancer. The patient also has two maternal aunts with ovarian cancer. Physical examination is normal and fecal occult blood test (FOBT) is negative. Laboratory data are normal. Which of the following statements is true in this patient?

- a. He most likely has the *BRCA2* mutation
- b. He needs an annual colonoscopy beginning at age 36
- c. He should have a prophylactic colectomy
- d. If he develops colon cancer, it would most likely be in the proximal colon
- e. If he develops colon cancer, it would most likely be in the distal colon

289. A 61-year-old woman presents to the emergency room with dyspnea on exertion and facial swelling for nearly 2 wk. She has smoked 3 packs of cigarettes per

day for nearly 40 years but does not drink alcohol. Her blood pressure is 120/88 mm Hg, pulse is 90/min, respirations are 16/min, and she is afebrile. Heart and lung examinations are normal. She has dilated veins in the neck and upper chest area. Blood gases are normal. Which of the following is the most likely diagnosis?

- a. Tumor lysis syndrome
- b. Superior vena cava syndrome
- c. Cord compression
- d. Hypercalcemia
- e. Pericardial tamponade
- f. Pancoast syndrome

290. A 19-year-old woman with a lifelong history of easy bruisability presents with menorrhagia. She also admits to occasional nosebleeds. She has no family history of bleeding disorders and takes no medications. Physical examination is normal. Laboratory investigation reveals a normal platelet count but a prolonged bleeding time. Which of the following is the most likely diagnosis?

- a. Hemophilia A
- b. Hemophilia B
- c. Type III von Willebrand disease
- d. Type I von Willebrand disease
- e. Christmas disease
- f. Bernard-Soulier syndrome

291. A 70-year-old woman was treated for infiltrating breast cancer with lumpectomy and radiotherapy. Her breast cancer did not involve any of her axillary nodes and she had positive estrogen and progesterone receptors. She was started on tamoxifen to decrease the risk of recurrent disease. The patient now presents complaining of hot flashes. Eye examination reveals absence of the red light reflex bilaterally. The rest of the physical examination is normal. Which of the following is the most likely diagnosis?

- a. Recurrence of breast cancer
- b. Development of a new primary cancer
- c. Menopause
- d. Side effects of tamoxifen
- e. Side effects of radiotherapy

292. Carcinoid tumor is associated with which of the following cardiac valvular lesions?

- a. Mitral valve prolapse
- b. Tricuspid insufficiency
- c. Pulmonic insufficiency
- d. Tricuspid stenosis
- e. Mitral regurgitation

293. A 7-year-old boy with sickle cell disease presents with severe left upper quadrant pain that started suddenly 2 h before he arrived at the emergency room. He has no previous history of pain in that area. Physical examination reveals a temperature of 98.6°F and a normal blood pressure. Heart rate is 108/min. Heart and lung examinations are normal. There is a fullness and tenderness in the left upper quadrant of the abdomen with palpation but there is no audible rub. There is no hepatomegaly or rebound tenderness and FOBT is negative. The rest of the physical examination is normal. Hemoglobin is 6.1 g/dL. Which of the following is the most likely diagnosis?

- a. Vasoocclusive crisis
- b. Splenic infarction
- c. Splenic sequestration crisis
- d. Left pleural effusion
- e. Pulmonary infarction

294. Which of the following is a risk factor for breast cancer?

- a. Late menarche
- b. Early menopause
- c. Early age at birth of first child
- d. Nulliparity
- e. Decrease in breast tissue density on mammogram

295. A 42-year-old woman of Italian descent presents for a preemployment physical examination. She has no past medical problems and takes no medications. Her physical examination is normal except for pale conjunctiva. Fecal occult blood test (FOBT) is negative. Her CBC is remarkable for a hemoglobin of 11.4 g/dL, a mean corpuscular volume (MCV) of 60 fL, and a reticulocyte count of 0.6%. Her white blood cell count and platelets are normal. The peripheral smear reveals microcytosis, hypochromia, acanthocytes (cells with irregularly spaced projections), and occasional target cells. Which of the following is the most likely diagnosis?

- a. Iron-deficiency anemia
- b. Sideroblastic anemia
- c. Anemia of chronic disease
- d. Thalassemia trait
- e. Hemolytic anemia

296. A 23-year-old man with sickle cell disease presents with shortness of breath and pleuritic chest pain. His temperature is 101.3°F and he is tachypneic and tachycardic. Heart examination is normal. Lung examination is notable for right basilar crackles. The patient's arterial saturation is 85%. He has a leukocytosis and chest radiograph reveals an infiltrate. Which of the following is the most likely diagnosis?

- a. Acute osteomyelitis
- b. Acute chest syndrome
- c. Myocardial infarction
- d. Congestive heart failure
- e. B19 virus infection

297. A 19-year-old woman in her second trimester of pregnancy presents with a deep venous thrombosis (DVT) of her left lower extremity. She has no previous history of DVT and has no family history of thromboembolism. Which of the following is the most likely reason for the patient developing a DVT?

- a. Protein C deficiency
- b. Protein S deficiency
- c. Antithrombin III deficiency
- d. Resistance to protein C
- e. Hyperhomocysteinemia
- f. Dysfibrinogenemia

298. A 31-year-old African American man presents to the emergency room and is diagnosed as having a community-acquired pneumonia. After 2 days of antibiotics, the patient becomes jaundiced. His hematocrit is 30% (decreased from 40% on admission), reticulocyte count is 6%, and indirect bilirubin value is 4.5 mg/dL (total bilirubin of 6.0 mg/dL). Peripheral blood smear demonstrates Heinz bodies. The patient recalls a similar problem when he was given antibiotics 5 years ago for an acute sinusitis. His three brothers have a similar “reaction” to antibiotics. Which of the following is the most likely diagnosis?

- a. Sickle cell anemia
- b. Sickle cell trait
- c. Autoimmune hemolytic anemia
- d. Glucose-6-phosphate dehydrogenase deficiency
- e. Allergic reaction

299. A 32-year-old woman presents with the recent onset of petechiae of her lower extremities. She denies menorrhagia and gastrointestinal bleeding. She has no family history of a bleeding disorder and has been in excellent health her entire life. Physical examination is remarkable for petechiae of both legs. There is no hepatosplenomegaly. The rest of the physical examination is normal. Platelet count is 8000/ μ L. Hemoglobin and white blood cell count are normal. Peripheral smear reveals reduced platelets and an occasional megathrombocyte. Which of the following is the most likely diagnosis?

- a. Thrombocytopenic thrombotic purpura (TTP)
- b. Hemolytic-uremic syndrome (HUS)
- c. Evans syndrome
- d. Disseminated intravascular coagulation (DIC)
- e. Idiopathic thrombocytopenic purpura (ITP)
- f. Henoch-Schönlein purpura (HSP)

300. A 52-year-old man presents with a painless neck mass. He states that after he drinks one to two glasses of wine, the neck mass becomes painful. He also complains of intermittent fever, night sweats, pruritus, and a 10-lb weight loss over the last month. On physical examination he has a 3-cm mass in the left anterior cervical lymph node chain that is hard and tender to deep palpation. Several other cervical nodes and a left axillary node are palpable. The liver is enlarged but there is no splenomegaly. Which of the following is the most likely diagnosis?

- a. Non-Hodgkin's lymphoma
- b. Hodgkin's lymphoma
- c. Mononucleosis
- d. Hairy cell leukemia
- e. Sarcoidosis

301. A 62-year-old man presents for his annual health maintenance visit. The review of systems is positive for occasional fatigue and headache. The patient admits to generalized pruritus following a warm bath or shower. He has plethora and engorgement of the retinal veins. A spleen is palpated on abdominal examination. The patient's hematocrit is 63%, and he has a leukocytosis and thrombocytosis. Peripheral blood smear is normal. The patient does not smoke. Which of the following is the most likely diagnosis?

- a. Spurious polycythemia
- b. Essential thrombocytosis
- c. Myelofibrosis
- d. Polycythemia vera
- e. Secondary polycythemia
- f. Chronic myeloid leukemia
- g. Erythropoietin-secreting renal tumor

302. A 42-year-old man develops fever and chills within a few hours after a blood transfusion. His temperature is 101.6°F and blood pressure is 120/80 mm Hg. He is slightly tachycardic but his respiratory rate is normal. His complete blood count is normal except for the anemia for which he was receiving the transfusion. Laboratory data including electrolytes, liver function tests, and urinalysis are normal. Which of the following is the most likely diagnosis?

- a. Anaphylaxis to blood transfusion
- b. Hemolytic reaction to blood transfusion
- c. Febrile, nonhemolytic reaction to blood transfusion
- d. Transfusion-associated circulatory overload
- e. Urticarial reaction to blood transfusion

DIRECTIONS: Each set of matching items in this section consists of a list of lettered options followed by several numbered items. For each numbered item, select the appropriate lettered option(s). Each lettered option may be selected once, more than once, or not at all. **Each item will state the number of options to select. Choose exactly this number.**

Items 303–307

For each patient with cancer, select the most likely risk factor for the malignancy.

- a. *Helicobacter pylori* infection
- b. Hepatitis C infection
- c. Mutation to *BRCA1*
- d. A 9;22 translocation
- e. Schistosomiasis
- f. Vinyl chloride
- g. Human papillomavirus
- h. Tobacco use
- i. Villous adenomatous polyp
- j. Tubular adenomatous polyp
- k. Radon gas
- l. Epstein-Barr virus
- m. HHV 8 (herpesvirus type 8)
- n. HTLV-I (human T cell lymphotropic/leukemia virus type I)

303. A previously healthy 49-year-old man presents with fever and night sweats. He has splenomegaly. His peripheral white blood cell count is 22,000/ μ L and a peripheral smear shows immature leukocytes with an increase in the number of basophils. Leukocyte alkaline phosphatase score is low and B₁₂ level is elevated. **(CHOOSE 1 RISK FACTOR)**

304. A 29-year-old patient presents with squamous cell carcinoma of the anus. He is sexually promiscuous and is requesting an HIV test. **(CHOOSE 1 RISK FACTOR)**

305. A 57-year-old patient presents with right upper quadrant abdominal pain. Serum α -fetoprotein level is >1200 ng/mL. The patient does not drink alcohol and has no history of intravenous drug use or blood transfusions. A hepatic mass is present on CT scan of the abdomen. **(CHOOSE 1 RISK FACTOR)**

306. A 62-year-old woman presents with jaundice, back pain, and weight loss. CT scan of the abdomen demonstrates a mass at the head of the pancreas. **(CHOOSE 1 RISK FACTOR)**

307. A 44-year-old man presents with intermittent epigastric pain and is found to have a gastric lymphoma. **(CHOOSE 1 RISK FACTOR)**

Items 308–309

For each patient with a lung mass, select the most likely malignancy.

- Adenocarcinoma of the lung
- Hamartoma
- Bronchial adenoma
- Squamous cell carcinoma of the lung
- Small cell carcinoma of the lung
- Bronchioalveolar carcinoma of the lung
- Mesothelioma

308. A 54-year-old woman presents with a lung mass. She has no history of tobacco use and has worked as a seamstress all her life. She has no family history of lung cancer. (CHOOSE 1 MALIGNANCY)

309. A 39-year-old woman with a tobacco history has a centrally located lung mass and a serum sodium of 121 meq/L. (CHOOSE 1 MALIGNANCY)

Items 310–311

For each cell abnormality, choose the most appropriate name of the abnormality.

- Howell-Jolly bodies
- Reed-Sternberg cells
- Pelger-Huet cells
- Heinz bodies
- Auer rods
- Hypersegmented polymorphonuclear leukocytes
- Schistocytes
- Pappenheimer bodies
- Döhle bodies
- Toxic granulations

310. These nuclear remnants are seen in circulating red blood cells in asplenic patients. (CHOOSE 1 NAME FOR THE ABNORMALITY)

311. Oxidized hemoglobin denatures and forms these inclusions or precipitants. (CHOOSE 1 NAME FOR THE ABNORMALITY)

Items 317–318

172 Physical Diagnosis

Items 312–316

For each malignancy, select the most appropriate tumor marker(s).

- a. CA-125
- b. LDH
- c. PSA
- d. CEA
- e. AFP
- f. hCG
- g. 5-HIAA
- h. β_2 -microglobulin

312. Hodgkin's disease (CHOOSE 1 TUMOR MARKER)

313. Multiple myeloma (CHOOSE 1 TUMOR MARKER)

314. Breast cancer (CHOOSE 1 TUMOR MARKER)

315. Testicular cancer (CHOOSE 3 TUMOR MARKERS)

316. Carcinoid tumor (CHOOSE 1 TUMOR MARKER)

For each patient with a hematologic disorder, choose the appropriate diagnostic test.

- a. Positive leukocyte alkaline phosphatase (LAP) test
- b. Positive acid hemolysis (HAM) test
- c. Positive osmotic fragility test
- d. Positive sugar-water test

317. A patient has anemia and gallstones at the age of 20. The peripheral smear demonstrates spherocytosis. (CHOOSE 1 TEST)

318. A patient presents with hemolysis and recurrent venous thromboses. He has hemosiderinuria. (CHOOSE 2 TESTS)

HEMATOLOGY AND ONCOLOGY

Answers

286. The answer is a. (*Fauci, 14/e, pp 712–715.*) **Multiple myeloma** (MM) is a neoplasm characterized by proliferation of plasma cells (“**fried-egg-appearing cells**”) seen typically in patients over the age of 50. The disorder may lead to bone pain, pathologic fracture, anemia, susceptibility to infections, renal failure, and hypercalcemia. The bone pain of MM worsens with movement (the pain of metastatic bone disease is typically worse at night). Patients have an increased serum globulin and a monoclonal IgA or IgG spike (M component) on electrophoresis. The monoclonal immunoglobulin causes the rouleaux formation on blood smear. Urine examination reveals **Bence-Jones** proteinuria. Osteolytic lesions are seen in many bones on plain radiographic studies, but bone scan (technetium 99m) is normal (this would be positive in Paget’s disease and in metastatic disease). **MGUS** is a monoclonal gammopathy that is more common than MM. However, these patients do not have anemia, renal failure, Bence-Jones proteinuria, lytic bone lesions, or hypercalcemia. Bone marrow aspirate is normal in MGUS. **Waldenström’s macroglobulinemia** is a B-cell malignancy (so is MM) with an IgM monoclonal protein and both lymphocytosis and plasmacytosis in the bone marrow. Patients present with bleeding, cytopenia, lymphadenopathy, and hyperviscosity crises.

287. The answer is b. (*Fauci, 14/e, pp 1588–1595.*) Progressive (solids > liquids) difficulty swallowing or dysphagia accompanied by rapid weight loss and odynophagia (painful swallowing) often indicates esophageal carcinoma. Risk factors for esophageal carcinoma include tobacco and alcohol use, chronic gastric reflux causing a Barrett’s esophagus, achalasia, and lye ingestion. Tumor involvement of the recurrent laryngeal nerve would cause hoarseness. The fixed supraclavicular node (**Virchow node**) is consistent with the diagnosis. **Adenocarcinoma is more common in white patients, while squamous cell carcinoma is more common in black patients.** Patients with **Schatzki’s ring** (lower esophageal web) have intermittent

dysphagia to solids, and patients with strictures typically present with complaints of heartburn. **Achalasia** is a neuromuscular disorder of esophageal relaxation; patients often present with respiratory symptoms from aspiration. Esophagram in achalasia reveals a dilated esophagus with a beaklike tapering distal to the esophageal contraction.

288. The answer is d. (*Fauci, 14/e, pp 512–514.*) The pedigree of the patient (multiple primary cancers) is most consistent with hereditary non-polyposis colon cancer (HNPCC). The median age for adenocarcinoma of the colon is 50 years, and the most common site is the proximal colon. Inheritance is autosomal dominant, and members of the family should undergo biennial colonoscopy starting at age 25. Prophylactic colectomy is recommended for patients with familial adenomatous polyposis, an autosomal dominant disorder characterized by small polyps that develop during the second decade of life and undergo malignant transformation before the age of 40. Breast cancer is not associated with HNPCC (the genetic defect is in DNA mismatch repair genes).

289. The answer is b. (*Fauci, 14/e, p 627.*) There are several life-threatening complications in cancer patients. **Superior vena cava (SVC) obstruction** is due to lung cancer in 85% of cases. Tumors that may cause SVC syndrome include small cell carcinoma of the lung, squamous cell carcinoma of the lung, lymphoma, thymoma, and germ cell tumor. Tissue diagnosis is preferable prior to starting any treatment. Some malignancies are so responsive to chemotherapy that **tumor lysis syndrome** occurs, resulting in hyperkalemia, hyperphosphatemia, hypocalcemia, hyperuricemia, and renal failure hours after receiving treatment (these tumors require **allopurinol prophylaxis** prior to chemotherapy to prevent hyperuricemia). Patients with **cord compression** may present with back pain, gait difficulty, weakness, sensory deficits, and incontinence. Patients with **hypercalcemia from malignancy-paraneoplastic syndrome** may present with lethargy, weakness, constipation, vomiting, and coma. Cancer patients may develop **cardiac tamponade from pericardial metastasis** and physical examination might demonstrate findings such as hypotension, jugular venous distension, distant heart sounds, and pulsus paradoxus. **Pancoast syndrome** (superior sulcus tumor) is a complication of lung cancer when it extends into the apex. Patients have compression of the C8, T1, and T2 nerves and often complain of arm and shoulder pain.

290. The answer is d. (*Tierney, 39/e, pp 539–541.*) **von Willebrand disease** (vWD) is the most common inherited bleeding disorder (autosomal dominant). It is due to an abnormality in the quantity or quality of von Willebrand factor. The most common type is type I (80% of cases), caused by a quantitative decrease in vWF. Type IIA and IIB vWD are qualitative disorders; type III vWD is a rare autosomal recessive disorder in which vWF is nearly absent. Most bleeding from vWD is mucosal (epistaxis, gingival bleeding, menorrhagia) or gastrointestinal, and bleeding is exacerbated by aspirin use. Hemarthroses does not occur in vWD. The treatment for vWD types I and IIA is desmopressin, which stimulates the release of vWF from endothelial cells. Spontaneous hemarthroses are characteristic of **hemophilia A** or factor VIII deficiency (classic hemophilia); the diagnosis is made by finding a decrease level of factor VIII:C. Specific assays can distinguish between factor VIII and factor IX hemophilia (hemophilia B or **Christmas disease**). Hemophilia has an X-linked pattern of inheritance, and the symptoms and prognosis are similar for hemophilia A and B. **Bernard-Soulier syndrome** is a rare platelet disorder in which platelets cannot adhere to the endothelium since they lack receptors for vWF. Patients present with severe bleeding, especially postoperatively. Platelets appear abnormally large on peripheral smear. Measurements of vWF in Bernard-Soulier syndrome are normal.

291. The answer is d. (*Fauci, 14/e, pp 526, 565–566.*) **Tamoxifen** is one of the most commonly prescribed antineoplastic agents. It is considered to be an estrogen receptor blocker, but it has both estrogen receptor agonist and antagonist properties. The most common side effect is hot flashes, but patients may also develop deep venous thrombosis, pulmonary embolus, and cataracts. Tamoxifen is associated with an increased risk for endometrial carcinoma. **Side effects of radiotherapy** include short-term reactions (fatigue, skin reaction, nausea, vomiting, diarrhea, dysphagia, mucositis, and xerostomia) and long-term complications (pericarditis, pneumonitis, hepatitis, sterilization, and nephropathy).

292. The answer is b. (*Fauci, 14/e, pp 585–588.*) Patients with **carcinoid tumor** often present with the **carcinoid syndrome** (cutaneous flushing, diarrhea, wheezing, telangiectasias, and paroxysmal hypotension) due to the production of serotonin. Patients often have cardiac lesions, such as tricuspid insufficiency and pulmonic stenosis.

293. The answer is c. (*Tierney, 39/e, p 513.*) Patients with hemoglobin SC disease and children with sickle cell disease are at risk for **splenic sequestration crisis** when blood is trapped in the spleen (leading to further splenic enlargement and anemia). Splenic infarction is not associated with anemia or sudden splenomegaly; patients often have a left upper quadrant rub on physical examination. Episodes of **vasoocclusive crisis** (“pain crises”) are not associated with increased hemolysis, anemia, or splenomegaly.

294. The answer is d. (*Seidel, 4/e, p 491.*) The **risk factors for breast cancer** include age (80% of cases occur after age 50), family history of breast cancer, previous breast biopsy for benign disease, genetic mutations (*BRCA1* and *BRCA2*), increased breast tissue density on mammogram, early menarche (<12 years old), nulliparity, late menopause (>50 years old), and late age at birth of first child (>30 years old).

295. The answer is d. (*Tierney, 39/e, pp 501–505.*) The differential diagnosis for microcytic hypochromic anemia is **TICS** (Thalassemia, Iron deficiency, Chronic disease, and Sideroblastic). This patient of Mediterranean descent most likely has thalassemia trait. **Thalassemia** generally produces a greater degree of microcytosis for any given level of anemia than does iron deficiency. **Target cells** are seen in this disorder, but these are also seen in lead poisoning, liver disease, hyposplenism, and hemoglobin C disease. The most common cause of a microcytic anemia is iron deficiency, but this is unlikely in this asymptomatic patient with a negative FOBT. The MCV in anemia of chronic disease is usually normal or slightly reduced, and patients typically have a history of chronic infection or inflammation, cancer, or liver disease. Alcoholics, patients taking antituberculosis medication or chloramphenicol, or those with lead poisoning may develop sideroblastic anemia (a failure to incorporate heme into protoporphyrin). Bone marrow staining will demonstrate iron deposits (**ringed sideroblasts**) encircling the nucleus in siderocytes. Coarse **basophilic stippling** of the red blood cells on peripheral smear would be characteristic of lead poisoning.

296. The answer is b. (*Goldman, 21/e, pp 898–899.*) This patient with sickle cell disease most likely has **acute chest syndrome**, which is characterized by fever, dyspnea, leukocytosis, pulmonary infiltrate, and hypoxemia. The usual causes of acute chest syndrome are vasoocclusion,

infection, and pulmonary fat embolus from infarcted marrow. Acute chest syndrome affects 30% of patients with sickle cell disease and is responsible for significant mortality. **B19 virus** causes **aplastic anemia** in patients with sickle cell disease.

297. The answer is d. (*Goldman, 21/e, pp 1016–1021.*) The most common reason for DVT in pregnancy is the **factor V Leiden mutation** or activated protein C (APC) resistance. The defect is a mutation in activated factor V, not in protein C, and is found in 8% of the general population (exclusively in white populations). Forty percent of all patients presenting with a DVT have the mutation. All of the primary hypercoagulable states in the answer may cause DVT, especially during pregnancy (due to the elevation in estrogen), but these are less common than APC resistance.

298. The answer is d. (*Tierney, 39/e, p 510.*) The clinical picture strongly suggests glucose-6-phosphate dehydrogenase (**G6PD**) deficiency, in which red blood cells are unable to deal with oxidative stresses. Acute hemolysis occurs when affected patients are exposed to an infection or an oxidizing drug (dapsons, primaquine, sulfonamides, nitrofurantoin, quinine). The hemolytic episodes are self-limited even if the offending agent is still present, because older red cells with low enzyme activity are removed and replaced by younger red cells with adequate levels of G6PD. Cells that survive a hemolytic episode have adequate amounts of G6PD, so testing is not useful during the acute illness. G6PD deficiency has an X-linked pattern of inheritance. G6PD deficiency is often called **favism** in the Mediterranean, as hemolysis can occur after patients eat fava beans.

299. The answer is e. (*Tierney, 39/e, pp 535–538.*) Idiopathic thrombocytopenic purpura (**ITP**) is an autoimmune disorder in which an IgG autoantibody binds to platelets. Destruction of the platelets takes place in the spleen, where macrophages bind to the antibody-coated platelets. Fifty percent of patients with ITP have no associated disease, but HIV infection, SLE, or a lymphoproliferative disorder should be considered. ITP is a disease of persons between the ages of 20 and 50 years and occurs in women more than men. There is no splenomegaly in ITP. The diagnosis is one of exclusion, but often megathrombocytes are seen on peripheral smear. **Evans syndrome** is ITP with coexistent autoimmune hemolytic anemia. **DIC** is a systemic coagulation disorder that can be accompanied by throm-

bocytopenia. It may be secondary to transfusion, infection, malignancy, trauma, and obstetric complications. **TTP** is unlikely since the patient does not have the pentad of symptoms seen in 40% of patients (**FAT R.N.** = Fever, Autoimmune hemolytic anemia, Thrombocytopenia, Renal disease, Neurologic disease). **HUS** presents with three of the five symptoms seen in TTP (**RAT** = Renal disease, Autoimmune hemolytic anemia, and Thrombocytopenia). Fever and neurologic disease are lacking. **Henoch-Schönlein purpura** occurs in children; patients present with **AGAR** = Abdominal pain, Glomerulonephritis, Arthralgia, and a Rash that is purpuric.

300. The answer is b. (*Tierney, 39/e, pp 529–532.*) Patients with **Hodgkin's lymphoma** often present with painless regional lymphadenopathy and the constitutional symptoms of fever, drenching night sweats, and weight loss. Occasionally, patients may present with pruritus or pain in an involved lymph node after ingestion of alcohol. There is a bimodal age distribution with one peak in the twenties and a second peak at over age 50. The diagnosis of Hodgkin's disease is made by lymph node biopsy with the finding of **Reed-Sternberg cells** ("owl eyes"). Patients with non-Hodgkin's lymphoma (a group of cancers variable in presentation and course) often present with disseminated disease such as systemic adenopathy. Patients with hairy cell leukemia present with pancytopenia, massive splenomegaly, and hairy cells on peripheral blood smear.

301. The answer is d. (*Tierney, 39/e, pp 518–525.*) The patient most likely has **polycythemia vera**. This is an acquired myeloproliferative disorder characterized by a primary erythrocytosis, but there is overproduction of all three cell lines. Hematocrits are >54% in males and >51% in females. Patients present with symptoms related to an increase in blood volume and viscosity. Pruritus after a warm bath or shower is due to histamine release by basophils. Splenomegaly exists in virtually every patient with polycythemia vera. The treatment of choice for polycythemia vera is phlebotomy. **Spurious polycythemia** or **Gaisbock syndrome** is due to a contracted plasma volume (diuretic use); **secondary polycythemia** may be due to smoking, high altitudes, cardiac or pulmonary disease, and erythropoietin-secreting cysts or tumors. Patients with chronic myelogenous leukemia (CML) typically have a leukocytosis and the Philadelphia chromosome. Patients with **essential thrombocythemia** have platelet

counts > 2 million/ μ L. Patients with **myelofibrosis** have splenomegaly, dry bone marrow taps, and peripheral blood smears showing abnormal and bizarre morphologies and immature forms.

302. The answer is c. (*Tierney, 39/e, pp 549–551.*) The most common reaction to **blood transfusion** is the febrile, nonhemolytic reaction. Patients develop fever and chills several hours after receiving the transfusion because of recipient antibodies to donor leukocyte antigens. Hemolytic reactions (fever, chills, hemoglobinuria, back pain, flank pain, dyspnea, anxiety, renal failure, DIC, multiorgan failure, and death) are due to erythrocyte (ABO) incompatibility. Other transfusion reactions, such as urticaria (recipient antibodies to protein), anaphylaxis (anti-IgA in the recipient), and circulatory overload (pulmonary congestion), are unlikely in this patient.

303–307. The answers are 303-d, 304-g, 305-b, 306-h, 307-a. (*Kutty, 3/e, pp 762–765.*) Most patients with **CML** have the Philadelphia chromosome t(9,22) and the bcr/abl fusion protein. Mucosa-associated lymphoid tissue (**MALT**) tumor has been shown to be secondary to *H. pylori*. Squamous cell carcinomas of the anus, penis, and cervix have been linked to human papillomavirus (**HPV**). Hepatitis B and C and hemochromatosis are the major risk factors for hepatocellular carcinoma. Other risk factors include aflatoxin exposure and being from the Far East or Africa (high-incidence areas). Cigarette smoking is the most consistently observed risk factor for pancreatic cancer. Schistosomiasis is associated with squamous cell carcinoma of the bladder. Patients with *BRCA1* gene on chromosome 17 present with breast cancer at a young age with a family history of breast or ovarian cancer. Vinyl chloride exposure is a risk factor for hemangiosarcoma of the liver. Patients with colonic polyps are at risk for developing colon cancer. **Villous adenomas** are more likely to be malignant, but **tubular adenomas** are 4 times more common. Radon gas is associated with lung cancer. Epstein-Barr virus is associated with Burkitt's lymphoma and nasopharyngeal cancer; patients often present with an enlarging neck mass. **HHV-8** is associated with Kaposi's sarcoma, and **HTLV-1** is associated with adult T-cell leukemia.

308–309. The answers are 308-a, 309-e. (*Fauci, 14/e, pp 552–556, 1431.*) **Adenocarcinoma of the lung** (increasing in incidence in women)

often occurs in the absence of a smoking history (although the role of secondhand smoke is still unknown). Adenocarcinoma is the most common lung cancer (usually found in the **periphery**). **Small cell carcinoma of the lung** (20% of all new cases of lung cancer) is usually found **centrally** and is associated with a history of tobacco use and the production of ectopic hormones, such as antidiuretic hormone (ADH), PTH, and ACTH. **Squamous cell carcinoma** (another **central** lesion) is associated with PTH production. Patients with **bronchioalveolar carcinoma** (a variant of adenocarcinoma) may present with an infiltrate on chest radiograph. **Hamartomas** and **bronchial adenomas** are benign lung tumors. Hamartomas are located peripherally; bronchial adenomas are located centrally. **Mesothelioma** is associated with asbestos exposure but not tobacco use.

310–311. The answers are 310-a, 311-d. (*Fauci, 14/e, pp 350–351. Goldman 21/e, pp 882–883.*) **Howell-Jolly bodies** are found in asplenic or hyposplenic patients; **Heinz bodies** are the precipitants of denatured oxidized hemoglobin in G6PD deficiency. The **Reed-Sternberg cell** is the diagnostic tumor cell of Hodgkin's disease. The **Pelger-Huet anomaly** is a benign inherited trait resulting in neutrophils with bilobed nuclei. **Hypersegmented polymorphonuclear cells** are seen in B₁₂ or folic acid deficiency. Prominent cytoplasmic granules called **toxic granulations** and **Döhle bodies** representing fragments of ribosome-rich endoplasmic reticulum are seen in immature neutrophils in bacterial infections. **Auer rods** are eosinophilic inclusions seen in acute myelogenous leukemia (AML); **schistocytes** (as well as helmet cells, burr cells, triangular cells, and spherocytes) are seen in microangiopathic hemolytic anemia. **Pappenheimer cells** are often seen in thalassemia.

312–316. The answers are 312-b, 313-h, 314-d, 315-b, e, f, 316-g. (*Goldman, 21/e, pp 751, 1039–1042.*) Tumor markers should not be used to diagnose cancer, but may be helpful in following patients for whom a diagnosis has already been made. **CEA** is associated with colon and breast cancer. **CA-125** is associated with ovarian cancer. Lactate dehydrogenase (LDH) is an important prognostic factor for Hodgkin's disease; **β₂-microglobulin** is the most important prognostic factor for multiple myeloma. **LDH, AFP, and hCG** are associated with testicular cancer, and **5-HIAA** is associated with carcinoid syndrome (facial flushing and diarrhea from a tumor usually located in the lung or ileum). AFP is also associated

with hepatocellular carcinoma. **PSA** is associated with prostate cancer. The most commonly used marker for pancreatic cancer is **CA 19-9**.

317–318. The answers are 317-c, 318-b, d. (*Fauci, 14/e, p 670.*) The **osmotic fragility test** is used to identify patients with red blood cell membrane defects (hereditary spherocytosis), and the **acid hemolysis test** and the **sugar-water test** are screening tests for paroxysmal nocturnal hemoglobinuria (PNH). **Leukocyte alkaline phosphatase** is elevated in polycythemia vera, Hodgkin's lymphoma, hairy cell leukemia, aplastic anemia, myelofibrosis, and leukemoid reactions, but is decreased in CML.

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RHEUMATOLOGY

Questions

DIRECTIONS: Each of the numbered items or incomplete statements in this section is followed by answers or by completion of the statements. Select the **one** lettered answer or completion that is **best** in each case.

319. A 60-year-old, mildly obese woman presents complaining of bilateral medial right knee pain that occurs with prolonged standing. The pain does not occur with sitting or climbing stairs but seems to be worse with other activity and at the end of the day. The patient denies morning stiffness. Examination of the knees reveals no deformity, but there are small effusions. Some mild pain and crepitus is produced with palpation of the medial aspect of the knees. Which of the following is the most likely diagnosis?

- a. Rheumatoid arthritis
- b. Gouty arthritis
- c. Chondromalacia patellae
- d. Osteoarthritis
- e. Psoriatic arthritis

320. Which of the following statements is true regarding Libman-Sacks endocarditis?

- a. Aortic insufficiency is often a sequela
- b. Mitral valve insufficiency is often a sequela
- c. It only affects the tricuspid valve
- d. It may be a source for cerebral emboli
- e. It is not associated with antiphospholipid antibody syndrome
- f. It is a bacterial endocarditis

321. A 17-month-old boy has a history of multiple fractures due to “brittle bones.” The child is short in stature and has a deformed skull. Physical examination is normal except for the finding of blue sclerae. Which of the following is the most likely diagnosis?

- a. Osteoporosis
- b. Achondroplasia
- c. Osteomalacia
- d. Osteitis deformans
- e. Osteogenesis imperfecta

322. A 34-year-old woman has a 15-year history of Crohn's disease. She presents to your office with the acute onset of right ankle and left knee pain. She recalls a worsening of her gastrointestinal symptoms a few days before the joint symptoms developed. Radiographs of the knee and ankle demonstrate soft tissue swelling and small effusions but no bone destruction. Which of the following statements is true?

- a. The patient is not HLA-B27 positive
- b. The patient is experiencing the most common extraintestinal manifestation of inflammatory bowel disease
- c. Controlling the intestinal symptoms will eliminate the knee and ankle arthritis
- d. The patient will go on to develop bone erosion and destruction of the knee and ankle
- e. The patient requires high-dose nonsteroidal anti-inflammatory drugs (NSAIDs)

323. Which of the following cardiac disorders may be seen in patients with ankylosing spondylitis?

- a. Aortic stenosis
- b. Aortic insufficiency
- c. Tricuspid insufficiency
- d. Mitral stenosis
- e. Mitral regurgitation
- f. Pulmonic stenosis

324. A 25-year-old man presents with morning back pain and stiffness and tenderness over the sacroiliac joints. The patient denies any previous history of eye or genitourinary problems. On physical examination, there is diminished chest expansion with breathing. Which of the following is the most likely diagnosis?

- a. Rheumatoid arthritis
- b. Ankylosing spondylitis
- c. Sjögren syndrome
- d. Systemic lupus erythematosus
- e. Reiter syndrome

325. A 28-year-old woman presents with her third episode of left lower extremity deep venous thrombosis. She has a history of two second-trimester miscarriages in the past. Laboratory data reveals an elevated activated partial thromboplastin time (PTT) that is not corrected by dilution with normal plasma and an abnormal dilute Russell's viper venom. Which of the following is the most likely diagnosis?

- a. Libman-Sacks disease
- b. Livedo reticularis
- c. Antiphospholipid syndrome
- d. Takayasu's arteritis
- e. Sjögren syndrome

326. A 61-year-old woman with a 10-year history of rheumatoid arthritis presents with painful swelling at the back of the knee that is visible on physical examination only when the knee is extended. Which of the following is the most likely diagnosis?

- a. Anserine bursitis
- b. Baker's cyst
- c. Deep venous thrombosis
- d. Prepatellar bursitis
- e. Infrapatellar bursitis

327. A 28-year-old law student complains of blanching and cyanosis of her fingertips in cold weather and in times of emotional stress. She complains that her fingers become numb and painful during these episodes. She has a 6-mo history of dysphagia and arthralgias. She does not smoke or take any medications. On physical examination, the skin of her hands appears to be taut and atrophic with a flexion deformity from the tight skin (sclerodactyly). Which of the following is the most likely diagnosis?

- a. Rheumatoid arthritis
- b. Progressive systemic sclerosis
- c. Dermatomyositis
- d. Ulcerative colitis
- e. Sarcoidosis

328. A 9-year-old girl with no past medical history presents with the acute onset of fever, arthralgias, abdominal pain, hematochezia, and hematuria. Physical examination reveals purpura on the patient's lower extremities bilaterally. Which of the following is the most likely diagnosis?

- a. Cryoglobulinemia
- b. Kawasaki's disease
- c. Wegener's granulomatosis
- d. Goodpasture's disease
- e. Henoch-Schönlein purpura

329. A 49-year-old man presents with painful, recurring episodes of swelling in his left great toe. He takes 25 mg of hydrochlorothiazide daily for blood pressure control but otherwise is in good health. On physical examination, the patient is afebrile but his great toe is warm, swollen, erythematous, and exquisitely tender to palpation. He has several subcutaneous nodules in his pinna. Which of the following is the most likely diagnosis?

- a. Calcium pyrophosphate dihydrate deposition disease
- b. Calcium oxalate deposition disease
- c. Monosodium urate deposition disease
- d. Calcium phosphate deposition disease
- e. Osteoarthritis of the great toe

330. A 41-year-old music teacher presents with a 10-mo history of prolonged morning stiffness accompanied by swelling of her wrists and the proximal interphalangeal joints of both hands. Now she feels that her knees are also swollen and painful. Physical examination reveals synovial tenderness and swelling of her knees, wrists, and proximal interphalangeal joints. She has subcutaneous nodules in the extensor area of her right forearm. The right knee has a positive bulge sign consistent with an effusion. Which of the following is the most likely diagnosis?

- a. Osteoarthritis
- b. Rheumatoid arthritis
- c. Septic arthritis
- d. Chondrocalcinosis
- e. Scleroderma

331. A 43-year-old man presents with fever and arthritis. During the past 2 mo, he has been treated four times for a maxillary sinus infection. He also complains of the recent onset of hematuria. Which of the following is the most likely diagnosis?

- a. Churg-Strauss syndrome
- b. Wegener's granulomatosis
- c. Lofgren syndrome
- d. Sjögren syndrome
- e. Sarcoidosis

332. A 31-year-old man presents with fever and arthralgias for 1 day. He complains of diffuse abdominal pain and inability to move his left foot due to weakness. He also states he has had hematuria for several hours. On physical examination, the patient has a temperature of 101.2°F. He has diffuse abdominal tenderness on palpation but has no rebound tenderness. Testicular exam reveals marked tenderness of the testes but no urethral discharge. Neurologic examination reveals a left footdrop. Which of the following is the most likely diagnosis?

- a. Polyarteritis nodosa
- b. Behçet syndrome
- c. Whipple's disease
- d. Osteonecrosis

333. Which of the following fulfills 1 of the 11 criteria for systemic lupus erythematosus (as published by the American College of Rheumatology)?

- a. Alopecia
- b. Oral ulcers
- c. Arthralgias
- d. Erosive arthritis
- e. Photophobia
- f. Anemia of chronic disease

334. A 44-year-old woman presents with diffuse myalgias and excessive fatigue. She has morning stiffness and pain of all her joints, especially her wrists, elbows, shoulders, hips, knees, and neck. She does not sleep well at night. Her symptoms have been progressing for over 4 years. On physical examination, the patient has 13 tender points at the elbows, knees, shoulders, and hips. Which of the following is the most likely diagnosis?

- a. Polymyalgia rheumatica
- b. Fibromyalgia syndrome
- c. Rheumatoid arthritis
- d. Scleroderma
- e. Polymyositis

DIRECTIONS: Each set of matching items in this section consists of a list of lettered options followed by several numbered items. For each numbered item, select the appropriate lettered option(s). Each lettered option may be selected once, more than once, or not at all. **Each item will state the number of options to select. Choose exactly this number.**

Items 335–336

For each patient with joint pain, choose the best diagnosis.

- a. Behçet syndrome
- b. Drug-induced lupus
- c. Systemic lupus erythematosus
- d. Thromboangiitis obliterans

335. A 69-year-old man taking hydralazine for hypertension presents with joint pain and chest pain. On cardiac examination, the patient has a pericardial rub. (CHOOSE 1 DIAGNOSIS)

336. A 17-year-old woman complains of intermittent ankle pain and swelling, photosensitivity, and oral ulcers. On physical examination, joints are normal but a pericardial rub is audible. (CHOOSE 1 DIAGNOSIS)

Items 337–339

For each patient with rheumatologic complaints, choose the most likely diagnosis.

- a. Dermatomyositis
- b. Polymyositis
- c. Polymyalgia rheumatica
- d. Felty syndrome
- e. Scleroderma

337. A 75-year-old woman presents with malaise and myalgias for the last several months. She is chronically tired and has 1 h of morning stiffness in the cervical, shoulder, and hip areas. She often has a low-grade temperature and has lost approximately 8 lb during this period. Neurologic exam reveals normal sensation, strength, and reflexes. (CHOOSE 1 DIAGNOSIS)

338. A 53-year-old woman presents with a 2-mo history of difficulty climbing stairs and arising from the seated position. On physical examination, she has a purplish discoloration of the skin over the forehead, eyelids, and cheeks. She has tenderness on palpation of the quadriceps muscles. (CHOOSE 1 DIAGNOSIS)

339. A patient with a 15-year history of rheumatoid arthritis develops splenomegaly and neutropenia. (CHOOSE 1 DIAGNOSIS)

RHEUMATOLOGY

Answers

319. The answer is d. (*Mehta, pp 313–316. Fauci, 14/e, pp 1935–1938.*)

Osteoarthritis most often affects the weight-bearing joints and is associated with obesity or other forms of mechanical stress. It has no systemic manifestations. It is more common in women and onset is usually after the age of 50. Pain often occurs on exertion and is relieved with rest, after which the joint may become stiff. Distal interphalangeal joints may be involved with the production of **Heberden nodes**. **Bouchard nodes** are often found at the proximal interphalangeal joint. **Crepitus** (the sensation of bone rubbing against bone) is often felt on examination of the involved joint. **Rheumatoid arthritis** is a systemic disease of women under the age of 40. Joint involvement is usually symmetric, involving the proximal interphalangeal and metacarpophalangeal joints. Ninety-five percent of gouty arthritis occurs in men and often involves the great toe. **Chondromalacia patellae** or **chondromalacia** means softening of the cartilage. Patients present with anterior knee pain and tenderness over the undersurface of the patella. Pain is worse when sitting for long periods of time or when climbing stairs. Psoriatic arthritis is an asymmetric oligoarthritis that involves the knees, ankles, shoulders, or digits of the hands and feet and occurs in 50% of patients with psoriasis.

320. The answer is d. (*Fauci, 14/e, p 1877.*) **Libman-Sacks** endocarditis may occur on any valve (not just the tricuspid valve, as previously thought) but rarely causes any valvular insufficiency. It is a nonbacterial endocarditis probably associated with the antiphospholipid antibody syndrome. It is a source of cerebral emboli.

321. The answer is e. (*Fauci, 14/e, pp 2186–2189, 2253–2258, 2267, 2274.*) **Osteogenesis imperfecta** is inherited as an autosomal dominant trait and is characterized by brittle bones that often lead to multiple fractures. Other characteristics include blue sclerae, short stature, deformed skull, hearing loss, and dental abnormalities. **Osteomalacia** (rickets in children) is a disorder of defective mineralization of the organic matrix of

the skeleton. It is due to inadequate intake or metabolism of vitamin D. Patients are susceptible to fractures, weakness, disturbances in growth, and skeletal deformities, but the disorder does not affect the eyes. Paget's disease of the bone or **osteitis deformans** is due to excessive resorption of bone by osteoclasts; patients present after the age of 40 with swelling or deformity of a long bone or enlargement of the skull. Achondroplasia results from a decrease in the proliferation of cartilage in the growth plate and results in dwarfism.

322. The answer is c. (*Fauci, 14/e, p 1781.*) **HLA-B27** diseases are easy to remember with the mnemonic **PAIR** (**P**soriasis, **A**nkylosing spondylitis, **I**nflammatory bowel disease, and **R**eiter syndrome). These are called the **seronegative spondylarthropathies**. Reiter syndrome preceded by a bacterial infection (*Yersinia, Salmonella, or gonococcus*) has a high association with a positive HLA-B27. Ankylosing spondylitis has a 90% association with HLA-B27; overall, Reiter syndrome and inflammatory bowel disease (IBD) have an 80% HLA-B27 association. Patients with IBD (Crohn's disease and ulcerative colitis) may develop a nonerosive oligoarthritis of the large peripheral joints that is usually eliminated after controlling the gastrointestinal symptoms. Arthritis is the second most common extraintestinal manifestation in patients with IBD after anemia (anemia is the most common extraintestinal manifestation). NSAIDs must be used with caution in patients with IBD.

323. The answer is b. (*Fauci, 14/e, p 1905.*) Aortitis in ankylosing spondylitis may cause aortic insufficiency. The AI manifests itself early in the course of the spinal disease and may lead to congestive heart failure.

324. The answer is b. (*Fauci, 14/e, pp 1904–1906.*) **Ankylosing spondylitis** (Marie-Strümpell arthritis) is a chronic and progressive inflammatory disease that most commonly affects the spinal, sacroiliac, and hip joints. All patients have symptomatic **sacroiliitis**. Other symptoms may include uveitis and aortitis. Men in the third decade of life are most frequently affected and there is a strong association with HLA-B27 (90%) in white patients. Patients with advanced disease present with a **bent-over posture**. A positive **Schober test** indicates diminished anterior flexion of the lumbar spine. Involvement of the costovertebral joints limits chest expansion and eye involvement may cause an iritis. Patients with **Reiter syndrome** may present with a history of conjunctivitis, urethritis, arthritis, and enthesopathy (Achilles tendinitis).

325. The answer is c. (*Fauci, 14/e, pp 1401–1403, 1877, 1918.*) The patient most likely has **antiphospholipid syndrome**. Patients with this antibody are at risk for venous and arterial thrombotic events, probably due to antibody reactivity with platelets or endothelial cell phospholipids. Patients often have a history of miscarriages, leg ulcers, Raynaud's phenomenon, and livedo reticularis. Laboratory data often reveals a positive lupus anticoagulant, thrombocytopenia, a prolonged PTT (**not corrected by adding normal plasma; a clotting factor deficiency would correct with normal plasma**), elevated titers of anticardiolipin antibodies, and an abnormal dilute Russell's viper venom. **Takayasu's arteritis** ("pulseless disease") is a granulomatous arteritis that affects women more than men. Patients are usually in their fourth decade of life. The disease typically affects the aorta and its major branches, including the arteries that supply the upper extremities. Patients have absent pulses in the upper arm and complain of arm claudication. **Livedo reticularis** is characterized by reddish or bluish mottling of the extremities and is usually idiopathic and requires no treatment. Livedo reticularis may be secondary to atheroembolism-induced emboli following an intraarterial procedure. Libman-Sacks disease is endocarditis in patients with SLE and may be associated with the antiphospholipid antibodies.

326. The answer is b. (*Mehta, pp 296–297.*) A **Baker's cyst** occurs in the midline of the popliteal fossa and is often a complication of rheumatoid arthritis. The cyst represents a diverticulum of the synovial sac that protrudes through the joint capsule of the knee. The knee is composed of 12 different bursae. **Anserine bursitis** occurs with inflammation of the bursa on the medial side of the proximal tibia. There is localized tenderness and swelling over the knee. Prepatellar bursitis is called **housemaid's knee** (i.e., associated with scrubbing floors) and is characterized by inflammation of the bursa anterior to the patella. Usually, the history supports the diagnosis. Inflammation of the infrapatellar bursa is called **clergyman's or carpet-layer's knee**. Deep venous thrombosis (DVT) is due to partial or complete occlusion of a vein by a thrombus and may be characterized by a painful, swollen calf or thigh. Occasionally, there is a positive **Homan sign** (pain with dorsiflexion of the foot), but often a DVT is asymptomatic.

327. The answer is b. (*Fitzpatrick, 3/e, pp 358–367, 396, 410.*) The patient presents with symptoms suggestive of scleroderma or **progressive**

systemic sclerosis (PSS). This disease, when diffuse, involves the skin, joints, lungs, heart, and gastrointestinal system. **Limited systemic sclerosis (LSSc)** was formerly known as the **CREST syndrome** (Calcinosis cutis, Raynaud's phenomenon, Esophageal dysfunction, Sclerodactyly, and Telangiectasia). Raynaud's phenomenon may be associated with tobacco use, medication use (beta-adrenergic blockers) and other diseases such as systemic lupus erythematosus, rheumatoid arthritis, carpal tunnel syndrome, and thromboangiitis obliterans. **Dermatomyositis** is a systemic disease characterized by a violaceous rash of the eyelids and periorbital areas (**heliotrope**) and flat, violaceous papules over the knuckles (**Gottron sign**). The rash seen in ulcerative colitis is pyoderma gangrenosum. These painful ulcers are large and irregular and drain a purulent, hemorrhagic exudate. **Sarcoidosis** is a systemic disease with skin manifestations, bilateral hilar adenopathy, and pulmonary disease. Patients with sarcoidosis may present with erythema nodosum, which typically takes the form of multiple firm, red, painful, plaques that are bilateral and most frequently distributed on the legs. Musculoskeletal findings in sarcoidosis include arthritis and tenosynovitis.

328. The answer is e. (*Fauci, 14/e, pp 1547, 1914–1920.*) The multisystem disease described in this patient is most likely **Henoch-Schönlein purpura (HSP)**, which is a small-vessel vasculitis that affects mostly children. The purpura and all of the symptoms described are a result of the vasculitis. Histopathology of the vasculitic lesions reveals the deposition of IgA in the walls of the small vessels (postcapillary venules). The mnemonic for HSP is **AGAR** (Abdominal pain, Glomerulonephritis, Arthralgia, and Rash). The prognosis for Henoch-Schönlein purpura is excellent. **Kawasaki's disease (KD)** or mucocutaneous lymph node syndrome is uncommon in children over the age of 8 years and is characterized by fever, a desquamating, edematous, blotchy-appearing, mucocutaneous erythema, cervical lymphadenitis, and aneurysms of the coronary arteries. It is idiopathic. Wegener's disease and Goodpasture's disease usually have pulmonary involvement. **Cryoglobulinemia** does cause palpable purpura, abdominal pain, and glomerulonephritis, but it does not cause any gastrointestinal bleeding. Cryoglobulinemia is associated with hepatitis B or C virus.

329. The answer is c. (*Fauci, 14/e, pp 1941–1944.*) Tophaceous gout is characterized by the finding in synovial fluid of monosodium urate crystals

that are **needle-shaped and strongly negative birefringent (bright yellow when parallel to the axis)**. Gouty attacks may be precipitated by trauma, medications that inhibit tubular secretion of uric acid (aspirin, hydrochlorothiazide), surgery, stress, alcohol, and a high-protein diet. The patient may have an accumulation of **tophi** in and around the joints and earlobe. Radiographs may show “**rat bite**” **erosions**. **Pseudogout** is due to calcium pyrophosphate dihydrate (CPPD) deposition disease; the crystals here are **rhomboid-shaped and weakly positive birefringent (blue when parallel to the axis)**. Calcium oxalate deposition disease is usually seen in patients with end-stage renal disease; calcium phosphate deposition disease causes calcific tendinitis or **Milwaukee shoulder**.

330. The answer is b. (*Fauci, 14/e, pp 1880–1885.*) A septic joint will usually produce systemic symptoms such as fever. Osteoarthritis produces a short period of morning stiffness and often affects the distal interphalangeal joints. Chondrocalcinosis is a radiologic finding (destructive arthropathy) associated with pseudogout or CPPD crystals. The patient most likely has **rheumatoid arthritis** since she meets **four of the seven criteria as classified by the American College of Rheumatology**:

1. Symmetric polyarthritis for over 3 mo
2. Morning stiffness lasting more than 1 h
3. **Rheumatoid nodules**
4. Arthritis of more than three joint areas
5. Involvement of the joints of the hands and wrists; patients may have **swan-neck deformity** (hyperextension of the proximal interphalangeal joints with compensatory flexion of the distal joint), **boutonnière deformity** (extension of the distal interphalangeal joint), and **ulnar deviation** of the digits
6. A positive rheumatoid factor (RF)
7. Erosions or decalcification on radiographs

331. The answer is b. (*Fauci, 14/e, pp 1901–1903, 1914–1917, 1924.*) **Wegener’s granulomatosis** involves the upper airways (nasopharynx and sinuses) and the lungs, kidneys, and joints. The diagnosis is made by the clinical picture, a positive antineutrophil cytoplasmic antibody with a cytoplasmic staining pattern (C-ANCA), and biopsy showing necrotizing granulomas. The disease causes a systemic necrotizing arteritis and is fatal

without treatment. The typical history for **Churg-Strauss syndrome** (allergic angiitis and granulomatosis) is asthma followed by systemic vasculitis with eosinophilia (mnemonic is **RAVE: Rhinitis, Asthma, Vasculitis, and Eosinophilia**). **Lofgren syndrome** is a benign form of sarcoidosis that causes bilateral hilar adenopathy, periartthritis of the ankles, and erythema nodosum of the anterior tibial regions of the lower extremities. **Sjögren syndrome** is a slowly progressive autoimmune disease that primarily affects middle-aged women; it affects the lacrimal and salivary glands, resulting in xerostomia and dry eyes. It may occur alone (primary) or in association with other autoimmune diseases such as rheumatoid arthritis or systemic lupus erythematosus.

332. The answer is a. (*Fauci, 14/e, pp 1910–1913, 1951.*) The most probable diagnosis is **polyarteritis nodosa (PAN)**, a life-threatening vasculitis of the medium-sized vessel that causes visceral ischemia, especially in the gastrointestinal tract. Other systems, such as the genitourinary system (kidney and testes) and neurologic system (mononeuritis multiplex manifesting itself as wristdrop or footdrop), may also be involved. Hepatitis B has been shown to be present in 50% of patients with PAN. **Whipple's disease** causes a synovitis of the hands, feet, and knees. Often the patient exhibits fever, lymphadenopathy, and signs of malabsorption, such as diarrhea. Whipple's disease is caused by the infectious agent *Tropheryma whipplei*. Osteonecrosis is usually found in patients with sickle cell disease.

333. The answer is b. (*Fauci, 14/e, pp 1875–1876.*) The American College of Rheumatology criteria for **SLE (need 4 of the 11: BRAIN SOAP M.D.)** are the following:

1. Blood or hematologic (hemolytic anemia, thrombocytopenia, or lymphopenia)
2. Renal (proteinuria or casts)
3. ANA
4. Immunologic (+VDRL or anti-dsDNA Ab or anti-Sm Ab or LE prep)
5. Neurologic (seizures or psychosis)
6. Serositis (pericarditis, pleuritis)
7. Oral ulcers
8. Arthritis that is nonerosive and involves more than two joints
9. Photosensitivity

10. Malar rash
11. Discoid rash

334. The answer is b. (*Fauci, 14/e, pp 1955–1956.*) The history and physical examination revealing “**tender points**” makes fibromyalgia syndrome the most likely diagnosis. This is a disorder predominantly of females; patients complain of insomnia, easy fatigability, and widespread musculoskeletal pain and stiffness. There are up to 18 symmetrical bilateral tender points occurring in the same locations on all patients. Laboratory data is normal in primary fibromyalgia syndrome.

335–336. The answers are 335-b, 336-c. (*Fauci, 14/e, pp 1874, 1910, 1921.*) The 69-year-old woman has **drug-induced lupus**. Drugs that may cause lupus are dilantin, procainamide, quinidine, hydralazine, and isoniazid. Patients are usually older and renal involvement is rare. The 17-year-old woman has 4 of the 11 criteria for systemic lupus erythematosus. **Behçet syndrome** is a multisystem disorder that involves the eye and causes painful oral and genital ulcerations. The nondeforming arthritis of Behçet syndrome affects the knees and ankles. Thromboangiitis obliterans or **Buerger’s disease** is an inflammatory peripheral vascular disease of the upper and lower extremities that usually affects men under the age of 40 who smoke. Patients may complain of extremity claudication or Raynaud’s phenomenon. The treatment of Buerger’s disease is to quit smoking cigarettes.

337–339. The answers are 337-c, 338-a, 339-d. (*Fauci, 14/e, pp 1884, 1896–1901.*) **Polymyalgia rheumatica** affects older patients. They present with weight loss, profound fatigue, and pain and stiffness of the neck, shoulders, thighs, and hips. Physical examination is typically normal. **Temporal arteritis** may be seen in patients with polymyalgia rheumatica and must always be ruled out. **Dermatomyositis** is an autoimmune disease that causes proximal muscle weakness that involves the skin; **polymyositis** spares the skin. Patients with rheumatoid arthritis who develop splenomegaly and neutropenia are said to have **Felty syndrome**.

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MUSCULOSKELETAL SYSTEM

Questions

DIRECTIONS: Each of the numbered items or incomplete statements in this section is followed by answers or by completion of the statements. Select the **one** lettered answer or completion that is **best** in each case.

340. A 52-year-old nurse has a history of low back pain for 2 mo. She states the pain started after she lifted a heavy patient at work. It is a nagging pain that worsens with bed rest. She has tried nonsteroidal anti-inflammatory agents without any relief and has continued to work. She has a past medical history significant for breast cancer 8 years ago and, except for a recent 10-lb weight loss, has been well since her lumpectomy. Her neurologic exam and straight-leg raising test are normal. The rest of her physical examination is unremarkable. Which of the following is the most likely diagnosis?

- a. Lumbosacral strain
- b. Metastatic breast cancer
- c. Disk herniation of L5–S1
- d. Spondylolysis
- e. Spondylolisthesis

341. A 33-year-old graduate student complains of low back pain after carrying heavy suitcases on a recent vacation in Europe. Because of his pain, he went to a neurologist in London who recommended bed rest and nonsteroidal anti-inflammatory agents. After 10 days, the back pain resolved, but the patient comes to see you because of new weakness of his right anterior tibialis. The rest of the physical examination is normal. Which of the following is the most likely diagnosis?

- a. Nerve root impingement
- b. Tibial stress fracture
- c. Anterior compartment syndrome
- d. Gastrocnemius muscle tear
- e. Popliteal cyst

342. A 45-year-old swimmer presents with a sore right shoulder for nearly 2 mo. He was taking non-steroidal anti-inflammatory agents throughout this period with minimal relief. Over the last several days, he has developed pain with elevation of his arm above the horizontal and has some loss of passive motion in external rotation and with abduction. The pain is relieved after you inject 2 ml of lidocaine into the subacromial space. Which of the following is the most likely diagnosis?

- a. Fracture of the surgical neck of the humerus
- b. Bicipital tendinitis due to snapping
- c. Cervical radiculopathy due to a herniated disk
- d. Calcific tendinitis
- e. Frozen shoulder due to a rotator cuff injury

343. A 7-year-old boy presents with a 1-year history of pain of the left anterior thigh. He has no history of trauma. On physical examination, he has limited hip motion, especially with abduction and internal rotation. A slight limp is noticeable with ambulation. Pain is brought on by activity and improves with rest. Which of the following is the most likely diagnosis?

- a. Legg-Calvé-Perthes disease
- b. Osgood-Schlatter's disease
- c. Muscular dystrophy
- d. Rickets
- e. Juvenile rheumatoid arthritis

344. A 20-year-old college student develops left shoulder pain after jumping into a lake from a swinging rope. She presents holding her arm beside her body (adducted) and avoiding any shoulder movement. On examination, the rounded contour of the shoulder is lost and the head of the humerus is felt under the coracoid process. Which of the following is the most likely diagnosis?

- a. Inferior glenohumeral dislocation
- b. Rupture of the long head of the biceps
- c. Posterior glenohumeral dislocation
- d. Anterior glenohumeral dislocation

345. A 47-year-old man fell on his outstretched right hand while rollerblading. Several days later, he develops right wrist pain that is constant and progressive. Pain is in the area of the anatomical snuffbox and is worse with wrist flexion, extension, and ulnar deviation. The anatomical snuffbox is tender to palpation but there is no swelling. Finkelstein test is negative. Which of the following is the most likely diagnosis?

- a. Cervical radiculopathy
- b. Scaphoid fracture
- c. Compartment syndrome
- d. de Quervain's disease
- e. Boxer's fracture

346. A 31-year-old man develops left ankle pain after stepping off a curb. He treated the injury with ice overnight but the next day could not walk due to the pain. On examination of the ankle, you notice that it is swollen and ecchymotic. The anterior and lateral aspects of the ankle are tender to palpation. Inversion of the ankle is painful. Which of the following is the most likely diagnosis?

- a. Ankle sprain
- b. Rupture of the Achilles tendon
- c. Metatarsal stress fracture
- d. Plantar fasciitis
- e. Tarsal tunnel syndrome

347. An 81-year-old woman has recurrent back pain in her lumbar area. The pain radiates to her buttocks but is worse on the right side than the left side. Both sitting and walking aggravate the pain. She denies bladder dysfunction. On physical examination, the patient has diminished sensation and decreased reflexes of the right lower limb. Straight-leg raising and cross-leg raising tests are positive for reproduction of right lower limb symptoms. The patient has no spinal deformities. Which of the following is the most likely diagnosis?

- a. Sciatica
- b. Osteomyelitis
- c. Cauda equina syndrome
- d. Kyphosis
- e. Epidural abscess

348. A 12-year-old boy is brought to your office 2 days after a fracture of the humerus in its distal third. The patient complains that he is unable to extend the wrist. Which of the following structures was most likely damaged?

- a. Median nerve
- b. Ulnar nerve
- c. Radial nerve
- d. Axillary nerve
- e. Artery supplying the brachial plexus

349. A 60-year-old man was involved in a motor vehicle accident and suffered multiple long bone fractures and a severe injury to the pelvis. Two days following admission to the hospital, he develops a fever, tachypnea, and tachycardia. The rest of his physical examination reveals chest, neck, and conjunctival petechiae. Respiratory exam reveals scattered crackles bilaterally but no wheezes. Pulse oximetry reveals a hemoglobin saturation of 80% on room air. Which of the following is the most likely diagnosis?

- a. Pneumothorax
- b. Pneumonia
- c. Exacerbation of chronic obstructive pulmonary disease (COPD)
- d. Anemia from traumatic blood loss
- e. Fat embolism syndrome

350. An 18-year-old gymnast heard a “popping” sound in her left knee while practicing for the Olympic Games. Her knee immediately became swollen and painful. On physical examination, it is obvious that the left knee has an effusion. The anterior drawer test and Lachman test are positive. McMurray test is negative. Which of the following is the most likely diagnosis?

- a. Anterior cruciate ligament tear
- b. Posterior cruciate ligament tear
- c. A torn medial meniscus
- d. A torn lateral meniscus

351. A 15-year old boy presents with complaints of pain in the left hip and left proximal femur. The pain has been present for approximately 3 wk and is increasing in severity. It is worse at night and is relieved by aspirin. There is no history of trauma or previous hip or leg problems. Which of the following is the most likely diagnosis?

- a. Osteosarcoma
- b. Paget’s disease
- c. Osteoid osteoma
- d. Chondrosarcoma
- e. Muscle strain

352. A 17-year-old football player with his foot planted is tackled from the side, causing a forced valgus bending of the knee. On physical examination, there is tenderness over the medial femoral condyle. McMurray test is negative for any palpable clicks. Which of the following is the most likely diagnosis?

- a. Tear of the lateral meniscus
- b. Rupture of the lateral collateral ligament
- c. Rupture of the medial collateral ligament
- d. Dislocation of the patella
- e. Subluxation of the patella

353. A 30-year-old woman with a history of diabetes mellitus presents with a 3-wk history of hand numbness that often awakens her from sleep. The symptoms resolve after she shakes her hands for a few minutes. On physical examination, there is no sensory or motor deficit of her hands but there is a positive Tinel sign. Which of the following is the most likely diagnosis?

- a. Thoracic outlet syndrome
- b. Carpal tunnel syndrome
- c. Dupuytren’s contracture
- d. Mallet finger
- e. Ganglion
- f. Trigger finger

354. A 41-year-old construction worker complains of the sudden onset of severe back pain after lifting some heavy equipment. He describes the pain as being in his right lower back and radiating down the posterior aspect of his right buttock to the knee area. He has no bladder or bowel dysfunction. The pain has improved with bed rest. On physical examination, the patient has tenderness in his lumbar area with palpation. The straight-leg maneuver with the right leg increases the back pain at 80°. The straight-leg maneuver with the left leg also causes thigh pain. Sensation, strength, and reflexes are normal. Which of the following is the most likely diagnosis?

- a. Nerve root compression
- b. Paravertebral abscess
- c. Lumbosacral strain
- d. Osteoporosis compression fracture
- e. Paget's disease

355. A 73-year-old man presents complaining of right lateral hip pain that worsens when he lies on his right side or when he is standing. He has no other complaints. Physical examination is normal. He has a negative Faber test. Which of the following is the most likely diagnosis?

- a. Ischial bursitis
- b. Osteoarthritis of the hip
- c. Avascular necrosis of the hip
- d. Trochanteric bursitis
- e. Fracture of the proximal femur

356. A 2-year-old child cannot raise his arm completely on the right side and has torticollis. He has no other congenital abnormalities. Which of the following is the most likely diagnosis?

- a. Slipped capital femoral epiphysis
- b. Juvenile rheumatoid arthritis
- c. Sprengel deformity
- d. Arnold-Chiari malformation
- e. Cerebral palsy

357. A 67-year-old musician presents with a long history of low back pain. Pain is worsened with prolonged standing and with exercise. For the last several months, the patient has noticed that the back pain comes on with walking less than one block and radiates to the buttocks. The pain is relieved by sitting for several minutes. On physical examination, there are no neurologic deficits and bilateral straight-leg raising maneuvers are normal. Peripheral pulses are strong and bilaterally equal. Which of the following is the most likely diagnosis?

- a. Lumbar spinal stenosis
- b. Peripheral vascular disease
- c. Lumbosacral sprain
- d. Disk herniation
- e. Diffuse idiopathic skeletal hyperostosis

358. A 42-year-old man presents with a crush injury to his left lower extremity. He complains of severe leg pain that seems out of proportion to his injury. He also complains of paresthesias of the injured extremity. Leg examination is significant for pallor and coldness. The dorsalis pedis and posterior tibialis pulses are not palpable. Which of the following is the most likely diagnosis?

- a. Arterial insufficiency
- b. Pelvic fracture
- c. Aortic insufficiency
- d. Aortic dissection
- e. Compartment syndrome

359. A 20-year-old woman presents complaining of proximal forearm pain exacerbated by extension of the wrist against resistance with the elbow extended. She denies trauma but is an avid racquetball player. Which of the following is the most likely diagnosis?

- a. Lateral epicondylar tendonitis
- b. Medial epicondylar tendonitis
- c. Olecranon bursitis
- d. Biceps tendinitis
- e. Long thoracic nerve early paralysis

360. A 41-year-old man was recently in a motor vehicle accident (MVA) where he was the driver. He states he was wearing his seat belt at the time of the accident. A day after the accident, he developed neck pain that has now continued for 10 days. He is noticing crunching on extension and lateral bending of the neck. On physical examination, the patient has no neurologic deficits. His neck has no areas of tenderness and there are no areas of spasm. He has normal lateral bend, extension, and flexion of the neck. Which of the following is the most likely diagnosis?

- a. Ankylosing spondylitis
- b. Osteoarthritis
- c. Reiter syndrome
- d. Whiplash
- e. Wry neck

DIRECTIONS: Each set of matching items in this section consists of a list of lettered options followed by several numbered items. For each numbered item, select the appropriate lettered option(s). Each lettered option may be selected once, more than once, or not at all. **Each item will state the number of options to select. Choose a 364–365 number.**

Items 361–363

For each patient with a foot problem, choose the most likely diagnosis.

- a. Hammer toe
- b. March fracture
- c. Genu valgum
- d. Genu varum
- e. Bunion
- f. Genu recurvatum
- g. Gout
- h. Genu impressum
- i. Pes planus
- j. Morton's neuroma

361. A patient with hallux valgus develops lateral displacement of the extensor and flexor hallucis longus tendons. (CHOOSE 1 DIAGNOSIS)

362. A long-distance runner develops foot pain with exercise. (CHOOSE 1 DIAGNOSIS)

363. A patient develops painful swelling of the first metatarsophalangeal joint. (CHOOSE 1 DIAGNOSIS)

For each patient with a joint complaint, choose the most likely diagnosis.

- a. Reflex sympathetic dystrophy
- b. Ankylosing spondylitis
- c. Reiter syndrome
- d. Hypertrophic osteoarthropathy
- e. Charcot joint

364. A 67-year-old man with lung cancer presents with metacarpophalangeal joint pain. On physical examination, there is pain on moving his fingers and a spongy sensation when palpating the proximal aspects of the fingernails. (CHOOSE 1 DIAGNOSIS)

365. An 18-year-old man presents with a history of low back pain that awakens him from sleep. He also complains of morning stiffness and decreased mobility. The pain does not improve with activity. Schober test is positive. (CHOOSE 1 DIAGNOSIS)

Items 366–367

For each assessment described, choose the most likely root that is being tested.

- a. S1 nerve root
- b. L5 nerve root
- c. L4 nerve root
- d. L2 nerve root

366. Best assessed by asking patient to walk on heels (**CHOOSE 1 ROOT**)

367. Best assessed by asking patient to squat or rise (**CHOOSE 1 ROOT**)

Items 368–369

For each description of a maneuver, sign, or test, choose the most appropriate name of the maneuver, sign, or test.

- a. Ballotement procedure
- b. Bulge sign
- c. Apley test

368. The patient lies prone with knee flexed to 90° and leg is externally and internally rotated. (**CHOOSE 1 NAME**)

369. With the knee extended, the medial aspect of knee is milked upward two to three times and the lateral side of the patella is tapped. (**CHOOSE 1 NAME**)

MUSCULOSKELETAL SYSTEM

Answers

340. The answer is b. (*Mehta, pp 173–190.*) Lower back pain is a very common complaint. The **differential diagnosis includes soft tissue problems (muscles and ligaments), disk problems (prolapse), facet problems (degenerative joint disease), spinal canal disease (spinal stenosis), and vertebral body diseases (osteoporosis causing a compression fracture, infection, metastatic disease, spondylolisthesis).** Patients with **disk herniation** at L5–S1 may present with S1 nerve root compression (the herniated disk affects the nerve root below the lesion). The patient is unable to stand on his or her toes and has an absent Achilles reflex (S1). The straight-leg raising test is positive. **Spondylolysis** is a defect of a lumbar vertebra (lack of ossification of the articular processes) and rarely causes symptoms. **Spondylolisthesis** occurs when the vertebra slips forward from its position and is generally a consequence of spondylolysis or degenerative joint disease (DJD) without spondylolysis. It, too, is usually asymptomatic. A back strain is an injury to a ligament or muscle; it may mimic disk disease, but the neurologic exam and straight-leg raising test generally remain normal. Although radiologic studies are needed in this patient to make a definitive diagnosis, the leading diagnosis with her history of breast cancer and weight loss is metastatic disease to the lumbosacral area. **Pain made worse by lying down or at night may be a sign of malignancy or infection.**

341. The answer is a. (*Mehta, pp 38, 111, 180–182.*) Lumbar **disk herniation** may occur rapidly after lifting heavy objects awkwardly or with poor technique but usually resolves with a short period of rest (“unloading the spine”) and nonsteroidal anti-inflammatory agents. Surgery is rarely needed. If a patient develops significant neurologic deficit after the initial pain has resolved, the diagnosis is most likely **nerve impingement** due to a herniation of the disk. Tibial stress fractures (**shin splints**) may occur due to weight-bearing exercises or training errors. These injuries cause

anterior tibial pain after exercise but not weakness. **Anterior compartment syndrome** occurring after weight-bearing exercise may cause a neuropraxia of the peroneal nerve, leading to footdrop. A **gastrocnemius muscle tear** usually occurs suddenly after rapid dorsiflexion of the ankle and causes severe midcalf pain. In a few days, the calf characteristically develops a bluish discoloration. A popliteal cyst (Baker's cyst) causes calf pain, swelling, and knee effusion. It is often a complication of rheumatoid arthritis and represents a diverticulum of the synovial sac that protrudes through the posterior joint capsule of the knee.

342. The answer is e. (Mehta, pp 191–214.) **Passive range of motion (ROM) tests** are performed by the examiner, while **active ROM tests** are performed by the patient. Passive ROM tests need not be done if active ROM tests are performed adequately. The loss of passive range of motion indicates a stiffening shoulder (“frozen shoulder” or adhesive capsulitis). The most likely etiology in this patient would be impingement of the rotator cuff causing inflammation, degeneration, and possibly a tear. The **rotator cuff**, which is formed by the **SITS** tendons of the Supraspinatus, Infraspinatus, Teres minor, and Subscapularis muscles, stabilizes the glenohumeral joint and prevents upward movement of the head of the humerus. Injuries may occur from overhead activities including freestyle and butterfly-style swimming. The “**drop arm sign**” may be positive in rotator cuff tear (abduct the arm to 180° and ask patient to bring it down slowly; at 90° the arm will drop quickly due to weakness). An injection of lidocaine often relieves the inflammation in the subacromial space in patients with rotator cuff tendinitis and alleviates the symptoms. Fracture of the surgical head of the humerus is usually seen in the elderly after a fall. Swelling and ecchymosis are visible. Cervical radiculopathy typically results in decreased sensation, strength, and reflexes all matching one root level of the upper extremity. **Bicipital tendinitis** may be seen with overuse and trauma, but pain is typically felt over the anterior aspect of the shoulder and palpation of the biceps tendon in the bicipital groove elicits tenderness. A pain produced on supination of the forearm against resistance (**Yergason sign**) confirms bicipital tendinitis. Lidocaine injection into the synovial sheath of the long head of the biceps relieves pain. **Calcific tendinitis** is due to calcium deposits in the subacromial region and is especially common in the supraspinatus tendon near its insertion.

343. The answer is a. (*Mehta, pp 282–286.*) **Legg-Calvé-Perthes disease** (osteochondrosis) is an uncommon disorder that affects boys more than girls between the ages of 2 and 12. The hallmark is avascular necrosis of the capital femoral epiphysis, which has the potential to regenerate new bone. Consequently, children with Legg-Calvé-Perthes disease are of short stature and present with a “painless limp.” **Osgood-Schlatter’s disease** occurs in adolescence and is usually self-limiting. It is due to patellar tendon stress, which causes pain in the region of the tibial tuberosity especially when the patient extends the knee against resistance. **Rickets** is attributed to vitamin D deficiency and is manifested by bowing of the long bones, enlargement of the epiphyses of the long bones, delayed closure of the fontanel, and enlargement of the costochondral junctions of the ribs (rachitic rosary). **Juvenile rheumatoid arthritis** is an inflammatory disorder that begins in childhood and may produce extraarticular symptoms, including iridocyclitis, fever, rash, anemia, and pericarditis. Muscular dystrophy is characterized by progressive weakness and muscle atrophy.

344. The answer is d. (*Mehta, pp 198, 209–210.*) **Glenohumeral dislocations** may be anterior, posterior, or inferior depending on the position of the head of the humerus in relation to the glenoid. The most common dislocation is **anterior** (>90%) and is due to forceful abduction, external rotation, or extension. There is typically flattening of the deltoid and loss of the greater tuberosity, causing a “**squared-off**” appearance of the shoulder. The patient is usually in severe pain and holds the arm in slight abduction and external rotation. Posterior dislocations are typically seen following a seizure. Possible complications of shoulder dislocation include damage to the axillary artery, axillary nerve (deltoid paralysis), and brachial plexus. First-time dislocation requires orthopedic management (surgery or therapeutic exercise), since 80% of patients will have a recurrence. Rupture of the long head of the biceps causes a bulge in the lower half of the arm and pain upon elbow flexion.

345. The answer is b. (*Mehta, pp 225–230.*) **Scaphoid fractures** occur as a result of a fall on an outstretched hand. These fractures heal poorly due to a poor blood supply in this area. Radiographs done early may be negative, but later radiographs may show evidence of healing (callus fracture). Cervical (C6–C8) radiculopathy causes pain, numbness, and tingling from

the neck to the hand. **de Quervain's disease** or tenosynovitis of the tendon sheath of the extensor pollicis brevis and abductor pollicis longus causes swelling and tenderness of the anatomic snuffbox. This disorder is usually found in middle-aged women who perform repetitive activity. The **Finkelstein test** is positive (patient makes a fist around his or her own thumb; pain is produced with adduction toward the ulnar side) in de Quervain's disease. Compartment syndrome is a surgical emergency and is due to a tight cast or swelling causing compression of the blood vessels and nerves in the forearm. A **boxer's fracture** causes flattening or loss of the fifth knuckle prominence due to displacement of the metacarpal toward the palm. It is usually the result of striking an object with a clenched fist.

346. The answer is a. (*Mehta, pp 330–335.*) Ligament injuries of the ankle are common and may occur in sports requiring jumping and running. These injuries occur when the foot twists as it lands on the ground and can even be a consequence of walking on uneven ground. **The medial ligament is typically injured with eversion and the lateral ligament (the ligament most commonly affected by injuries) with inversion.** The lateral ligament is composed of three parts: the anterior talofibular ligament, the calcaneofibular ligament, and the posterior talofibular ligament. The injured ligament is tender to palpation, ecchymotic, and swollen. **Metatarsal stress fractures** (“march” fractures) occur after long periods of running or walking; pain is typically in the middle of the forefoot. **Rupture of the Achilles tendon** may occur with running and jumping. It causes a palpable defect, swelling, and tenderness over the tendon. The **Thompson test** is positive (patient lies with knee flexed to 90° and the examiner squeezes the calf muscle; if the Achilles tendon is ruptured, the foot will not move, but if the tendon is intact, the foot will plantarflex). **Plantar fasciitis** causes pain over the medial aspect of the plantar fascia. It usually starts slowly and is of long duration. The **windlass test** is positive (pain increases with ankle and great toe dorsiflexion). **Tarsal tunnel syndrome** occurs with entrapment of the posterior tibial nerve. The patient complains of burning and numbness that extends from the sole of the foot and toes to the medial malleolus.

347. The answer is a. (*Mehta, pp 73, 176.*) The sciatic nerve is located between the ischial tuberosity and the greater trochanter; tenderness over the nerve indicates irritation of the nerve roots forming the nerve. **The most common cause of sciatica is a herniated disk** usually occurring at

the L4–L5 or L5–S1 levels. The **straight-leg raising test** is usually positive in sciatic nerve irritation (pain is produced with elevation of $<70^\circ$ and worsened with dorsiflexion of foot or **Lasègue's sign**). A pulling or tight sensation in the hamstring is not a positive straight-leg raising test. **Cross-leg raising test** (elevation of unaffected leg causes pain in affected leg) may also be positive. Osteomyelitis and epidural abscesses are usually accompanied by systemic symptoms (i.e., fever) and are found in patients who are immunocompromised. The typical presentation for **cauda equina syndrome** is progressive weakness and numbness of the lower extremities bilaterally with urinary retention. There is perineal and perianal sensory loss ("**saddle anesthesia**") and a lax anal sphincter. The cauda equina syndrome is a true surgical emergency. Kyphosis ("hunchback") is a smooth and rounded backward convexity of the thoracic region.

348. The answer is c. (*Mehta, pp 225–233.*) The **radial nerve** lies next to the shaft of the humerus in the spiral groove. It may be injured as a result of humeral fractures, especially those involving the distal third of the humerus. The radial nerve (C6–C8) supplies the extensor muscles of the wrist; damage to it results in **wristdrop**, a condition in which the patient is unable to extend the wrist. **Clawhand** is due to paralyzed interosseous and lumbrical muscles from an **ulnar nerve** (C8–T1) injury. The **median nerve** (C6–T1) supplies most of the flexors in the forearm (motor branches) and supplies sensory branches to the radial part of the hand; an injury will cause thenar atrophy.

349. The answer is e. (*Mehta, p 47.*) The signs and symptoms of **fat embolism syndrome** are those of adult respiratory distress syndrome (ARDS) in association with musculoskeletal trauma. It usually occurs 2–4 days after the injury. The predominant feature is respiratory failure. Petechiae are found in 50–60% of patients, generally on the anterior chest and neck, axillae, and conjunctivae. Although fractures of the pelvis may cause life-threatening blood loss and subsequent hypovolemic shock, the patient will probably have had other symptoms, such as oliguria, hypotension, pale conjunctiva, clouded sensorium, and cool extremities.

350. The answer is a. (*Mehta, pp 289–306.*) The anterior and posterior cruciate ligaments are intraarticular ligaments and contribute to the stability of the knee. The most likely diagnosis in this gymnast is tear of the **ante-**

rior cruciate ligament (ACL). Both the **Lachman test** (the patient is placed in the supine position with the knee flexed at 15° while the examiner stabilizes the distal thigh with one hand and grasps the patient's leg distal to the tibiofemoral joint with the other hand; the test is positive if the examiner is able to move the tibia anteriorly) and the **anterior drawer test** (the foot is immobilized while the hip and knee are flexed, then the tibia is moved anterior relative to the femur; a positive test occurs with forward displacement of the tibia of more than 0.5 cm) are positive in this kind of injury. The Lachman test is more sensitive than the drawer test. Aspirated joint fluid is usually bloody in ACL injuries. An MRI is helpful in diagnosing this injury. A **posterior cruciate ligament (PCL)** tear would have a positive **posterior drawer test** whereby posterior displacement of the tibia is elicited on physical examination. A torn medial meniscus often causes the patient to complain of knee catching, locking, and clicking. The **McMurray test** (with the patient supine, flex the knee and hold the foot in one hand; rotate the leg and slowly extend the knee while palpating the posteromedial margins of the joint for a palpable click as the femur passes over the torn meniscus) is positive for a **torn medial meniscus**. A torn lateral meniscus is tested by palpating the posterolateral margin of the knee joint with the leg in full internal rotation as the knee is extended. Medial meniscus tears are more common than lateral meniscus tears and are usually due to twisting injuries. Unlike the immediate swelling seen with tears of vascular structures such as the ACL, the relatively avascular meniscus (cartilage) causes more gradual swelling.

351. The answer is c. (Fauci, 14/e, pp 611–613.) A history of pain that increases in severity, worsens at night, and is relieved by aspirin suggests the diagnosis of osteoid osteoma. This benign tumor is more common in males than females, and patients present between 20 and 30 years of age. The proximal femur is the most common site for this tumor. Other benign tumors of bone include giant cell tumor (osteoclastoma), osteochondroma, chondroblastoma, and osteoblastoma. The most common malignant tumors of bone include osteosarcoma (45%), chondrosarcoma (25%), Ewing's sarcoma (15%), and malignant fibrous histiocytoma. Osteosarcomas commonly involve the distal femur. Chondrosarcomas are seen in older patients (40–50 years old). Osteosarcomas may be seen later in life as a complication of Paget's disease.

352. The answer is c. (*Mehta, pp 302–311.*) The lateral and medial collateral ligaments are on either side of the knee. Forced valgus bending of the knee may rupture the **medial collateral ligament (MCL)**, also called the tibial collateral ligament. **This is the most frequently injured ligament of the knee.** Patients present with pain over the medial aspect of the knee. Injuries to the MCL may, in turn, tear the medial meniscus since the MCL is attached to the medial meniscus. Patients with medial mensical tears may complain of “**locking**” of the knee in flexion with activity while walking. Injuries of the lateral (fibular) collateral ligament cause tenderness over the lateral knee with palpation, but these injuries are not common. Dislocation or subluxation of the patella is due to a great force. “Locking” is common and the patella is usually displaced laterally. Subluxation reduces by itself, while dislocation requires reduction.

353. The answer is b. (*Mehta, pp 231–235, 245–247.*) **Carpal tunnel syndrome (CTS)** is the most likely diagnosis. It is due to median nerve compression by the transverse carpal ligament. Risk factors for this disorder include diabetes mellitus, pregnancy, hypothyroidism, rheumatoid arthritis, repetitive activity, and acromegaly. The **Tinel sign** (paresthesias or pain reproduced with percussion of the volar surface of the wrist) and **Phalen sign** (symptoms are reproduced by holding the wrist in passive flexion for 1 min) may be positive. Patients may complain of pain in the forearm, the thenar eminence, and the first three digits. **Thoracic outlet syndrome** usually causes medial arm pain and paresthesia when using the arms. The presence of a cervical rib is a risk factor for this disorder. **Dupuytren’s contracture** is a fibrotic process of the palmar fascia that causes fixed flexion of the ring finger. **Mallet finger** is a flexion deformity of the distal interphalangeal joint and is generally the result of traumatic rupture of the extensor tendon of the distal phalanx. A ganglion is a painless, firm cystic mass arising from any joint or tendon sheath. A trigger finger may be seen in patients with rheumatoid arthritis. It occurs when an enlarged flexor tendon sheath passes through the pulleys of the digits, causing locking or catching.

354. The answer is c. (*Mehta, pp 118, 173–180.*) Since the patient has no neurologic compromise, the most likely diagnosis is back strain. Strain is common in people in their forties. It is exacerbated by activity and improves

with rest. A **straight-leg maneuver** is positive for nerve root compression from disk herniation when pain is produced at less than 70° of elevation. **Crossover pain** (straight-leg maneuver of nonpainful leg worsens pain of involved leg) is also a strong indicator of nerve root compression, but only if pain is produced below the knee. Paravertebral abscess usually presents with fever and tenderness with percussion of the affected back area. Risk factors for osteoporosis include female gender, menopause, lack of activity, slim body habitus, older age, inadequate calcium intake, medications such as corticosteroids, and racial-ethnic background (Asian and northern European descent). **Paget's disease** (osteitis deformans) is a slowly progressing disease of bone that may be asymptomatic or may cause bone pain, deformities (such as a large skull or leg bowing), hearing loss, and fractures. It begins in middle-aged men and is thought to be due to an inborn error of metabolism causing the formation of poorly organized bone.

355. The answer is d. (Mehta, pp 253–288.) **Trochanteric bursitis** is a common cause of hip pain in the elderly but may be seen in bicyclists and runners. Pain is exacerbated by standing and by external rotation. Lying on the affected side compresses the inflamed bursa. **Ischial bursitis** (“weaver’s bottom,” so named because weavers had to sit for long periods of time, which led to ischial bursitis) causes pain in the buttock made worse with sitting and with hip flexion. Today, it is usually a problem for workers who operate heavy equipment on rough roads. **Avascular necrosis (AVN) of the hip** may be due to trauma or to medications such as corticosteroids. Patients are usually between the ages of 30 and 60 years and often complain of groin pain made worse with weight-bearing. Fracture of the proximal femur usually follows trauma. On inspection, the affected lower extremity lies in external rotation and is shorter than the normal side. Hip osteoarthritis presents with groin pain exacerbated by the **Faber** maneuver (also called the **Patrick test**), which is a mnemonic for **F**lexion, **A**Bduction, and **E**xternal **R**otation.

356. The answer is c. (Hay, 14/e, pp 660, 699–701.) A child with **Sprengel's deformity** cannot raise one arm completely due to a small and elevated scapula. Torticollis (wry neck due to shortening of the sternocleidomastoid muscle) often accompanies the deformity. Adolescents with **slipped capital femoral epiphysis (SCFE)** are often obese African American males who present with thigh or knee pain. SCFE is a disorder of unknown etiology

that causes posterior and medial displacement of the femoral head. Children with **juvenile rheumatoid arthritis (JRA)** present with fever, salmon-colored rash, arthritis, hepatosplenomegaly, nodules, pericarditis, and iridocyclitis (may lead to blindness). There is no diagnostic test for JRA, but the disease resolves by puberty in the majority of children. **Arnold-Chiari malformation** is an abnormality of neural tube closure. **Cerebral palsy (CP)** is a nonprogressive disorder resulting from a perinatal insult; it causes either a spastic paresis of the limbs or extrapyramidal symptoms (chorea, athetosis, ataxia). Patients with CP often have an associated seizure disorder, mental retardation, and speech or sensory deficits.

357. The answer is a. (*Mehta, pp 113–115.*) The patient is describing **pseudoclaudication**, which is characteristic of **lumbar spinal stenosis**. This arises from compression of the exiting nerve roots by a disk, osteophyte, or narrow canal. The leg pain is most pronounced when walking downhill or descending stairs and takes several minutes of sitting or flexing forward before resolution. Often patients who continue to walk with pain will stoop over to relieve the symptoms (“**stoop sign**”). Claudication is seen in peripheral vascular disease, but the pain that occurs with walking resolves immediately upon stopping or standing without sitting. Peripheral pulses may be compromised. Diffuse idiopathic skeletal hyperostosis (DISH) causes calcification of the longitudinal ligaments of the spine and is usually found in patients with diabetes mellitus.

358. The answer is e. (*Tintinalli, 5/e, pp 1838–1841.*) The patient most likely has compartment syndrome from elevated pressure in a confined space compromising nerve, soft tissue, and muscle perfusion. Etiologies include burn injuries, crush injuries, and fractures. **Compartment syndrome** is often referred to as the disorder of **Six P’s** (**P**ain, **P**allor, **P**aralysis, **P**aresthesias, **P**oikilothermia, and **P**ulselessness). Immediate fasciotomy and restoration of tissue perfusion is the treatment for compartment syndrome.

359. The answer is a. (*Mehta, pp 215–224.*) **Tennis elbow or lateral epicondylar tendonitis** is most commonly characterized by tenderness of the common extensor muscles at their origin (the lateral epicondyle of the humerus). Passive flexion of the fingers and wrist and having the patient extend the wrist against resistance causes pain. **Golfer’s elbow or medial**

epicondylar tendonitis is a similar disorder of the common flexor muscle group at its origin, the medial epicondyle of the humerus. **Olecranon bursitis** is an inflammation of the bursa over the olecranon process caused by acute or chronic trauma (“**student’s elbow**”) or secondary to gout, rheumatoid arthritis, or infection. Clinically, there is swelling or pain upon palpation of the posterior elbow. Paralysis of the serratus anterior muscle (innervated by the long thoracic nerve) causes the scapula to protrude posteriorly from the posterior thoracic wall when the patient is asked to push against a wall (**winged scapula**).

360. The answer is d. (*Fauci, 14/e, p 80.*) The most likely diagnosis in this patient is **whiplash** or cervical musculoligamentous sprain or strain. Whiplash-associated disorders begin after a symptom-free period following a hyperextension or hyperflexion injury, usually in an MVA. It is vital to perform a complete neurologic examination to exclude other causes of neck pain. Ankylosing spondylitis is a chronic and progressive inflammatory disease that most commonly affects spinal, sacroiliac, and hip joints. Osteoarthritis most often affects the weight-bearing joints. Reiter syndrome usually causes an arthritis of the hips, and there is often a history of urethritis, conjunctivitis, and foot involvement.

361–363. The answers are 361-e, 362-b, 363-g. (*Mehta, pp 323, 338–343.*) Improper footwear results in lateral deviations of the great toe, extensor, and flexor hallucis longus tendons (bunion formation). Hammer toe often affects the second toe. The metatarsophalangeal joint is dorsiflexed and the proximal interphalangeal joint has plantar flexion. A stress fracture of a metatarsal is called a “march” fracture. **Stress fractures** result in bone resorption followed by insufficient remodeling due to continued activity. Stress fractures occur in the tibia as well as the metatarsal; examination typically reveals point tenderness and swelling. In **genu varum** (bowleg), the lateral femoral condyles are widely separated when the feet are placed together in the extended position. In **genu recurvatum**, the knee hyperextends, and in **genu impressum**, there is flattening and bending of the knee to one side with displacement of the patella. **Pes planus** is a flattened longitudinal arch of the foot often called flat foot. **Morton’s neuroma** causes pain in the forefoot that radiates to one or two toes with tenderness between the two metatarsals. The pain may be further aggravated by squeezing the metatarsals together.

364–365. The answers are 364-d, 365-b. (*Mehta, pp 67–68, 248–251.*)

Hypertrophic osteoarthropathy is nail clubbing accompanied by a symmetrical polyarthritis involving the large joints and occasionally the metacarpophalangeal joints. Hypertrophic osteoarthropathy may be seen secondary to malignancy, endocarditis, vasculitis, and other pulmonary and cardiac diseases. **Ankylosing spondylitis (AS)** is a chronic and progressive inflammatory disease, seen mostly in men in their thirties, that most commonly affects the spinal, sacroiliac, and hip joints. It may go undiagnosed for many years and bilateral hip pain due to sacroiliac involvement may be clinically undetectable. It is strongly associated with HLA-B27. Examination of the spine usually reveals a limitation in movement; patients in advanced stages may have a characteristic bent-over posture. Patients with AS may present with an acute nongranulomatous uveitis and limited chest expansion due to involvement of the costovertebral joints. The **Schober test** is positive in AS (with the patient erect, marks are made 5 cm below and 10 cm above the lumbosacral junction between the posterior superior iliac spines; the patient bends, marks are measured, and if the distance between the two marks increases by less than 4 cm there is spinal immobility). The pathogenesis of **reflex sympathetic dystrophy** is unknown. The presentation may be seen after peripheral limb injury; early symptoms include pain in the limb and edema. This disorder may lead to contractures. **Charcot joint** is a complication of peripheral neuropathy seen in diabetic patients. Repetitive minor trauma to the foot causes deformities, which may lead to skin breakdown, erythema, edema, and callus formation.

366–367. The answers are 366-b, 367-c. (*Sapira, pp 483–485.*) Ninety percent of radiculopathies involve the L5 or S1 nerve roots.

L5 motor: Assessed by asking the patient to walk on the heels

L5 sensory: Medial forefoot and lateral aspect of the leg

S1 motor: Assessed by asking the patient to walk on the toes

S1 sensory: Lateral foot

S1 reflex: Achilles reflex

L4 motor: Assessed by asking the patient to squat and rise (knee flexion and extension)

L4 sensory: Medial aspect of the leg

L4 reflex: Patellar

L2 motor: Assessed by hip adduction

368–369. The answers are 368-c, 369-b. (*Seidel, 4/e, pp 729, 731.*) The **Apley test** is used to detect a torn meniscus. A positive test occurs when there is pain, clicking, or locking of the knee with rotation. Both the **ballottement test** and the **bulge sign** detect a knee effusion. The ballottement procedure is performed with the knee extended. Downward pressure is applied on the suprapatellar pouch and the patella is pushed backward against the femur. Pressure on the patella is then released and the patella floats out (fluid wave) with an effusion. A positive bulge test occurs when a bulge of fluid returns to the medial aspect of the knee with lateral tapping.

NEUROLOGY

Questions

DIRECTIONS: Each of the numbered items or incomplete statements in this section is followed by answers or by completion of the statements. Select the **one** lettered answer or completion that is **best** in each case.

370. A 31-year-old man complains of daily throbbing headaches for the last 2 wk. He has approximately eight episodes per day, each lasting 20 min. The headaches are localized to the left periorbital area and are accompanied by tearing of the left eye, left ptosis, rhinorrhea, and left facial redness. The patient remembers having a similar problem 2 years ago that lasted for 3 wk. He did not seek medical help at that time. The patient feels that the headaches are often precipitated by drinking a glass of wine. Which of the following is the most likely diagnosis?

- a. Migraine headache
- b. Cluster headache
- c. Tension headache
- d. Trigeminal neuralgia
- e. Sinusitis

371. A 22-year-old woman presents with the chief complaint of diplopia for several weeks. She admits to occasional vertigo and ataxia. Six months ago, she had urinary incontinence for 1 mo. Examination of the eyes reveals nystagmus and funduscopic exam reveals swelling of the optic nerve (papillitis). The patient has increased muscle tone of the lower extremities and is hyperreflexic. She has bilateral extensor plantar reflexes and loss of position sense. Which of the following is the most likely diagnosis?

- a. Multiple sclerosis
- b. Friedreich's ataxia
- c. Acute transverse myelitis
- d. Brown-Séquard syndrome
- e. Syringomyelia

372. A 49-year-old woman is brought to the emergency room after suddenly losing consciousness. Her husband states that the patient was in good health until 2 h ago, when she suddenly complained of a severe headache. After one episode of vomiting, the patient lost consciousness. The husband states that there were no seizure-like movements and no incontinence. The patient did not take any medications, smoke, drink, or use illicit drugs. On physical examination, the patient has a regular heart rate of 100/min, a respiratory rate of 16/min, and a blood pressure of 120/80 mm Hg, and is afebrile. Heart and lung examinations are normal. On neurologic exam, the patient responds only to painful stimuli and her deep tendon reflexes are bilaterally equal. She has bilateral flexor plantar responses. She has neck stiffness and attempts to resist forward flexion. Which of the following is the most likely diagnosis?

- a. Carotid artery thrombosis
- b. Embolic infarction of the brain
- c. Frontal lobe hemorrhage
- d. Subarachnoid hemorrhage
- e. Complicated migraine

373. A 39-year-old man presents with progressive weakness of his arms and legs. He noticed difficulty in performing tasks such as buttoning up his shirt several months ago, and his symptoms have continued to worsen. On physical examination, cranial nerve and sensory findings are normal. Severe atrophy and fasciculations are seen in the legs, arms, and tongue. The patient has a spastic muscle tone, hyperactive reflexes, and bilateral extensor plantar reflexes. Which of the following is the most likely diagnosis?

- a. Werdnig-Hoffmann disease
- b. Multiple sclerosis
- c. Pott's disease
- d. Amyotrophic lateral sclerosis
- e. Todd's paralysis
- f. Poliomyelitis
- g. Guillain-Barré syndrome

374. When testing a patient's extraocular muscle movements, you detect that the right eye cannot adduct past the midline. However, when you move a fingertip toward the patient's nose, convergence does occur. Which of the following is the most likely diagnosis?

- a. Paralysis of cranial nerve VI
- b. Paralysis of cranial nerve III
- c. Internuclear ophthalmoplegia
- d. Retrobulbar optic neuritis
- e. Paralysis of cranial nerve II

375. A 30-year-old obese woman presents with a 2-mo history of a nonthrobbing headache that is constant and dull in nature. The headache is worsened with bending over or sneezing and upon awakening in the morning. The patient also complains of blurred vision and occasional diplopia. Funduscopic examination reveals blurring of the optic discs bilaterally and no other neurologic deficit. Which of the following is the most likely diagnosis?

- a. Infratentorial brain tumor
- b. Pseudotumor cerebri
- c. Supratentorial brain tumor
- d. Pituitary adenoma
- e. Metastatic brain tumor

376. A 44-year-old man presents with facial asymmetry. On physical examination, touching the cornea of either eye with a cotton swab results in blinking of only the left eye. The patient states that he feels the cotton swab touch in both eyes. Which of the following is the most likely diagnosis?

- a. Left trigeminal palsy
- b. Right trigeminal palsy
- c. Right facial nerve palsy
- d. Left facial nerve palsy
- e. Left oculomotor nerve palsy

377. Which of the following statements is correct concerning reflex eye movements?

- a. Oculocephalic eye movements (“doll’s eye” phenomenon) are elicited by slowly moving the head from side to side
- b. If the brainstem is intact, comatose patients’ eyes should move conjugately in the same direction that the head is turned
- c. In comatose patients with brainstem involvement, the eyes always move disconjugately or not at all
- d. If the brainstem is intact, the caloric reflex test (oculovestibular), which introduces ice water into the external auditory canal, produces tonic deviation of the eyes to the side opposite that of irrigation
- e. The oculovestibular or caloric reflex is not used to assess brainstem involvement

378. A 51-year-old alcoholic presents to the emergency room with horizontal nystagmus, ataxic gait, and confusion. Which of the following is the most likely diagnosis?

- a. Wernicke syndrome
- b. Niacin deficiency
- c. Korsakoff syndrome
- d. Klüver-Bucy syndrome
- e. Delirium tremens

379. An 18-year-old presents with bilateral leg weakness that has progressed over the last several days. He noticed some numbness and tingling of the toes and feet that has now progressed to his thigh and pelvic areas. He has no bladder or bowel incontinence. He denies use of tobacco, alcohol, or drugs and takes no medications. Past medical history is unremarkable except for an upper respiratory tract infection 2 wk ago. On physical examination, the vital signs are normal. Neurologic examination reveals an inability to move the muscles of facial expression on the left side of the face. There is bilateral symmetric weakness and deficit to pinprick and vibration of the lower extremities. Deep tendon reflexes are absent in the lower extremities. Which of the following is the most likely diagnosis?

- a. Myasthenia gravis
- b. Multiple sclerosis
- c. Poliomyelitis
- d. Charcot-Marie-Tooth disease
- e. Guillain-Barré syndrome

380. Patients with a left hypoglossal nerve palsy will have which of the following?

- a. Deviation of the tongue to the left
- b. Deviation of the tongue to the right
- c. Loss of taste on the left
- d. Deviation of the jaw to the left
- e. Deviation of the jaw to the right

381. A 37-year-old woman who works as a computer data analyst presents with intermittent numbness and tingling of her right thumb, middle finger, and index finger. The sensation awakens her from sleep and is worse when she is knitting or driving. She denies back, neck, arm, or shoulder pain. There is no history of trauma. On physical examination, there is atrophy and weakness of the muscles of abduction of the right thumb. Flexion of the wrist or percussion of the wrist intensifies the tingling sensation. Which of the following is the most likely diagnosis?

- a. Wristdrop
- b. Ulnar neuropathy
- c. Erb-Duchenne palsy
- d. Klumpke-Déjérine palsy
- e. Carpal tunnel syndrome
- f. Cervical radiculopathy

382. Which of the following grades of deep tendon reflexes best describes a patient with transient and intermittent clonus?

- a. Grade 0
- b. Grade 1+
- c. Grade 2+
- d. Grade 3+
- e. Grade 4+

383. Which of the following is considered to be a positive Romberg test?

- a. The patient stands erect with feet together, head erect, and eyes open, and is then asked to close the eyes and develops vertigo
- b. The patient stands erect with feet together, head flexed, and eyes open, and is then asked to close the eyes and loses balance
- c. The patient stands erect with feet together, head erect, and eyes open, and is then asked to close the eyes and loses balance
- d. The patient stands erect with feet apart, head erect, and eyes open, and is then asked to close the eyes and loses consciousness

384. A 14-year-old boy presents with a history of intermittent facial grimacing, twitching, and eye blinking since childhood. The movements are repetitive and often move from one part of the face to another. On physical examination, cranial nerve, sensory, and cerebellar examinations are normal. Motor examination reveals frequent and quick repetitive eye blinking, nasal twitching, and facial grimacing accompanied by an occasional snort or grunt. Which of the following is the most likely diagnosis?

- a. Tardive dyskinesia
- b. Gilles de la Tourette syndrome
- c. Asterixis
- d. Sydenham's chorea
- e. Huntington's chorea
- f. Wilson's disease

385. A 26-year-old woman presents with the chief complaint of weakness that worsens throughout the day. She especially notices weakness and feeling tired when chewing food. The patient states that she feels strong upon arising in the morning but the weakness develops over the course of the day. She also complains of her eyelids drooping and occasional diplopia. Neurologic examination reveals ptosis after 1 min of sustained upward gaze. Which of the following is the most likely diagnosis?

- a. Lambert-Eaton syndrome
- b. Botulism
- c. Myasthenia gravis
- d. Multiple sclerosis
- e. Friedreich's ataxia

386. Examination of a patient's visual fields reveals complete blindness in the left eye. Ophthalmoscopic examination is normal. Which of the following lesions is most likely causing this abnormality?

- a. A lesion between the optic chiasm and the lateral geniculate body
- b. A lesion between the retina and the optic chiasm
- c. A lesion between the lateral geniculate body and the visual cortex
- d. A lesion at the medial longitudinal fasciculus
- e. A lesion of one occipital lobe
- f. Bilateral lesions of the occipital lobes

387. A 32-year-old previously healthy man is brought to the emergency room after having a seizure. He has no family history of seizure and denies alcohol use, illicit drug use, or trauma. A family member states that recently the patient has been complaining of a headache and has been acting bizarre, which is a change in his personality. Physical examination reveals a temperature of 100.9°F. Blood pressure and heart rate are normal. During examination, the patient has a partial complex seizure. CT scan of the head reveals hemorrhagic necrosis of the temporal lobes. Which of the following is the most likely diagnosis?

- a. Lyme disease
- b. Cysticercosis
- c. Progressive multifocal leukoencephalopathy
- d. Herpes encephalitis
- e. Rabies
- f. Waterhouse-Friderichsen syndrome

DIRECTIONS: Each set of matching items in this section consists of a list of lettered options followed by several numbered items. For each numbered item, select the appropriate lettered option(s). Each lettered option may be selected once, more than once, or not at all. **Each item will state the number of options to select. Choose exactly this number.**

Items 388–391

For each patient with neurologic deficit, choose the most likely diagnosis.

- a. Basilar artery stroke
- b. Middle cerebral stroke
- c. Anterior cerebral stroke
- d. Transient ischemic attack
- e. Posterior cerebral stroke
- f. Persistent vegetative state
- g. Wallenberg syndrome
- h. Lacunar infarct

388. A 52-year-old man presents with “locked-in” syndrome. On neurologic examination, the patient is quadriplegic with sensory loss and cranial nerve involvement. He is able to respond to questions using his eyes. **(CHOOSE 1 DIAGNOSIS)**

389. A 71-year-old woman presents with aphasia and severe right-sided hemiparesis greater in the arm than the leg. Her eyes deviate to the left. **(CHOOSE 1 DIAGNOSIS)**

390. A 67-year-old man presents with an episode of right face, arm, and leg weakness that resolved on arrival to the emergency room. **(CHOOSE 1 DIAGNOSIS)**

391. A 31-year-old woman is resuscitated after a motor vehicle accident but does not respond to painful stimuli. She occasionally yawns, coughs, and has spontaneous eye opening and movement. She maintains a sleep-wake cycle. **(CHOOSE 1 DIAGNOSIS)**

Items 392–395

For each patient with neurologic deficit, choose the most likely diagnosis.

- a. Upper motor neuron disease
- b. Lower motor neuron disease
- c. Myelopathy
- d. Radiculopathy
- e. Broca’s aphasia
- f. Wernicke’s aphasia

392. A 61-year-old man presents with flaccid paralysis, atrophy, fasciculations, and hyporeflexia. **(CHOOSE 1 DIAGNOSIS)**

393. A 48-year-old man presents with spastic paralysis, hyperreflexia, and an extensor plantar reflex. **(CHOOSE 1 DIAGNOSIS)**

394. A 41-year-old man presents with spastic legs, bilateral extensor plantar reflexes, hyperreflexia, and loss of sensation (position sense and vibration) of the lower extremities. (CHOOSE 1 DIAGNOSIS)

395. A 70-year-old woman presents with poorly articulated phrases but understands commands. (CHOOSE 1 DIAGNOSIS)

Items 396–397

For each patient with headache, describe the most likely kind of headache.

- Complicated migraine
- Basilar artery migraine
- Classic migraine
- Common migraine
- Sinus headache
- Temporal arteritis

396. A 24-year-old woman has a 2-year history of recurrent right-sided headaches that are throbbing in nature and are preceded by 30 min of scintillating scotomas and fortifications. (CHOOSE 1 KIND OF HEADACHE)

397. A 23-year-old woman complains of periodic, throbbing, right-sided headaches accompanied by nausea and vomiting. On physical examination during the time of headache, the patient demonstrates a right oculomotor nerve palsy. MRI is normal. (CHOOSE 1 KIND OF HEADACHE)

Items 398–401

For each patient with a gait disturbance, choose the most likely kind of gait disturbance.

- Ataxic gait
- Parkinsonian gait
- Spastic hemiplegic gait
- Steppage gait
- Scissor gait

398. A 60-year-old man ambulates with his upper torso stooped forward. His feet shuffle and he has lost his arm swing. (CHOOSE 1 GAIT)

399. A 55-year-old woman walks by lifting one foot further off the ground than the other. (CHOOSE 1 GAIT)

400. A 62-year-old man walks with his feet widely spaced; steps occur with each foot lifted abruptly and too high and brought down in a stamping manner. (CHOOSE 1 GAIT)

401. A 49-year-old woman walks by moving her right leg forward by abduction and circumduction. (CHOOSE 1 GAIT)

NEUROLOGY

Answers

370. The answer is b. (*Fauci, 14/e, pp 2307–2311, 2377.*) **Cluster headaches** are often referred to as “suicide headaches” because of the severity of the symptoms. These recurring headaches are accompanied by facial flushing, nasal stuffiness, tearing, and a partial Horner syndrome (there is no anhidrosis). They are more common in men (the usual age is 20–50) than women and are exacerbated by alcohol use. Migraine headaches do not have this timing or duration. **Tension headaches** are bilateral, nonthrobbing, and symmetric. They are usually located in the frontal or occipital areas of the skull and are thought to be related to muscle contraction. They are often described as being viselike. The **headache of sinusitis** is not abrupt in onset or cessation and patients often have tenderness with percussion of the sinuses. **Trigeminal neuralgia** (tic douloureux) is a paroxysmal severe facial pain over the distribution of the trigeminal nerve. Women are affected more than men, and patients are usually over the age of 40. The pain of trigeminal neuralgia can be triggered by simply touching the skin near the nostril.

371. The answer is a. (*Fauci, 14/e, pp 1120, 2409–2414, 2366, 2382, 2387–2388.*) The patient most likely has **multiple sclerosis**, a demyelinating disease characterized by visual impairment, an afferent pupillary defect (**Marcus Gunn pupil**) diplopia, nystagmus, limb weakness, spasticity, hyperreflexia, extensor plantar reflexes, vertigo, ataxia, dysarthria, scanning speech, emotional lability, and bladder dysfunction. Patients with optic neuritis are at risk for developing blindness. **Friedreich’s ataxia** is an autosomal recessive disease in which young patients present with pes cavus foot deformity, spasticity, areflexia, ataxia, and cardiomyopathy. Patients with acute **transverse myelitis** initially present with back pain followed by weakness and loss of sensation below the level of the pain. Often, there may be bladder and bowel incontinence. Transverse myelitis may be seen after vaccination or infections. **Brown-Séquard syndrome** (cord hemisection) is characterized by contralateral loss of pain and temperature and ipsilateral spasticity, weakness, hyperreflexia, extensor plantar reflex, and loss of pro-

prioception (vibration and position sense). Patients with **syringomyelia** have bilateral paralysis, muscle atrophy, and fasciculations along with pain and temperature sensory loss in a shawl-like or capelike distribution.

372. The answer is d. (*Fauci, 14/e, pp 2325–2346.*) There are **three types of stroke**: subarachnoid hemorrhage, cerebral infarction, and intracerebral hemorrhage. This patient presents after complaining of a severe headache. She has neck stiffness and no focal deficit on neurologic exam. The loss of consciousness requires bihemispherical dysfunction, and this along with the abrupt history is most consistent with a **subarachnoid hemorrhage** (SAH). Common causes of SAH include ruptured aneurysm (i.e., berry) and arteriovenous malformation (AVM). **Intracerebral hemorrhage** (ICH) rarely produces coma (must be significantly large to do so) and patients do not complain of headache (does not involve the meninges). Patients with ICH have focal deficits that appear abruptly and slowly progress over hours. An **embolic stroke** can involve any carotid artery but must be bilateral to cause loss of consciousness. Patients often have a history of atrial fibrillation or cardiac problems.

373. The answer is d. (*Fauci, 14/e, pp 1007, 2368–2371.*) **Amyotrophic lateral sclerosis** (ALS) is a degenerative disease that is the result of lower (anterior horn cells) and upper (corticospinal tracts) motor neuron loss. Patients present with asymmetric muscle weakness, atrophy, fasciculations, spasticity, hyperactive reflexes, and extensor plantar reflexes. Patients may complain of dysphagia and difficulty holding the head up. **Pott's disease** is tuberculosis of the thoracic vertebral bodies. **Todd's paralysis** is a transient paralysis following a seizure. **Werdnig-Hoffmann disease** is “floppy baby” disease; infants present with fasciculations. Poliomyelitis is a lower motor neuron disease.

374. The answer is c. (*Seidel, 14/e, pp 285–286.*) **Internuclear ophthalmoplegia** (INO) is caused by a lesion in the medial longitudinal fasciculus (MLF) and may be due to glioma in children, multiple sclerosis in young adults, or vascular infarction in the geriatric age group. INO commonly causes paresis of adduction of the ipsilateral eye (patients cannot look medially), horizontal nystagmus in the contralateral abducting eye, vertical nystagmus with upward gaze, and intact convergence.

375. The answer is b. (*Fauci, 14/e, pp 167, 1989–1990.*) Patients with **pseudotumor cerebri** (benign intracranial hypertension) present with headache and papilledema. They are often obese women in their childbearing years. Other possible causes include hypervitaminosis A and the use of oral contraceptives or antibiotics (tetracycline). Lumbar puncture will reveal an elevated opening pressure. Treatment includes weight reduction and repeated lumbar punctures to reduce intracranial pressure. A complication of pseudotumor cerebri is blindness; patients with visual changes may require emergency optic nerve sheath decompression. **Pituitary adenomas** are benign tumors that may cause a bitemporal hemianopsia and endocrine disturbances, such as hyperprolactinemia (galactorrhea), acromegaly or gigantism, and Cushing's disease. A ruptured berry aneurysm causes a subarachnoid hemorrhage (SAH). Patients present with the acute onset of severe headache, photophobia, and neck stiffness. **Adults commonly have supratentorial primary brain tumors (astrocytoma including glioblastoma multiforme is the most common), while children have infratentorial primary brain tumors (medulloblastoma is the most common).** Overall, **metastatic brain tumors are more common than primary brain tumors.** The most common metastatic brain tumors come from the **Lung, Breast, Skin, Kidney, GI tract** (mnemonic: Lots of Bad Stuff Kills Glia). **The headache of tumor is often continuous; exacerbated by coughing, sneezing, movement, and Valsalva maneuver; and worse in the morning.**

376. The answer is c. (*Seidel, 4/e, p 775.*) The **corneal reflex** is normal when touching the cornea (trigeminal nerve provides sensation) causes bilateral eye closure (facial nerve provides motor). This reflex will not occur on the side of a facial nerve paralysis.

377. The answer is c. (*Sapira, pp 479–480.*) The test for the **oculocephalic** or “**doll's eyes**” reflex is performed by rapidly rotating the head from side to side. If the brainstem is intact in a comatose patient, the eyes will move conjugately in the direction opposite to the head rotation. If the brainstem is not intact, the eyes will move disconjugately or not at all. The **oculovestibular** or **caloric reflex** is performed by introducing ice water into the external auditory canal. The comatose patient with an intact brainstem will respond with deviation of the eyes to the side of the irrigation. If the brainstem is not intact, the reflex will be absent or the eyes will move disconjugately.

378. The answer is a. (*Fauci, 14/e, pp 2455, 2504, 2506–2507.*) The triad of nystagmus and paralysis of eye muscles, ataxia, and confusion is associated with **Wernicke syndrome**. **Korsakoff syndrome** consists of confabulation, confusion, and recent memory loss. These disorders are often found in thiamine (B₁)-deficient malnourished alcoholics and are secondary to lesions in the mamillary bodies. Niacin deficiency (pellagra or vitamin B₃ deficiency) causes the triad of **D's** (**D**ementia, **D**ermatitis, and **D**iarrhea). **Klüver-Bucy syndrome** is due to lesions in the amygdala; patients present with hypersexuality, compulsive attention to detail, docile behavior, and an inability to recognize objects visually (agnosia). **Delirium tremens** is seen 48–96 h following abstinence from alcohol; patients present with insomnia, confusion, tremors, delusions, visual hallucinations, and hyperactivity of the autonomic nervous system (i.e., sweating, tachycardia, fever, and dilated pupils).

379. The answer is e. (*Fauci, 14/e, pp 2300–2301, 2463.*) Acute inflammatory polyneuropathy or **Guillain-Barré syndrome** is a progressive, symmetrical, autoimmune demyelinating disorder that affects distal areas first (legs) and marches proximally to involve the arms, trunk, and intercostal, neck, and cranial muscles. Patients often have an antecedent viral infection (respiratory or gastrointestinal) or a history of a recent immunization. Patients are areflexic and have sensory and motor deficits with cranial nerve involvement. **Poliomyelitis** is a viral meningoencephalitis that destroys the anterior horn cells and causes an asymmetric flaccid weakness with fasciculations and hyporeflexia (lower motor neuron). **Charcot-Marie-Tooth disease** (CMT) is an inherited, slowly progressive peripheral sensory-motor neuropathy causing distal muscle atrophy (“inverted champagne bottle legs” or “stork legs”) and sensory loss. Patients with CMT typically have pes cavus or hammer toe foot deformities.

380. The answer is a. (*Seidel, 4/e, pp 777–778.*) The tongue will deviate to the left with a left hypoglossal nerve palsy. The nerve is purely motor.

381. The answer is e. (*Fauci, 14/e, pp 2467–2468.*) The patient most likely has **carpal tunnel syndrome** (CTS), which is compression of the median nerve by the transverse volar ligament of the wrist. Patients complain of pain and paresthesias of the hand and weakness and atrophy of the thenar muscles. The **Tinel sign** (tapping the median nerve at the wrist) and **Phalen sign** (forced wrist flexion) intensify the symptoms. Risk factors for CTS include

pregnancy, diabetes mellitus, hypothyroidism, rheumatoid arthritis, amyloid infiltration as seen in patients with multiple myeloma, acromegaly, and repetitive trauma. Ulnar nerve paralysis causes a “**claw hand**” deformity. Radial nerve palsy causes **wristdrop**. **Erb-Duchenne palsy** (C5–C6) causes weakness of the shoulder and elbow and results in the “**waiter’s tip**” position (arm dangles at the side with palm in a backward position with fingers flexed). **Klumpke-Déjérine palsy** (C8–T1) is a triad of claw hand deformity, absent triceps reflex, and Horner syndrome. Patients with cervical radiculopathy (C6 or C7 root) complain of neck pain that radiates to the arm (radicular pain), dermatomal sensory loss, and decreased reflexes.

382. The answer is e. (*Seidel, 4/e, pp 788, 900.*) **Clonus** is rapidly alternating involuntary contraction and relaxation of skeletal muscle. Deep tendon reflex (DTR) response is graded on a scale from 0 to 4+:

0 = No response

1+ = Sluggish or diminished response

2+ = Active or expected response

3+ = More brisk than expected and slightly hyperactive response

4+ = Intermittent or transient clonus; hyperactive and brisk response

383. The answer is c. (*Seidel, 4/e, p 780.*) The **Romberg test** is performed by having the patient stand with feet together, head erect, and eyes open. The patient is then examined for steadiness and then asked to close his or her eyes. A positive test occurs when the patient displays increased unsteadiness with the eyes closed but not with the eyes open. A positive Romberg test may be seen in diseases that affect the dorsal columns, such as **tabes dorsalis** and **vitamin B**

₁₂ **deficiency.**

384. The answer is b. (*Fauci, 14/e, pp 1310, 2166–2168, 2354, 2362.*) **Tourette syndrome** is a disorder of repetitive progressive multiple tics involving the face, head, and shoulders and is often accompanied by vocal tics (i.e., grunts, snorts, involuntary swearing, or coprolalia). **Huntington’s chorea** is an autosomal dominant disorder characterized by abrupt, involuntary, nonrepetitive, jerky movements and dementia. Patients with **tardive dyskinesia** have developed purposeless movements, such as mouth smacking and tongue protrusion, after use of a dopamine-blocking neuroleptic drug. **Asterixis** is seen in patients with hepatic encephalopathy (“liver flap”)

or renal failure and is characterized by frequent inability to sustain wrist extension (“bye-bye” gesture). **Wilson’s disease** (hepatolenticular degeneration) is an autosomal recessive disorder of copper metabolism characterized by choreoathetosis, ataxia, cirrhosis, and corneal deposits called Kayser-Fleischer rings. A low serum ceruloplasmin or a high urinary copper level is found in Wilson’s disease. Sydenham’s chorea is seen in rheumatic fever.

385. The answer is c. (*Fauci, 14/e, pp 904–905, 2295, 2469–2472.*) **Myasthenia gravis** is “fatigable weakness” that primarily affects the respiratory, bulbar, and ocular muscles. The etiology of the disorder is autoimmune causing destruction of the acetylcholine receptors in the affected muscles. Thymic abnormalities often accompany the disorder, and the tensilon test (injection of edrophonium, which is an acetylcholinesterase inhibitor) often results in improvement of symptoms. **Lambert-Eaton myasthenic syndrome** (LEMS) is a progressive generalized weakness that improves with exercise and is associated with small cell carcinoma of the lung. Ocular and bulbar muscles are spared, but patients often have autonomic dysfunction. **Botulism** causes rapid progressive paralysis of the bulbar (nonreactive dilated pupils) and extraocular muscles and eventually causes skeletal and respiratory muscle weakness. The disorder is caused by ingestion of the exotoxin produced by *Clostridium botulinum*, which blocks acetylcholine release from nerve terminals.

386. The answer is b. (*Seidel, 4/e, pp 274–275.*) When defects are detected in only one eye, the lesion must be anterior to the optic chiasm. Lesions at the optic chiasm produce a bitemporal hemianopsia because this is where the nasal retinal fibers decussate. The medial longitudinal fasciculus (MLF) is involved with extraocular muscle contraction; a lesion to the MLF bilaterally will not allow either eye to look medially. Lesions between the geniculate body and the visual cortex produce a contralateral upper homonymous quadrantanopsia. A lesion in the visual cortex (occipital lobe) produces similar defects in each eye. Bilateral lesions of the occipital lobes result in complete loss of vision, but pupillary reflexes (fibers end in the midbrain) and extraocular muscle movements remain intact.

387. The answer is d. (*Fauci, 14/e, pp 2053, 2424, 2436–2437, 2440–2442, 2448.*) Patients with **herpes simplex encephalitis** present with a subacute course consisting of personality changes, fever, headaches, and seizures. Temporal lobes are primarily affected and the disease is fatal without treatment.

Progressive multifocal leukoencephalopathy (PML) is a human papovavirus (JC virus) seen in patients with AIDS. Patients present with dementia, visual field defects, weakness, and spasticity. **Rabies** causes personality changes, headache, dysphagia to even water (“hydrophobia”), and pharyngeal muscle spasm that makes patients appear to be “frothing at the mouth.” **Lyme disease** can produce an encephalitis or demyelination that mimics multiple sclerosis, but infection follows a tick bite. **Waterhouse-Friderichsen syndrome** is hemorrhagic infarction of the adrenal glands due to fulminant meningococcemia. Cysticercosis is characterized by multiple brain cysts produced by the larval form of the pork tapeworm (*Taenia solium*).

388–391. The answers are 388-a, 389-b, 390-d, 391-f. (*Fauci, 14/e, pp 2325–2348.*) **Basilar artery stroke** causes quadriplegia, sensory loss, and cranial nerve involvement; patients may present with coma or a “locked-in” syndrome. **Wallenberg syndrome** or lateral medullary syndrome causes an ipsilateral weakness of the palate and vocal cords, ipsilateral ataxia, ipsilateral Horner syndrome, and ipsilateral loss of facial pain and temperature but contralateral loss of body pain and temperature sensation. There is no limb weakness in Wallenberg syndrome. **Anterior cerebral stroke** causes unilateral leg weakness and sensory loss. **Posterior cerebral artery stroke** causes an occipital stroke and a homonymous hemianopsia. **Middle cerebral artery stroke** causes hemiplegia or hemiparesis greater in the arm than the leg, aphasia, unilateral sensory loss, and eyes that deviate to the side of the hemispheric lesion. Patients with **lacunar infarcts** may present with different syndromes, such as dysarthria and mild hemiparesis (clumsy-hand dysarthria). Lacunar infarcts represent small artery occlusions; hypertension and diabetes are risk factors for these infarcts. Patients in a **vegetative state** from diffuse cortical damage have spontaneous eye opening and movement without evidence of awareness.

392–395. The answers are 392-b, 393-a, 394-c, 395-e. (*Fauci, 14/e, pp 134–137, 2386. Seidel, 4/e, pp 746, 788.*) Upper motor neuron (UMN) disease (above the level of the corticospinal synapses in the gray matter) is characterized by spastic paralysis, hyperreflexia, and a positive Babinski reflex (**everything is “up” in UMN disease**). Lower motor neuron (LMN) disease (below the level of synapse) is characterized by flaccid paralysis, significant atrophy, fasciculations, hyporeflexia, and a flexor (normal) Babinski reflex (**everything is “down” in LMN disease**). A **radiculopathy** occurs with root compression from a protruded disk that causes sensory

loss, weakness, and hyporeflexia in the distribution of the nerve root. **Myelopathy** causes severe sensory loss of posterior column sensation (position sense and vibration), spasticity, hyperreflexia, and positive Babinski reflexes. Broca's aphasia (left inferior frontal gyrus) is a nonfluent expressive aphasia (**Broca's should remind you of "broken" speech**); Wernicke's aphasia (left posterior-superior temporal gyri) is a receptive aphasia because patients lack auditory comprehension (**Wernicke's should remind you of "wordy" speech** that makes no sense).

396–397. The answers are 396-c, 397-a. (*Fauci, 14/e, pp 2307–2311.*) **Classic migraine** is a unilateral headache that is pulsatile and throbbing in nature and is preceded by a prodromal aura consisting of scotoma (black spots), scintillations (light flashes), or hemianopsia. **Common migraines lack a prodromal aura. Complicated migraines** may be preceded by aura and are headaches accompanied by sensory or motor deficits or muscle palsies. The patient described is having a specific kind of complicated migraine called an ophthalmoplegic migraine. A mnemonic for migraine is **POUND** (Pulsatile, lasts **O**ne day, **U**nilateral, **N**ausea, and interferes with **D**aily activities). **Basilar artery migraine** is a variant of classic migraine in which the aura consists of drop attacks, confusion, blindness, and vertigo (all signs of basilar artery ischemia). Patients with temporal arteritis are older (>50 years old) and have headaches along with jaw claudication and tenderness over the temporal artery.

398–401. The answers are 398-b, 399-d, 400-a, 401-c. (*Seidel, 4/e, pp 781–782.*) **Ataxic** gait is often characterized by clumsiness; when steps are taken, the advancing foot is lifted high. The foot is then brought down in a slapping or stamping manner. **Spastic** hemiplegic gait is the result of spasticity of the involved limb. The limb is moved forward by abduction and circumduction. Parkinsonian gait is noted for the forward stoop of the head and shoulders, with arms slightly abducted and forearms partially flexed; there is decreased arm swing as the feet shuffle. **Steppage** gait occurs with footdrop (paralysis of the peroneal nerve); the affected foot is raised higher than normal to prevent dragging of the toe. Bilateral footdrop results in a gait resembling that of a **high-stepping horse**. Spastic diplegia gait or **scissor** gait occurs with extrapyramidal disorders. The patient uses short steps and drags the foot; the legs are extended and stiff and cross on each other.

MISCELLANEOUS TOPICS

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GERIATRICS

Questions

DIRECTIONS: Each of the numbered items or incomplete statements in this section is followed by answers or by completion of the statements. Select the **one** lettered answer or completion that is **best** in each case.

402. A daughter brings her 81-year-old mother to your office and states that, over the last 6 mo, her mother has become forgetful. The mother has difficulty remembering recent events and often forgets to pay her bills. The patient has been in good health all of her life and takes no medications. Vital signs and physical examination are normal. Which of the following is the best first step in making the diagnosis in this patient?

- a. Imaging study of the brain
- b. Mini-mental status examination
- c. Thyroid function tests
- d. Lumbar puncture
- e. Vitamin levels

403. A stage 3 pressure ulcer is best described by which of the following?

- a. The skin is red but not broken
- b. There is damage through the epidermis and dermis
- c. There is damage through to the subcutaneous tissue
- d. The ulcer involves muscle
- e. The ulcer involves bone

404. A 76-year-old woman is admitted to the hospital for a urinary tract infection. The patient takes no medications and does not drink alcohol. During the evening hours the patient suddenly becomes anxious, restless, and combative. The nurses state that the woman is diaphoretic with a heart rate of 120/min. They feel the patient is hallucinating and has waxing and waning levels of consciousness. Which of the following is the most likely diagnosis?

- a. Dementia
- b. Delirium
- c. Mania
- d. Schizophrenia
- e. Depression

405. A 74-year-old man presents with no visual symptoms. On fundoscopic examination, the cup:disk ratio is greater than 0.5 in the left eye but normal in the right eye. Flame hemorrhages are visible at the disk edge. Which of the following is the most likely diagnosis?

- a. Macular degeneration
- b. Glaucoma
- c. Cataracts
- d. Pterygium
- e. Chemosis

406. A 74-year-old woman presents complaining of a severe right-sided headache for 1 day. She states that the vision in her right eye has diminished and she complains of claudication of her jaw when she is chewing food. On physical examination, her right temple is tender to palpation. Which of the following is the most likely diagnosis?

- a. Acute frontal sinusitis
- b. Giant cell arteritis
- c. Migraine headache
- d. Cluster headache
- e. Trigeminal neuralgia

407. A 66-year-old woman presents with several weeks of unsteady gait, forgetfulness, and urinary incontinence. She denies headache or any recent trauma. Her past medical history is significant only for meningitis as a child. On physical examination, her blood pressure is 130/85 mm Hg and her heart rate is 82 beats/min. Her neurologic examination is normal except for a stiff, “magnetic” gait. The patient scores a 22 on the mini-mental status examination. After a lumbar puncture, the gait disturbance improves. Which of the following is the most likely diagnosis?

- a. Multi-infarct dementia
- b. Pick’s disease
- c. Alzheimer’s disease
- d. Normal pressure hydrocephalus
- e. Pseudodementia
- f. Binswanger’s disease
- g. Creutzfeldt-Jakob disease

408. Which of the following is a correct assessment tool for a patient over 70 years of age?

- a. A determination of cerebral atrophy by CT scan of the head
- b. A determination of arrhythmias by Holter monitor
- c. A determination of hearing loss by referral to an audiologist
- d. A determination of who will help the patient in case of emergency
- e. A determination of alcohol use by the CAGE questionnaire

409. A 76-year-old woman presents with the sudden onset of severe left-sided chest pain that radiates in a bandlike fashion to her left side and back. Heart and lung examinations are normal. The patient complains of excruciating pain when the area is lightly touched with a cotton swab. No rash is visible. Electrocardiogram is normal. Which of the following is the most likely diagnosis?

- a. Myocardial infarction
- b. Gastroesophageal reflux disease
- c. Costochondritis
- d. Dissecting aortic aneurysm
- e. Herpes zoster

410. A 71-year-old woman presents with the chief complaint of distorted central vision. Funduscopic examination reveals the presence of subretinal neovascularization and there are depigmented areas in the macula. Distinct yellow-white lesions are seen in the posterior pole surrounding the macula. The patient reports wavy lines during Amsler grid testing. Which of the following is the most likely diagnosis?

- a. Cataract formation
- b. Macular degeneration
- c. Open-angle glaucoma
- d. Angle-closure glaucoma
- e. Narrow-angle glaucoma

411. A 62-year-old man presents with a 2-year history of tremors of the right hand that disappear with voluntary movement. He has no past medical history and takes no medications. Review of systems is positive for anhidrosis and a 5-year history of impotence. On physical examination, the patient is alert and oriented. He has a resting tremor of his hands that has a “pill rolling” quality. His face is expressionless (mask-like) and his movements are slow. He has difficulty getting out of a chair and is unable to complete the “get up and go” test in under 15 s. There is a decrease in tone and strength of the extremities. Deep tendon reflexes are diminished. The Babinski reflex is normal (flexor). Which of the following is the most likely diagnosis?

- a. Benign essential tremor
- b. Parkinson’s disease
- c. Shy-Drager syndrome
- d. Creutzfeldt-Jakob disease
- e. Cerebellar tremor
- f. Progressive supranuclear palsy

412. Which of the following is a risk factor for osteoporosis?

- a. African American race
- b. Multiparity
- c. Heavy or obese body frame
- d. Excellent teeth
- e. Calcium intake of <500 mg/day

413. A 74-year-old woman presents with paresthesias of the feet and an unsteady gait for several months. Other than a previous history of anemia, the patient has no past medical history. She takes no medications and does not smoke cigarettes or drink any alcohol. On physical examination, the patient is alert and oriented but cannot recall three objects after 5 min. Her gait is unsteady and broad-based and she has increased muscle tone in the lower extremities. Muscle strength is normal, but the patient has diminished sensation to vibration from the midcalf areas to the feet. Patellar and ankle reflexes are absent bilaterally. The patient has bilateral extensor Babinski reflexes and has a positive Romberg test. Laboratory data reveals a macrocytic anemia. Which of the following is the most likely diagnosis?

- a. Vitamin B₁₂ deficiency
- b. Tabes dorsalis
- c. Lead poisoning
- d. Vitamin B₆ deficiency
- e. Vitamin E deficiency

414. A 68-year-old asymptomatic man is found on routine testing to have a peripheral blood count of 79,000/ μ L with 20% neutrophils, 75% lymphocytes, and 5% monocytes. His hemoglobin is 14.2 g/dL and his platelet count is 210,000/ μ L. Peripheral smear reveals well-differentiated lymphocytes and the presence of smudge cells. Physical examination reveals no lymphadenopathy and no hepatosplenomegaly. Which of the following statements is most likely to be true regarding disease in this patient?

- a. His disease is a clonal proliferation of B cells
- b. His disease is a clonal proliferation of T cells
- c. He is likely to have hypogammaglobulinemia
- d. He is not expected to survive more than 5 years
- e. His disease will most likely transform into an acute leukemia

415. Which of the following is a normal age-related physiologic change?

- a. Decrease in body fat
- b. Increase in thyroxine clearance
- c. Increase in righting reflex
- d. Increase in ankle reflexes
- e. Decrease in sleep stages 3 and 4
- f. Increase in lean body mass
- g. Increase in total body water
- h. Increase in colonic motility

416. A 67-year-old man, with a past medical history significant only for moderate bilateral hearing loss, presents with the chief complaint of leg pain. He states that he has started to limp. On physical examination, the patient has bowing of the lower extremities and the right lower extremity is longer than the left lower extremity. Both legs are warm to the touch anteriorly. The rest of the physical examination is normal. Laboratory data reveals an isolated elevated serum alkaline phosphatase level. Which of the following is the most likely diagnosis in this patient?

- a. Cerebral vascular accident
- b. Paget's disease
- c. Parkinson's disease
- d. Metastatic bone disease
- e. Vitamin D deficiency

417. A 74-year-old woman presents with an inability to walk after a fall in the home. On physical examination, the left lower extremity is shorter than the right lower extremity. The injured extremity is in abduction and is slightly externally rotated. Which of the following is the most likely diagnosis?

- a. Tibial fracture
- b. Fibular fracture
- c. Bursitis of the hip
- d. Fracture of the femoral neck
- e. Quadriceps muscle rupture

418. A 76-year-old man, who has been healthy all of his life, presents to the emergency room after a syncope episode. He was strolling through the supermarket when he suddenly lost consciousness. He denies having chest pain, dizziness, or palpitations. He has no previous history of syncope and takes no medications. He was not incontinent of bladder or bowel and he had no tonic-clonic movements. When he awoke in the ambulance, he was oriented and asymptomatic. Vital signs and physical examination are normal. The patient has no orthostatic changes. The electrocardiogram is normal. Which of the following is the most likely diagnosis?

- a. Vasovagal syncope
- b. Hyperventilation syncope
- c. Cardiac syncope
- d. Cerebral transient ischemia attack
- e. Carotid sinus syncope
- f. Subclavian steal syndrome
- g. Seizure disorder

419. Which of the following is a risk factor for falls in the elderly?

- a. History of weight loss
- b. Poor personal hygiene
- c. Urinary incontinence
- d. Peripheral edema
- e. Poor sleep pattern
- f. Low energy level
- g. Tobacco smoking

420. An 80-year-old woman presents to the emergency room with cough, pleuritic chest pain, and shortness of breath. Her cough is productive of purulent sputum. The patient had been ill for 1 wk with what her private physician had diagnosed as influenza, but for the last 2 days she has been afebrile and asymptomatic and thought “the flu was over.” The patient is febrile, tachycardic, and tachypneic. Lung auscultation reveals increased fremitus, egophony, dullness, and crackles at the right base. Chest radiograph reveals a right lower lobe area of consolidation. Which of the following is the most likely diagnosis?

- a. Bacterial pneumonia
- b. Pulmonary embolus
- c. Lung abscess
- d. Bronchiectasis
- e. Asthma

421. A 72-year-old man was recently admitted to a nursing home after having had a stroke. For the last 2 wk, the patient has exhibited a depressed mood. He eats very little and has no interest in the social activities of the nursing home. He sleeps most of the day and refuses to get out of bed. He lacks energy and seems uninterested in participating in daily rehabilitation. Most of the time, he states that he wishes to be left alone. When he speaks, he remarks how little he has accomplished in his life. Which of the following is the most likely diagnosis?

- a. Schizophrenia
- b. Depression
- c. Dementia
- d. Delirium
- e. Parkinson’s disease

422. Which of the following is the most common pattern of functional decline in the geriatric population?

- a. Hygiene, dressing, toileting, ambulating, eating
- b. Ambulating, hygiene, eating, dressing, toileting
- c. Dressing, eating, hygiene, toileting, ambulating
- d. Hygiene, ambulating, toileting, eating, dressing
- e. Toileting, ambulating, hygiene, eating, dressing

DIRECTIONS: Each set of matching items in this section consists of a list of lettered options followed by several numbered items. For each numbered item, select the appropriate lettered option(s). Each lettered option may be selected once, more than once, or not at all. **Each item will state the number of options to select. Choose exactly this number.**

Items 423–425

For each patient with incontinence, select the most likely explanation for the symptoms.

- a. Urge incontinence
- b. Stress incontinence
- c. Overflow incontinence
- d. Functional incontinence

423. A 71-year-old woman with a history of stroke is incontinent of large amounts of urine. She is ambulatory with a walker and takes no medications. The incontinence is not associated with activity. Her postvoid residual urine volume is 75 mL. **(CHOOSE 1 EXPLANATION)**

424. A 74-year-old man with BPH presents with urgency (strong desire to void) immediately followed by incontinence. He is active and takes no medications. His postvoid residual urine volume is 65 mL. **(CHOOSE 1 EXPLANATION)**

425. A 66-year-old man with a 15-year history of diabetes mellitus presents with dribbling of his urine. He has a sensation of fullness in his abdomen and inadequate emptying. Palpation of the abdomen reveals a smooth, round, tense mass. Prostate exam reveals an enlarged (50 g) symmetric gland. There are no nodules palpated. The patient's postvoid residual urine volume is 800 mL. **(CHOOSE 1 EXPLANATION)**

GERIATRICS

Answers

402. The answer is b. (*Fauci, 14/e, pp 148–149.*) The best first test to evaluate changes in mental status in elderly patients is the **Folstein minimal status examination (MMSE)**. A score of ≤ 23 out of a possible 30 is consistent with dementia. The differential diagnosis for dementia includes Alzheimer's disease (the most common etiology), but other causes must be considered, such as multi-infarct dementia (stepwise decline), normal pressure hydrocephalus (NPH), hypothyroidism, vitamin B₁₂ deficiency, folic acid deficiency, depression (pseudodementia), neurosyphilis, HIV, and subdural hematoma.

403. The answer is c. (*Seidel, 4/e, p 195.*) The grading for pressure ulcers is as follows:

Stage 1 = The skin is red but not broken

Stage 2 = Damage through the epidermis and dermis

Stage 3 = Damage through to the subcutaneous tissue

Stage 4 = Muscle and possible bone involvement

404. The answer is b. (*Goldman, 21/e, pp 20–22.*) **Delirium** is a transient global disorder characterized by waxing and waning levels of consciousness, hallucinations, anxiety, restlessness, combative behavior, paranoia, short attention span, autonomic disturbances (tachycardia and diaphoresis), and decreased short-term memory. Patients often worsen in the evening hours (“**sundowning**”). Risk factors for delirium include **Hypoxemia, Infection, Drugs, and Electrolyte abnormalities (HIDE)**; the mainstay of treatment is to treat the underlying cause.

405. The answer is b. (*Berson, pp 40–55.*) **Glaucoma** is a disorder that may occur without visual symptoms, and patients at risk for the disease should be screened carefully. Patients at risk include the elderly, African Americans, those with a family history of glaucoma, and those with a history of hypertension, diabetes mellitus, or myopia. Signs of glaucoma

include asymmetry of the cup:disc ratios (even if normal), cup:disc ratio > 0.5 , and flame hemorrhages at the edge of the disc. The disc of glaucoma is pale, not hyperemic. **Macular degeneration**, etiology unknown, is the leading cause of blindness in older persons. Patients complain of a progressive loss of vision, and funduscopy reveals **drusen deposits** (small, yellow-white) around the macula and posterior pole of the eye. **Cataracts** are opacities of the lens; patients often complain of glare and the inability to see well in reduced light (contrast sensitivity). Eye examination reveals a reduced red reflex. A pterygium is an abnormal triangular fold of membrane extending from the conjunctiva to the cornea that occurs because of irritation secondary to sand, dust, or ultraviolet light. Chemosis is conjunctival edema.

406. The answer is b. (*Fauci, 14/e, pp 186, 1917, 2310.*) **Giant cell arteritis** or temporal arteritis usually appears after the age of 55 and is more common in women than men. Patients typically present with severe headache, malaise, fever, and tenderness over the involved temporal artery. Patients may have ocular symptoms due to ischemic optic neuropathy (blindness is an irreversible complication) and complain of jaw pain when chewing (jaw claudication). **Polymyalgia rheumatica** (limb girdle stiffness and pain, weight loss, malaise) may be seen in up to 30% of patients with temporal arteritis. Patients suspected of having temporal arteritis require immediate corticosteroids; diagnosis is confirmed by temporal artery biopsy. Trigeminal neuralgia (tic douloureux) causes severe unilateral facial pain but is not associated with vision changes or claudication. Cluster headaches occur mostly in men and are characterized by periorbital or temporal pain lasting up to 2 h and accompanied by lacrimation and ptosis. Patients complain of several attacks a day for several weeks followed by a period of remission.

407. The answer is d. (*Fauci, 14/e, pp 2348–2355, 2449.*) The patient has normal pressure hydrocephalus (NPH), which is **a triad of dementia, incontinence, and ataxia** in a patient with a past history of meningitis or subarachnoid hemorrhage. CT scan will show large ventricles. In Alzheimer's disease (dementia of the senile type), patients have motor signs and incontinence, but usually late in the disease. Mini-mental status examination (MMSE) score is typically 20 or less out of a possible score of 30. Patients with pseudodementia or depression have vegetative signs, such as

sleep disturbances and lack of energy. **Multi-infarct dementia** (vascular dementia) causes a “stair-step” progression of symptoms; patients often have a history of hypertension, cardiac emboli, or atherosclerosis. **Binswanger’s disease** is a specific kind of vascular dementia associated with demyelination of the cerebral white matter. Patients with **Pick’s disease** have dementia with alterations in emotion and personality. Creutzfeldt-Jakob disease (spongiform encephalopathy) is due to a transmissible prion and is related to “**mad cow disease.**” It is a rare disorder characterized by dementia, ataxia, myoclonus, and death within 6–12 mo of onset.

408. The answer is d. (*Fauci, 14/e, p 40.*) Physicians must determine the degree of functional incapacity of the elderly patient based on both medical and psychosocial evaluations. Determining the activities of daily living (ADLs), the instrumental activities of daily living (IADLs), and the **socio-economic circumstances** and **social support system** (who will help the patient in case of illness or in an emergency) are integral in the functional assessment of an elderly patient. The **ADLs** are **D**ressing, **E**ating, **A**mbulating, **T**oileting, and **H**ygiene (**DEATH**). The **IADLs** are **S**hopping, **H**ouse-keeping, **A**ccounting, **F**ood preparation, and **T**ransportation (**SHAFT**).

409. The answer is e. (*Fauci, 14/e, p 2445.*) **Herpes zoster** is due to reactivation of latent varicella virus; patients typically present with a history of pain, tingling, or itching of the affected area followed by an eruption of vesicles overlying an erythematous base. Although the disease can disseminate and produce diffuse eruptions, it typically presents with involvement of a single dermatome. The disease is not limited to adults or immunocompromised patients and may be seen in children.

410. The answer is b. (*Berson, pp 41, 50–54.*) **Macular changes** include the formation of drusen, subretinal neovascularization, and degenerative changes (depigmentation and atrophy) of the retinal epithelium. Drusen are hyaline nodules or colloid bodies deposited in Bruch’s membrane. Amsler grid testing is a method of evaluating the function of the entire macula. The patient looks at a square grid pattern; if he or she sees irregularities in the grid in the form of wavy or fuzzy lines, this indicates a scotoma (due to macular involvement). **Open-angle glaucoma** is an insidious form of glaucoma whereby the chamber angle remains open. **Acute angle-**

closure glaucoma (also called narrow-angle glaucoma) is an ocular emergency in which the trabeculum suddenly becomes completely occluded by iris tissue. Patients complain of severe eye pain, nausea, and the presence of halos or rainbows around light. The pupil may be fixed and dilated secondary to the abrupt rise in intraocular pressure.

411. The answer is c. (*Fauci, 14/e, pp 2356–2361.*) **Shy-Drager syndrome** (also called **multiple system atrophy** or **MSA**) is parkinsonism associated with autonomic dysfunction; patients may present with anhidrosis, disturbance of sphincter control, impotence, and orthostatic hypotension. Patients typically have signs of **LMN** involvement (everything is “down” or “low” meaning flaccid paralysis, diminished reflexes, and flexor Babinski reflex). **Parkinson’s disease (PD)** is a **triad** of resting, asymmetric tremor, rigidity (cogwheel in nature), and bradykinesia. Patients have difficulty getting out of a chair, and gait, which is slow at first, becomes faster (festination) with ambulation. The “**get up and go**” test (patient gets out of a chair, walks 10 ft, turns around, and returns to chair in under 15 s) is a good test for assessing gait and will be abnormal in patients with parkinsonism. PD is an idiopathic progressive disease in which there is Lewy body inclusion and degeneration of neurons in the substantia nigra. **Benign essential tremor** is also called senile tremor or familial tremor (autosomal dominant) and is reduced by alcohol use. **Cerebellar tremor** occurs with intention and is absent at rest. Patients usually have other signs of cerebellar disease, such as ataxia. **Progressive supranuclear palsy** is a disorder of bradykinesia and rigidity with dementia and loss of voluntary control of eye movements. Creutzfeldt-Jakob disease is accompanied by parkinsonian features, but patients typically have dementia and myoclonic jerky movements.

412. The answer is e. (*Seidel, 4/e, p 703.*) Risk factors for **osteoporosis** include white, Asian-Pacific Islander, and Native American race, Northwestern European descent, blonde or red hair, freckles, thin body frame, nulliparity, early menopause, family history of osteoporosis, postmenopause, constant dieting, calcium intake < 500 mg/day, scoliosis, rheumatoid arthritis, poor teeth, previous fractures, cigarette smoking, heavy alcohol use, medications (heparin, steroids, thyroxine), and metabolic disorders (diabetes, hyperthyroidism, hypercortisolism).

413. The answer is a. (*Fauci, 14/e, pp 2388, 2455–2457.*) The patient most likely has vitamin B₁₂ deficiency due to **pernicious anemia (lack of intrinsic factor)**. Patients show loss of posterior column sensation (vibration and position sense), positive Romberg test, mild spasticity, and bilateral extensor plantar reflexes (upper motor neuron). Patients may also present with mild dementia or psychiatric symptoms. The polyneuropathy associated with B₆ (pyridoxine) deficiency is associated with isoniazid use. Lead poisoning causes a motor neuropathy (i.e., wristdrop, footdrop) and requires chronic exposure to lead as an adult. **Tabes dorsalis** due to tertiary syphilis causes progressive sensory loss, ataxia, and a positive Romberg test, but patients complain of severe lancinating leg pain. Patients are not spastic and do not have a positive Babinski sign. Vitamin E deficiency is seen in liver disease, cystic fibrosis, and other malabsorption syndromes; patients present with ataxia and peripheral neuropathy.

414. The answer is a. (*Fauci, 14/e, pp 699–700.*) The peripheral blood results are highly suggestive of **chronic lymphocytic leukemia (CLL)**, which is primarily a clonal proliferation of B cells. Often **smudge cells** are seen in the peripheral blood smear. The life expectancy of this patient (stage 0 since he has no lymphadenopathy, hepatosplenomegaly, anemia, or thrombocytopenia) is greater than 10 years. Hypogammaglobulinemia with subsequent infections from encapsulated organisms is a late manifestation of CLL. Patients with CLL almost never undergo transformation into acute lymphoblastic leukemia.

415. The answer is e. (*Goldman, 21/e, p 16. Tierney, 39/e, p 48.*) Age-related physiologic changes include increase in body fat, decrease in total body water, decrease in thyroxine clearance and production, decrease in gastric acidity, decrease in colonic motility, and decrease in lean body mass. The process of aging produces important physiologic changes in the central nervous system, which cause age-related symptoms. The elderly may have the following changes:

Cognitive: Forgetfulness, declining processing speed, decreased verbal fluency

Reflexes: Decreased righting reflex, absent ankle reflexes, postural instability

Sensory: **Presbycusis** or diminished high-frequency hearing

Presbyopia due to decreased lens elasticity

Olfactory system deterioration

Vertigo

Decreased upward gaze

Gait/balance: Stiffer, slower, forward flexed, unsteady, increased body sway

Sleep: Fatigue, insomnia, increased naps, decrease in sleep stages 3 and 4

416. The answer is b. (*Fauci, 14/e, pp 2266–2268.*) **Paget's disease** of bone (osteitis deformans) is a disorder in which normal bone is replaced by disorganized trabecular bone. Patients may be asymptomatic but may present with increased hat size (skull enlargement), hearing loss (involvement of the ossicles of the inner ear), facial pain, headache, backache, leg pain, growth of the lower extremities (one leg may be longer than the other), tibial bowing, and increased blood flow to the involved areas of bone growth. Alkaline phosphatase may be elevated and a bone scan will detect the lytic lesions. A complication of Paget's disease is osteosarcoma (<1%).

417. The answer is d. (*Tintinalli, 5/e, p 1809.*) **Femoral neck fractures** are common in the elderly and occur more frequently in women than men. Ninety percent are due to minor trauma secondary to falls. Displaced fractures cause pain and an inability to walk. The involved extremity is often shorter, slightly externally rotated, and abducted.

418. The answer is c. (*Fauci, 14/e, pp 100–103. Sapira, p 342.*) The patient most likely has **cardiac syncope**, which results from a sudden reduction in cardiac output usually caused by an arrhythmia. Patients with **vasovagal or neurocardiogenic syncope** (common fainting) present with bradycardia and hypotension due to activation of the parasympathetic nervous system. Patients with **carotid sinus syncope** initiate symptoms by turning the head to one side, wearing a tight shirt collar, or shaving over the carotid artery. The **subclavian steal syndrome** occurs with exercise of the upper extremities. When a subclavian artery is occluded and the patient exercises, blood is "stolen" from the ipsilateral vertebral artery and delivered first to the brain and then to the arm, bypassing the subclavian artery (reversal of flow). Patients may have a decreased radial pulse amplitude and lower blood pressure in the affected arm.

419. The answer is d. (Fauci, 14/e, pp 42–43.) Risk factors for **falls in the elderly** are reduced visual acuity, reduced hearing, vestibular dysfunction, peripheral neuropathy, dementia, musculoskeletal disorders, foot disorders (bunions, edema), postural hypotension, alcohol use, and medications (diuretics, sedatives, benzodiazepines, antidepressants, antihypertensives, antiarrhythmics, anticonvulsants).

420. The answer is a. (Fauci, 14/e, pp 1112–1116.) Secondary bacterial infection may be a complication of **acute influenza**. The common pathogens are *Staphylococcus aureus*, *Streptococcus pneumoniae*, and *Haemophilus influenzae*. Often the patient experiences improvement in the influenza symptoms prior to the development of the bacterial pneumonia. A sputum gram stain or sputum culture is often helpful because patients may have a primary influenza viral pneumonia (the most common complication of influenza) or a mixed viral-bacterial pneumonia.

421. The answer is b. (Fauci, 14/e, p 40.) The patient most likely has depression. The mnemonic for depression is **SIG E CAPS**.

S = Sleep problems

I = Decreased Interest in life

G = Guilt feelings

E = Lowered Energy level

C = Decreased Concentration

A = Decreased Appetite

P = Psychomotor retardation/agitation

S = Suicidal ideation

422. The answer is a. (Kochar, 3/e, p 510.) An elderly patient's decline in function in response to disease usually follows the same pattern. Hygiene or bathing are lost first, followed by dressing, toileting, ambulating (transferring), and eating. Recovery usually occurs in the reverse order.

423–425. The answers are 423-a, 424-a, 425-c. (Seidel, 4/e, pp 543, 571–572.) Normal postvoid residual urine volume (PVR) is <50 mL, and normal bladder capacity is 400–600 mL. The patients with stroke and BPH have **urge incontinence** or detrusor overactivity. Patients with parkinsonism and dementia may also develop urge incontinence. Patients complain

of urinary incontinence (sometimes of large volume) following a sudden urge to urinate. The patient senses the need to void at below normal volumes (<200 ml) and the bladder is unable to tolerate normal bladder capacity. **Overflow incontinence** is caused by (1) an acontractile bladder (diabetes or spinal cord injury), (2) anatomic obstruction (BPH), and (3) detrusor-sphincter dyssynergy or neurogenic bladder (multiple sclerosis and spinal cord lesions). Often a tense, smooth, and round mass (overdistended bladder) will be palpated on abdominal exam and the bladder can be percussed (a lower percussion note than the surrounding air-filled intestines). Patients with overflow incontinence often have leakage of small amounts of urine and calculated PVRs of >100 ml. **Stress incontinence** is characterized by the loss of small amounts of urine during activities that increase abdominal pressure, such as coughing, laughing, sneezing, and exercising. **Functional incontinence** is often due to the combination of cognitive impairment and immobility. The urinary tract is intact in functional incontinence.

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INFECTIOUS DISEASES

Questions

DIRECTIONS: Each of the numbered items or incomplete statements in this section is followed by answers or by completion of the statements. Select the **one** lettered answer or completion that is **best** in each case.

426. A 25-year-old heterosexual man develops a urethral discharge and dysuria 5 days after having unprotected sexual intercourse with a new partner. Physical examination reveals meatal erythema. There are no penile lesions and no inguinal lymphadenopathy. A purulent urethral discharge is evident. Gram stain of the discharge reveals neutrophils and intracellular gram-negative diplococci and the patient is treated for *Neisseria gonorrhoeae*. Two weeks after antibiotic therapy (ceftriaxone intramuscular injection), the patient returns with a clear urethral discharge and dysuria. Gram stain reveals many neutrophils but no organisms. Which of the following is the most likely diagnosis?

- a. Resistant strain of *Neisseria gonorrhoeae*
- b. Lymphogranuloma venereum
- c. Chancroid
- d. *Chlamydia trachomatis* urethritis
- e. Syphilis infection

427. A 41-year-old woman presents with a maculopapular rash on her soles and palms. Both the VDRL (RPR) and FTA-ABS are positive. Two hours after being treated with penicillin, the patient develops fever, chills, myalgias, tachypnea, tachycardia, and a leukocytosis. Which of the following is the most likely diagnosis?

- a. Neurosyphilis
- b. Tertiary syphilis
- c. Jarisch-Herxheimer reaction
- d. Rocky Mountain spotted fever
- e. Endocarditis

428. Which of the following deficiencies causes patients to be susceptible to gonococcemia and meningococcemia infections?

- a. C₂
- b. C₃
- c. C₃, C₄
- d. C₅, C₆, C₇, C₈, C₉
- e. C_{1q}, C_{1r}, C_{1s}

429. A 19-year-old previously healthy college student presents with a 5-day history of fever, generalized malaise, and sore throat. He denies cough. He does not use illicit drugs and uses condoms with his one sexual partner. He has been vaccinated against hepatitis B. On physical examination the patient appears jaundiced and has a temperature of 101.7°F. The pharynx is erythematous but has no exudate. There is bilateral tender cervical lymphadenopathy. Liver size is 14 cm in the MCL and the spleen tip is palpable 2 cm below the left costal margin. The white blood cell count is elevated and many atypical forms are reported. Which of the following is the most likely diagnosis?

- a. Drug-induced hepatitis
- b. Mononucleosis syndrome
- c. Hepatitis B infection
- d. Hepatitis C infection
- e. *Mycoplasma pneumoniae*

430. A neonate develops meningitis and you suspect that the responsible organism was acquired during passage through the birth canal. Which of the following organisms is most likely responsible for the neonate's illness?

- a. *Staphylococcus aureus*
- b. *Pseudomonas*
- c. *Rubeola*
- d. *Listeria monocytogenes*
- e. *Salmonella*

431. A 23-year-old man presents with the acute onset of fever, skin lesions that are papular and erythematous with a hemorrhagic and necrotic center, joint pain, and an acute tenosynovitis of the dorsum of his left foot. He has no past medical history and takes no medications. He does not smoke, drink alcohol, or use illicit drugs. On physical examination, the patient has a temperature of 102.4°F. Passive flexion and extension of the left great toe causes severe pain over the dorsum of the midfoot and ankle. Which of the following is the most likely diagnosis?

- a. de Quervain's tenosynovitis
- b. Reiter syndrome
- c. Acute gouty attack
- d. Disseminated gonococcal infection
- e. Still's disease

432. Which of the following organisms should be considered in a patient with bacterial endocarditis when blood cultures continuously remain negative?

- a. *Staphylococcus aureus*
- b. *Campylobacter jejuni*
- c. *Vibrio parahemolyticus*
- d. *Haemophilus aphrophilus*
- e. *Streptococcus viridans*

433. A 40-year-old gardener presents with painless papules that appeared following a puncture wound from a rose thorn a few weeks earlier. Physical examination reveals a chain of erythematous nodules along the dorsal aspect of the arm. Which of the following is the most likely diagnosis?

- a. Coccidioidomycosis
- b. Sporotrichosis
- c. Blastomycosis
- d. Cutaneous larva migrans
- e. Histoplasmosis

434. An ill-looking 58-year-old man with a 20-year history of diabetes mellitus presents with severe pain and swelling of his right arm that started 2 days ago after some minor trauma. He has a temperature of 103.6°F. Examination of the arm reveals a 13-cm area of dark red epidermal induration. Large bullae filled with purple fluid are seen in the center of the wound. Some parts of the wound are friable and appear black in color. Crepitus is felt with palpation of the arm. Laboratory data reveals a leukocytosis and an elevated serum creatinine phosphokinase. Which of the following is the most likely diagnosis?

- a. Erysipelas
- b. Folliculitis
- c. Cellulitis
- d. Necrotizing fasciitis
- e. Fournier's gangrene

435. A 54-year-old man presents with a 2-wk history of headache, fever, chills, and night sweats. He complains of myalgias and easy fatigability. He has just returned from a business trip to Africa and the Middle East. Before the trip, the patient received immunizations against poliomyelitis, hepatitis A, hepatitis B, and dengue fever. Throughout the trip, he took chloroquine prophylaxis against malaria. On physical examination, the patient has a temperature of 103.2°F and is diaphoretic. There is no neck stiffness, photophobia, or lymphadenopathy. Heart and lung examinations are normal. There is mild splenomegaly. Which of the following is the most likely diagnosis in this patient?

- a. Malaria
- b. Tuberculosis
- c. Mononucleosis
- d. Trypanosomiasis
- e. Toxoplasmosis

436. A 68-year-old man with endocarditis and bacteremia from *Streptococcus bovis* infection has a high incidence of which of the following malignancies?

- a. Prostate cancer
- b. Pancreatic cancer
- c. Lymphoma
- d. Colon cancer
- e. Lung cancer

437. Which of the following statements regarding lymphadenopathy is true?

- a. The harder the node, the more likely it is to be benign
- b. The more discrete the node, the more likely it is to be benign
- c. The more tender the node, the more likely it is to be inflammation
- d. Lymph nodes may occasionally be pulsatile
- e. A palpable left supraclavicular node is often benign
- f. A sentinel node is usually a benign lymph node
- g. A Sister Joseph node is a benign lymph node

438. A 35-year-old woman presents with fever, diarrhea, and right upper quadrant pain. She has recently returned from a 2-mo business trip in Mexico. Physical examination reveals no jaundice. She has point tenderness over the liver and has a positive FOBT. CT scan of the abdomen reveals several oval lesions in the liver. Which of the following is the most likely diagnosis in this patient?

- a. Hepatitis A infection
- b. Hepatocellular carcinoma
- c. Metastatic liver disease
- d. *Entamoeba histolytica*
- e. *Campylobacter jejuni*
- f. *Salmonella*

439. A 46-year-old woman with a history of sinusitis presents with a severe headache. She complains of neck stiffness and photophobia. On physical examination she has a temperature of 103.4°F. Blood pressure is normal and heart rate is 110/min. She has a normal funduscopic examination and no focal neurologic deficit. She has nuchal rigidity. Brudzinski and Kernig signs are positive. Which of the following is the most likely diagnosis?

- a. Migraine headache
- b. Cluster headache
- c. Torticollis
- d. Bacterial meningitis
- e. Cysticercosis
- f. Fever of unknown origin

440. A 16-year-old boy is bitten on the leg by a neighbor's dog. The dog is healthy and has proof of a rabies vaccination. The next day, the patient develops a cellulitis at the site of the bite accompanied by a purulent, foul-smelling discharge. There is unilateral inguinal lymphadenopathy. Which of the following organisms is most likely responsible for the patient's symptoms?

- a. Rabies virus
- b. *Pasteurella multocida*
- c. *Aeromonas hydrophila*
- d. *Pseudomonas aeruginosa*
- e. *Vibrio parahemolyticus*

441. A 41-year-old woman develops abdominal cramps and diarrhea 2 h after eating fried rice. Physical examination is normal except for some mild abdominal tenderness with palpation. Examination of the stool reveals no fecal leukocytes. Which of the following is the most likely etiology for the symptoms?

- a. *Shigella*
- b. *Salmonella*
- c. *Vibrio cholerae*
- d. *Bacillus cereus*
- e. *Staphylococcus aureus*
- f. *Vibrio parahemolyticus*

442. Fecal leukocytes are seen with which of the following gastrointestinal pathogens?

- a. *Vibrio cholerae*
- b. *Giardia lamblia*
- c. *Campylobacter jejuni*
- d. *Clostridium perfringens*
- e. *Aeromonas hydrophila*
- f. *Cryptosporidium*
- g. Rotovirus
- h. Norwalk virus

443. Patients with glucose-6-phosphate dehydrogenase deficiency are afforded protection against which of the following?

- a. *Rickettsia typhi*
- b. *Borrelia burgdorferi*
- c. *Plasmodium falciparum*
- d. Hantavirus
- e. Monkeypox virus

444. A 52-year-old woman presents to the emergency room 5 h after eating some grouper at a seafood restaurant while on vacation in Hawaii. She has abdominal cramps, nausea, vomiting, and watery diarrhea. She also complains of tingling and numbness of her lips and extremities. Physical examination reveals a fine tremor and some mild ataxia. Which of the following is the most likely diagnosis in this patient?

- a. Ciguatera poisoning
- b. Scombroid poisoning
- c. Traveler's diarrhea
- d. Pseudomembranous colitis
- e. *Mycobacterium marinum*

445. *Helicobacter pylori* is associated with which of the following disorders?

- a. Squamous cell carcinoma of the esophagus
- b. Adenocarcinoma of the esophagus
- c. Barrett's esophagus
- d. Gastroesophageal reflux disease
- e. Mucosa-associated tissue lymphomas (MALT)
- f. Non-Hodgkin's lymphoma of the small intestine

446. A 22-year-old woman with sickle cell disease presents with a painful pretibial ulcer. Physical examination reveals the presence of purulent material draining from the wound site. The patient has a low-grade fever. Radiographs reveal soft tissue swelling and a periosteal reaction. Which of the following is the most likely pathogen responsible for the symptoms?

- a. *Staphylococcus epidermis*
- b. *Salmonella*
- c. *Shigella*
- d. *Streptococcus pyogenes*
- e. *Mycobacterium tuberculosis*

DIRECTIONS: Each set of matching items in this section consists of a list of lettered options followed by several numbered items. For each numbered item, select the appropriate lettered option(s). Each lettered option may be selected once, more than once, or not at all. **Each item will state the number of options to select. Choose exactly this number.**

Items 447–450

For each patient with symptoms, choose the most likely responsible pathogen.

- a. *Giardia lamblia*
- b. *Trichinella*
- c. *Chlamydia psittacosis*
- d. *Acanthamoeba castellanii*
- e. Brucellosis
- f. *Clostridium tetani*
- g. Cysticercosis

447. A 41-year-old man presents with periorbital edema, myalgias, and eosinophilia 3 wk after eating some undercooked pork at an outdoor restaurant. (CHOOSE 1 PATHOGEN)

448. A 19-year-old college student develops a keratitis thought to be secondary to use of disposable soft contact lenses. (CHOOSE 1 PATHOGEN)

449. A 22-year-old veterinary student develops fever, myalgias, joint pain, and headache. He has lymphadenopathy and hepatosplenomegaly. A murmur is heard on auscultation of the heart. (CHOOSE 1 PATHOGEN)

450. A 28-year-old immigrant from Mexico is brought to the emergency room because of new onset of seizures. CT scan of the head reveals several discrete calcified densities throughout the frontal lobe, brainstem, and cerebellum. (CHOOSE 1 PATHOGEN)

Items 451–452

For each patient with neurologic symptoms, choose the most likely diagnosis.

- a. Toxoplasmosis
- b. Cryptococcal meningitis
- c. Progressive multifocal leukoencephalopathy
- d. HIV dementia

451. A 37-year-old woman with HIV presents with headache, irritability, and confusion. Funduscopic examination reveals bilateral papilledema. India ink smear of the spinal fluid is positive. **(CHOOSE 1 DIAGNOSIS)**

452. A 47-year-old woman with HIV presents with new right-sided arm and leg weakness. CT scan of the head reveals multiple ring-enhancing lesions located in both hemispheres and involving the basal ganglia and corticomedullary junction. **(CHOOSE 1 DIAGNOSIS)**

INFECTIOUS DISEASES

Answers

426. The answer is d. (*Tintinalli, 5/e, pp 943–946.*) The patient has **gonococcal urethritis** (gram stain is a sensitive and specific method of making the diagnosis) and concomitant ***Chlamydia trachomatis*** infection. Patients require treatment for the gonococcal infection (usually ceftriaxone intramuscularly) and doxycycline or a macrolide for eradication of the chlamydial infection. Gonococcal resistance to penicillin and tetracycline (but not to ceftriaxone) has developed. Patients with **lymphogranuloma venereum** (*Chlamydia trachomatis*) present with inguinal buboes. Patients with **chancroid** (*Haemophilus ducreyi*) present with a painful genital ulcer. **Primary syphilis** is characterized by a painless chancre that appears 21 days after exposure and disappears in 3–6 wk.

427. The answer is c. (*Fauci, 14/e, p 1032.*) The **Jarisch-Herxheimer reaction** is a dramatic flulike reaction that occurs within 2 h of syphilis treatment. It may occur in patients with primary, secondary, or early latent syphilis and is thought to be secondary to the massive destruction of spirochetes and the formation of inflammatory mediators (tumor necrosis factor). The VDRL (RPR) is a nonspecific screening test for syphilis and reverts to negative with treatment. The FTA-ABS is a sensitive and specific diagnostic test and will remain positive for life. The rash of Rocky Mountain spotted fever begins in the palms and soles and spreads centrally; the disease may be confirmed by the Weil-Felix test.

428. The answer is d. (*Fauci, 14/e, pp 919, 1776.*) Patients deficient in complement components C

5, C₆, C₇, C₈, C₉ are susceptible to gonococemia and meningococemia infections due to an inability to mount a bactericidal response to these organisms.

429. The answer is b. (*Fauci, 14/e, pp 1089–1091.*) The patient's symptomatology is most consistent with **mononucleosis**. A "monospot" test (IgM or heterophile test) must be ordered to confirm the diagnosis of EBV mononucleosis syndrome. If the heterophile test is negative, the most likely

etiology of the mononucleosis is CMV. **Atypical lymphocytes** may be seen transiently in EBV, CMV, toxoplasmosis, drug reactions, viral hepatitis, rubella, mumps, and rubeola. Mononucleosis is transmitted through saliva.

430. The answer is d. (*Tintinalli, 5/e, p 1054.*) Organisms of the female genital tract may be acquired during passage through the birth canal and may cause meningitis in neonates. These organisms include *Listeria monocytogenes*, group B β -hemolytic streptococci, and gram-negative rods such as *Escherichia coli*. Neonates may develop infections outside the birth canal, namely *Salmonella*, *S. aureus*, *Proteus*, and *Pseudomonas*, from contact with contaminated persons or articles after birth. The **TORCHES** organisms (**T**Oxoplasmosis, **R**ubella, **C**ytomegalovirus, **H**Erpes simplex, **S**yphilis) and HIV (human immunodeficiency syndrome) are other intrauterine-acquired infections.

431. The answer is d. (*Mehta, p 67. Fauci, 14/e, pp 1060, 1933, 1946.*) **Disseminated gonococcal infection** is the leading cause of bacterial arthritis in young adults. This disease often starts as an early tenosynovitis-dermatitis syndrome, which is often followed by a septic arthritis. Tenosynovitis is most commonly seen over the dorsum of the hand, wrist, ankle, or knee. de Quervain's synovitis is a chronic inflammation of the common sheath of the abductor pollicis longus and extensor pollicis brevis tendons due to repetitive use and causes marked pain and tenderness in the region of the anatomic snuffbox. In Reiter syndrome, patients develop an inflammatory arthritis after an episode of urethritis, dysentery, or cervicitis. It is more common in males than females and HLA-B27 is present in more than 60% of patients. Other findings in Reiter syndrome include conjunctivitis, circinate balanitis (superficial ulcer on the glans penis) and keratoderma blennorrhagicum (papules on the soles of the feet). Patients with Still's disease present with a salmon rash, symmetrical joint involvement, and hepatosplenomegaly.

432. The answer is d. (*Fauci, 14/e, p 926.*) Specific gram-negative organisms are slow-growing (fastidious) and require carbon dioxide for growth. Blood cultures may take 30 days to become positive. These organisms are often referred to as the **HACEK** organisms (**H**aemophilus *parainfluenza*, **H**aemophilus *aphrophilus*, **A**ctinobacillus *actinomycetemcomitans*, **C**ardiobacterium *hominis*, **E**ikenella *corrodens*, and **K**ingella *kingae*).

433. The answer is b. (Fitzpatrick, 3/e, pp 730, 740, 748, 752, 853.) The occupational history and cutaneous skin findings are consistent with **sporotrichosis**. The mycotic organism *Sporothrix schenckii* is found in the soil. The lesion begins as a painless nodule that eventually becomes fixed and necrotic. After a few weeks, multiple nodules develop along the lymphatic channels, causing a chronic nodular lymphangitis. **Blastomycosis** is endemic in the southeastern United States and may be found in agricultural workers but is characterized by pulmonary symptoms. Skin lesions are usually ulcerated, hyperkeratotic, and verrucous. **Histoplasmosis** is transmitted through bird and bat droppings and is endemic in the Ohio and Mississippi River Valleys of the United States. Agricultural workers and others involved in outdoor activities, including cave explorers, are at risk for outbreaks. An acute pulmonary infection typically precedes the skin lesions. **Coccidioidomycosis** is caused by a soil saprophyte endemic to the arid San Joaquin Valley of the United States (Arizona, California, and western Texas). Patients present with respiratory symptoms and skin lesions such as erythema nodosum.

434. The answer is d. (Fauci, 14/e, pp 827–830.) **Necrotizing fasciitis** is a painful and rapidly spreading infection of the fascia of muscle. It often begins at the site of nonpenetrating minor trauma and is usually due to *Streptococcus pyogenes*, although infections may be polymicrobial. Toxicity is severe and patients require immediate surgical exploration to deep fascia and muscle and subsequent debridement. Necrotizing fasciitis that leaks into the peritoneum is called **Fournier's gangrene**. **Cellulitis** is an acute inflammatory condition of the skin that causes erythema, pain, and localized swelling. Erysipelas is a painful superficial cellulitis of the face. Cellulitis is well demarcated from normal skin. Folliculitis is typically due to *Staphylococcus aureus*; patients present with pustules of the hair follicles. **Crepitus** (crackling of the skin due to small air bubbles of air moving through the tissues) may be felt in necrotizing fasciitis due to the presence of gas-producing organisms (*Clostridium perfringens*).

435. The answer is a. (Fauci, 14/e, pp 1182–1185.) Chloroquine-resistant **malaria** is an increasing problem because *Plasmodium vivax* and falciparum malaria may be multidrug resistant. Because of the increasing spread and intensity of plasmodium resistance, the Centers for Disease Control and Prevention recommends a weekly dose of mefloquine for all

travelers. Chemoprophylaxis is never entirely reliable, and malaria must always be considered in the differential diagnosis of fever in patients who have traveled to endemic areas. **Trypanosomiasis**, caused by the protozoan *Trypanosoma cruzi*, is a parasite found only in the Americas. Patients present with the **Romaña sign** (unilateral and painless edema of the periorcular tissues) and cardiomyopathy (**Chagas disease**). Patients with toxoplasmosis who are immunocompetent are generally asymptomatic and have self-limiting disease.

436. The answer is d. (Fauci, 14/e, p 573.) For unknown reasons, patients with *S. bovis* bacteremia have a high incidence of colon carcinoma (and perhaps upper gastrointestinal malignancies as well) and require colonoscopy.

437. The answer is c. (Sapira, p 143. Seidel, 4/e, p 232.) The more tender the node, the more likely it is to be due to inflammation. Cancerous nodes are usually nontender. The harder and more discrete the node, the more likely it is to be malignant. Arteries pulsate, not nodes. A left supraclavicular node, since it is located at the end of the thoracic duct, is a clue to gastrointestinal or thoracic malignancy. A **sentinel node** or **Virchow node** is a firm supraclavicular node. A **Sister Joseph node** is a palpable paraumbilical node seen in patients with intrabdominal or pelvic malignancies.

438. The answer is d. (Fauci, 14/e, pp 1177–1179.) *E. histolytica* is the third most common cause of death by parasites worldwide after schistosomiasis and malaria. Endemic areas include Mexico, India, Central America, South America, tropical Asia, and Africa. Patients may present with fever, right upper quadrant pain, and stools that are FOBT positive. There is no eosinophilia but alkaline phosphatase is often elevated. Abdominal radiographs (CT scan or MRI) typically show the abscesses.

439. The answer is d. (Fauci, 14/e, pp 780, 2423. Seidel, 4/e, p 790.) The patient is demonstrating signs of meningeal irritation. She has nuchal rigidity, a positive **Brudzinski sign** (involuntary flexion of the hips and knees when flexing the neck), and a positive **Kernig sign** (flexing the hip and knee when the patient is supine, then straightening out the leg, causes resistance and back pain). Other signs of meningitis include headache, photophobia, seizures, and altered mental status. Patients with meningitis

(<1%) rarely have papilledema secondary to increased intracranial pressure. Risk factors for meningitis include sinusitis, ear infection, and sick contacts. Fever of unknown origin (FUO) is defined as a fever of >101°F for 3 wk that remains undiagnosed after 1 wk of aggressive investigation.

440. The answer is b. (Fauci, 14/e, pp 835–839, 967.) **Dogs are responsible for 80% of animal bites;** organisms include *P. multocida*, *Eikenella corrodens*, and *Capnocytophaga canimorsus* (formerly called DF-2). *Aeromonas hydrophila* is the organism seen in bite wounds from alligators and other aquatic animals. Rabies is an acute viral disease of the central nervous system and is transmitted by infected dogs, cats, skunks, foxes, raccoons, mongooses, wolves, and bats. *Pseudomonas aeruginosa* may cause a variety of skin lesions, such as “hot tub folliculitis” and ecthyma gangrenosum. *Vibrio parahemolyticus* is an organism found in undercooked shellfish; patients present with diarrhea.

441. The answer is d. (Fauci, 14/e, pp 798–801.) The incubation period for both *S. aureus* and *B. cereus* is 1–2 h after eating. *B. cereus* toxicity is often due to eating fried (the toxin is heat-stable) or uncooked rice. *S. aureus* toxicity is usually due to eating ham, poultry, potato or egg salad, mayonnaise, or cream pastries. All the other organisms require an incubation period of >16 h. *V. cholera* toxicity is due to eating shellfish and causes an inflammatory (presence of fecal leukocytes) diarrhea. *V. parahemolyticus* toxicity is due to eating mollusks and crustaceans and causes dysentery (production of cytotoxins, bacterial invasion, and destruction of intestinal mucosal cells). *Salmonella* toxicity is due to eating beef, poultry, eggs, or dairy products and causes a watery diarrhea. *Shigella* causes dysentery and can be present in potato or egg salad, lettuce, or raw vegetables.

442. The answer is c. (Fauci, 14/e, p 797.) Pathogens that may cause an inflammatory diarrhea and produce **fecal leukocytes** include *Shigella*, *Salmonella*, *Campylobacter jejuni*, *Yersinia enterocolitica*, *Clostridium difficile*, *Vibrio parahemolyticus*, enterohemorrhagic *E. coli*, and enteroinvasive *E. coli*.

443. The answer is c. (Fauci, 14/e, p 1182.) The geographic distribution of glucose-6-phosphate dehydrogenase (G6PD) deficiency, sickle cell disease, sickle cell trait, and thalassemia resembles that of malaria, and having one of these disorders affords protection against *P. falciparum*.

444. The answer is a. (Fauci, 14/e, pp 798, 1023.) The most likely pathogen responsible for the symptoms is ciguatera poison, which is found in the Caribbean, Hawaii, and Florida and is associated with consumption of carnivorous reef fish such as grouper or barracuda. Scromboid poisoning is associated with consumption of tuna, mackerel, and dolphin; patients present with flushing, headache, dizziness, palpitations, nausea, diarrhea, and vomiting (due to histidine release). **Traveler's diarrhea** is predominantly due to enterotoxigenic *E. coli*; patients develop the symptoms within 3–5 days of arriving in a tropical area. **Pseudomembranous colitis** is a nosocomial infection due to *Clostridium difficile*; patients often have a previous history of antibiotic use. *Mycobacterium marinum* is an organism of swimming pools and fish tanks that produces a pustule or nodule at the site of minor trauma.

445. The answer is e. (Fauci, 14/e, p 941.) *H. pylori* is associated with gastritis, duodenal ulcer, gastric ulcer, non-Hodgkin's gastric lymphoma, adenocarcinoma of the stomach, and mucosa-associated tissue lymphomas (MALT).

446. The answer is b. (Fauci, 14/e, pp 824, 955, 1960.) Osteomyelitis is usually a polymicrobial infection, but *S. aureus* is the pathogen in over 50% of all cases. Patients with sickle cell disease are at risk of developing *Salmonella osteomyelitis* (>50% of all cases). Pott's disease is spinal tuberculosis; it usually involves the upper thoracic vertebral bodies.

447–450. The answers are 447-b, 448-d, 449-e, 450-g. (Fauci, 14/e, pp 902, 1063, 1179, 1206, 1225.) **Trichinosis** is caused by the ingestion of infected pork products. Patients present with abdominal pain, diarrhea, a maculopapular rash, periorbital edema, myositis (especially of the extraocular muscles), eosinophilia, and myocarditis. *Acanthamoeba castellanii* is associated with contact lens usage. **Brucellosis** is transmitted through infected milk or raw meat or inhaled during contact with animals (i.e., by slaughterhouse workers, veterinarians, and farmers). Patients present with fever, chills, ophthalmoplegia, joint pain, skin rash, lymphadenopathy, hepatosplenomegaly, cardiac murmur, endocarditis, and meningitis. **Cysticercosis** is associated with the pork tapeworm (*Taenia solium*); patients commonly present with neurologic manifestations, such as seizures and signs of increased intracranial pressure. CT scan of the head often shows

the calcified, multiple lesions of varying size common in neurocysticercosis. *Giardia lamblia* may be asymptomatic or may cause severe diarrhea and malabsorption. Transmission is usually waterborne (i.e., camping sites, sewers, reservoirs) since the cysts survive both cold water and routine chlorination. *Chlamydia psittaci* is associated with bird exposure; patients present with fever, cough, chest pain, dyspnea, pleural effusion, pleural rub, pericardial effusion, and pneumonia. Patients with *C. tetani* present with an infected wound, muscle spasms, and increased muscle tone especially of the masseter muscles (**lockjaw**).

450–451. The answers are 451-b, 452-a. (*Fauci, 14/e, pp 1153, 1200.*)

Patients with HIV may develop cryptococcal meningitis. Patients present with headache, irritability, confusion, ataxia, blurred vision, papilledema, and cranial nerve palsies. Fever and neck stiffness are rare. India ink smear of the spinal fluid will demonstrate the encapsulated yeast. Lesions of toxoplasmosis are usually multiple and ring-enhancing (lymphomas in HIV patients may also be multiple and ring-enhancing, so this description is not pathognomonic for toxoplasmosis). PML is a progressive disorder due to JC virus. The disorder is one of demyelination; patients present with visual deficits, mental impairment, and motor deficits. CT scan or MRI may show the hypodense, nonenhancing white matter lesions. Patients with HIV dementia present with apathy, hyperreflexia, clumsiness, weakness, ataxia, and loss of memory.

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OBSTETRICS AND GYNECOLOGY

Questions

DIRECTIONS: Each of the numbered items or incomplete statements in this section is followed by answers or by completion of the statements. Select the **one** lettered answer or completion that is **best** in each case.

452. A 23-year-old woman presents with fever and bilateral lower quadrant abdominal pain for two days. She complains of the onset of a mucopurulent vaginal discharge with her menses, which she states is yellowish in color. She has a new sexual partner and uses a nonbarrier method of contraception. Her temperature is 103.2°F. She has bilateral lower quadrant tenderness with palpation, and pelvic examination reveals cervical and adnexal motion tenderness. A mass is palpable in the left adnexa. Which of the following is the most likely diagnosis?

- a. Fitz-Hugh-Curtis syndrome
- b. Pelvic inflammatory disease
- c. Perihepatitis
- d. Acute inflammation of Bartholin's gland
- e. Chancroid

453. A 37-year-old woman in her 32nd wk of gestation (G2P1) presents with a seizure. She has been healthy and does not smoke cigarettes, drink alcohol, or use illicit drugs. She has been poorly compliant in receiving her prenatal care. Physical examination reveals a blood pressure of 150/95 mm Hg. The patient's face and hands appear edematous. Other than the patient being postictal (confused and disoriented after the seizure), the neurologic examination is normal. The urinalysis reveals proteinuria. The rest of the patient's laboratory data is normal. Which of the following is the most likely diagnosis?

- a. HELLP syndrome
- b. Preeclampsia
- c. Eclampsia
- d. Essential hypertension
- e. Primary seizure disorder

454. A 20-year-old woman presents with the sudden onset of severe lower abdominal pain that radiates to her left shoulder. She has some vaginal bleeding now, but her last menstrual period was 6 wk ago. She has no history of sexually transmitted diseases and has never been pregnant. She uses condoms inconsistently about 50% of the time with her partner of 18 mo. She denies dysuria or frequency. On physical examination, blood pressure is 100/70 mm Hg, heart rate is 100/min, and temperature is normal. Abdominal exam reveals tenderness and rebound in the left lower quadrant. Adler sign is positive. Pelvic examination reveals a boggy and poorly delineated mass in the left adnexa. The patient's abdominal pain worsens upon slight movement of the cervix. Which of the following is the most likely diagnosis?

- a. Pelvic inflammatory disease
- b. Pyelonephritis
- c. Appendicitis
- d. Ectopic pregnancy
- e. Ruptured corpus luteum cyst

455. Which of the following best describes irregular, prolonged, and heavy menstrual bleeding?

- a. Menorrhagia
- b. Metrorrhagia
- c. Menometrorrhagia
- d. Polymenorrhea
- e. Oligomenorrhea

456. A 24-year-old woman, gravida 3, para 2, presents with the chief complaint of some lower abdominal pain accompanied by a small amount of vaginal bleeding. She is 16 wk pregnant and has been healthy throughout the pregnancy. She does not smoke cigarettes, drink alcohol, or use illicit drugs. Abdominal examination is normal. Pelvic examination reveals that the internal cervical os is closed. Which of the following is the most likely diagnosis?

- a. Complete abortion
- b. Incomplete abortion
- c. Threatened abortion
- d. Inevitable abortion
- e. Missed abortion

457. A 42-year-old woman, G2, P2, presents with the chief complaint of severe bilateral breast pain that seems to be worse around the time of menses. Physical examination reveals bilateral breast tenderness with palpation. Multiple lumps are palpated in both breasts. Mammogram reveals dense bilateral breast tissue. Which of the following is the most likely diagnosis in this patient?

- a. Fibroadenoma
- b. Fibrocystic disease
- c. Paget's disease
- d. Mastitis
- e. Mammary duct ectasia

458. A 32-year-old woman in her third trimester presents with painless and profuse bright red vaginal bleeding. Pelvic examination is deferred. Transvaginal ultrasonography reveals an abnormally positioned placenta. Which of the following is the most likely diagnosis?

- a. Placenta accreta
- b. Placenta previa
- c. Abruptio placentae
- d. Bloody show
- e. Vasa previa

459. A 52-year-old woman complains of recurrent episodes in which she becomes extremely hot and diaphoretic. During these episodes, she becomes anxious and feels like her heart is racing. Each episode lasts approximately 5 min. The episodes are so intense that she must put on the air conditioner or open a window until the episode resolves. Hot weather and stress often precipitate the symptoms. The episodes seem to be worse at night. The patient further states that she has been amenorrheic for 12 mo and has recently begun experiencing vaginal dryness and dyspareunia. Physical examination is normal. Which of the following is the most likely diagnosis?

- a. Depression
- b. Menopause
- c. Hypothyroidism
- d. Somatization
- e. Personality disorder

460. A 30-year-old woman in her 36th week of gestation (G1, P0) presents with a platelet count of 85,000/ μ L. She has no complaints of easy bruisability or mucosal bleeding and feels healthy. She has no past illnesses and takes no medications. She has no family history of bleeding problems. Laboratory data reveals a normal complete blood count, prothrombin time, and partial thromboplastin time. Liver enzymes and urinalysis are normal. Peripheral blood smear reveals normal morphology of red blood cells and platelets. Which of the following is the most likely diagnosis?

- a. Idiopathic thrombocytopenic purpura
- b. Pseudothrombocytopenia
- c. Gestational thrombocytopenia
- d. HELLP syndrome
- e. Thrombotic thrombocytopenic purpura (TTP)
- f. Hemolytic-uremic syndrome (HUS)

461. As you are performing the external portion of a pelvic examination, you palpate a warm, fluctuant mass that is unilateral in the posterolateral portion of the labia majora. The patient states that palpation is painful. The surrounding tissue is inflamed and edematous. Which of the following is the most likely diagnosis?

- a. Bartholin's cyst
- b. Bartholin's abscess
- c. Rectocele
- d. Cystocele
- e. Genital herpes

462. A 64-year-old woman presents with vaginal bleeding similar to “spotting” that has occurred daily for 1 mo. Her last menses was at age 50 and she has been healthy her entire life. She denies fever, weight loss, or abdominal pain. Physical examination is normal. Which of the following is the most likely diagnosis?

- a. Atrophic vaginitis
- b. Endometriosis
- c. Uterine leiomyoma
- d. Endometrial carcinoma
- e. Polycystic ovarian syndrome

463. A 29-year-old woman in her first trimester presents with painless profuse vaginal bleeding. Her blood pressure is 130/90 mm Hg. She has facial and hand edema. Pelvic examination reveals a 24-wk-sized uterus. Urinalysis reveals proteinuria. Which of the following is the most likely diagnosis?

- a. Placenta previa
- b. Abruption placenta
- c. Hydatidiform mole
- d. Normal pregnancy
- e. Multiple-gestation pregnancy

464. A 23-year-old woman presents to your office for a prenatal visit. She has not received any previous prenatal care and does not know the date of her last menstrual period. On physical examination, the fundal height is palpated to be at the level of the umbilicus. Which of the following is the estimated number of weeks of gestation?

- a. 10 wk
- b. 15 wk
- c. 20 wk
- d. 25 wk
- e. 30 wk

DIRECTIONS: Each set of matching items in this section consists of a list of lettered options followed by several numbered items. For each numbered item, select the appropriate lettered option(s). Each lettered option may be selected once, more than once, or not at all. **Each item will state the number of options to select. Choose exactly this number.**

Items 465–467

For each patient with a vaginal finding, choose the most likely causative organism.

- a. *Trichomonas vaginalis*
- b. *Neisseria gonorrhoeae*
- c. *Gardnerella vaginalis*
- d. *Candida albicans*
- e. *Chlamydia trachomatis*
- f. *Enterobius vermicularis*

465. A 19-year-old woman presents with a malodorous, watery, gray-colored vaginal discharge. Clue cells are visible on wet mount preparation and there is a fishy odor to the discharge when mixed with KOH. (SELECT 1 ORGANISM)

466. A 35-year-old woman presents with vaginal itching. Examination reveals strawberry patches or petechiae on the cervix and vaginal mucosa and a frothy green-colored discharge. A pear-shaped organism is visible on wet mount preparation. (SELECT 1 ORGANISM)

467. A 31-year-old woman presents with vaginal burning and a white, cheeselike vaginal discharge. Pseudohyphae are visible with a KOH preparation. (SELECT 1 ORGANISM)

Items 468–472

For each patient with a breast finding, select the most likely diagnosis.

- a. Breast cancer
- b. Paget's disease of the breast
- c. Inflammatory breast carcinoma
- d. Intraductal papilloma
- e. Fibroadenoma

468. A 25-year-old woman presents with a palpable breast mass that has well-defined margins and is movable. (SELECT 1 DIAGNOSIS)

469. A 50-year-old woman presents with a hard, circumscribed, fixed, edematous breast mass. The overlying skin has a peau d'orange appearance. (SELECT 1 DIAGNOSIS)

470. A 52-year-old woman presents with bloody discharge from her right nipple. She has no palpable breast mass. (SELECT 1 DIAGNOSIS)

471. A 36-year-old woman has erythema and a visible erysipeloid margin of her left breast. The involved area is warm and tender to palpation. (SELECT 1 DIAGNOSIS)

472. A 39-year-old woman presents with eczematoid changes of her left breast, which occasionally itches, burns, oozes an exudate, and bleeds. (SELECT 1 DIAGNOSIS)

OBSTETRICS AND GYNECOLOGY

Answers

452. The answer is b. (*Fauci, 14/e, pp 915–919, 926.*) The patient most likely has pelvic inflammatory disease (**PID**) due to *Neisseria gonorrhoeae*. Infections typically occur during menstruation, and patients complain of abdominal pain and yellow mucopurulent vaginal discharge. Spread of the gonococci (or, in some cases, Chlamydia) into the upper abdomen may cause a perihepatitis or **Fitz-Hugh-Curtis syndrome**, and patients will complain of upper abdominal pain. Acute inflammation of Bartholin's gland (an infected duct) would be visible in the labium majus. Chancroid is due to *Haemophilus ducreyi*; patients typically present with a painful ulcer that bleeds easily.

453. The answer is c. (*Cunningham, 20/e, pp 718–725. DeCherney, 8/e, pp 380–386.*) **Preeclampsia** is defined as hypertension, proteinuria (>300 mg/24 h), and/or nondependent edema of the face and hands. Risk factors for preeclampsia include African American race, nulliparity, multiple gestations, extremes of age (<15 or >35), chronic hypertension, and a family history positive for preeclampsia. **Eclampsia** is defined as seizures in a patient with preeclampsia. The cure for preeclampsia/eclampsia is delivery. Magnesium sulfate is often used for seizure prophylaxis and management. The **HELLP syndrome** (**H**emolysis, **E**levated **L**iver enzymes, **L**ow **P**latelets) is a variant of preeclampsia.

454. The answer is d. (*Cunningham, 20/e, pp 607–615. DeCherney, 8/e, pp 316–319.*) The incidence of **ectopic pregnancy** (outside the uterine cavity) is 1 in 100 pregnancies. Risk factors include previous history of PID or ectopic pregnancy, use of an intrauterine device (IUD), DES exposure, and prior pelvic surgery. Patients present with **abdominal pain that may radiate to the shoulder (indicating irritation of the diaphragm from the hemoperitoneum)**, vaginal bleeding, cervical motion tenderness (CMT), and the presence of a boggy and poorly delineated pelvic mass 1–8 wk after

a missed period. The patient may have other symptoms of pregnancy, such as nausea, vomiting, and breast tenderness. If the ectopic pregnancy ruptures, the patient may present with signs of shock. The **Adler sign** is the presence of “fixed” abdominal tenderness on turning the patient and may be seen in ectopic pregnancy. A ruptured corpus luteum cyst causes a tender ovary but no palpable mass. PID causes fever and bilateral lower quadrant pain and tenderness. Appendicitis involves right-sided pain. Pelvic examination is typically normal in appendicitis and pyelonephritis.

455. The answer is c. (*DeCherney, 8/e, p 665.*) **Menorrhagia** is excessive or prolonged menses. **Metrorrhagia** or intermenstrual bleeding occurs at any time between menstrual periods. **Menometrorrhagia** is prolonged and heavy menstrual bleeding that occurs at irregular intervals. **Polymenorrhea** is increased frequency of menstruation and **oligomenorrhea** is scanty menstruation.

456. The answer is c. (*Cunningham, 20/e, pp 591–594. DeCherney, 8/e, pp 306–310.*) Threatened abortion, incomplete abortion, complete abortion, and inevitable abortion all present with vaginal bleeding and occur at <20 wk of gestation. Patients with **threatened** abortion complain of abdominal pain and vaginal bleeding. The membranes remain intact and no products of conception are expelled. The internal cervical os is closed and the fetus is viable. The internal cervical os is open and some products of conception are expelled in **incomplete** abortion. In **complete** abortion, all products of conception are expelled and the internal cervical os is closed. **Inevitable** abortion is when the membranes rupture, the internal cervical os is open, and no products of conception are expelled. Patients complain of abdominal cramps in inevitable abortion. **Missed** abortion is retained fetal tissue with no cardiac activity in a uterus that is not growing. There is no vaginal bleeding, no products of conception are expelled, and the internal cervical os is closed.

457. The answer is b. (*Seidel, 4/e, pp 508–512.*) Women between the ages of 30 and 55 may develop benign cyst formation of the breasts or **fibrocystic breast disease**. Patients typically state that the symptoms worsen premenstrually or as they approach menopause (decreased progesterone). Physical examination often reveals bilateral lumpy and tender breasts. Mammography shows dense breast tissue. Mastitis is most com-

mon in lactating breasts and is usually secondary to *Staphylococcus aureus* infection. The breast is warm, tender, swollen, and erythematous. Mammary duct ectasia is a nonmalignant condition that affects menopausal women. The subareolar ducts become blocked with debris, causing pain, inflammation, nipple discharge, and retraction of the nipple.

458. The answer is b. (Cunningham, 20/e, pp 746–751, 755–757, 765–767.) Placenta previa and abruptio placenta are the two most common causes of third-trimester bleeding. **Placenta previa** is abnormal implantation of placenta near or at the cervical os, and may be total, partial, marginal, or low-lying. Risk factors for placenta previa include advanced maternal age, multiparity, smoking history, and prior cesarean section. Patients present at 30 wk gestation with painless vaginal bleeding. There is no fetal distress. Vaginal examination is contraindicated and sonogram is required to make the diagnosis. **Abruptio placentae** is premature separation of a normally implanted placenta. Patients present with painful (unremitting abdominal and back pain) vaginal bleeding and there is fetal distress. Risk factors for abruptio placentae include advanced maternal age, multiparity, diabetes, hypertension, tobacco use, alcohol use, and cocaine use. **Placenta accreta** is a placenta that adheres to the myometrium without an intervening decidual layer; it is associated with postpartum hemorrhage. In **vasa previa**, the fetal vessels associated with the cord traverse the lower uterine segment and present in advance of the fetal presenting part, causing rapid bleeding when disrupted during labor. Bloody show is a blood-tinged vaginal discharge that occurs when the cervix is dilated and the onset of labor is imminent.

459. The answer is b. (Fauci, 14/e, p 2102.) The patient is presenting with symptoms of normal menopause, which may include “**hot flashes**,” urinary frequency, dysuria, urinary incontinence, vaginal dryness, vaginal itchiness, and dyspareunia. Patients also have amenorrhea. Patients may become anxious or depressed during this time, but there is no evidence that personality or mood changes are due to menopause.

460. The answer is c. (Cunningham, 20/e, pp 705–710. Goldman, 21/e, pp 997–1001.) **Gestational thrombocytopenia** develops in the last trimester of pregnancy (in 8% of pregnant women) and is reversible after delivery. It is difficult to differentiate between gestational thrombocytopenia and ITP,

but ITP will persist after delivery. **HELLP** (Hemolysis, Elevated Liver enzymes, Low Platelet count) syndrome, a variant of preeclampsia, is unlikely in this patient with no evidence of hemolysis and normal liver enzymes. Immediate delivery is the treatment for HELLP syndrome. Pseudothrombocytopenia occurs when platelets aggregate in laboratory test tubes, giving falsely decreased platelet counts. Careful inspection of the peripheral smear will show the aggregates. TTP and HUS are unlikely without kidney involvement.

461. The answer is b. (*DeCherney, 8/e, p 710.*) Obstruction of the main duct of Bartholin's gland results in retention of secretions (cyst) and secondary infection (abscess). Abscesses are generally painful to palpation, hot to the touch, and fluctuant. A **rectocele** is a weakness in the fascia of the posterior vaginal wall in which the rectum appears as a bulging mass. A **cystocele** is a protrusion of the bladder into the anterior vaginal wall. Asking the patient to bear down will enhance these protrusions and make them more easily seen.

462. The answer is a. (*DeCherney, 8/e, pp 668–669.*) The most common cause of postmenopausal vaginal bleeding is **atrophic vaginitis** (with or without trauma). Endometriosis is the most common cause of infertility; patients present with dyspareunia (painful intercourse), abnormal vaginal bleeding, and pelvic pain. Uterine leiomyomas (uterine fibroids) change in size with the menstrual cycle but regress in size during menopause. Often the fibroid is palpable on pelvic examination. Polycystic ovarian syndrome (Stein-Leventhal syndrome) affects younger women (15–30). The etiology of polycystic ovary syndrome is unknown; patients present with amenorrhea, obesity, hirsutism, and infertility. **All postmenopausal women with vaginal bleeding require a biopsy to rule out endometrial carcinoma.**

463. The answer is c. (*Cunningham, 20/e, pp 677–683. DeCherney, 8/e, pp 967–976.*) Malignant gestational trophoblastic neoplasms include the tumors of **hydatidiform mole, invasive mole, and choriocarcinoma**. These tumors arise from fetal tissue, not maternal tissue. Patients present with first-trimester vaginal bleeding and signs of preeclampsia (pathognomonic for hydatidiform mole). Typically, patients have increased β -hCG titers (greater than expected for gestational age) and rapid enlargement of the uterus (greater than anticipated by dates) with absence of fetal heart

sounds and structures. The “**cluster of grapes**” appearance of the mole makes it easily identifiable on gross examination. Rarely, patients with hydatidiform moles may present with hyperthyroidism due to the production of thyrotropin by the molar tissue.

464. The answer is c. (Seidel, 4/e, p 614.) At 20 wk of pregnancy, **fundal height is at the level of the umbilicus**. Part of the obstetrics and gynecology history should include **GPAL (Georgia Power and Light)**: Gravida, Para, Abortions, and Living children).

465–467. The answers are 465-c, 466-a, 467-d. (DeCherney, 8/e, pp 690–700.) *Gardnerella vaginalis* (the most common cause of vaginitis) causes a profuse, malodorous discharge. Wet mount preparation will demonstrate **clue cells** (epithelial cells with adherent bacteria that cause their borders to be irregular), and a KOH preparation will reveal the discharge to have a fishy odor (**positive sniff or whiff test**). *Candida* produces a thick, white, cottage-cheese-appearing discharge, and KOH preparation will reveal the characteristic pseudohyphae. Ten percent of patients with *Trichomonas* will have a “**strawberry-appearing**” cervix or vaginal mucosa. The vaginal discharge may be green and is often described as frothy. The trichomonal flagellates are characteristically motile and pear-shaped. A vaginal discharge with leukocytes but no organisms is characteristic of *Chlamydia*. *Enterobius vermicularis* (pinworms) may cause pruritus of the perineum. The diagnosis is made by applying scotch tape to the perineum, then to a slide; looking microscopically will reveal the characteristic double-walled ova of the parasite.

468–472. The answers are 468-e, 469-a, 470-d, 471-c, 472-b. (Fauci, 14/e, pp 562–568.) Most breast cancers present in the **upper outer quadrant** of the breast; patients may present with a hard, circumscribed mass that is fixed to the skin or deep muscle. Cancer may be nodular with indistinct borders. Patients may also have nipple edema or retraction. A woman under the age of 30 years presenting with a mobile breast mass that has well-defined borders most likely has a **fibroadenoma**. However, breast cancer must still be ruled out since clinical exam and even mammography are not sufficient to exclude the diagnosis. **Intraductal papilloma** is a benign tumor; patients often present with a bloody discharge from the nipple in the absence of a breast mass. Patients who present with an erythematous and

warm breast (which eventually becomes indurated and firm) may have **inflammatory breast carcinoma**. Patients with **Paget's disease** classically present with eczematoid changes in the nipple (i.e., itching, oozing, and bleeding), all of which occur over a relatively long period of time. Mammography may be negative, and biopsy is required to make the diagnosis.

PEDIATRICS AND NEONATOLOGY

Questions

DIRECTIONS: Each of the numbered items or incomplete statements in this section is followed by answers or by completion of the statements. Select the **one** lettered answer or completion that is **best** in each case.

473. An 18-mo-old boy is brought to the pediatrician because of progressively worsening episodes of cyanosis. The child has moments where he turns blue and becomes dyspneic. During these episodes the child becomes irritable and remains in a squatting position. Physical examination reveals a small and thin child with clubbing of the fingers and toes. Lungs are normal. Heart auscultation reveals an RV lift and a grade III/VI harsh systolic ejection murmur at the upper left sternal border. Which of the following is the most likely diagnosis?

- a. Transposition of the great vessels (TOGV)
- b. Tetralogy of Fallot (TOF)
- c. Truncus arteriosus
- d. Tricuspid atresia
- e. Total anomalous pulmonary venous return

474. A 3-year-old boy is brought to the emergency room with lethargy, irritability, and ataxia. The child often complains of diffuse abdominal pain and is constipated. On physical examination, the tongue size is normal but a black line is visible along the gingiva. Peripheral smear reveals basophilic stippling of the red blood cells. Which of the following is the most likely diagnosis?

- a. Porphyria
- b. Kernicterus
- c. Fragile X syndrome
- d. Lead poisoning
- e. Cretinism

475. A grammar school is going to start screening children for scoliosis and has asked for your recommendations regarding testing. Which of the following is the most appropriate screening test for this purpose?

- a. Growth charts
- b. Lateral radiograph of the thoracic spine
- c. Forward bending test
- d. MRI of the thoracic spine
- e. Ortolani test

476. A 4-year-old boy is brought to the emergency room complaining of left ear pain that awakened him from sleep. The child has no past medical history and has been in good health. During the physical examination, the child is irritable and often tugs at his left ear. His temperature is 101.5°F and he has no lymphadenopathy. The left tympanic membrane is bulging and erythematous. Which of the following is the most likely diagnosis?

- a. Perforation of the eardrum
- b. Serous otitis media
- c. Acute otitis media
- d. Acute mastoiditis
- e. Foreign body in the ear

477. The mother of an 11-mo-old infant is concerned because her child is easily startled with slight noise and cannot sit alone without assistance. On physical examination, the child does not seem to respond to visual cues and is extremely hypotonic. Funduscopic examination reveals a macular cherry red spot. Which of the following is the most likely diagnosis?

- a. Pompe's disease
- b. Tay-Sachs disease
- c. Adrenoleukodystrophy
- d. Phenylketonuria
- e. Cerebral palsy
- f. Dandy-Walker malformation

478. A 2-year-old boy presents with a "barking" cough and fever. The cough started suddenly in the middle of the night. On physical examination, the patient's temperature is 101.5°F and he appears frightened and anxious. He has a heart rate of 160 beats/min and a respiratory rate of 36/min. His breathing is labored and he is using his accessory muscles of respiration. Marked inspiratory stridor is audible. Lung examination is unremarkable. Which of the following is the most likely diagnosis?

- a. Epiglottitis
- b. Peritonsillar abscess
- c. Croup
- d. Asthma
- e. Bronchiolitis

479. A 2-year-old boy is having difficulty breathing. The mother states that he has had a cough since birth and that this visit to the emergency room is one of many for her sickly son. The neonatal history reveals that the boy did not defecate for some time after delivery. The growth chart reveals that the child is in the 5th percentile. Which of the following is the most helpful test to order in this patient?

- a. HIV antibody test
- b. Sweat test
- c. Urine toxicology screen
- d. Lead level
- e. MRI of the head

480. A 6-year-old girl is brought to your office by her parents, who feel that the child has been having brief episodes of unresponsiveness with fluttering of the eyelids and lip smacking. The child's school-teacher has recently sent home a note stating that the girl is "day-dreaming" in class and is often inattentive. Physical examination is normal but at least twice during the examination, the child appears to look blank or be dazed for 20–30 s. Which of the following is the most likely diagnosis?

- a. Atonic seizure
- b. Absence seizure
- c. Neonatal seizure
- d. Focal seizure
- e. Tardive dyskinesia
- f. Psychomotor seizure

481. A 6-wk-old girl is constantly coughing. She is afebrile and began coughing about 10 days ago with increasing regularity. Delivery was uncomplicated, but when the girl was 10 days old, a mild conjunctivitis developed that responded well to topical antibiotics. On physical examination, respiratory rate is 55/min and the infant is breathing by using the accessory muscles of respiration. The cough is paroxysmal and staccato in character. Lung auscultation reveals bilateral diffuse crackles. A chest radiograph reveals a bilateral diffuse interstitial infiltrate. Which of the following is the most likely diagnosis?

- a. Chlamydial pneumonia
- b. Pertussis
- c. Respiratory syncytial viral pneumonia (RSV)
- d. Foreign body aspiration
- e. *Pneumocystis carinii* pneumonia (PCP)

482. A white reflex on examination of the optic fundus of an infant is most suggestive of which of the following?

- a. Retinoblastoma
- b. Retinocerebellar angioma
- c. Choroidal angioma
- d. Primary congenital glaucoma
- e. Papilledema

483. A 9-mo-old child is brought to the emergency room by her parents. They state the child has been irritable for the last several days and progressively lethargic. The infant vomited several times in the car on the way to the hospital. The parents state that the infant has not been previously ill. They deny any history of trauma or accidental ingestion of medication or poisons. On physical examination, the child is lethargic and difficult to arouse. Her vital signs are normal. There is no evidence of external trauma, but retinal hemorrhages are visible on funduscopic examination. Her fontanel is bulging. Which of the following is the most likely diagnosis?

- a. Bacterial meningitis
- b. Oligodendroglioma
- c. DiGeorge syndrome
- d. Fetal alcohol syndrome
- e. Shaken baby syndrome

484. A 4-h-old full-term newborn had been doing well until the staff in the nursery attempted to feed her. The girl became cyanotic during the feeding challenge but improved with crying when the attempt to feed was discontinued. Which of the following is the most likely diagnosis?

- a. Hyaline membrane disease
- b. Choanal atresia
- c. Meconium aspiration
- d. Tracheoesophageal fistula
- e. Tracheomalacia

485. A 10-year-old girl presents with several light brown maculae, each greater than 1 cm in diameter, on her trunk. Physical examination reveals axillary freckling and firm subcutaneous masses. Which of the following is the most likely diagnosis?

- a. Von Hippel-Lindau syndrome
- b. Tuberous sclerosis
- c. Meningioma
- d. Craniopharyngioma
- e. Neurofibromatosis type 1

486. An 8-year-old girl presents with the acute onset of swelling of her hands, feet, legs, and face. Her past medical history is significant for a recent upper respiratory tract infection. Physical examination reveals normal vital signs. The patient has clear lungs but has pitting edema up to her sacrum. Heart examination is normal. Urinalysis reveals severe proteinuria (4+). Which of the following is the most likely diagnosis?

- a. Rapidly progressive glomerulonephritis (RPGN)
- b. Membranoproliferative glomerulonephritis (MPGN)
- c. Minimal change disease
- d. Focal glomerulosclerosis
- e. Membranous nephropathy

487. A 3-year-old boy with a 4-day history of upper respiratory tract infection presents to the emergency room for evaluation of pallor and fatigue. Physical examination reveals a pale child with normal vital signs. He has scattered petechiae on the chest and extremities and a palpable spleen tip. Laboratory data reveals a leukocytosis (white blood cell count of $>30,000/\mu\text{L}$). Hemoglobin is 7.4 gm/dL and platelet count is $50,000/\mu\text{L}$. The peripheral blood smear reveals the presence of blasts. Which of the following is the most likely diagnosis?

- Acute lymphoblastic leukemia
- Acute nonlymphocytic leukemia
- Chronic lymphocytic leukemia
- Acute myelogenous leukemia
- Chronic myelogenous leukemia
- Atypical lymphocytosis

488. Physical examination of a newborn female reveals that a posterior hip dislocation occurs when a posterior force is applied while flexing and adducting the hip. This positive maneuver for the diagnosis of congenital hip dislocation is called which of the following?

- Ortolani maneuver
- Trendelenburg sign
- Allis sign
- Barlow maneuver
- Galeazzi sign

489. A 7-year-old girl comes to the emergency room with fever, sore throat, and “noisy breathing.” She has no cough. On physical examination, she appears ill and speaks with a hoarse voice. She has obvious difficulty swallowing and is febrile with a temperature of 103.8°F . Her pulse is 120 beats/min and her respiratory rate is 18/min. Her blood pressure is normal. She is drooling and prefers to remain in a sitting position, leaning forward with her mouth open. She has no palpable lymphadenopathy. Which of the following is the most likely diagnosis?

- Exudative pharyngitis
- Epiglottitis
- Croup
- Diphtheria
- Peritonsillar abscess

490. A 4-mo-old child is brought to the emergency room because of a swollen scrotum. On physical examination, the child is afebrile. The scrotum is distended but not taut. A mass is palpable that is firm, smooth, and nontender. The mass transilluminates with a penlight. Which of the following is the most likely diagnosis?

- Inguinal hernia
- Spermatocele
- Varicocele
- Hydrocele
- Cryptorchidism

491. A 5-wk-old infant is brought to the pediatrician for a well baby visit. The mother states that the child has been healthy. Physical examination reveals no cyanosis and no clubbing. Palpation of the heart reveals a systolic thrill and auscultation reveals a grade IV/VI pansystolic murmur heard best at the lower left sternal border. S_2 is loud but not split. Which of the following is the most likely diagnosis?

- a. Atrial septal defect
- b. Patent ductus arteriosus
- c. Ventricular septal defect
- d. Eisenmenger syndrome
- e. Endocarditis

492. A 13-year-old boy, who has recently recovered from an upper respiratory tract infection, presents to the emergency room with lethargy, vomiting, and delirium. While being transported to the emergency room, the boy has a seizure. On physical examination, the child is jaundiced and has hepatomegaly. He has no focal deficits on neurologic examination but is comatose. Which of the following is the most likely diagnosis?

- a. Reye syndrome
- b. Wilson's disease
- c. West Nile encephalitis
- d. Viral hepatitis
- e. Botulism

493. A 1-year-old boy is brought to the emergency room because of the passage of several maroon-colored stools per rectum. The abdominal exam reveals normal bowel sounds and no masses. Which of the following is the most likely diagnosis?

- a. Biliary atresia
- b. Intussusception
- c. Meckel's diverticulum
- d. Zenker's diverticulum
- e. Pyloric stenosis

494. A 9-year-old girl is brought into your office by her mother, who states that the daughter has been losing weight and having difficulty at school. The mother discovered some yellow-colored discharge on the child's underwear. On physical examination, you notice erythema to all parts of the patient's vulva and to the vagina. There is some yellow discharge visible. Which of the following is the most likely diagnosis?

- a. Müllerian duct tumor
- b. Wolffian duct tumor
- c. Dermatitis
- d. Sexual abuse
- e. Straddle injury

495. A 10-year-old child presents with a confluence of pustular and vesicular lesions on the hands and face, some of which have ruptured and expressed a serous exudate. They appear to be honey-colored. A Tzank preparation is negative for multinucleated giant cells but a gram stain is significant for gram-positive cocci. Which of the following is the most likely diagnosis?

- a. Folliculitis
- b. Kawasaki's disease
- c. Staphylococcal scalded-skin syndrome
- d. Miliaria
- e. Impetigo

496. A 2-year-old boy presents with progressive clumsiness and difficulty walking. On physical examination, the child has large calves. He has difficulty walking on his toes and has a waddling gait. Gower maneuver is positive. Which of the following is the most likely diagnosis?

- a. Becker muscular dystrophy
- b. Myotonic dystrophy
- c. Facioscapulohumeral dystrophy
- d. Duchenne muscular dystrophy

497. A 6-year-old boy has a history of corneal opacities and relapsing polyneuropathy. Physical examination reveals the presence of large, orange-colored tonsils. The patient's serum cholesterol is low but his triglyceride level is normal. Which of the following is the most likely diagnosis in this patient?

- a. Malnutrition
- b. Malabsorption
- c. Exudative pharyngitis
- d. HIV infection
- e. Myeloproliferative disorder
- f. Tangier disease

498. A 3-year-old child presents to the emergency room with dysuria and hematuria for 1 day. The mother states that the child has been losing weight and has been complaining of nausea and vomiting. Vital signs reveal a blood pressure of 135/85 mm Hg and a temperature of 102°F. Palpation of the abdomen reveals a mass that extends to the left flank. Which of the following is the most likely diagnosis?

- a. Neuroblastoma
- b. Ewing's sarcoma
- c. Wilms tumor
- d. Rhabdomyosarcoma
- e. Hodgkin's lymphoma

DIRECTIONS: Each set of matching items in this section consists of a list of lettered options followed by several numbered items. For each numbered item, select the appropriate lettered option(s). Each lettered option may be selected once, more than once, or not at all. **Each item will state the number of options to select. Choose exactly this number.**

Items 499–500

For each child with a rash, choose the most likely diagnosis.

- a. Rubeola
- b. Rubella
- c. Varicella
- d. Roseola

499. An 8-year-old child has the sudden onset of vesicles beginning first on the face and scalp and then spreading to the trunk and extremities. Some vesicles have evolved into pustules and crusts. The lesions are extremely pruritic. Two weeks ago, the child visited a nursing home on a school field trip. **(CHOOSE 1 DIAGNOSIS)**

500. A 1-year-old infant presents with a high fever for 4 days. Today the child is afebrile but developed a blanchable, maculopapular rash over the trunk and neck. The child appears remarkably well. **(CHOOSE 1 DIAGNOSIS)**

PEDIATRICS AND NEONATOLOGY

Answers

473. The answer is b. (*Behrman, 16/e, pp 1385–1399. Hay, 14/e, pp 496–497.*) The five congenital heart disorders listed in the answer (**the five T's**) cause **right-to-left** shunts and subsequent cyanosis. **Tetralogy of Fallot is the most common type of cyanotic heart lesion** and consists of Pulmonary stenosis, RVH, an Overriding aorta, and VSD (**PROV**). Children present with dyspnea, cyanosis after the neonatal period, irritability, easy fatigability, and retarded growth and development. Physical examination may reveal an RV lift, a murmur of VSD, and clubbing. The cyanosis of tetralogy is often relieved by increasing venous return to the heart by the knee-chest position (**squatting or “tet” spells**). Chest radiograph may reveal a “boot-shaped” heart due to RVH. Children with transposition of the great vessels (aorta connected to RV and pulmonary artery connected to LV), tricuspid atresia (no communication between RA and RV), truncus arteriosus (one great vessel arises from the heart to supply the arterial and pulmonary circulation), and total anomalous pulmonary venous return (blood drains into RA instead of LA) typically present with cyanosis in the neonatal period.

474. The answer is d. (*Behrman, 16/e, pp 2156–2159.*) **Lead poisoning** produces a motor neuropathy and is associated with anemia, a gingival lead line, colicky abdominal pain, and basophilic stippling of red blood cells. Patients with acute intermittent porphyria (AIP) present with recurrent bouts of abdominal pain, confusion, and peripheral and cranial neuropathies. Kernicterus is accumulation of bilirubin in the newborn that may cause neuronal death and scarring. Children with fragile X syndrome present with mental retardation, large ears, and a prominent jaw. The triad of macroglossia, abdominal distension, and constipation is consistent with cretinism.

475. The answer is c. (*Behrman, 16/e, pp 2077–2078, 2083–2086. Mehta, pp 170–171.*) The presence of a hump or asymmetry when the patient

bends forward is the hallmark of a scoliotic deformity. Radiographic evaluation is used to determine the degree of scoliosis but would not be a cost-effective screening test since films of the entire spine are required. The **Ortolani test** is used to identify congenital dislocation of the hip in an infant. While the patient is in the supine position, the examiner holds the legs with the thumbs against the inside of the knee and thigh and the fingers over the posterior aspect of the proximal femur. A “click” will be noted as the examiner applies anterior force to the femur and the hip is reduced into the acetabulum.

476. The answer is c. (*Behrman, 16/e, pp 1950–1959. Ludman, pp 1–8.*) The most likely diagnosis in this patient is acute bacterial **otitis media**. A mucopurulent discharge in acute otitis media occurs only if the drum perforates; otherwise, the tympanic membrane is bulging and erythematous. The organisms responsible for this infection are *Haemophilus influenzae*, *Streptococcus pneumoniae*, and *Moraxella catarrhalis*. Adenopathy is usually absent in simple otitis media. Perforations of the eardrum may occur with infections; sudden changes in pressure, especially when diving; and trauma. **Serous otitis media** will cause the tympanic membrane to be retracted and scarred. Acute mastoiditis is caused by the breakdown of the thin bony partitions between the mastoid cells and occurs when an otitis media continues, often with few symptoms, despite adequate treatment. Patients have a continuous discharge through a perforation in the eardrum and complain of swelling, tenderness, and erythema over the mastoid bone.

477. The answer is b. (*Behrman, 16/e, pp 1811, 1849–1851.*) **Tay-Sachs disease** is a progressive autosomal recessive disorder resulting from a deficiency of the enzyme hexosaminidase A with the subsequent storage of ganglioside in the lysosomes of the neurons. Infants present with hyperacusis (startling to sound), hypotonia, and delayed motor development. Funduscopic examination will reveal a macular cherry red spot. **Pompe’s disease** is acid maltase deficiency; infants present with weakness and floppiness. **Adrenoleukodystrophy** is an inherited demyelinating disease of males resulting in an enzymatic defect in peroxisomes. Children present with behavioral problems, spasticity, deafness, visual loss, dementia, and brown skin pigmentation. **Phenylketonuria** (PKU) is an autosomal recessive disease in which neonates present with growth failure, seizures, and

mental retardation. Patients are diagnosed by obtaining elevated phenylalanine levels during required screening. Cerebral palsy (CP) is a group of disorders in which patients present with motor deficits (intelligence may be spared) acquired in the prenatal or perinatal period because of an episode of hypoxemia, ischemia, or infection. There is midline cerebellar agenesis with a 4th ventricle cyst in the **Dandy-Walker malformation**, and this causes hydrocephalus.

478. The answer is c. (*Behrman, 16/e, pp 991, 1275–1278. Hay, 13/e, pp 435–436.*) **Croup** (acute laryngotracheobronchitis) occurs in the fall and winter months and is most often due to one of the parainfluenzae viruses. It occurs in boys more often than girls between the ages of 3 mo and 5 years. The inflammation of croup is subglottic. Patients exhibit labored breathing, stridor, and use of the accessory muscles of respiration to assist breathing. Because of the viral etiology, temperature is typically less than 103°F and peripheral white blood cell count is usually normal. An anteroposterior radiograph of the larynx will show subglottic narrowing, known as the “**hourglass**” sign or the “**steeple**” sign. **Epiglottitis** is most often caused by *Haemophilus influenzae* type B. It is seen in children between the ages of 2 and 7 and may cause life-threatening airway obstruction. Patients present with fever, dysphagia, muffled voice, inspiratory retractions, cyanosis, and drooling. To keep the airway open, patients with epiglottitis often sit in the “**sniffing dog position.**” The “**thumbprint**” sign is seen in a soft tissue lateral radiograph of the neck, but these films are rarely done since children require immediate protection of the airway with intubation. **Bronchiolitis** occurs in infants <6 mo old and is most likely due to RSV. There is characteristic hyperinflation of the lungs and the infant appears anxious due to difficulty in expiration.

479. The answer is b. (*Behrman, 16/e, pp 1315–1327. Seidel, 4/e, p 404.*) The child most likely has **cystic fibrosis** (CF). CF is a multisystemic autosomal recessive disorder that affects the sinuses, lower respiratory tract (bronchiectasis), exocrine function of the pancreas, intestinal function (deficiencies in fat-soluble vitamins A, D, E, and K), sweat glands, and urogenital tract (infertility). Patients have episodes of recurrent respiratory tract infections and a history of failure to thrive. Salt loss in sweat is distinctive. A **meconium ileus** (obstruction from hardened meconium) occurs in 15% of all patients and may be the first manifestation of CF. Res-

piratory infections are most often due to *Pseudomonas aeruginosa* and *S. aureus*. The recurrent infections produce large amounts of mucus that cause obstructive lesions in the bronchi and bronchioles. Diagnosis is made by combining the clinical presentation with an abnormal sweat chloride value (>70 mmol/L).

480. The answer is b. (*Behrman, 16/e, pp 1813–1818.*) **Absence seizure** (petit mal) occurs in children between the ages of 3 and 10 and is characterized by numerous daily episodes of unresponsiveness often associated with lip smacking, eye rolling, eyelid fluttering, or lip movement. Atonic (astatic) seizures are called “**drop attacks**”; patients experience a sudden loss of tone in postural muscles. Neonatal seizures are various forms of seizures that may be seen in the newborn. **Focal seizures** (partial complex) involve one part of the body and are not associated with loss of consciousness. These seizures can spread to involve adjacent areas of the body (“Jacksonian march”). **Psychomotor seizures** (temporal lobe) are associated with automatisms (purposeless motor movements with altered consciousness). Lip smacking may be seen in tardive dyskinesia, but it is usually a consequence of the use of neuroleptics.

481. The answer is a. (*Behrman, 16/e, pp 838–842, 991–993.*) The clinical presentation is consistent with chlamydial pneumonia, which develops in 20% of infants born to women with chlamydia infections. Newborns will present within 3 mo of birth with a week of persistent symptoms. The majority will have bilateral crackles on lung auscultation. Inclusion conjunctivitis and pneumonia are often a consequence of the perinatal infection. The etiologic agent (*C. trachomatis*) is found in up to 25% of pregnant women. **Pertussis or whooping cough** is a highly contagious infection and is unlikely to be mild on presentation. The word *pertussis* means violent cough, and the disease is often called “the cough of 100 days” because of its chronic nature. The cough of pertussis is described as being paroxysmal and **staccato** in character, ending with a high-pitched inspiratory “**whoop.**” Respiratory syncytial viral pneumonia (RSV) presents like chlamydial pneumonia but with no history of conjunctivitis. Patients with RSV present with rhinorrhea and cough. Aspiration of a foreign body causes cyanosis, the abrupt onset of respiratory distress, stridor, intercostal retractions, wheezing, and asymmetric breath sounds.

482. The answer is a. (*Behrman, 16/e, pp 1561–1562.*) **Retinoblastoma** causes a white reflex (**leukocoria**). This is a life-threatening malignant tumor rarely seen in infants and children. Leukocoria may also be due to a cataract. Retinocerebellar angiomas is part of a rare autosomal dominant disease (von Hippel-Lindau disease); patients present with nystagmus, retinal detachment, cerebellar hemangioblastoma, intraabdominal cysts, and renal carcinoma. Choroidal angioma is found in **Sturge-Weber disease**; patients present with congenital glaucoma, cloudiness of the cornea, and marked enlargement of the eye at birth (buphthalmos). Infants with Sturge-Weber disease may also have facial angiomas. Primary congenital glaucoma is a condition of increased intraocular pressure caused by abnormal development of the aqueous drainage structures of the eye. In papilledema, the optic disc margins are bilaterally indistinct due to optic nerve swelling from increased intracranial pressure.

483. The answer is e. (*Behrman, 16/e, pp 331, 531. Tintinalli, 5/e, p 759.*) Retinal hemorrhages with no evidence of external trauma along with a history of irritability, lethargy, vomiting, and a bulging fontanel suggest increased intracranial pressure from a chronic subdural hematoma or “**shaken baby syndrome.**” Increased head circumference is also suggestive of increased intracranial pressure. **DiGeorge syndrome** is a congenital disorder; infants present with cardiac defects, tetany from hypocalcemia secondary to an underdeveloped parathyroid gland, facial abnormalities, and thymus gland maldevelopment causing an isolated T-cell deficiency. Oligodendroglioma commonly involves the temporal lobe, and patients often present with seizures. **Fetal alcohol syndrome** is the number one cause of congenital malformations. Infants are born with developmental retardation and facial, heart, lung, and limb abnormalities.

484. The answer is b. (*Behrman, 16/e, pp 1258–1259. Hay, 14/e, pp 24, 36, 42–44, 58.*) **Choanal atresia** is a congenital nasal obstruction (due to a septum between the nose and pharynx). Newborns are obligate nose breathers and any nasal obstruction may cause respiratory distress. In choanal atresia, the baby appears to be fine when crying (breathing through the mouth) but becomes cyanotic when crying stops. The incidence of this disorder is 1 in 2500 live births. Treatment consists of maintaining the airway (which may be achieved emergently by making a large

hole in the pacifier), which allows the infant to mouth-breathe. Fifty percent of infants with choanal atresia have other congenital anomalies (**CHARGE syndrome** = Coloboma, Heart disease, Atresia choanae, Retarded growth, hypoGonadism, and Ear abnormalities). Newborns with tracheal-esophageal (T-E) fistula present within a few hours of birth with choking, cyanosis, and respiratory distress. **Hyaline membrane disease, the most common cause of respiratory distress in the premature newborn**, is a deficiency of surfactant causing severe respiratory distress usually in premature newborns. Meconium aspiration syndrome occurs immediately upon birth and is associated with significant pulmonary morbidity. Tracheomalacia is a self-limited disorder that causes “noisy” breathing (wheezing or stridor) in infancy due to the lack of a rigid trachea.

485. The answer is e. (*Behrman, 16/e, pp 1835–1839.*) Patients with **neurofibromatosis** (NF) type 1 (classical or peripheral) typically present with multiple **café-au-lait spots**, axillary freckling, cutaneous neurofibromas, acoustic neuromas, neurilemmomas, optic gliomas, Lisch nodules (hamartomas of the iris that appear as brown elevations), and skeletal abnormalities. Patients with neurofibromatosis type 2 (central) present with bilateral acoustic neuromas and multiple meningiomas and rarely have café-au-lait spots. Neurofibromatosis is also called von Recklinghausen syndrome. **Tuberous sclerosis** (Bourneville’s disease) is a multisystem disease; patients present with skin lesions, benign tumors of the central nervous system, seizures, and mental retardation. **Von Hippel-Lindau syndrome** (VHL) is characterized by cerebellar hemangioblastoma, renal and pancreatic cysts, renal cell carcinoma, and retinal angiomatosis. The neurocutaneous syndromes (NF, VHL, and tuberous sclerosis) are all autosomal dominant disorders. Meningioma is a slow-growing benign tumor that arises from the leptomeningeal arachnoidal cells. Craniopharyngioma is a slow-growing cystic tumor arising from the pituitary; patients present with visual field defects and endocrine abnormalities.

486. The answer is c. (*Behrman, 16/e, pp 1593–1594.*) Nephrotic syndrome is a clinical complex consisting of >3.0 g proteinuria in 24 h, hypoalbuminemia, edema, hyperlipidemia, lipiduria, and hypercoagulability. **Minimal change disease** (MCD) accounts for 80% of nephrotic syndrome in children under the age of 16 and 20% of nephrotic syndrome in

adults. Patients typically present with nephrosis and a benign urinary sediment. The etiology of MCD is unknown, but occasionally the syndrome develops after a respiratory tract infection or an immunization. Patients respond to steroids and the prognosis is excellent. RPGN and MPGN are immunologically mediated diseases characterized by oliguria, subnephrotic proteinuria, edema, hematuria, red blood cell casts, and hypertension (acute nephritic syndrome).

487. The answer is a. (*Behrman, 16/e, pp 1543–1548.*) **Acute lymphoblastic leukemia** (ALL) comprises 80% of all childhood leukemias (peak incidence is between 3 and 7 years of age). Most patients present with fatigue, mucosal bleeding, gum hypertrophy, and bone pain. Patients may present with an infection due to the severe neutropenia or with a dramatically high hyperleukocytosis. Physical examination is often remarkable for pallor, petechiae, purpura, mucous membrane bleeding, bone pain, generalized lymphadenopathy, and hepatosplenomegaly. The hallmark of ALL is pancytopenia with circulating blast cells on peripheral smear and a bone marrow that is replaced by at least 30% blasts. Acute nonlymphocytic leukemia (ANLL), also called acute myelogenous leukemia (AML), is primarily a disease of adults. The **Auer rod is pathognomonic of AML**. Atypical lymphocytosis is seen in mononucleosis.

488. The answer is d. (*Behrman, 16/e, pp 2077–2078. Mehta, pp 260–263.*) All newborns must be evaluated for congenital hip dislocation, but it is most commonly seen in females, firstborns, and breech presentations. The **Barlow test** (with the hip in 90° of flexion and maximum abduction, the femur is pushed down while trying to adduct the hip; this will dislocate an unstable hip joint) and **Ortolani maneuver** (thighs are abducted from the midline with anterior pressure on the greater trochanter; the femoral head is displaced anteriorly into the acetabulum and a soft click is produced) should be performed on all newborns. The Ortolani test is a maneuver to reduce a recently dislocated hip. Other maneuvers include the **Trendelenburg sign** (used in older children; a dip of the pelvis to the opposite side when the patient stands on the affected side or a waddling gait with bilateral dislocation of the hip) and the **Allis sign**, also called the **Galeazzi sign**, which is unequal heights of the knees (the dislocated side is lower) when the hips and knees are flexed.

489. The answer is b. (Behrman, 16/e, pp 1275–1276.) **Epiglottitis** is a progressive cellulitis of the epiglottis and surrounding tissues due to *Haemophilus influenzae* type B in children (usual age is 2–7 years) or *S. pneumoniae* or *S. aureus* in adults. Patients with epiglottitis have a high fever and complain of sore throat, drooling (inability to swallow secretions), dysphagia, odynophagia, and a muffled voice. **The mnemonic to remember the symptoms of epiglottitis is the four D's (Drooling, Dysphagia, Dyspnea, and Dysphonia).** Posture is usually upright, leaning forward, and in children is called the “**sniffing dog**” position. Stridor (a loud, high-pitched sound) may also be present. The diagnosis of a “cherry red” epiglottitis is confirmed by laryngoscopy. Patients with exudative pharyngitis due to group A *Streptococcus* present with fever and large, tender anterior cervical lymphadenopathy. **Peritonsillar abscess** (quinsy) occurs as a complication of bacterial tonsillitis and is the accumulation of pus between the tonsil and its bed. Patients complain of sore throat, unilateral otalgia, dysarthria, and trismus. On throat examination, an enlarged, medially displaced tonsil (abscess) is seen in the peritonsillar area and the uvula is displaced to the opposite side. A typical gray-white membranous exudate in the pharynx is consistent with diphtheria, but this infection is rare in North America.

490. The answer is d. (Behrman, 16/e, pp 1185–1186, 1653.) **Hydrocele** is common in infancy; if the tunica vaginalis is not patent, the hydrocele will usually resolve in the first 6 mo of life. A **spermatocele** does transilluminate, but it does not grow as large as a hydrocele and it remains localized as a cystic swelling on the epididymis. A **varicocele** is due to torsion of the pampiniform plexus that surrounds the spermatic cord. It usually occurs on the left side in boys or young men and is very painful. When palpated, a varicocele feels like a “bag of worms.” Cryptorchidism is an undescended testis; the scrotum remains small, flat, and underdeveloped.

491. The answer is c. (Behrman, 16/e, pp 1369–1371, 1409–1410.) **The most common congenital heart abnormality is VSD.** Small shunts may be asymptomatic, but large shunts may cause dyspnea, exercise intolerance, and congestive heart failure. Typically, patients have a loud P

2, a palpable thrill, and a pansystolic murmur. Small VSDs may close spontaneously, but others may progress to cause **Eisenmenger syndrome** (pulmonary hypertension that leads to right heart failure and shunt rever-

sal). Patients who develop Eisenmenger syndrome (irreversible) are inoperable. The three congenital heart defects that cause **left-to-right shunts are the three D's** (VSD, ASD, and PDA). All three may cause Eisenmenger syndrome. Endocarditis is a complication of VSD.

492. The answer is a. (*Behrman, 16/e, pp 1214–1216.*) **Reye syndrome** is an often fatal sequela to certain viral illnesses. Patients present with encephalopathy and fatty infiltration and dysfunction of the liver. Salicylates are suspected of potentiating this syndrome; however, they are not believed to be the primary cause of the syndrome because the illness may occur in the absence of salicylate use. The mortality rate in Reye syndrome is 50%. Infants may become flaccid after **eating honey** due to the inhibition of acetylcholine release (from *Clostridium botulinum*).

493. The answer is c. (*Behrman, 16/e, pp 1142–1143. Hay, 14/e, pp 530–538.*) **Meckel's diverticulum** rarely causes symptoms, but infants may present with the painless passage of maroon-colored stools. The diverticulum is a remnant of the omphalomesenteric duct and is the most common gastrointestinal tract congenital anomaly (**2%** of the population). It is usually **2** cm long within **2** ft of the ileocecal valve, and males (usually **<2** years old) are affected **2** times more than females. It is made of **2** kinds of ectopic tissues (stomach and pancreas) and has **2** complications (bleeding and inflammation). (**Meckel's diverticulum is called the rule of 2's.**) **Pyloric stenosis** is seen in newborns. Patients present with projectile vomiting, abdominal distention, and a palpable **olive-sized mass in the RUQ** that appears after vomiting. Prominent peristaltic waves are often visible going from the left to the right side of the abdomen. **Intussusception** (one segment of the intestine prolapses into another) is the most common cause of obstruction in the first 2 years of life. Infants present with melena, abdominal pain, vomiting, and diarrhea mixed with mucus and blood, giving it a red "**currant jelly**" appearance. Often a **sausage-shaped mass** is palpable in the upper midabdominal area. **Biliary atresia** is a congenital obstruction or absence of the bile duct system. Newborns (2–3 wk old) present with light-colored stools, dark urine, hepatomegaly, pruritus, and jaundice. **Zenker's diverticulum** is a disorder of adults in which the pharyngeal mucosa protrudes through an area of weakness in the musculature proximal to the upper pharyngeal sphincter. Patients present with halitosis from retention of food and saliva in the diverticulum.

494. The answer is d. (Behrman, 16/e, pp 115–117. Hay, 14/e, pp 195–199.) The majority of victims of sexual abuse have no physical examination findings. Swelling and erythema of the vulvar tissue (genital trauma) should be a “red flag” for child abuse, especially if associated with bruising or a foul-smelling discharge. In addition to the anorectal and genitourinary problems, there can be significant behavioral changes, such as sexually provocative mannerisms, excessive masturbation, inappropriate sexual knowledge, enuresis, depression, social withdrawal, anxiety, school problems, and weight changes. A straddle injury, often from a bicycle seat, occurs over the symphysis pubis, whereas signs of sexual abuse are more posterior around the perineum.

495. The answer is e. (Behrman, 16/e, pp 2028–2029.) **Impetigo**, which arises from minor superficial breaks in the skin, is caused by *Staphylococcus aureus* or β -hemolytic *Streptococcus* and usually occurs in children. It is a highly contagious epidermal rash characterized by vesicles, erosions, or ulcers that crust and appear golden-yellow and stuck on. Folliculitis, which is an infection of the upper portion of the hair follicle, may appear as an erythematous papule, pustule, erosion, or crust lesion and is usually due to *S. aureus*. In folliculitis due to hot tub use, the etiology is *Pseudomonas aeruginosa*. **Kawasaki’s disease** (KD) or mucocutaneous lymph node syndrome is uncommon in children over the age of 8 years and is characterized by fever, a desquamating, edematous, blotchy-appearing, mucocutaneous erythema, cervical lymphadenitis, and aneurysms of the coronary arteries. It is idiopathic. **Staphylococcal scalded skin syndrome** (SSSS) is most common in neonates during the first 3 mo of life. It is a toxin-mediated epidermolytic disease characterized by tender erythema that wrinkles, resembling wet tissue paper. Bullous formation and desquamation may occur. Widespread detachment of the superficial layers of the epidermis resembles scalding. Miliaria or “prickly heat” is a burning and pruritic rash of infants localized to the upper extremities, the trunk, and the intertriginous areas. A Tzanck smear is most often used to diagnose herpesvirus.

496. The answer is d. (Behrman, 16/e, pp 1797, 1873–1882.) Children with **Duchenne muscular dystrophy** (DMD) present between the ages of 2 and 6 years with fatigability, clumsiness, difficulty standing, difficulty

walking on toes, pseudohypertrophy of the calf muscles, and a waddling gait. DMD results from a deficiency of dystrophin, while Becker MD is the result of abnormal dystrophin. Becker MD is less severe than DMD and occurs after the age of 5 years. Both Becker and Duchenne MD are X-linked myopathies. The autosomal dominant myopathies are myotonic dystrophy and facioscapulohumeral dystrophy. Myotonic dystrophy occurs in adolescence and is characterized by diminished facial movements, cataracts, testicular atrophy, and muscle weakness. Facioscapulohumeral dystrophy occurs between the ages of 10 and 20 years and is characterized by facial and shoulder girdle weakness. The **Gower maneuver** (pushing off with the hands when rising from the floor because of proximal muscle weakness) is positive in muscular dystrophy.

497. The answer is f. (*Behrman, 16/e, p 396. Fauci, 14/e, pp 2144–2145.*)

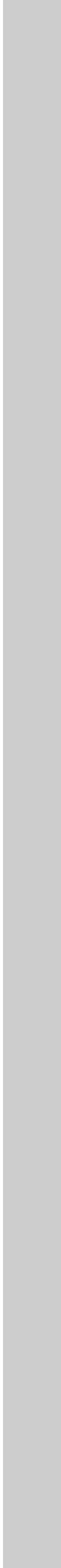
Tangier disease is a rare inherited disorder of lipoprotein metabolism. Patients present with a low serum cholesterol level, virtually no HDL cholesterol, a normal or elevated triglyceride level, orange-colored tonsils, corneal opacities, and a relapsing polyneuropathy. The disorder does not lead to premature atherosclerosis and treatment is not required.

498. The answer is c. (*Behrman, 16/e, pp 1554–1556. Hay, 14/e, pp 782–792.*)

The most common renal tumor in children is Wilms tumor or nephroblastoma (an embryonal tumor of renal origin). Children present with a painful abdominal mass, dysuria, polyuria, hematuria, weight loss, nausea, and vomiting. Physical examination typically reveals fever, hypertension, and an abdominal or flank mass. **Neuroblastoma** is a tumor of neural crest cell origin. Patients present with fever, anorexia, malaise, an abdominal mass, diarrhea, and neuromuscular symptoms. Physical examination may reveal fever, hypertension, abdominal distension, an abdominal mass, peripheral edema, and periorbital bruises. Both Wilms tumor and neuroblastoma are seen in children <5 years old. Patients with Hodgkin's lymphoma usually present between the ages of 15 and 45 years or over the age of 60 years with the complaint of cervical lymphadenopathy. **Ewing's sarcoma** is a tumor predominantly of white children that involves the diaphyses of long bones. Rhabdomyosarcoma may occur anywhere in the body; symptoms depend on the location of the progressively enlarging mass.

499–500. The answers are 499-c, 500-d. (*Behrman, 16/e, pp 946–953, 964–966, 973.*) **Rubella** (German measles or 3-day measles) is a common childhood infection manifested by a characteristic exanthem and lymphadenopathy. **Rubeola** or measles is highly infectious and is characterized by fever, **Conjunctivitis**, **Coryza**, **Cough** (**the three C's**), and **Koplik spots**. It has a significant morbidity and mortality. **Roseola** (exanthem subitum) is a childhood disease due to human herpesvirus type 6 and 7 and is characterized by high fever for several days before the skin lesions. Multiple, blanchable macules and papules appear on the back as the fever resolves. Sequelae are rare. **Chickenpox** (varicella zoster virus) is characterized by crops of pruritic vesicles that evolve into pustules, crusts, and even scars. Most cases occur in young children and may be complicated by pneumonia or encephalitis. The incubation period is approximately 14 days. Patients may remember an exposure to another child with chickenpox or to an older person with zoster.

HIGH-YIELD FACTS



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DERMATOLOGY

- Morphologic warning signs of **MELANOMA**:
mnemonic: **ABCD**
 - Asymmetry
 - Border
 - Color variation
 - Diameter increase
- Possible causes of **ACANTHOSIS NIGRICANS**:
mnemonic: **PAID COB**
 - Polycystic ovarian disease
 - Acromegaly
 - Insulin resistance
 - Diabetes mellitus
 - Cancer (colon, stomach)
 - Obesity
- Possible cause of migratory necrolytic erythema: **GLUCAGONOMA**
- Possible cause of acrodermatitis enteropathica: **ZINC DEFICIENCY**
- Precursor lesion of squamous cell carcinoma of the skin: **ACTINIC KERATOSIS**
- Precursor lesion of melanoma: **DYSPLASTIC NEVUS**
- **ERYTHEMA NODOSUM**: associated conditions:
mnemonic: **BUMP SIS**
 - Behçet's syndrome, birth control pills (BCPs)
 - Ulcerative colitis
 - MTB
 - Parasites

 - Sarcoidosis, sulfonamides
 - Inflammatory bowel disease
 - Streptococcal and fungal infections
- Erythema chronicum migrans (ECM): Lyme disease
- Erythema migrans lingualis: geographic tongue (erythema migrans of the tongue)
- Erythema marginatum: rheumatic fever
- Erythema multiforme: Stevens-Johnson Syndrome, sulfonamides, NSAIDs, Dilantin

302 High-Yield Facts

- Pityriasis rosea: initial lesion “herald patch”; other lesions follow a “Christmas tree” pattern
- “Ice pick”-like pitting of the nails: specific for psoriasis
- **NAIL CLUBBING:**
 - Lung diseases: lung cancer, chronic bronchitis (not emphysema) PTB, bronchiectasis, hypoxemia due to pulmonary shunts
 - GI diseases: IBD (Crohn’s disease/ulcerative colitis), cirrhosis
 - Cardiac diseases: infective endocarditis, cardiogenic shunts
 - Hypertrophic pulmonary osteoarthropathy (HPO)
 - Pregnancy
 - Amyloidosis

HEENT

- **ARGYLL ROBERTSON PUPILS:**
mnemonic: **SAD**
Pupils constrict only in response to accommodation but not to light
Seen in tertiary Syphilis,
Alcoholism (Wernicke's encephalopathy)
Diabetes
- **MARCUS GUNN PUPIL:** seen in **OPTIC NEURITIS, CENTRAL RETINAL ARTERY OCCLUSION**
- **BLUE SCLERAE:** Hallmark of osteogenesis imperfecta
- Most common causes of **PAPILLEDEMA:** mnemonic: **HAM TIP**
Conditions associated with increased intracranial pressure:
Hematoma
Abscesses
Meningitis

Tumors
Intracranial hemorrhages
Pseudotumor cerebri
- **BULLOUS MYRINGITIS:**
Pathognomonic for mycoplasma pneumonia infection
May occur in Ramsay Hunt syndrome
Viral and bacterial infections
- **WEBER TEST:** base of the vibrating tuning fork over the midline of the **SKULL**
In a **CONDUCTIVE** hearing loss: Weber sign lateralizes to the bad ear
In **SENSORINEURAL LOSS:** Weber sign lateralizes to the good ear
- **RINNE TEST:** base of the vibrating tuning fork over the **MASTOID**
In a **CONDUCTIVE** defect: Normal bone conduction
Impaired air conduction

In a **SENSORINEURAL LOSS:** Air and bone conduction are equally affected
Air conduction lasts longer than bone conduction

RESPIRATORY DISEASES

- **SADDLE NOSE DEFORMITY:**
mnemonic: **CRoWS**
Cocaine abuse
Relapsing polychondritis
Wegener's granulomatosis
Syphilis
- Criteria for **ALLERGIC BRONCHOPULMONARY ASPERGILLOSIS (ABPA):**
mnemonic: **ESCAPE A** (escape ABPA)
Eosinophilia
Skin reactivity to *Aspergillus* antigen
Central bronchiectasis
Asthma
Pulmonary infiltrates
Elevated serum IgE levels
Antibodies to *Aspergillus* antigen
- The most sensitive physical sign of pulmonary embolism: sinus tachycardia
- Livedo reticularis + shortness of breath following fracture of femur: fat emboli
- **Blue bloater:** chronic bronchitis
- **Pink puffer:** emphysema

CHEST EXAMINATION PHYSICAL FINDINGS:

Disease	Trachea	Fremitus	Percussion	Breath Sounds
Pleural effusion (large)	Shifted to opposite side	Decreased	Dullness	Decreased
Consolidation (pneumonia)	Midline	Increased	Dull	Bronchial
Pneumothorax	Shifted to opposite side	Decreased	Hyperresonant	Decreased
Atelectasis	Shifted to same side	Decreased	Dull	Decreased
Emphysema	Midline	Decreased	Hyperresonant	Decreased

CARDIOLOGY

- Jones criteria: mnemonic: **FEAR CASES**

Minor Criteria*	Major Criteria*
Fever	Carditis
ECG changes (PR prolonged)	Arthritis, migratory
	Sydenham's chorea
Arthralgias	Erythema marginatum
Reactant, acute phase	Subcutaneous nodules

*To fulfill the Jones criteria, either two major criteria or one major and two minor criteria plus evidence of an antecedent streptococcal infection are required.

- Tumor plop: **ATRIAL MYXOMA**
- **AORTIC REGURGITATION:** Corrigan pulse, waterhammer pulse, “pistol shot” femoral sound, Duroziez sign, (+) Hill sign (BP in thigh 20 mm Hg higher than arm BP), Quincke pulses, Austin Flint murmur
- Continuous machinery murmur: **PATENT DUCTUS ARTERIOSUS**
- Mnemonic for the four auscultatory sites: **APT M** or **All People Try Mushrooms**
 - Aortic (2 RICS)
 - Pulmonic (2 LICS)
 - Tricuspid (4 LICS)
 - Mitral (5 LICS)
- Bacterial endocarditis: Roth spots, splinter hemorrhages, Janeway lesions (non-tender), Osler nodes (painful)
- Systolic ejection murmur with a **THRILL ON THE UPPER LEFT STERNAL BORDER:** pulmonic stenosis
- Holosystolic murmur with a **THRILL ON THE LOWER LEFT STERNAL BORDER:** VSD
- Holosystolic murmur best heard on the apex, radiating to the **AXILLA:** mitral regurgitation
- Systolic murmur along with **LSB THRILL RADIATING TO THE RIGHT SIDE OF THE NECK:** aortic stenosis
- Midsystolic click with late systolic murmur: mitral valve prolapse
- Opening snap, loud S₁, diastolic rumble, atrial fibrillation: mitral stenosis

- Pericardial knock: constrictive pericarditis
- Atrial flutter: “saw-tooth” pattern on ECG
- Atrial fibrillation: “irregularly irregular” pulse, absent P waves, and irregular baseline on ECG

IMPORTANT PULSE PATTERNS:

Pulsus alternans:	Cardiac tamponade
Pulsus bisferiens:	Aortic regurgitation and HCM/IHSS
Pulsus paradoxus:	Cardiac tamponade, asthma, constrictive pericarditis
Pulsus tardus:	Aortic stenosis

HEART SOUNDS:

Midsystolic click:	MVP
Opening snap:	Mitral/tricuspid stenosis
Pericardial knock:	Constrictive pericarditis
Pericardial friction rub:	Pericarditis

FIRST HEART SOUND:

Loud	Soft
1. Mitral stenosis	1. Mitral regurgitation
2. Short PR interval (WPW)	2. Long PR interval
3. Left atrial myxoma	3. LBBB
4. MVP with regurgitation	4. AR, TR

SECOND HEART SOUND:

Wide Split	Narrow or Paradoxical	Fixed Split	Summary
1. RBBB	1. LBBB	1. ASD	Fixed Split = ASD (the only one)
2. MR, VSD	2. HTN		Narrow/paradoxical If— LHAIM
3. RV volume overload (l-r shunt)	3. Aortic stenosis		All others have a wide split
4. RV pressure overload (PS, PAH)	4. IHSS		
	5. MI, acute		

GASTROENTEROLOGY

- **Charcot triad:** its presence indicates acute cholangitis in 70% of cases
 1. Biliary pain
 2. Jaundice
 3. Fever (with chills and rigor)
- **Raynold's pentad:** only positive in 10% of patients with cholangitis
 - 1–3. Charcot triad
 4. Mental confusion
 5. Refractory sepsis manifested by hypotension
- Common **MANEUVERS/SIGNS** and their associations:
 1. Cullen sign, Turner sign: hemorrhagic pancreatitis
 2. Murphy sign: acute cholecystitis
 3. Caput medusae: liver cirrhosis
 4. Courvoisier gallbladder: cancer of the biliary tract or pancreatic head
 5. Kehr sign: splenic rupture
 6. Obturator test, reverse psoas maneuver: retrocecal appendicitis
 7. Markle sign (jar tenderness): specific for peritonitis
 8. Succussion splash: intestinal obstruction or gastric dilatation
- Bedside maneuvers to detect **ASCITES**:
 1. Inspection for bulging flanks
 2. Percussion for flank dullness
 3. Puddle sign
 4. Shifting dullness maneuver
 5. Fluid wave maneuver

- Best clues to make a diagnosis of **ASCITES**:
 1. Focused history (history of liver disease)
 2. Recent weight gain
 3. Ankle edema
 4. Increased abdominal girth
- Causes of **CIRRHOSIS**: mnemonic: **ABCDEF**
 - Alpha 1-antitrypsin deficiency
 - B**udd-Chiari syndrome, hepatitis **B**
 - Hepatitis **C**, **C**opper overload
 - D**rugs
 - E**thanol
 - F**e overload
- Physical findings seen in **HEMOCHROMATOSIS**:
 1. Bronzed skin pigmentation (sun-exposed areas)
 2. Hepatomegaly with or without cirrhosis
 3. Degenerative arthritis of the hands and fingers (proximal PIPs)
 4. Testicular atrophy
- Irreversible complications of **HEMOCHROMATOSIS** (despite therapy):
 1. Arthropathy
 2. Hypogonadism
 3. Cirrhosis

NEPHROLOGY

- Causes of **HIGH ANION GAP ACIDOSIS**:
mnemonic: **C MUDPILES**
 - Cyanide
 - Methanol
 - Uremia
 - Diabetic ketoacidosis
 - Paraldehyde
 - Isoniazid, Iron
 - Lactic acidosis
 - Ethylene glycol, Ethanol
 - Salicylates, Starvation
- Causes of **NON-ANION GAP ACIDOSIS** (hyperchloremic):
mnemonic: **USED CARP**
 - Ureteroenterostomy
 - Spiroolactone
 - Expansion acidosis
 - Diarrhea

 - Carbonic anhydrase inhibitors, Cyclosporine
 - Amiloride
 - Renal tubular acidosis
 - Pancreatic fistula, Pentamidine
- Causes of **HEMATURIA**:
mnemonic: **SWITCH GPS**
 - Stones, Sickle cell disease, Scleroderma, SLE, Sulfonamides
 - Wegener's granulomatosis
 - Infections, Instrumentation, Iatrogenic, Interstitial nephritis
 - Trauma, TB, Tumor, TTP, Tubulointerstitial disease
 - Cryoglobulinemia, Cyclophosphamide
 - Hemolytic uremic syndrome, Henoch-Schönlein purpura, Hemophilia

 - Goodpasture's disease
 - Papillary necrosis, Polycystic kidney disease, Polyarteritis nodosa
 - Schistosomiasis, Sponge disease (medullary)

310 High-Yield Facts

- Most common organisms responsible for **URINARY TRACT INFECTIONS** (UTIs):

mnemonic: **SEEK PP**

Serratia marcescens

Escherichia coli

Enterobacter cloacae

Klebsiella

Proteus mirabilis

Pseudomonas aeruginosa

ENDOCRINOLOGY

- **Complications of ACROMEGALY:**
 1. Sleep apnea syndrome
 2. Carpal tunnel syndrome
 3. CHF (LVH)
 4. Increased risk of colon cancer
 5. Increased risk of osteoarthritis
 6. Hypertension
- **BITEMPORAL HEMIANOPSIA** vs. **HOMONYMOUS HEMIANOPSIA**
 Etiologies:

Craniopharyngioma	Occipital lesions secondary to AIDS, herpes, tumor
Aneurysm	
Pituitary tumor	
- **SYNDROME OF INAPPROPRIATE ADH SECRETION (SIADH)** vs. **DIABETES INSIPIDUS (DI)**

Decreased serum sodium	Increased serum sodium
Increased urine osmolality	Decreased urine osmolality
Increased urine sodium	
- **TSH:** single best test of thyroid function
- Lid lag and stare: most important physical findings to suggest **GRAVE'S DISEASE**
- Delayed deep tendon reflexes (DTRs): most important physical finding in **HYPO-THYROIDISM**
- **CHVOSTEK and TROUSSEAU SIGNS:** suggest hypocalcemia
- **POLYCYSTIC OVARIAN DISEASE** (Stein-Leventhal syndrome, PCOD): amenorrhea, obesity, hirsutism, elevated LH:FSH ratio (>3)

MEN 1

MEN 2A

(Wermer Syndrome)

(Sipple Syndrome)

MEN 2B

PPP	PPT	PNT
Pituitary adenoma	Parathyroid hyperplasia	Pheochromocytoma
Pancreatic islet cell tumor	Pheochromocytoma	Neuromas
Parathyroid hyperplasia	Medullary Thyroid cancer	Medullary Thyroid cancer

312 High-Yield Facts

- A man with gynecomastia + small testes + tall stature + female hair distribution: think **KLINEFELTER SYNDROME**
- A patient with pigmented mucosa of the gums + hypokalemia + pigmentation of skin creases: think **ADDISON'S DISEASE**
- Hypogonadism + anosmia: **KALLMAN SYNDROME**
- **PHEOCHROMOCYTOMA**: Rule of 10's: bilateral, malignant, extraadrenal, familial, children

HEMATOLOGY AND ONCOLOGY

- Purpuric rash + abdominal pain + glomerulonephritis in a child/young patient:
HENOCH-SCHÖNLEIN PURPURA (HSP):
mnemonic: **AGAR**
 - Abdominal pain
 - Glomerulonephritis
 - Arthralgia
 - Rash
- Purpura (livedo reticularis) after a coronary angiogram: think **CHOLESTEROL ATHEROEMBOLIC DISEASE**
- Purpura (livedo reticularis) + hepatitis B + abdominal pain after meals + footdrop + HTN: think **POLYARTERITIS NODOSA**
- **THROMBOTIC THROMBOCYTOPENIC PURPURA (TTP):**
mnemonic: **FAT RN**
Pentad:
 1. Fever
 2. Anemia, microangiopathic hemolytic (+) schistocytes
 3. Thrombocytopenia
 4. Renal abnormalities
 5. Neurologic abnormalities (confusion, aphasia, headache, coma, seizures)
- **HEMOLYTIC UREMIC SYNDROME (HUS):**
mnemonic: **RAT**
 - Renal failure
 - Anemia, microangiopathic hemolytic
 - Thrombocytopenia
- The FAT RN has TTP and her HUS has a RAT
- TTP and HUS both have
 - (1) Normal coagulation tests (normal PT/PTT)
 - (2) Elevated LDH
- HUS is similar to TTP, except that it only affects the RENAL system

314 High-Yield Facts

- Patients with chronic low-grade lymphoproliferative disorders for years who develop new lymphadenopathy: consider transformation to a high-grade lymphoma
- Patients with ACUTE LEUKEMIAS usually present with low to normal WBC, whereas patients with CHRONIC LEUKEMIAS may present with splenomegaly and high WBC

MORE COMMON PERIPHERAL SMEARS AND GENETIC MARKERS:

- Smudge cells (mature lymphocytes): chronic lymphocytic leukemia
- Auer rods: acute myelogenous leukemia/promyelocytic leukemia
- Reed-Sternberg cells: Hodgkin's disease
- Burr cells: uremia, DIC
- Spur cells: liver disease, DIC
- Reactive lymphocytes: infectious mononucleosis
- "Fried egg" appearance of cells that are TRAP (+): hairy cell leukemia
- Target cells: liver disease, iron deficiency, thalassemia
- Helmet cells: traumatic hemolysis, DIC
- Polychromasia and spherocytosis: implies autoimmune hemolytic anemia
- Young patients with unexplained pancytopenia: consider paroxysmal nocturnal hemoglobinuria
- Philadelphia chromosome t(9,22)/bcr-abl gene: chronic myelogenous leukemia
- Bite cells/Heinz bodies: Think glucose-6-phosphate dehydrogenase (G6PD) deficiency

IRON-DEFICIENCY

ANEMIA OF

ANEMIA

vs. CHRONIC DISEASE

IRON	Decreased	Decreased
FERRITIN	Decreased	Increased
TIBC	Increased	Decreased

- **LEAD poisoning signs:**
mnemonic: **LEAD**
 - Lead lines in gingiva
 - Erythrocyte stippling
 - Abdominal pain
 - Drop (foot, wrist)

- Causes of **HYPERCALCEMIA**:
mnemonic: **CHIMPANZEES**
 - Calcium supplements
 - Hyperparathyroidism
 - Iatrogenic (thiazides), immobility
 - Milk-alkali syndrome
 - Paget's disease
 - Addison's disease/acromegaly
 - Neoplasm
 - Z E syndrome (MEN 1)
 - Excess vitamin A
 - Excess vitamin D
 - Sarcoidosis

RHEUMATOLOGY

- **CHURG-STRAUSS syndrome:**
mnemonic: **RAVE**
 - Rhinitis
 - Asthma
 - Vasculitis
 - Eosinophilia
- **BEHÇET SYNDROME:**
mnemonic: **PGOES**
 - Pathergy
 - Genital ulcers (recurrent)
 - Oral ulcers (recurrent aphthous ulcers)
 - Eye lesions (uveitis)
 - Skin lesions (*E. nodosum*, vasculitis)
- **DRUGS THAT MAY INDUCE LUPUS (SLE):**
mnemonic: **Be HIPPAQ**
 - Beta blockers
 - Hydralazine
 - Isoniazid
 - Procainamide
 - Phenothiazine
 - Dilantin
 - Aldomet
 - Quinidine
- **REITER'S SYNDROME:**
mnemonic: **CUBA**
 - Conjunctivitis ("can't see")
 - Urethritis ("can't pee")
 - Balanitis
 - Arthritis ("can't bend my knees")
- **SAUSAGE-SHAPED DIGITS:**
mnemonic: **RAP** (rap those digits)
 - Reiter syndrome
 - Ankylosing spondylitis
 - Psoriatic arthritis

- “Ice pick”-like pitting of the nails: specific for **PSORIASIS**
- **STILL’S DISEASE (adult onset)** vs. **FELTY SYNDROME**
 - Rheumatoid arthritis
 - Splenomegaly
 - Leukocytosis
 - Rash (salmon colored)
 - Fever

NEUROLOGY

- Cranial nerves involved in Ramsay-Hunt syndrome: 7th and 8th CN
- Facial palsy + herpes zoster of the face: think Ramsay-Hunt syndrome
- Third cranial nerve palsy + pupil sparing: think diabetes or hypertension
- Third cranial nerve palsy + dilated pupil: think compression by a tumor or aneurysm
- Third cranial nerve palsy + 5th nerve palsy: think tumor/aneurysm/thrombosis in the cavernous sinus
- Triad of **NORMAL PRESSURE HYDROCEPHALUS**: weird, wet, and wobbly
 1. Altered mentation/dementia (“weird”)
 2. Urinary incontinence (“wet”)
 3. Ataxic gait (“wobbly”)
- **WERNICKE’S ENCEPHALOPATHY**:
mnemonic: Wernicke’s **COAt**
 - Confusion
 - Ophthalmoplegia
 - Ataxia
- Korsakoff psychosis: confusion; confabulation; antegrade and retrograde amnesia
- Triad of niacin deficiency/pellagra: dementia, dermatitis, diarrhea (triple D)
- **CLASSIC MIGRAINE**:
mnemonic: **A POUND**
 - Aura
 - Pulsatile
 - One-day duration
 - Unilateral
 - Nausea
 - Interferes with **D**aily activities
- **EYE** examination: all the eye muscles are supplied by CN3 (cranial nerve 3) except LR6 S04
 - LR6: lateral rectus/CN6
 - S04: superior oblique/CN4
- **CLAW HAND DEFORMITY**: ulnar nerve paralysis

- **WRISTDROP:** radial nerve palsy
- **CARPAL TUNNEL SYNDROME:** median nerve compression
- **BRAIN TUMORS:**

Adults	Children
Supratentorial	Infratentorial
(1) Astrocytoma	(1) Medulloblastoma
(2) Meningioma	(2) Astrocytoma
(3) Pituitary	(3) Ependymoma

- **METASTASIS TO THE BRAIN:**
mnemonic: Lots of **B**ad **S**tuff **K**ills **G**lia (**LBSKG**)
Lung
Breast
Skin
Kidney
GI

GERIATRICS

- **ACTIVITIES OF DAILY LIVING (ADLs):**

mnemonic: **DEATH**

- Dressing
- Eating
- Ambulating
- Toileting
- Hygiene

- **INSTRUMENTAL ACTIVITIES OF DAILY LIVING (IADLs):**

mnemonic: **SHAFT**

- Shopping
- Housekeeping
- Accounting
- Food preparation
- Transportation

- **COMMON CAUSES OF ACUTE URINARY INCONTINENCE:**

mnemonic: **DRIP**

- Delirium
- Restricted mobility
- Impaction
- Polyuria

- **COMMON CAUSES OF CHRONIC URINARY INCONTINENCE:**

mnemonic: **DIAPPERS**

- Delirium
- Infection
- Atrophy (postmenopausal)
- Pharmacologic
- Psychogenic
- Endocrine
- Restricted mobility
- Stool impaction

- **COMMON SYMPTOMS OF DEMENTIA IN THE ELDERLY:**

mnemonic: **PAGE SICS** or **SIGE CAPS**

P psychomotor retardation/agitation

A Appetite loss

G Guilt feelings

L Lowered **E**nergy level

S Sleep problems

D Decreased **I**nterest in life

D Decreased **C**oncentration

Suicidal ideation

- **COMMON CAUSES OF VISUAL LOSS IN THE ELDERLY**

1. Macular degeneration

2. Cataracts

3. Glaucoma

4. Diabetes mellitus

OBSTETRICS AND GYNECOLOGY

- **PREECLAMPSIA:** mnemonic: **HEP**
Triad:
 1. Hypertension (>160/110)
 2. Edema
 3. Proteinuria (>5 g in 24 h)
- **ECLAMPSIA:** preeclampsia (HEP) + seizures
- **HELLP syndrome:**
Hemolysis
Elevated liver enzymes
Low Platelets
- **PLACENTA PREVIA:** sudden, painless vaginal bleeding in the third trimester
- **ABRUPTIO PLACENTA:**
 1. Premature separation of the placenta with unremitting abdominal (uterine) and low back pain
 2. Visible or concealed bleeding in the third trimester
- **CONDYLOMA LATA:** flat warts that are lesions of secondary syphilis
- **CONDYLOMA ACUMINATA:** genital warts caused by human papillomavirus (HPV)
- **Purulent-appearing cervical discharge:** harbinger of **PURULENT CERVICITIS**
- **CHANDELIER SIGN or cervical motion tenderness:** indicator of **PELVIC INFLAMMATORY DISEASE**
- **CHADWICK SIGN:** bluish-violet appearance of the cervix or vagina
Sign of PREGNANCY that appears after the 7th wk of pregnancy
May also be associated with a PELVIC TUMOR
- **GOODELL SIGN:** softening of the cervix associated with pregnancy; occurs at about the 8th wk of gestation
- **HEGAR SIGN:** softening of the uterus at the junction between the cervix and the fundus; occurs in the first trimester of pregnancy

- Differential diagnosis of **ADNEXAL TENDERNESS**:
 1. Ectopic pregnancy
 2. Tuboovarian abscess
 3. Ovarian cysts
 4. Endometriomas
 5. Appendicitis

PEDIATRICS

- **TETRALOGY OF FALLOT:**
mnemonic: **PROVe**
 - Pulmonic stenosis (PS)
 - Right ventricular hypertrophy (RVH)
 - Overriding aorta
 - Ventricular septal defect (VSD)
- **CONGENITAL RIGHT-TO-LEFT SHUNTS:**
mnemonic: **Five T's**
 - Tetralogy of Fallot
 - Transposition of great vessels
 - Tricuspid atresia
 - Total anomalous pulmonary venous return
 - Truncus arteriosus
- **CONGENITAL LEFT-TO-RIGHT SHUNTS:**
mnemonic: **Three D's**
 - Ventricular septal **D**efect
 - Atrial septal **D**efect
 - Patent **D**uctus arteriosus
- **The four CARDINAL SIGNS OF CONGESTIVE HEART FAILURE in small children**
 1. Tachycardia
 2. Tachypnea with shallow respirations and retractions
 3. Cardiomegaly
 4. Hepatomegaly
- **VENTRICULAR SEPTAL DEFECT (VSD):** most common congenital heart disease
- Forced pharyngeal examination may precipitate acute airway obstruction in kids with **EPIGLOTTITIS** and should not be attempted in those who have stridor
- **INTUSSUSCEPTION:** sausage-shaped mass on abdominal exam and passage of “currant jelly” stools

- **INTRAUTERINE ACQUIRED INFECTIONS:**

mnemonic: **TORCHES**

Toxoplasmosis

Rubella

Cytomegalovirus

Herpes

Syphilis

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Notes