

**2012-2013**

**Step 2  
Clinical Knowledge (CK)  
Content Description and  
General Information**



**US·MLE**  
United States  
Medical  
Licensing  
Examination®

A Joint Program of the Federation of State  
Medical Boards of the United States, Inc.,  
and the National Board of Medical Examiners®

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## Introduction

This booklet is intended to help you prepare for the Step 2 Clinical Knowledge (Step 2 CK) component of the United States Medical Licensing Examination® (USMLE®) if you are an applicant with an eligibility period that has an ending date in mid to late fall of 2012, or in 2013. *Eligibility periods* are explained in the *2013 USMLE Bulletin of Information*, with which you must become familiar to apply for the examination. In addition to reading the *Bulletin*, you should run the sample Step 2 CK test materials and tutorials provided at the USMLE website.

The information in this booklet, USMLE sample test materials and software tutorials, and other informational materials are available at the USMLE website (<http://www.usmle.org>). Information regarding any changes in the USMLE program will also be posted at the USMLE website. You must obtain the most recent information to ensure an accurate understanding of current USMLE rules.

### Preparing for the Test, Applying for the Test, Scheduling Test Dates, and Testing

In addition to the information in this booklet, you should review the sections that appear in the *Bulletin*: Preparing for the Test, Applying for the Test, Scheduling Your Test Date, and Testing.

The sample test materials in this booklet are provided in computer format at the USMLE website. You must run the tutorial and sample materials to become familiar with test software prior to your test date. The tutorial provided at the beginning of the Step 2 examination has fewer screens and less detailed information than the tutorial available as part of the Step 2 Practice Materials on the USMLE website. In the exam-day tutorial, the screens describing some of the navigation features of the test delivery software have been consolidated into fewer screens. In advance of testing, examinees should review the longer tutorial available in the Step 2 Practice Materials. Please monitor the USMLE website (<http://www.usmle.org>) announcements section to check for changes in test delivery software, and to access updated orientation and practice materials.

The Practice Materials on the website include an additional block of items with associated audio or video findings, a sequential item set, a pharmaceutical advertisement item, and an item in the abstract format

(a summary of an experiment or clinical investigation, accompanied by two or more questions). You should become familiar with test items that have audio and video components and sequential item sets as these formats may be used in the actual examination. The block of items with associated audio or video and a sequential item set does not appear in this booklet.

The Step 2 CK examination consists of questions ("test items") presented in standard multiple-choice formats, as described on pages 5-6 of this booklet. The test items are divided into "blocks" (see Test Lengths and Formats in the *Bulletin*), and test item formats may vary within each block.

The number of items in a block will be displayed at the beginning of each block. This number will vary among blocks, but will not exceed 45 items. The total number of items on the overall examination form will not exceed 355 items. You will have one hour to complete each block, regardless of the number of items.

You may want to study the descriptions of test item formats that follow before you run the sample test items. A Normal Laboratory Values Table, including Standard International conversions, is reproduced on pages 21 and 22 of this booklet. This table will be available as an online reference when you take the examination. Please note that values shown in the actual examination may differ slightly from those printed in this booklet.

### Examination Content

Step 2 CK consists of multiple-choice questions prepared by examination committees composed of faculty members, teachers, investigators, and clinicians with recognized prominence in their respective fields. Committee members are selected to provide broad representation from the academic, practice, and licensing communities across the United States and Canada. Test questions focus on the principles of clinical science that are deemed important for the practice of medicine under supervision in postgraduate training. The examination is constructed from an integrated content outline that organizes clinical science material along two dimensions.

Normal Conditions and Disease categories (Dimension 1) form the main axis for organizing the outline. The first section deals with normal growth and development, basic concepts, and general principles. The remaining sections deal with individual disorders.

Sections focusing on individual disorders are subdivided according to Physician Task (Dimension 2). The first set of physician tasks, Promoting Preventive Medicine and Health Maintenance, encompasses the assessment of risk factors, appreciation of epidemiologic data, and the application of primary and secondary preventive measures.

The second set of tasks, Understanding Mechanisms of Disease, encompasses etiology, pathophysiology, and effects of treatment modalities in the broadest sense.

The third set of tasks, Establishing a Diagnosis, pertains to interpretation of history and physical findings and the results of laboratory, imaging, and other studies to determine the most likely diagnosis or the most appropriate next step in diagnosis.

The fourth set of tasks, Applying Principles of Management, concerns the approach to care of patients with chronic and acute conditions in ambulatory and inpatient settings. Questions in this category will focus on the same topics covered in the diagnosis sections.

A full content outline for the USMLE Step 2 CK examination is provided on pages 7-19. It describes the scope of the examination in detail. To facilitate review, the major categories are indicated in bold type, with the subcategories in regular type.

The diseases noted in the outline do *not* represent an all-inclusive registry of disorders about which questions may be asked. They reflect the development of a “High-Impact Disease List” that includes common problems, less common problems where early detection or treatability are important considerations, and noteworthy exemplars of pathophysiology. Questions are generally, *but not exclusively*, focused on the listed disorders. In addition, not all listed topics are included on each examination.

The content outline is not intended as a curriculum development or study guide. It provides a flexible structure for test construction that can readily accommodate new topics, emerging content domains, and shifts in emphases. The categorizations and content coverage are subject to change. Broadly based learning that establishes a strong general foundation of understanding of concepts and principles in the clinical sciences is the best preparation for the examination.

## Test Question Formats

### Single One Best Answer Questions

This is the traditional, most frequently used multiple-choice format. It consists of a statement or question followed by three to twenty-six options that are in alphabetical or logical order. The response options in this format are lettered (eg, A, B, C, D, E). Examinees are required to select the best answer to the question. Other options may be partially correct, but there is only ONE BEST answer.

Items with an associated pharmaceutical ad or abstract were introduced into the examination in August 2011. Each pharmaceutical ad or abstract appears as a 2- or 3-item set; examinees will see no more than 5 of these item sets in their examination. Because item sets with an associated pharmaceutical ad or abstract may require more time to answer than other multiple-choice items, exam blocks that include a pharmaceutical ad or abstract item set contain fewer items. A screen at the beginning of each block that includes a pharmaceutical ad or abstract item set alerts examinees so that they can monitor their time accordingly.

#### *Strategies for Answering Single One Best Answer Test Questions*

- Read each question carefully. It is important to understand what is being asked.
- Try to generate an answer and then look for it in the option list.
- Alternatively, read each option carefully, eliminating those that are clearly incorrect.
- Of the remaining options, select the one that is most correct.
- If unsure about an answer, it is better to guess, since unanswered questions are automatically counted as wrong answers.

### *Example Item 1*

1. A 32-year-old woman with type 1 diabetes mellitus has had progressive renal failure over the past 2 years. She is not yet on dialysis. Examination shows no abnormalities. Her hemoglobin concentration is 9 g/dL, hematocrit is 28%, and mean corpuscular volume is  $94 \mu\text{m}^3$ . A blood smear shows normochromic, normocytic cells. Which of the following is the most likely cause?

- (A) Acute blood loss
- (B) Chronic lymphocytic leukemia
- (C) Erythrocyte enzyme deficiency
- (D) Erythropoietin deficiency
- (E) Immuno-hemolysis
- (F) Microangiopathic hemolysis
- (G) Polycythemia vera
- (H) Sickle cell disease
- (I) Sideroblastic anemia
- (J)  $\beta$ -Thalassemia trait

(Answer D)

### Sequential Item Sets

A single patient-centered vignette may be associated with two or three consecutive questions about the information presented. Each question is linked to the initial patient vignette but is testing a different point. Questions are designed to be answered in sequential order. You are required to select the one best answer to each question. Other options may be partially correct, but there is only ONE BEST answer. You must click “Proceed to Next Item” to view the next item in the set; once you click on this button, you will not be able to add or change an answer to the displayed (previous) item.

## Matching Sets

This format consists of a series of questions related to a common topic. All matching sets contain set-specific instructions, a list of lettered response options, and at least two questions. There will be between four and twenty-six response options. Each set is preceded by a box that indicates the number of questions in the set associated with the response options that follow. Examinees are directed to select one answer for each question in the set. Questions will be presented one at a time, with instructions and response options repeated for each subsequent question.

### *Strategies for Answering Matching Sets*

- Begin each set by reading through the option list to become familiar with the available responses.
- Read each question carefully.
- Within a set, some options may be used several times, while other options may not be used at all. Respond to each question independently.
- For matching sets with large numbers of options, try to generate an answer to the question and then locate the answer in the option list. This is more efficient than considering each option individually.

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**The response options for the next 2 items are the same. Select one answer for each item in the set.**

### *Example Items 2-3: Matching set*

- (A) Chronic lymphocytic leukemia
- (B) Drug reaction
- (C) Hodgkin disease
- (D) Infectious mononucleosis
- (E) Metastatic carcinoma
- (F) Sarcoidosis
- (G) Systemic lupus erythematosus
- (H) Toxoplasmosis
- (I) Tuberculosis
- (J) Tularemia

For each patient with lymphadenopathy, select the most likely diagnosis.

2. A previously healthy 30-year-old man has had fever, night sweats, pruritus, and an enlarging lump above his left clavicle for 3 weeks. Examination shows a 3-cm, nontender, rubbery, supraclavicular lymph node. An x-ray of the chest shows mediastinal lymphadenopathy.

(Answer C)

3. A 41-year-old woman comes to the physician for a follow-up examination. She has taken aspirin for chronic headaches and phenytoin for a seizure disorder for 2 years. Examination shows mild epigastric tenderness and bilateral, 3-cm, nontender axillary lymph nodes. A lymph node biopsy shows hyperplasia.

(Answer B)

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## 1. General Principles

### **Infancy and Childhood**

- Normal growth and development

### **Adolescence**

- Sexuality; separation from parents/autonomy; physical changes of puberty

### **Senescence**

- Normal physical and mental changes associated with aging

### **Medical Ethics and Jurisprudence**

- Consent and informed consent to treatment (eg, full disclosure, alternate therapies, risks and benefits, life support, advance directives, health care proxy) and research issues (eg, consent, placebos, conflict of interest, vulnerable populations)
- Physician-patient relationship (eg, truth telling, confidentiality, privacy, autonomy, public reporting) and birth-related issues (eg, prenatal diagnosis, abortion, maternal-fetal conflict)
- Death and dying (eg, diagnosing death, organ donation, euthanasia, physician-assisted suicide) and palliative care (eg, hospice, pain management, family counseling, psychosocial and spiritual issues, fear and loneliness)

### **Applied Biostatistics and Clinical Epidemiology**

- Understanding statistical concepts of measurement in medical practice
- Interpretation of the medical literature

### **Systems-Based Practice and Patient Safety**

- System-based practice and quality improvement (microsystems and teams including hand-offs, standardization of processes, reducing deviance)
- Patient safety, medical errors and near misses (sentinel events, problem identification, root cause analysis)

## 2. Infectious and Parasitic Diseases

*(Topic covered under each organ system)*

## 3. Neoplasms

*(Topic covered under each organ system)*

## 4. Immunologic Disorders

### **Health and Health Maintenance**

- Anaphylaxis and other allergic reactions
- HIV infection/AIDS
- Immunization against infectious agents (including infants, children, adults, the elderly; patients having compromised immune systems)

#### 4. Immunologic Disorders (continued)

##### **Mechanisms of Disease**

- Abnormalities of cell-mediated immunity
- Abnormalities of humoral immunity

##### **Diagnosis**

- Anaphylactic reactions and shock
- Connective tissue disorders (eg, mixed connective tissue disease and systemic lupus erythematosus)
- HIV infection/AIDS; deficiencies of cell-mediated immunity
- Deficiencies of humoral immunity; combined immune deficiency

##### **Principles of Management**

*(With emphasis on topics covered in Diagnosis)*

- Pharmacotherapy only
- Management decision (treatment/diagnosis steps)
- Treatment only

#### 5. Diseases of the Blood and Blood-forming Organs

##### **Health and Health Maintenance**

- Anemia (iron deficiency, vitamin-related, drug-induced, sickle cell)
- Infection (systemic)

##### **Mechanisms of Disease**

- Red cell disorders
- Coagulation disorders
- White cell disorders, including leukopenia, agranulocytosis, and neoplasms

##### **Diagnosis**

- Anemia, disorders of red cells, hemoglobin, and iron metabolism (eg, blood loss; iron deficiency anemia, nutritional deficiencies; pernicious anemia, other megaloblastic anemias; hemolytic anemia; anemia associated with chronic disease; aplastic anemia, pancytopenia; thalassemia; sickle cell disease; polycythemia vera; hemochromatosis)
- Bleeding disorders, coagulopathies, thrombocytopenia (eg, hemophilia, von Willebrand disease; qualitative and quantitative platelet deficiencies; disseminated intravascular coagulation; hypofibrinogenemia; immune thrombocytopenic purpura; hemolytic uremic syndrome)
- Neoplastic disorders (eg, Hodgkin disease, non-Hodgkin lymphoma; acute leukemia in children; acute leukemia in adults; chronic leukemic states; mycosis fungoides; multiple myeloma)
- Eosinophilia and reactions to transfusion of blood components (including complications) and leukopenic disorders, agranulocytosis
- Infection (eg, sepsis, malaria, mononucleosis)

## 5. Diseases of the Blood and Blood-forming Organs (continued)

### Principles of Management

*(With emphasis on topics covered in Diagnosis)*

- Pharmacotherapy only
- Management decision (treatment/diagnosis steps)
- Treatment only

## 6. Mental Disorders

### Health and Health Maintenance

- Early identification and intervention (eg, suicide potential, depression, alcohol/substance abuse, family involvement in schizophrenia)

### Mechanisms of Disease

- Biologic markers of mental disorders and mental retardation syndromes
- Intended/unintended effects of therapeutic interventions, including effects of drugs on neurotransmitters

### Diagnosis

- Mental disorders usually first diagnosed in infancy, childhood, or adolescence (eg, mental retardation; communication disorders; pervasive developmental disorders; attention-deficit/hyperactivity disorder; disruptive disorders; tic disorders; elimination disorders)
- Substance-related disorders (eg, alcohol and other substances)
- Schizophrenia and other psychotic disorders
- Mood disorders (eg, bipolar disorders; major unipolar depressive disorders; dysthymic disorder; mood disorder due to a general medical condition; medication-induced mood disorder)
- Anxiety disorders (eg, panic disorder; phobia; obsessive-compulsive disorder; post-traumatic stress disorder; generalized anxiety disorder; acute stress disorder; separation anxiety disorder; anxiety due to a general medical condition; substance-induced anxiety disorder)
- Somatoform disorders (eg, factitious disorder; somatization disorder; pain disorder; conversion disorder; hypochondriasis)
- Other disorders/conditions (eg, sexual and gender identity disorders; personality disorders; child, spouse, elder abuse; eating disorders; adjustment disorders; dissociative disorders; psychological factors affecting medical conditions)

### Principles of Management

*(With emphasis on topics covered in Diagnosis)*

- Pharmacotherapy only
- Management decision (treatment/diagnosis steps)
- Treatment only

## 7. Diseases of the Nervous System and Special Senses

### Health and Health Maintenance

- Cerebrovascular disease, cerebral infarction
- Nutritional deficiencies, toxic injuries, and occupational disorders including lead, carbon monoxide, and organophosphate poisoning
- Infection involving the nervous system, eyes, or ears
- Degenerative and demyelinating disorders, including Alzheimer disease and multiple sclerosis

### Mechanisms of Disease

- Localizing anatomy:
  - brain and special senses
  - brain stem
  - spinal cord
  - neuromuscular system
- Anatomy of cerebral circulation
- Increased intracranial pressure and altered state of consciousness
- Infection
- Degenerative/developmental and metabolic disorders

### Diagnosis

- Disorders of the eye (eg, blindness; glaucoma; infection; papilledema; optic atrophy; retinal disorders; diabetic retinopathy; diplopia; cataract; neoplasms; vascular disorders; uveitis; iridocyclitis; traumatic, toxic injury; toxoplasmosis)
- Disorders of the ear, olfaction, and taste (eg, deafness, hearing loss, otitis, mastoiditis; vertigo, tinnitus, Meniere disease; acoustic neuroma; traumatic, toxic injury)
- Disorders of the nervous system:
  - paroxysmal disorders (eg, headache; trigeminal neuralgia; seizure disorders; syncope)
  - cerebrovascular disease (eg, intracerebral hemorrhage; ischemic disorders; aneurysm, subarachnoid hemorrhage; cavernous sinus thrombosis)
  - traumatic, toxic injury; including lead, carbon monoxide, and organophosphate poisoning
  - infections (eg, bacterial, fungal, viral, opportunistic infection in immunocompromised patients; Lyme disease; abscess; neurosyphilis; Guillain-Barré syndrome)
  - neoplasms (eg, primary; metastatic; neurofibromatosis)
  - metabolic disorders (eg, metabolic encephalopathy, vitamin B<sub>12</sub> [cobalamin] deficiency, vitamin B<sub>1</sub> [thiamine] deficiency; coma, confusion, delirium, dementia)
  - degenerative and developmental disorders (eg, Alzheimer disease; Huntington disease; parkinsonism; amyotrophic lateral sclerosis; Tay-Sachs disease; multiple sclerosis; cerebral palsy; dyslexia)
  - neuromuscular disorders, gait abnormalities, and disorders relating to the spine and spinal nerve roots (eg, myasthenia gravis; muscular dystrophy; peripheral neuropathy; neck pain; cervical radiculopathy; lumbosacral radiculopathy; spinal stenosis)
  - sleep disorders (eg, narcolepsy, idiopathic hypersomnolence, restless legs syndrome, REM sleep behavior disorder, circadian rhythm sleep disorder, sleep apnea)

## 7. Diseases of the Nervous System and Special Senses (continued)

### Principles of Management

*(With emphasis on topics covered in Diagnosis)*

- Pharmacotherapy only
- Management decision (treatment/diagnosis steps)
- Treatment only

## 8. Cardiovascular Disorders

### Health and Health Maintenance

- Arterial hypertension
- Atherosclerosis and coronary artery disease; hyperlipidemia
- Prevention of rheumatic heart disease, thromboembolic disease, pulmonary emboli, bacterial endocarditis

### Mechanisms of Disease

- Cardiac output, resistance, central venous pressure
- Valvular stenosis, incompetence
- Congenital heart disease
- Regulation of blood pressure
- Disorders of the arteries and veins

### Diagnosis

- Dysrhythmias; palpitations, syncope (eg, premature beats; paroxysmal tachycardias; atrial flutter and fibrillation; bradycardias; ventricular fibrillation; cardiac arrest)
- Heart failure (congestive, diastolic, systolic dysfunction), dyspnea, fatigue, peripheral edema of cardiac origin (eg, chronic heart failure; cor pulmonale)
- Ischemic heart disease; chest pain of cardiac origin (eg, angina pectoris; coronary insufficiency; myocardial infarction)
- Diseases of the myocardium (eg, hypertrophic; myocarditis)
- Diseases of the pericardium (eg, acute pericarditis; chronic constrictive pericardiopathy; pericardial effusion; pericardial tamponade)
- Valvular heart disease (eg, acute rheumatic fever; mitral and aortic valve disorders; infective endocarditis)
- Congenital cardiovascular disease (eg, patent ductus arteriosus; atrial septal defect; ventricular septal defect; endocardial cushion defect; tetralogy of Fallot; coarctation of the aorta)
- Systemic hypotension, hypovolemia, cardiogenic shock; cyanosis
- Arterial hypertension (eg, essential; secondary)
- Atherosclerosis - lipoproteins
- Disorders of the great vessels (eg, dissecting aortic aneurysm; ruptured aneurysm; aortoiliac disease)
- Peripheral arterial vascular diseases, vasculitis (eg, polyarteritis; temporal arteritis; arteriovenous fistula)
- Diseases of the veins, peripheral edema (eg, varicose veins; thrombophlebitis; deep venous thrombosis)
- Traumatic injury

## 8. Cardiovascular Disorders (continued)

### Principles of Management

*(With emphasis on topics covered in Diagnosis)*

- Pharmacotherapy only
- Management decision (treatment/diagnosis steps)
- Treatment only

## 9. Diseases of the Respiratory System

### Health and Health Maintenance

- Chronic bronchitis, asthma, emphysema, carcinoma of the larynx, carcinoma of the lung; pulmonary aspiration, atelectasis; tuberculosis

### Mechanisms of Disease

- Ventilatory dysfunction (eg, obstructive disorders: asthma, chronic obstructive pulmonary disease, cystic fibrosis, bronchitis, bronchiectasis, emphysema)
- Respiratory failure, acute and chronic, including oxygenation failure (eg, interstitial pneumonitis, pulmonary edema, acute respiratory distress syndrome, ventilation failure)
- Circulatory dysfunction
- Neoplastic disorders

### Diagnosis

- Disorders of the nose, paranasal sinuses, pharynx, larynx, and trachea (eg, rhinitis; pharyngitis, tonsillitis, peritonsillar abscess; thrush; sinusitis; acute laryngotracheitis; epiglottitis; carcinoma of the larynx; laryngeal/pharyngeal obstruction; trauma; tracheoesophageal fistula)
- Infections of the lung (eg, acute bronchiolitis; pneumonia; tuberculosis)
- Obstructive airways disease (eg, chronic bronchitis, bronchiectasis; asthma, bronchospasm, wheezing; emphysema,  $\alpha_1$ -antitrypsin deficiency; cystic fibrosis)
- Atelectasis, pulmonary aspiration
- Pneumothorax, hemothorax, traumatic injury to the lungs and disorders involving the pleura (eg, pleurisy; pleural effusion)
- Pneumoconiosis, fibrosing or restrictive pulmonary disorders (eg, asbestosis; silicosis; sarcoidosis)
- Respiratory failure, hypoxia, hypercapnia, dyspnea (eg, respiratory distress syndrome of the newborn; acute respiratory distress syndrome; acute and chronic respiratory failure; drowning)
- Pulmonary vascular disorders (eg, pulmonary embolism; pulmonary hypertension; pulmonary edema)
- Neoplastic disorders of the lungs and pleura (eg, primary tumors; metastatic tumors)

### Principles of Management

*(With emphasis on topics covered in Diagnosis)*

- Pharmacotherapy only
- Management decision (treatment/diagnosis steps)
- Treatment only

## 10. Nutritional and Digestive Disorders

### Health and Health Maintenance

- Screening (eg, cancer)
- Viral hepatitis and alcohol-related hepatopathy

### Mechanisms of Disease

- Malabsorption/malnutrition
- Jaundice
- Infections/parasites
- Obstruction/mechanical

### Diagnosis

- Disorders of the mouth, salivary glands, oropharynx, and esophagus (eg, dental disorders; disorders of the salivary glands; esophageal reflux; dysphagia; motility disorders of the esophagus; hiatal hernia; carcinoma of the esophagus)
- Disorders of the stomach, small intestine, colon, and rectum/anus (eg, gastritis; peptic ulcer disease; congenital disorders; malabsorption; appendicitis; granulomatous enterocolitis; ischemic colitis; irritable bowel syndrome; diverticula; colonic polyps; ulcerative colitis; peritonitis; bowel obstruction, volvulus, intussusception; hernia; necrotizing enterocolitis; infection; carcinoma of the stomach, colon, and rectum; antibiotic-associated colitis; hemorrhoids; anal fissures; anal fistula; perianal/perirectal abscess)
- Disorders of the pancreas (eg, pancreatitis; pseudocyst; carcinoma of the pancreas)
- Disorders of the liver and biliary system (eg, hepatitis; cirrhosis; hepatic failure, hepatic encephalopathy, jaundice; portal hypertension; ascites, esophageal varices; cholelithiasis; cholecystitis; hepatic abscess, subphrenic abscess; neoplasms of the liver; storage diseases; neoplasms of the biliary tract)
- Traumatic injury and poisoning (including drain cleaner ingestion)

### Principles of Management

*(With emphasis on topics covered in Diagnosis)*

- Pharmacotherapy only
- Management decision (treatment/diagnosis steps)
- Treatment only

## 11. Gynecologic Disorders

### Health and Health Maintenance

- Postmenarchal/reproductive
- Peri/postmenopausal

### Mechanisms of Disease

- Infections (eg, vulvovaginitis; pelvic inflammatory disease; toxic shock; sexually transmitted disease; endometritis; urethritis; Bartholin gland abscess; abscess of the breast; mastitis)
- Urinary incontinence and obstruction
- Menstrual and endocrinologic disorders; infertility

### Diagnosis

- Pelvic relaxation and urinary incontinence (eg, urinary tract infection; uterovaginal prolapse; cystocele, rectocele, urethrocele)
- Neoplasms (eg, cervical dysplasia, cancer; leiomyomata uteri; endometrial cancer; ovarian neoplasms; neoplastic disorders of the breast; vulvar neoplasms)
- Benign conditions of the breast
- Menstrual and endocrinologic disorders (eg, amenorrhea [including undiagnosed pregnancy]; abnormal uterine bleeding; dysmenorrhea; menopausal, postmenopausal disorders [osteoporosis]; premenstrual syndrome; hirsutism, virilization; ovarian disorders [ovarian failure, polycystic ovarian syndrome])
- Sexual abuse and rape

### Principles of Management

*(With emphasis on topics covered in Diagnosis)*

- Pharmacotherapy only
- Management decision (treatment/diagnosis steps)
- Treatment only

## 12. Renal, Urinary, and Male Reproductive Systems

### Health and Health Maintenance

- Infections (eg, urinary tract, sexually transmitted diseases [male])
- Acute and chronic renal failure including risk factors and prevention and methods of limiting progression
- Male health maintenance examination (eg, testicular, prostatic)

### Mechanisms of Disease

- Disorders of the male reproductive system
- Urinary incontinence and obstruction, enuresis
- Renal insufficiency/failure
- Electrolyte and water metabolism and acid-base balance



## 12. Renal, Urinary, and Male Reproductive Systems (continued)

### Diagnosis

- Disorders of the male reproductive system (eg, infections; torsion of the testis; undescended testicle; neoplasms of the testis; benign prostatic hyperplasia; carcinoma of the prostate; hypospadias; hydrocele, varicocele; urethral stricture, impotence, premature ejaculation)
- Disorders of the urinary bladder and urinary collecting system (eg, cystitis; pyelitis; dysuria, hematuria, pyuria; carcinoma of the bladder; urolithiasis; ureteral reflux; neurogenic bladder; urinary incontinence; enuresis; obstruction; hydronephrosis)
- Disorders of the kidneys (eg, pyelonephritis; glomerulonephritis; interstitial nephropathy; renal insufficiency and failure; oliguria, anuria, azotemia, uremia, renal osteodystrophy; hypertensive renal disease; lupus nephritis; inherited disorders)
- Traumatic injury

### Principles of Management

*(With emphasis on topics covered in Diagnosis)*

- Pharmacotherapy only
- Management decision (treatment/diagnosis steps)
- Treatment only

## 13. Disorders of Pregnancy, Childbirth, and the Puerperium

### Health and Health Maintenance

- Prenatal care (eg, nutrition; prevention of iron deficiency; prevention of vitamin deficiency; Rh immunoglobulin prophylaxis; prenatal diagnosis; teratology, diabetes mellitus, urinary tract infection,  $\alpha$ -fetoprotein, rubella, genital herpes, streptococcal infections)
- Assessment of the at-risk pregnancy; risk of preterm labor
- Intrapartum care; signs of fetal compromise
- Contraception; sterilization; prevention of pregnancy after rape

### Mechanisms of Disease

- Placenta, placental dysfunction
- Pregnancy and labor, including infection
- Postpartum disorders, including infection
- Fetus and newborn

### 13. Disorders of Pregnancy, Childbirth, and the Puerperium (continued)

#### Diagnosis

- Pregnancy and labor, including obstetric complications (eg, ectopic pregnancy; spontaneous abortion/septic abortion; hypertension; third-trimester bleeding; hydramnios; preterm labor, premature rupture of the membranes, normal labor; multiple gestation; intrapartum fetal distress/fetal death; maternal mortality; fetal growth and development abnormalities; congenital abnormalities; gestational trophoblastic disease)
- Nonobstetric complications of pregnancy (eg, major medical complications and preexisting medical conditions; surgical complications; hyperemesis gravidarum)
- Complications of the puerperium (eg, problems with breast-feeding; postpartum hemorrhage; postpartum sepsis; postpartum depression, psychosis; mastitis; venous thromboembolism)

#### Principles of Management

*(With emphasis on topics covered in Diagnosis)*

- Pharmacotherapy only
- Management decision (treatment/diagnosis steps)
- Treatment only

### 14. Disorders of the Skin and Subcutaneous Tissues

#### Health and Health Maintenance

- Epidemiology and prevention of skin disorders secondary to exposure to the sun; contact dermatitis and drug reactions; decubitus ulcers; dermatophytic skin disorders

#### Mechanisms of Disease

- Skin disorders, including cancer, infections, and inflammatory disorders

#### Diagnosis

- Infections (eg, herpes simplex, herpes zoster, chickenpox; cellulitis, carbuncle, abscess, gangrene; dermatophytoses; pilonidal cyst; viral warts; decubitus ulcers)
- Neoplasms (eg, squamous cell carcinoma; melanoma; actinic keratosis, basal cell carcinoma; pigmented nevi; hemangiomas)
- Other skin disorders (eg, industrial, occupational, and atopic dermatitis; psoriasis; seborrhea; acne)

#### Principles of Management

*(With emphasis on topics covered in Diagnosis)*

- Pharmacotherapy only
- Management decision (treatment/diagnosis steps)
- Treatment only

## 15. Diseases of the Musculoskeletal System and Connective Tissue

### Health and Health Maintenance

- Epidemiology, impact, and prevention of degenerative joint and disc disease
- Prevention of disability due to musculoskeletal disorders or infection (eg, osteomyelitis; septic arthritis; Lyme disease; gonococcal tenosynovitis)

### Mechanisms of Disease

- Infections
- Nerve compressions and degenerative, metabolic, and nutritional disorders
- Inherited, congenital, or developmental disorders
- Inflammatory or immunologic disorders

### Diagnosis

- Infections (eg, osteomyelitis; septic arthritis; Lyme disease; gonococcal tenosynovitis)
- Degenerative, metabolic, and nutritional disorders (eg, degenerative joint disease; degenerative disc disease; gout; rickets)
- Inherited, congenital, or developmental disorders (eg, congenital hip dysplasia; phocomelia; osteochondritis; slipped capital femoral epiphysis; scoliosis; syringomyelia, dislocated hip in infantile spinal muscular atrophy)
- Inflammatory, immunologic, and other disorders (eg, polymyalgia rheumatica; lupus arthritis; polymyositis-dermatomyositis; rheumatoid arthritis; ankylosing spondylitis; bursitis; tendinitis; myofascial pain; fibromyalgia; shoulder-hand syndrome; Dupuytren contracture; Paget disease)
- Neoplasms (eg, osteosarcoma; metastases to bone; pulmonary osteoarthropathy)
- Traumatic injury and nerve compression and injury (eg, fractures, sprains, dislocations, carpal tunnel syndrome; cauda equina syndrome, low back pain)

### Principles of Management

*(With emphasis on topics covered in Diagnosis)*

- Pharmacotherapy only
- Management decision (treatment/diagnosis steps)
- Treatment only

## 16. Endocrine and Metabolic Disorders

### Health and Health Maintenance

- Diabetes mellitus, including prevention of morbidity and mortality due to complications
- Screening (eg, cancer)

### Mechanisms of Disease

- Thyroid function
- Diabetes mellitus and carbohydrate metabolism
- Parathyroid and calcium metabolism
- Pituitary and hypothalamic function
- Adrenal function

**16. Endocrine and Metabolic Disorders (continued)**

**Diagnosis**

- Thyroid disorders (eg, nodule; carcinoma; acquired hypothyroidism; thyroiditis; thyrotoxicosis; congenital hypothyroidism; goiter)
- Diabetes mellitus (eg, type 1, type 2; ketoacidosis; hyperosmolar coma; chronic complications)
- Parathyroid and calcium disorders (eg, hyperparathyroidism; hypoparathyroidism), and hypoglycemia and hyperinsulinism (eg, iatrogenic; insulinoma)
- Pituitary and hypothalamic disorders (eg, diabetes insipidus; inappropriate ADH secretion; panhypopituitarism; acromegaly)
- Adrenal disorders (eg, corticoadrenal insufficiency; Cushing syndrome; adrenogenital syndrome; hyperaldosteronism; pheochromocytoma)
- Heat-related illness

**Principles of Management**

*(With emphasis on topics covered in Diagnosis)*

- Pharmacotherapy only
- Management decision (treatment/diagnosis steps)
- Treatment only

**17. Congenital Anomalies**

*(Topic covered under each organ system)*

**18. Conditions Originating in the Perinatal Period**

*(Topic covered under Disorders of Pregnancy, Childbirth, and the Puerperium [category 13])*

**19. Symptoms, Signs, and Ill-defined Conditions**

*(Topic covered under each organ system)*

**20. Injury and Poisoning**

*(Topic covered under each organ system)*

## Sample Step 2 CK

### *Sample Questions*

The following pages include 131 sample test questions. Most of these questions are the same as those you will see when you download the practice software program from the USMLE website. Please note that reviewing the sample questions in this booklet is **not** a substitute for acquainting yourself with the test software. You should run the Step 2 CK tutorial and sample test questions that are provided on the USMLE website well before your test date. The sample materials on the USMLE website include additional items that do not appear in this booklet: pharmaceutical ads and abstracts, items with associated audio or video findings, and sequential item sets. You should become familiar with these formats, which will be used in the actual examination.

These sample questions are illustrative of the types of questions used in the Step 2 CK examination. Although the questions exemplify content on the examination, they may not reflect the content coverage on individual examinations. Questions of the same format are grouped together in this booklet. In the actual examination, questions may appear randomly in the examination; they will not be grouped according to type or specific content. In the actual examination, the questions will be presented one at a time in a format designed for easy on-screen reading, including use of exhibit buttons (separate windows) for the Normal Laboratory Values Table (included here on pages 21-22) and some pictorials. Photographs, charts, and x-rays referred to in this booklet are not of the same quality as the pictorials used in the actual examination. In addition, you will have the capability to adjust the brightness and contrast of pictorials on the computer screen.

To take the following sample test questions as they would be timed in the actual examination, you should allow a maximum of one hour for each block, for a total of three hours. Please be aware that most examinees perceive the time pressure to be greater during an actual examination. An answer sheet for recording answers is provided on page 23. In the actual examination, answers will be selected on the screen; **no answer sheet will be provided**. An answer key is provided on page 73.

**USMLE Step 2 CK Laboratory Values**

\* Included in the Biochemical Profile (SMA-12)

	<u>REFERENCE RANGE</u>	<u>SI REFERENCE INTERVALS</u>
<b>BLOOD, PLASMA, SERUM</b>		
* Alanine aminotransferase (ALT), serum	8-20 U/L	8-20 U/L
Amylase, serum	25-125 U/L	25-125 U/L
* Aspartate aminotransferase (AST), serum	8-20 U/L	8-20 U/L
Bilirubin, serum (adult) Total // Direct	0.1-1.0 mg/dL // 0.0-0.3 mg/dL	2-17 $\mu$ mol/L // 0-5 $\mu$ mol/L
* Calcium, serum (Ca <sup>2+</sup> )	8.4-10.2 mg/dL	2.1-2.8 mmol/L
* Cholesterol, serum	Rec: <200 mg/dL	<5.2 mmol/L
Cortisol, serum	0800 h: 5-23 $\mu$ g/dL // 1600 h: 3-15 $\mu$ g/dL	138-635 nmol/L // 82-413 nmol/L
	2000 h: $\leq$ 50% of 0800 h	Fraction of 0800 h: $\leq$ 0.50
Creatine kinase, serum	Male: 25-90 U/L	25-90 U/L
	Female: 10-70 U/L	10-70 U/L
* Creatinine, serum	0.6-1.2 mg/dL	53-106 $\mu$ mol/L
Electrolytes, serum		
Sodium (Na <sup>+</sup> )	136-145 mEq/L	136-145 mmol/L
* Potassium (K <sup>+</sup> )	3.5-5.0 mEq/L	3.5-5.0 mmol/L
Chloride (Cl <sup>-</sup> )	95-105 mEq/L	95-105 mmol/L
Bicarbonate (HCO <sub>3</sub> <sup>-</sup> )	22-28 mEq/L	22-28 mmol/L
Magnesium (Mg <sup>2+</sup> )	1.5-2.0 mEq/L	0.75-1.0 mmol/L
Estriol, total, serum (in pregnancy)		
24-28 wks // 32-36 wks	30-170 ng/mL // 60-280 ng/mL	104-590 nmol/L // 208-970 nmol/L
28-32 wks // 36-40 wks	40-220 ng/mL // 80-350 ng/mL	140-760 nmol/L // 280-1210 nmol/L
Ferritin, serum	Male: 15-200 ng/mL	15-200 $\mu$ g/L
	Female: 12-150 ng/mL	12-150 $\mu$ g/L
Follicle-stimulating hormone, serum/plasma	Male: 4-25 mIU/mL	4-25 U/L
	Female: premenopause 4-30 mIU/mL	4-30 U/L
	midcycle peak 10-90 mIU/mL	10-90 U/L
	postmenopause 40-250 mIU/mL	40-250 U/L
Gases, arterial blood (room air)		
pH	7.35-7.45	[H <sup>+</sup> ] 36-44 nmol/L
PCO <sub>2</sub>	33-45 mm Hg	4.4-5.9 kPa
PO <sub>2</sub>	75-105 mm Hg	10.0-14.0 kPa
* Glucose, serum	Fasting: 70-110 mg/dL	3.8-6.1 mmol/L
	2-h postprandial: < 120 mg/dL	< 6.6 mmol/L
Growth hormone - arginine stimulation	Fasting: < 5 ng/mL	< 5 $\mu$ g/L
	provocative stimuli: > 7 ng/mL	> 7 $\mu$ g/L
Immunoglobulins, serum		
IgA	76-390 mg/dL	0.76-3.90 g/L
IgE	0-380 IU/mL	0-380 kIU/L
IgG	650-1500 mg/dL	6.5-15 g/L
IgM	40-345 mg/dL	0.4-3.45 g/L
Iron	50-170 $\mu$ g/dL	9-30 $\mu$ mol/L
Lactate dehydrogenase, serum	45-90 U/L	45-90 U/L
Luteinizing hormone, serum/plasma	Male: 6-23 mIU/mL	6-23 U/L
	Female: follicular phase 5-30 mIU/mL	5-30 U/L
	midcycle 75-150 mIU/mL	75-150 U/L
	postmenopause 30-200 mIU/mL	30-200 U/L
Osmolality, serum	275-295 mOsmol/kg H <sub>2</sub> O	275-295 mOsmol/kg H <sub>2</sub> O
Parathyroid hormone, serum, N-terminal	230-630 pg/mL	230-630 ng/L
* Phosphatase (alkaline), serum (p-NPP at 30°C)	20-70 U/L	20-70 U/L
* Phosphorus (inorganic), serum	3.0-4.5 mg/dL	1.0-1.5 mmol/L
Prolactin, serum (hPRL)	< 20 ng/mL	< 20 $\mu$ g/L
* Proteins, serum		
Total (recumbent)	6.0-7.8 g/dL	60-78 g/L
Albumin	3.5-5.5 g/dL	35-55 g/L
Globulin	2.3-3.5 g/dL	23-35 g/L
Thyroid-stimulating hormone, serum or plasma	0.5-5.0 $\mu$ U/mL	0.5-5.0 mU/L
Thyroidal iodine ( <sup>123</sup> I) uptake	8%-30% of administered dose/24 h	0.08-0.30/24 h
Thyroxine (T <sub>4</sub> ), serum	5-12 $\mu$ g/dL	64-155 nmol/L
Triglycerides, serum	35-160 mg/dL	0.4-1.81 mmol/L
Triiodothyronine (T <sub>3</sub> ), serum (RIA)	115-190 ng/dL	1.8-2.9 nmol/L
Triiodothyronine (T <sub>3</sub> ) resin uptake	25%-35%	0.25-0.35
* Urea nitrogen, serum	7-18 mg/dL	1.2-3.0 mmol/L
* Uric acid, serum	3.0-8.2 mg/dL	0.18-0.48 mmol/L

**USMLE Step 2 CK Laboratory Values (continued)**

	<u>REFERENCE RANGE</u>	<u>SI REFERENCE INTERVALS</u>
<b>BODY MASS INDEX (BMI)</b>		
Body mass index .....	Adult: 19-25 kg/m <sup>2</sup>	
<b>CEREBROSPINAL FLUID</b>		
Cell count .....	0-5/mm <sup>3</sup>	0-5 x 10 <sup>6</sup> /L
Chloride .....	118-132 mEq/L	118-132 mmol/L
Gamma globulin .....	3%-12% total proteins	0.03-0.12
Glucose .....	40-70 mg/dL	2.2-3.9 mmol/L
Pressure .....	70-180 mm H <sub>2</sub> O	70-180 mm H <sub>2</sub> O
Proteins, total .....	<40 mg/dL	<0.40 g/L
<b>HEMATOLOGIC</b>		
Bleeding time (template) .....	2-7 minutes	2-7 minutes
Erythrocyte count .....	Male: 4.3-5.9 million/mm <sup>3</sup> Female: 3.5-5.5 million/mm <sup>3</sup>	4.3-5.9 x 10 <sup>12</sup> /L 3.5-5.5 x 10 <sup>12</sup> /L
Erythrocyte sedimentation rate (Westergren) .....	Male: 0-15 mm/h Female: 0-20 mm/h	0-15 mm/h 0-20 mm/h
Hematocrit .....	Male: 41%-53% Female: 36%-46%	0.41-0.53 0.36-0.46
Hemoglobin A <sub>1c</sub> .....	≤ 6%	≤ 0.06
Hemoglobin, blood .....	Male: 13.5-17.5 g/dL Female: 12.0-16.0 g/dL	2.09-2.71 mmol/L 1.86-2.48 mmol/L
Hemoglobin, plasma .....	1-4 mg/dL	0.16-0.62 mmol/L
Leukocyte count and differential		
Leukocyte count .....	4500-11,000/mm <sup>3</sup>	4.5-11.0 x 10 <sup>9</sup> /L
Segmented neutrophils .....	54%-62%	0.54-0.62
Bands .....	3%-5%	0.03-0.05
Eosinophils .....	1%-3%	0.01-0.03
Basophils .....	0%-0.75%	0-0.0075
Lymphocytes .....	25%-33%	0.25-0.33
Monocytes .....	3%-7%	0.03-0.07
Mean corpuscular hemoglobin .....	25.4-34.6 pg/cell	0.39-0.54 fmol/cell
Mean corpuscular hemoglobin concentration .....	31%-36% Hb/cell	4.81-5.58 mmol Hb/L
Mean corpuscular volume .....	80-100 μm <sup>3</sup>	80-100 fL
Partial thromboplastin time (activated) .....	25-40 seconds	25-40 seconds
Platelet count .....	150,000-400,000/mm <sup>3</sup>	150-400 x 10 <sup>9</sup> /L
Prothrombin time .....	11-15 seconds	11-15 seconds
Reticulocyte count .....	0.5%-1.5%	0.005-0.015
Thrombin time .....	<2 seconds deviation from control	<2 seconds deviation from control
Volume		
Plasma .....	Male: 25-43 mL/kg Female: 28-45 mL/kg	0.025-0.043 L/kg 0.028-0.045 L/kg
Red cell .....	Male: 20-36 mL/kg Female: 19-31 mL/kg	0.020-0.036 L/kg 0.019-0.031 L/kg
<b>SWEAT</b>		
Chloride .....	0-35 mmol/L	0-35 mmol/L
<b>URINE</b>		
Calcium .....	100-300 mg/24 h	2.5-7.5 mmol/24 h
Chloride .....	Varies with intake	Varies with intake
Creatinine clearance .....	Male: 97-137 mL/min Female: 88-128 mL/min	
Estradiol, total (in pregnancy)		
30 wks .....	6-18 mg/24 h	21-62 μmol/24 h
35 wks .....	9-28 mg/24 h	31-97 μmol/24 h
40 wks .....	13-42 mg/24 h	45-146 μmol/24 h
17-Hydroxycorticosteroids		
Male: .....	3.0-10.0 mg/24 h	8.2-27.6 μmol/24 h
Female: .....	2.0-8.0 mg/24 h	5.5-22.0 μmol/24 h
17-Ketosteroids, total		
Male: .....	8-20 mg/24 h	28-70 μmol/24 h
Female: .....	6-15 mg/24 h	21-52 μmol/24 h
Osmolality .....	50-1400 mOsmol/kg H <sub>2</sub> O	
Oxalate .....	8-40 μg/mL	90-445 μmol/L
Potassium .....	Varies with diet	Varies with diet
Proteins, total .....	<150 mg/24 h	<0.15 g/24 h
Sodium .....	Varies with diet	Varies with diet
Uric acid .....	Varies with diet	Varies with diet

## Answer Sheet for Step 2 CK Sample Questions

### Block 1 (Questions 1-41)

- |           |           |           |           |           |
|-----------|-----------|-----------|-----------|-----------|
| 1. _____  | 11. _____ | 21. _____ | 31. _____ | 41. _____ |
| 2. _____  | 12. _____ | 22. _____ | 32. _____ |           |
| 3. _____  | 13. _____ | 23. _____ | 33. _____ |           |
| 4. _____  | 14. _____ | 24. _____ | 34. _____ |           |
| 5. _____  | 15. _____ | 25. _____ | 35. _____ |           |
| 6. _____  | 16. _____ | 26. _____ | 36. _____ |           |
| 7. _____  | 17. _____ | 27. _____ | 37. _____ |           |
| 8. _____  | 18. _____ | 28. _____ | 38. _____ |           |
| 9. _____  | 19. _____ | 29. _____ | 39. _____ |           |
| 10. _____ | 20. _____ | 30. _____ | 40. _____ |           |
- 

### Block 2 (Questions 42-86)

- |           |           |           |           |           |
|-----------|-----------|-----------|-----------|-----------|
| 42. _____ | 52. _____ | 62. _____ | 72. _____ | 82. _____ |
| 43. _____ | 53. _____ | 63. _____ | 73. _____ | 83. _____ |
| 44. _____ | 54. _____ | 64. _____ | 74. _____ | 84. _____ |
| 45. _____ | 55. _____ | 65. _____ | 75. _____ | 85. _____ |
| 46. _____ | 56. _____ | 66. _____ | 76. _____ | 86. _____ |
| 47. _____ | 57. _____ | 67. _____ | 77. _____ |           |
| 48. _____ | 58. _____ | 68. _____ | 78. _____ |           |
| 49. _____ | 59. _____ | 69. _____ | 79. _____ |           |
| 50. _____ | 60. _____ | 70. _____ | 80. _____ |           |
| 51. _____ | 61. _____ | 71. _____ | 81. _____ |           |
- 

### Block 3 (Questions 87-131)

- |           |            |            |            |            |
|-----------|------------|------------|------------|------------|
| 87. _____ | 97. _____  | 107. _____ | 117. _____ | 127. _____ |
| 88. _____ | 98. _____  | 108. _____ | 118. _____ | 128. _____ |
| 89. _____ | 99. _____  | 109. _____ | 119. _____ | 129. _____ |
| 90. _____ | 100. _____ | 110. _____ | 120. _____ | 130. _____ |
| 91. _____ | 101. _____ | 111. _____ | 121. _____ | 131. _____ |
| 92. _____ | 102. _____ | 112. _____ | 122. _____ |            |
| 93. _____ | 103. _____ | 113. _____ | 123. _____ |            |
| 94. _____ | 104. _____ | 114. _____ | 124. _____ |            |
| 95. _____ | 105. _____ | 115. _____ | 125. _____ |            |
| 96. _____ | 106. _____ | 116. _____ | 126. _____ |            |



## Sample Questions

### Block 1 (Questions 1-41)

1. Six hours after delivery, a 1200-g (2-lb 11-oz) newborn develops respiratory distress. She was born at 32 weeks' gestation. Her pulse is 136/min, respirations are 60/min, and blood pressure is 60/30 mm Hg. Examination shows grunting and moderate intercostal and subcostal retractions. The lungs are clear to auscultation. Umbilical artery blood gas analysis on 60% oxygen shows:

pH	7.32
PCO <sub>2</sub>	32 mm Hg
PO <sub>2</sub>	60 mm Hg

An x-ray of the chest shows diffuse reticulogranular densities with an air bronchogram. Which of the following is the most likely underlying mechanism?

- (A) Abnormality of mucociliary function
  - (B) Aspiration of meconium into the lungs
  - (C) Blockage of airways with mucus
  - (D) Increased pulmonary capillary permeability
  - (E) Infection with group B streptococcus
  - (F) Pulmonary surfactant deficiency
2. A previously healthy 15-year-old boy is brought to the emergency department in August 1 hour after the onset of headache, dizziness, nausea, and one episode of vomiting. His symptoms began during the first hour of full-contact football practice in full uniform. He reported feeling weak and faint but did not lose consciousness. He vomited once after drinking water. On arrival, he is diaphoretic. He is not oriented to person, place, or time. His temperature is 39.5°C (103.1°F), pulse is 120/min, respirations are 40/min, and blood pressure is 90/65 mm Hg. Examination, including neurologic examination, shows no other abnormalities. Which of the following is the most appropriate next step in management?
- (A) Obtain a CT scan of the head
  - (B) Administer sodium chloride tablets
  - (C) Administer intravenous fluids
  - (D) Immerse the patient in an ice water bath
  - (E) Obtain a lumbar puncture
3. An 18-year-old man is brought to the emergency department 45 minutes after his car slid off an icy road into a telephone pole at approximately 35 miles per hour. He was the restrained driver, and the air bag inflated. Examination shows multiple contusions over the chest bilaterally; there is tenderness to palpation over the right lower chest wall. The abdomen is flat, soft, and nontender. A complete blood count and serum concentrations of electrolytes, urea nitrogen, and creatinine are within the reference range. Toxicology screening is negative. His urine is pink; urinalysis shows 80 RBC/hpf but no WBCs. Which of the following is the most appropriate next step in management?
- (A) CT scan of the abdomen and pelvis with contrast
  - (B) Magnetic resonance arteriography of the renal arteries
  - (C) Intravenous administration of antibiotics
  - (D) Exploratory laparotomy
  - (E) No further studies are indicated

4. A previously healthy 34-year-old woman is brought to the physician because of fever and headache for 1 week. She has not been exposed to any disease. She takes no medications. Her temperature is 39.3°C (102.8°F), pulse is 104/min, respirations are 24/min, and blood pressure is 135/88 mm Hg. She is confused and oriented only to person. Examination shows jaundice of the skin and conjunctivae. There are a few scattered petechiae over the trunk and back. There is no lymphadenopathy. Physical and neurologic examinations show no other abnormalities. Test of the stool for occult blood is positive. Laboratory studies show:

Hematocrit	32% with fragmented and nucleated erythrocytes
Leukocyte count	12,500/mm <sup>3</sup>
Platelet count	20,000/mm <sup>3</sup>
Prothrombin time	10 sec
Partial thromboplastin time	30 sec
Fibrin split products	negative
Serum	
Urea nitrogen	35 mg/dL
Creatinine	3.0 mg/dL
Bilirubin	
Total	3.0 mg/dL
Direct	0.5 mg/dL
Lactate dehydrogenase	1000 U/L

Blood and urine cultures are negative. A CT scan of the head shows no abnormalities. Which of the following is the most likely diagnosis?

- (A) Disseminated intravascular coagulation
  - (B) Immune thrombocytopenic purpura
  - (C) Meningococcal meningitis
  - (D) Sarcoidosis
  - (E) Systemic lupus erythematosus
  - (F) Thrombotic thrombocytopenic purpura
5. A 27-year-old woman, gravida 3, para 2, at 25 weeks' gestation is admitted to the hospital 30 minutes after spontaneous rupture of membranes. She reports that after walking a 5-km course 24 hours ago, she began to have muscle aches and chills. Her temperature prior to going to bed last night was 38.9°C (102°F). She took 800 mg of ibuprofen and awoke 8 hours later with severe abdominal pain and shaking chills. She began to vomit, then noted a gush of blood-tinged fluid from her vagina. Her pregnancy had been uncomplicated. On admission, she appears ill. Her temperature is 39.1°C (102.3°F), pulse is 110/min, respirations are 18/min, and blood pressure is 110/60 mm Hg. Abdominal examination shows severe, diffuse tenderness throughout the lower quadrants. Pelvic examination shows exquisite cervical motion and uterine tenderness. Speculum examination confirms rupture of membranes. Ultrasonography shows the fetus in a vertex presentation. There is anhydramnios. Which of the following is the greatest predisposing factor for this patient's premature rupture of membranes?
- (A) Emesis
  - (B) Exercise
  - (C) Ibuprofen use
  - (D) Intra-amniotic infection
  - (E) Multiparity

6. A 47-year-old man comes to the physician 12 hours after the sudden onset of a severe occipital headache and stiff neck. He has not had any other symptoms and has no history of severe headache. He has hypertension and gastroesophageal reflux disease. Current medications include hydrochlorothiazide and ranitidine. He is oriented to person, place, and time. His temperature is 36.7°C (98.1°F), pulse is 100/min, and blood pressure is 160/90 mm Hg. Range of motion of the neck is decreased due to pain. Neurologic examination shows no focal findings. Which of the following is the most likely diagnosis?

- (A) Cluster headache
- (B) Meningitis
- (C) Migraine
- (D) Subarachnoid hemorrhage
- (E) Tension-type headache

7. A 47-year-old woman, gravida 2, para 2, comes to the physician after a screening at a health fair showed a serum total cholesterol concentration of 280 mg/dL, HDL-cholesterol concentration of 78 mg/dL, and a triglyceride concentration of 1420 mg/dL. She underwent the screening after eating dinner. She has a history of fibrocystic breast disease. She takes no medications. Her father has a history of coronary artery disease. She is 173 cm (5 ft 8 in) tall and weighs 63 kg (139 lb); BMI is 21 kg/m<sup>2</sup>. Her temperature is 37°C (98.6°F), pulse is 80/min, respirations are 14/min, and blood pressure is 110/70 mm Hg. Examination shows no abnormalities. Which of the following is the most appropriate next step in management?

- (A) Therapeutic lifestyle diet
- (B) Fasting serum lipid studies
- (C) Atorvastatin therapy
- (D) Gemfibrozil therapy
- (E) Niacin therapy

8. A 32-year-old woman comes to the physician because of fatigue for 6 months. She has had progressively severe dyspnea on exertion for 6 weeks. She had an extensive abdominal operation 5 years ago for Crohn disease. She does not take any medications. Her temperature is 37°C (98.6°F), pulse is 62/min, respirations are 18/min, and blood pressure is 110/65 mm Hg. Examination of the thyroid gland, lungs, heart, abdomen, and extremities shows no abnormalities. Test of the stool for occult blood is negative. Laboratory studies show:

Hemoglobin	8 g/dL
Mean corpuscular volume	70 $\mu\text{m}^3$
Leukocyte count	9000/mm <sup>3</sup>
Platelet count	500,000/mm <sup>3</sup>

Which of the following is the most likely diagnosis?

- (A) Acute leukemia
- (B) Anemia of chronic disease
- (C) Folic acid deficiency
- (D) Iron deficiency
- (E) Lyme disease
- (F) Microangiopathic hemolytic anemia
- (G) Pernicious anemia
- (H) Sleep apnea

9. A 57-year-old woman comes to the physician because of a worsening cough productive of yellow sputum over the past 3 days. She has a 2-year history of shortness of breath with exertion and chronic cough productive of white sputum daily but has no history of pneumonia or other pulmonary problems. She has a 20-year history of hypertension. Current medications include hydrochlorothiazide (25 mg daily) and an ipratropium inhaler (four puffs four times daily). She has smoked one-half pack of cigarettes daily for 37 years. Her temperature is 37°C (98.6°F), pulse is 80/min, respirations are 16/min, and blood pressure is 120/76 mm Hg. Examination shows an increased anteroposterior diameter. Occasional expiratory wheezes are heard. S<sub>1</sub> and S<sub>2</sub> are normal, and an S<sub>4</sub> is heard; the point of maximal impulse is subxiphoid. An x-ray of the chest shows flat diaphragms and a midline cardiac silhouette. Which of the following is the most appropriate next step in management?
- (A) Perform incentive spirometry
  - (B) Begin oral antibiotic therapy
  - (C) Begin oral theophylline therapy
  - (D) Increase hydrochlorothiazide dosage
  - (E) Switch from hydrochlorothiazide to furosemide therapy
10. A 37-year-old woman with AIDS comes to the physician because of a 1-month history of progressive diarrhea and a 1.8-kg (4-lb) weight loss. During the past week, she has had six large watery stools daily. She is currently receiving triple antiretroviral therapy. She is employed as a flight attendant and works regularly on domestic flights throughout the USA. She also flies to Asia at least once monthly. She is 163 cm (5 ft 4 in) tall and weighs 59 kg (130 lb); BMI is 22 kg/m<sup>2</sup>. Her temperature is 37°C (98.6°F), pulse is 88/min, and blood pressure is 112/64 mm Hg. The abdomen is scaphoid. The remainder of the examination shows no abnormalities. Her CD4+ T-lymphocyte count is 400/mm<sup>3</sup> (Normal ≥500). Which of the following is the most likely causal organism?
- (A) *Cryptosporidium parvum*
  - (B) Cytomegalovirus
  - (C) *Mycobacterium avium-intracellulare* complex
  - (D) *Salmonella enteritidis*
  - (E) *Strongyloides stercoralis*
11. A 37-year-old man with type 1 diabetes mellitus is admitted to the hospital because of inadequate control of his glucose concentrations for the past 2 months. Despite his poor control, he demands that he be discharged. He reports that he has had a 3-month history of fatigue, irritability, and feelings of hopelessness. He says that he has been noncompliant with his diabetic regimen, adding, "Sometimes I forget." He has been avoiding his family and friends because he is not in the mood to see them but admits that he is lonely. He did not get out of bed for 2 days, which prompted his wife to call an ambulance and have him admitted to the hospital. Prior to admission to the hospital, his only medication was insulin, although he often missed doses. He does not drink alcohol. He is 168 cm (5 ft 6 in) tall and weighs 100 kg (220 lb); BMI is 36 kg/m<sup>2</sup>. His temperature is 37°C (98.6°F), pulse is 68/min, respirations are 18/min, and blood pressure is 150/85 mm Hg. Physical examination shows no abnormalities. On mental status examination, he is tired and has a restricted affect. There is no evidence of suicidal ideation. Cognition is intact. His fasting serum glucose concentration is 120 mg/dL. Which of the following is the most appropriate next step in management?
- (A) Adhere to the patient's wishes and discuss home-care options
  - (B) Adhere to the patient's wishes on the condition that he agree to home nursing care
  - (C) Schedule neuropsychological testing
  - (D) Seek a court order to appoint a legal guardian
  - (E) Involuntarily hold the patient in the hospital

12. A previously healthy 17-year-old girl comes to the emergency department because of a 5-day history of progressive lower abdominal pain, fever, and malodorous vaginal discharge. Menarche was at the age of 12 years, and her last menstrual period was 2 weeks ago. She is sexually active with one male partner and uses a combination contraceptive patch. Her temperature is 37.8°C (100°F), pulse is 90/min, respirations are 22/min, and blood pressure is 110/70 mm Hg. Abdominal examination shows severe lower quadrant tenderness bilaterally. Pelvic examination shows a purulent cervical discharge, cervical motion tenderness, and bilateral adnexal tenderness. Her hemoglobin concentration is 10.5 g/dL, leukocyte count is 13,000/mm<sup>3</sup>, and platelet count is 345,000/mm<sup>3</sup>. A urine pregnancy test is negative. Which of the following is the most appropriate pharmacotherapy?
- (A) Oral azithromycin
  - (B) Vaginal clindamycin
  - (C) Intravenous penicillin and vancomycin
  - (D) Intramuscular ceftriaxone and oral doxycycline
  - (E) Intravenous oxacillin and metronidazole
13. A 20-year-old man has had frequent upper respiratory tract infections over the past 4 years. He has daily purulent sputum and has noted decreased exercise tolerance over the past 2 years. He and his wife have been unable to conceive because of his low sperm count. Scattered expiratory wheezing and rhonchi are heard throughout both lung fields. An x-ray of the chest shows hyperinflation. Spirometry shows a decreased FEV<sub>1</sub>:FVC ratio. Which of the following is most likely to confirm the diagnosis?
- (A) Arterial blood gas analysis
  - (B) Examination of sputum for eosinophils
  - (C) Sweat chloride test
  - (D) Sputum cytology
  - (E) Bronchoscopy

14. A 62-year-old man comes to the physician because of a 3-month history of progressive fatigue and joint pain, a 2-month history of sinus congestion, a 3-week history of cough, and a 1-week history of blood-tinged sputum. He has not had fever, nausea, vomiting, or diarrhea. He has hypercholesterolemia, stable angina pectoris, and hypertension. Medications include atorvastatin, labetalol, isosorbide, and aspirin. Over the past 3 weeks, he has been taking over-the-counter ibuprofen as needed for the joint pain. His pulse is 84/min, respirations are 12/min, and blood pressure is 132/76 mm Hg. Examination shows clear nasal discharge with no nasal or oral lesions. The joints are diffusely tender with no warmth or erythema; range of motion is full. Laboratory studies show:

Hematocrit	36%
Mean corpuscular volume	83 $\mu\text{m}^3$
Leukocyte count	14,000/ $\text{mm}^3$
Segmented neutrophils	74%
Eosinophils	1%
Lymphocytes	14%
Monocytes	11%
Platelet count	275,000/ $\text{mm}^3$
Serum	
Urea nitrogen	28 mg/dL
Creatinine	3.2 mg/dL
Antinuclear antibodies	1:256
Rheumatoid factor	negative
Antineutrophil cytoplasmic antibodies	positive
Urine	
Blood	3+
Protein	3+
RBC	15–17/hpf
WBC	1–2/hpf
RBC casts	rare

Which of the following is the most likely underlying mechanism of this patient's renal failure?

- (A) Atheroembolic disease
  - (B) Cold agglutinins
  - (C) Interstitial nephritis
  - (D) Lyme disease
  - (E) Septic arthritis
  - (F) Vasculitis
15. A 37-year-old woman is brought to the emergency department because of intermittent chest pain for 3 days. The pain is worse with inspiration, and she feels she cannot take deep breaths. She has not had shortness of breath, palpitations, or nausea. She had an upper respiratory tract infection 10 days ago and took an over-the-counter cough suppressant and decongestant and acetaminophen. Her temperature is 37.2°C (98.9°F), pulse is 90/min, and blood pressure is 122/70 mm Hg. The lungs are clear to auscultation. S<sub>1</sub> and S<sub>2</sub> are normal. A rub is heard during systole. There is no peripheral edema. An ECG shows normal sinus rhythm and diffuse, upwardly concave ST-segment elevation and PR-segment depression in leads II, III, and aVF. Which of the following is the most likely diagnosis?
- (A) Acute pericarditis
  - (B) Aortic dissection
  - (C) Gastroesophageal reflux disease
  - (D) Myocardial infarction
  - (E) Peptic ulcer disease
  - (F) Pulmonary embolism
  - (G) Unstable angina pectoris

16. A 37-year-old man comes to the physician because of nonradiating low back pain for 3 days. The pain began after he worked in his yard. He has not had any change in bowel movements or urination. He had one similar episode 3 years ago that resolved spontaneously. Vital signs are within normal limits. Examination of the back shows bilateral paravertebral muscle spasm. Range of motion is limited by pain. Straight-leg raising is negative. In addition to analgesia, which of the following is the most appropriate next step in management?
- (A) Bed rest  
 (B) Regular activity  
 (C) X-rays of the spine  
 (D) MRI of the spine  
 (E) Lumbar spine traction
17. A 27-year-old man is brought to the emergency department by his sister because of increasing confusion for 10 hours. He is unable to answer questions. His sister states that he recently saw a psychiatrist for the first time because of hearing voices; he was prescribed a medication, but she is not sure what it is. She says that he has a history of excessive drinking, and she thinks that he has also experimented with illicit drugs. He appears acutely ill. His temperature is 39.1°C (102.3°F), pulse is 124/min, and blood pressure is 160/102 mm Hg. Examination shows profuse diaphoresis and muscle rigidity. His neck is supple. The abdomen is soft and nontender. Mental status examination shows psychomotor agitation alternating with lethargy. His leukocyte count is 15,600/mm<sup>3</sup>, and serum creatine kinase activity is 943 U/L. Which of the following is the most likely explanation for this patient's symptoms?
- (A) Amphetamine intoxication  
 (B) Bacterial meningitis  
 (C) Delirium tremens  
 (D) Neuroleptic malignant syndrome  
 (E) Sepsis
18. During the past month, a 37-year-old woman has had epigastric pain 2 to 3 hours after eating and at night; she has a feeling of fullness and bloating even when she eats small amounts. For 2 days, she has been unable to keep any food "down" and has had repetitive vomiting between meals. Six months ago, she was diagnosed with a peptic ulcer and was treated with a proton pump inhibitor and antibiotics. After 2 weeks of treatment, her symptoms were alleviated, and she discontinued the medication due to the quantity of pills she had to take. Placement of a Foley catheter yields no urine. This patient is most likely to have which of the following electrolyte profiles?

	Na <sup>+</sup> (mEq/L)	K <sup>+</sup> (mEq/L)	Cl <sup>-</sup> (mEq/L)	HCO <sub>3</sub> <sup>-</sup> (mEq/L)
(A)	130	2.8	88	32
(B)	130	4.2	100	24
(C)	130	4.4	100	14
(D)	148	2.3	96	24
(E)	148	4.8	110	24

19. A 62-year-old white man comes to the physician because of an 8-month history of progressive pain and stiffness of his hands. The stiffness is worse at the end of the day. He has a 1-year history of fatigue and increased urination. He has no history of serious illness and takes no medications. His last visit to a physician was 10 years ago. He does not smoke or drink alcohol. He is 185 cm (6 ft 1 in) tall and weighs 82 kg (180 lb); BMI is 24 kg/m<sup>2</sup>. His pulse is 84/min, and blood pressure is 136/82 mm Hg. Examination shows dark brown skin. S<sub>1</sub> and S<sub>2</sub> are normal. An S<sub>3</sub> is heard at the apex. There is mild tenderness over the second and third metacarpophalangeal joints bilaterally without synovial thickening. Heberden nodes are present over the distal interphalangeal joints of the index and ring fingers bilaterally. Laboratory studies show:

Hemoglobin	16 g/dL
Leukocyte count	7700/mm <sup>3</sup>
Platelet count	332,000/mm <sup>3</sup>
Serum	
Glucose	182 mg/dL
Albumin	3.4 g/dL
Total bilirubin	1.1 mg/dL
Alkaline phosphatase	52 U/L
AST	55 U/L
ALT	68 U/L
Hepatitis B surface antigen	negative
Hepatitis C antibody	negative
Rheumatoid factor	negative

Which of the following is most likely to have prevented this patient's condition?

- (A) Calcium supplementation
  - (B) Enalapril therapy
  - (C) Metformin therapy
  - (D) Methotrexate therapy
  - (E) Phlebotomy
20. A 64-year-old woman comes to the physician because of a 5-month history of increasing shortness of breath, sore throat, and a cough productive of a small amount of white phlegm. Over the past week, she has had nausea related to excess coughing. Over the past year, she has had a 3.2-kg (7-lb) weight loss. She has asthma treated with theophylline and inhaled  $\beta$ -adrenergic agonists and corticosteroids. She has smoked one pack of cigarettes daily for 44 years and drinks one alcoholic beverage daily. She appears thin. Examination shows a 2-cm, nontender lymph node in the right supraclavicular area. Examination shows no other abnormalities. An x-ray of the chest shows a large right lower lobe density. A CT scan of the chest shows a 7.5 x 7.5 x 6-cm right lower lobe mass with some scattered calcifications. The lesion abuts the posterior chest wall without clear invasion. There are right lower peritracheal, precarinal, right hilar, and subcarinal lymph nodes. There is a 1.5-cm mass in the right adrenal gland. A biopsy specimen of the lung mass is most likely to show which of the following?
- (A) B-cell lymphoma
  - (B) Lung abscess
  - (C) Mesothelioma
  - (D) Metastatic adenocarcinoma of the breast
  - (E) Multiple endocrine neoplasia
  - (F) Non-small cell lung carcinoma
  - (G) Sarcoidosis
  - (H) Tuberculosis



21. A 21-year-old woman comes to the physician for preconceptional advice. She is recently married and would like to conceive within the next year. She does not eat meat, fish, or dairy products and wishes to decrease the risks of her diet on her baby. Menses occur at regular 28-day intervals and last 5 days. She does not smoke or drink alcohol. She takes no medications. She is 157 cm (5 ft 2 in) tall and weighs 50 kg (110 lb); BMI is 20 kg/m<sup>2</sup>. Physical examination shows no abnormalities. Pelvic examination shows a normal appearing vagina, cervix, uterus, and adnexa. Which of the following is most likely to decrease the risk of fetal anomalies in this patient?
- (A) Adjusting diet to include more sources of protein during the first trimester
  - (B) Beginning folic acid supplementation prior to conception
  - (C) Calcium supplementation during the first trimester
  - (D) Iron supplementation during the first trimester
  - (E) Soy protein shakes throughout pregnancy and lactation
22. A 42-year-old woman comes to the physician because of an 8-week history of intermittent nausea and abdominal pain that occurs 20 to 30 minutes after eating. The pain extends from the epigastrium to the right upper quadrant and is sometimes felt in the right scapula; it lasts about 30 minutes and is not relieved by antacids. The last episode occurred after she ate a hamburger and french fries. She has not had vomiting. She is currently asymptomatic. She is 165 cm (5 ft 5 in) tall and weighs 104 kg (230 lb); BMI is 38 kg/m<sup>2</sup>. Examination shows no other abnormalities. Which of the following is the most appropriate next step in management?
- (A) Abdominal ultrasonography of the right upper quadrant
  - (B) Upper gastrointestinal series with small bowel follow-through
  - (C) CT scan of the abdomen
  - (D) Endoscopic retrograde cholangiopancreatography
  - (E) Elective cholecystectomy
  - (F) Immediate cholecystectomy



23. A 62-year-old woman comes to the physician because of a 3-day history of a rash over her face and hands that has not improved with the use of skin moisturizers, antibiotic ointments, or corticosteroid cream. She has a 1-month history of progressive weakness. She has difficulty rising from a chair or reaching over her head. She has not had any pain. Vital signs are within normal limits. A photograph of the hands is shown. Muscle strength is 3/5 in the proximal upper and lower extremities. Which of the following is the most likely diagnosis?
- (A) Dermatomyositis
  - (B) Myasthenia gravis
  - (C) Psoriasis
  - (D) Systemic lupus erythematosus
  - (E) Systemic sclerosis (scleroderma)
- 
24. A 5-year-old girl is brought to the physician by her parents for evaluation of recurrent injuries. Her parents say that she started walking at the age of 14 months and since then has always seemed clumsier and had more injuries than other children. She has had increasingly frequent chest pain with exertion since starting a soccer program 3 months ago. She usually has pain or swelling of her knees or ankles after practice. She has been wearing glasses for 2 years. Her 16-year-old brother has required two operations for a severe rotator cuff injury he sustained while taking a shower, and she has a maternal cousin who died of a ruptured aortic aneurysm at the age of 26 years. Today, the patient walks with a limp. She is at the 99th percentile for height and 50th percentile for weight. A midsystolic click is heard at the apex. The left ankle is swollen and tender; range of motion is limited by pain. The joints of the upper and lower extremities are hypermobile, including 25 degrees of genu recurvatum, thumbs that may be extended to touch the forearms, and flexibility at the waist, with palms easily touching the floor with straight knees. Which of the following is the most appropriate next step in diagnosis?
- (A) Skeletal survey
  - (B) Echocardiography
  - (C) Bone scan
  - (D) MRI of the shoulder
  - (E) Aortic angiography

25. A study is conducted to assess the effectiveness of a new drug for the treatment of type 2 diabetes mellitus. A total of 1000 patients with type 2 diabetes mellitus are enrolled. Patients are randomly assigned to receive the new drug or standard treatment. The alpha and beta values for calculating probability are 0.05 and 0.20, respectively. Results show that the new drug is significantly better than standard treatment. If this study had been performed in a population of only 500 patients, which of the following would have been most likely to increase?
- (A) Chance of a type I error
  - (B) Chance of a type II error
  - (C) Power of the study
  - (D) Sensitivity of the study
  - (E) Specificity of the study
26. A previously healthy 27-year-old nulligravid woman comes to the emergency department because of a 2-day history of moderate-to-severe pain and swelling of the left labia. She is sexually active and uses condoms inconsistently. Her temperature is 37.2°C (99°F), pulse is 92/min, respirations are 18/min, and blood pressure is 115/75 mm Hg. Pelvic examination shows a 4 x 3-cm, tender, fluctuant mass medial to the left labium majus compromising the introital opening. Which of the following is the most appropriate next step in management?
- (A) Administration of intravenous metronidazole
  - (B) Administration of intravenous penicillin G
  - (C) Ultrasound-guided needle aspiration of the mass
  - (D) Incision and drainage
  - (E) Vulvectomy
27. A 65-year-old man who is quadriplegic as a result of multiple sclerosis is hospitalized for treatment of left lower lobe pneumonia. His temperature is 38.1°C (100.5°F), pulse is 95/min, respirations are 12/min, and blood pressure is 120/80 mm Hg. He appears malnourished. Rhonchi are heard at the left lower lobe of the lung on auscultation. Examination of the heart, lymph nodes, abdomen, and extremities shows no abnormalities. There is a 1-cm area of erythema over the sacrum with intact skin and no induration. Neurologic examination shows quadriparesis. Test of the stool for occult blood is negative. Which of the following is the most effective intervention for this patient's skin lesion?
- (A) Frequent turning
  - (B) Use of wet to dry dressings
  - (C) Whirlpool therapy
  - (D) Broad-spectrum antibiotic therapy
  - (E) Surgical debridement
28. A 32-year-old man who is a jackhammer operator comes to the physician because of pain and swelling of his right arm for 3 days. The symptoms are moderately exacerbated by exertion. Examination of the right upper extremity shows erythema and moderate edema. Capillary refill time is less than 3 seconds. Which of the following is the most likely diagnosis?
- (A) Axillary-subclavian venous thrombosis
  - (B) Deep venous valvular insufficiency
  - (C) Superficial thrombophlebitis of the basilic vein
  - (D) Superior vena cava syndrome
  - (E) Thoracic outlet syndrome



29. A 6-year-old girl is brought to the physician because of a 1-month history of a recurrent pruritic rash on her arms. She was born at term and has been healthy except for an episode of bronchiolitis 6 months ago treated with albuterol. A photograph of the rash is shown. Which of the following is the most appropriate next step in management?
- (A) Coal tar therapy
  - (B) Oral antibiotic therapy
  - (C) Topical antibiotic therapy
  - (D) Topical corticosteroid therapy
  - (E) Vitamin supplementation

30. Two days after admission to the hospital for congestive heart failure, an 82-year-old man is unable to walk because of severe, throbbing pain in his left foot. He has no history of similar episodes or recent trauma. He also has coronary artery disease and hypertension. Current medications include atenolol, lisinopril, furosemide, and aspirin. He does not smoke or drink alcohol. He is in moderate distress. His temperature is 38°C (100.4°F), pulse is 68/min and regular, respirations are 12/min, and blood pressure is 138/88 mm Hg. Jugular venous pulsations are present 3 cm above the sternal angle. Crackles are heard at both lung bases. A grade 2/6 systolic murmur is heard best at the left sternal border and second intercostal space. Examination of the lower extremities shows pitting pedal edema. There is tenderness, erythema, and edema of the left great toe. Active and passive range of motion of the first metacarpophalangeal joint produces pain; arthrocentesis of the joint is performed. Analysis of joint fluid aspirate is most likely to show which of the following?

	<b>WBC (/mm<sup>3</sup>)</b>	<b>Microscopic Examination for Crystals</b>	<b>Gram Stain</b>
(A)	100	needle-shaped	no organisms
(B)	100	none	gram-positive cocci
(C)	100	none	no organisms
(D)	100	rhomboid	no organisms
(E)	20,000	needle-shaped	no organisms
(F)	20,000	none	gram-positive cocci

31. Four days after undergoing open reduction and internal fixation of a fracture of the right femur sustained in a motor vehicle collision, a 47-year-old man continues to have agitation and confusion despite treatment with haloperidol. He has mild hypertension. Other medications include acetaminophen, atenolol, and prophylactic subcutaneous heparin. His temperature is 37.2°C (99°F), pulse is 98/min, respirations are 24/min, and blood pressure is 168/98 mm Hg. During the examination, he is uncooperative and refuses to answer questions. Neurologic examination shows tremulousness and no focal findings. He is oriented to person but not to place or time. A CT scan of the head shows no abnormalities. Which of the following is the most likely cause of these findings?

- (A) Adverse effect of medication
- (B) Alcohol withdrawal
- (C) Fat emboli
- (D) Sepsis
- (E) Subdural hematoma

32. A 16-year-old girl is brought to the physician because of intermittent pain and swelling of both ankles over the past month. She is currently not in pain. When the pain occurs, it is so severe that she is unable to walk. There is no associated fever or chills. She is sexually active and has had one sexual partner for 12 months. Her temperature is 37°C (98.6°F), pulse is 80/min, and blood pressure is 145/87 mm Hg. Examination shows no abnormalities or tenderness of the ankle joints. There is a nonpainful ulcer on the oral buccal mucosa. The lungs are clear to auscultation. Cardiac examination shows no abnormalities. Laboratory studies show:

Leukocyte count	4000/mm <sup>3</sup>
Segmented neutrophils	65%
Eosinophils	3%
Lymphocytes	25%
Monocytes	7%
Platelet count	60,000/mm <sup>3</sup>
Erythrocyte sedimentation rate	100 mm/h
Serum	
Antinuclear antibodies	1:320
Anti-DNA antibodies	positive
Rapid plasma reagin	1:16
Rheumatoid factor	negative
Urine	
Protein	3+
RBC casts	negative
RBC	none
WBC	10–20/hpf

X-rays of the ankles show no abnormalities other than tissue swelling. Which of the following is the most likely diagnosis?

- (A) Disseminated gonococcal disease
- (B) Polyarticular arthritis
- (C) Reactive arthritis
- (D) Secondary syphilis
- (E) Systemic lupus erythematosus

33. A 72-year-old woman with unresectable small cell carcinoma of the lung is brought to the emergency department after her family found her unresponsive. During the past week, she has become progressively confused. On arrival, she does not respond to command but withdraws all extremities to pain. Her temperature is 37°C (98.6°F), pulse is 80/min, respirations are 12/min, and blood pressure is 130/70 mm Hg. The pupils are equal and reactive to light, and corneal reflexes are brisk; there is spontaneous medial and lateral gaze. Laboratory studies show:

Hemoglobin	12.2 g/dL
Leukocyte count	6000/mm <sup>3</sup>
Serum	
Na <sup>+</sup>	118 mEq/L
Cl <sup>-</sup>	98 mEq/L
K <sup>+</sup>	4.5 mEq/L
HCO <sub>3</sub> <sup>-</sup>	26 mEq/L
Urea nitrogen	16 mg/dL
Glucose	95 mg/dL
Creatinine	0.8 mg/dL

Which of the following is the most likely mechanism of these findings?

- (A) Adrenal insufficiency
  - (B) Inadequate renal blood flow
  - (C) Injury to the renal tubules
  - (D) Nonphysiologic ADH (vasopressin) secretion
  - (E) Nonphysiologic aldosterone secretion
  - (F) Physiologic ADH (vasopressin) secretion
  - (G) Physiologic aldosterone secretion
34. A 52-year-old woman comes to the emergency department because of a 1-week history of low-grade fever and increasing abdominal cramps that are exacerbated by bowel movements. She began a course of amoxicillin-clavulanate and metronidazole 2 days ago but has had no relief of her symptoms. She has had intermittent constipation for the past 12 years. She has not had nausea, vomiting, urinary symptoms, or bloody stools. She has a 3-year history of hypertension. She underwent total abdominal hysterectomy and bilateral salpingo-oophorectomy 5 years ago because of leiomyomata uteri. She is 165 cm (5 ft 5 in) tall and weighs 86 kg (190 lb); BMI is 32 kg/m<sup>2</sup>. Her temperature is 38.1°C (100.6°F), pulse is 75/min, and blood pressure is 150/80 mm Hg. The lungs are clear to auscultation. Cardiac examination shows no abnormalities. The abdomen is soft, and there is tenderness to palpation of the left lower quadrant with guarding but no rebound. Bowel sounds are normal. The stool is brown, and test for occult blood is negative. Her hemoglobin concentration is 14.5 g/dL, leukocyte count is 15,000/mm<sup>3</sup>, and platelet count is 280,000/mm<sup>3</sup>; serum studies and urinalysis show no abnormalities. Which of the following is the most appropriate next step in diagnosis?
- (A) Examination of the stool for ova and parasites
  - (B) Test of the stool for *Clostridium difficile* toxin
  - (C) Endoscopic retrograde cholangiopancreatography
  - (D) Pelvic ultrasonography
  - (E) CT scan of the abdomen with contrast
  - (F) Colonoscopy

35. A previously healthy 18-year-old man is brought to the emergency department because of abdominal pain and nausea for 6 hours. He has had decreased appetite for the past week. He takes no medications. He drinks one to two beers daily and occasionally more on weekends. He does not use illicit drugs. His temperature is 37.8°C (100°F), pulse is 120/min, respirations are 24/min, and blood pressure is 105/60 mm Hg. Abdominal examination shows diffuse tenderness with no guarding or rebound. Bowel sounds are normal. Laboratory studies show:

Serum	
Na <sup>+</sup>	135 mEq/L
Cl <sup>-</sup>	98 mEq/L
K <sup>+</sup>	3.8 mEq/L
HCO <sub>3</sub> <sup>-</sup>	16 mEq/L
Glucose	360 mg/dL
Ketones	present
Urine ketones	present

Arterial blood gas analysis on room air shows a pH of 7.30. Which of the following is the most likely diagnosis?

- (A) Acute appendicitis
- (B) Acute pancreatitis
- (C) Alcoholic ketoacidosis
- (D) Diabetic ketoacidosis
- (E) Lactic acidosis

**The response options for the next 2 items are the same. Select one answer for each item in the set.**

- (A) Alcohol withdrawal
- (B) Coronary insufficiency
- (C) Hyperthyroidism
- (D) Hypoglycemia
- (E) Major depressive disorder
- (F) Panic disorder
- (G) Paroxysmal atrial tachycardia
- (H) Pheochromocytoma
- (I) Post-traumatic stress disorder
- (J) Pulmonary embolus
- (K) Somatization disorder

For each patient with anxiety, select the most likely diagnosis.

36. A 33-year-old woman comes to the emergency department 30 minutes after the sudden onset of chest pain, palpitations, shortness of breath, numbness and tingling in both arms, and fear of going crazy. She has visited local emergency departments several times over the past 3 months for similar symptoms that resolved within 1 hour. She uses an oral contraceptive. She drinks two beers daily and six beers on the weekend. She has no history of medical problems. Her mother and sisters have a history of anxiety. Her pulse is 90/min, respirations are 18/min, and blood pressure is 130/90 mm Hg. Physical examination, laboratory studies, and an ECG show no abnormalities.
37. A 35-year-old woman comes to the physician because of nervousness, tremors, emotional lability, and excessive sweating for 3 weeks; she has had a 4.5-kg (10-lb) weight loss during this period. She has no personal or family history of psychiatric disorders. Her pulse is 95/min, respirations are 12/min, and blood pressure is 120/80 mm Hg. Examination shows warm and moist skin, a fine tremor of the fingers and tongue, and hyperreflexia.

**The response options for the next 2 items are the same. Select one answer for each item in the set.**

- (A) Increased intracranial pressure
- (B) Migraine
- (C) Occipital neuralgia
- (D) Post-traumatic headache
- (E) Subarachnoid hemorrhage
- (F) Subdural hematoma
- (G) Temporomandibular joint syndrome
- (H) Tension-type headache

For each patient with headache, select the most likely diagnosis.

38. A 27-year-old man comes to the physician because of persistent headaches since a motor vehicle collision 2 weeks ago. In the collision, he struck his head on the windshield but did not lose consciousness. The headaches are generalized with a constant pressure-like pain. He also has had memory loss and difficulty sleeping. Neurologic examination and an MRI of the brain show no abnormalities.
39. A 32-year-old woman comes to the physician because of an 8-month history of moderately severe, bilateral, diffuse headaches that last "all day, every day." They are not responsive to over-the-counter medications. She has not had nausea, vomiting, or aura. She appears mildly depressed. Neurologic examination shows no abnormalities.



The response options for the next 2 items are the same. Select one answer for each item in the set.

- (A) Acute bacterial urethritis
- (B) Acute cystitis
- (C) Atrophic vaginitis
- (D) Bacterial vaginosis
- (E) Candidal vaginitis
- (F) Carcinoma of the bladder
- (G) Chemical urethritis
- (H) Chlamydial urethritis
- (I) Distal ureteral calculus
- (J) Gonorrheal urethritis
- (K) Herpes urethritis
- (L) Interstitial cystitis
- (M) Pyelonephritis, acute
- (N) Pyelonephritis, subclinical
- (O) Trichomonal vaginitis

For each patient with pain or burning with urination, select the most likely diagnosis.

40. A previously healthy 37-year-old woman comes to the physician because of a 2-day history of urinary frequency and urgency and burning with urination. This morning, she noticed some blood in her urine. Her last menstrual period was 3 weeks ago, and she has no abnormal vaginal discharge. She is in a monogamous relationship, and her partner has no similar symptoms. Her temperature is 37.2°C (99°F), pulse is 78/min, respirations are 12/min, and blood pressure is 120/82 mm Hg. Examination shows suprapubic tenderness to palpation without masses, guarding, or rebound. There is no costovertebral angle tenderness. Urine dipstick shows 1+ leukocyte esterase, 2+ blood, and no nitrites.
41. A previously healthy 32-year-old woman comes to the physician because of a 2-week history of episodic burning with urination without urinary hesitancy or urgency. She discontinued an oral contraceptive 4 months ago because of weight gain and now uses condoms and spermicidal jelly. She is in a monogamous relationship. Her temperature is 36.6°C (97.8°F), pulse is 78/min, and blood pressure is 118/60 mm Hg. There is no costovertebral angle tenderness. Abdominal examination shows no abnormalities. Pelvic examination shows vaginal erythema and scant mucoid discharge. There is no cervical motion tenderness or adnexal masses. Urine dipstick shows no leukocyte esterase, nitrites, or blood. KOH preparation, wet mount preparation, and testing for *Neisseria gonorrhoeae* and *Chlamydia trachomatis* are negative.

## Sample Questions

### Block 2 (Questions 42-86)

42. A 70-year-old man comes to the physician because of fever, productive cough, and pleuritic chest pain for 1 day. Over the past 2 years, he has had two similar episodes. He also has had persistent pain in the thoracic spine for 1 month. His temperature is 39.2°C (102.6°F), pulse is 94/min, respirations are 22/min, and blood pressure is 110/60 mm Hg. There is dullness to percussion and decreased breath sounds over the right base. Examination shows tenderness of the midthoracic spine. Laboratory studies show:

Hematocrit	34%
Leukocyte count	15,000/mm <sup>3</sup>
Segmented neutrophils	81%
Bands	4%
Lymphocytes	15%
Serum calcium	10.9 mg/dL

X-rays of the chest show consolidation of the right lower lobe, lytic lesions at T8 and T10, and diffuse osteopenia. Which of the following is the most likely diagnosis of this patient's back condition?

- (A) HIV infection
  - (B) Multiple myeloma
  - (C) Prostate cancer
  - (D) Staphylococcal osteomyelitis
  - (E) Tuberculosis osteomyelitis
43. A previously healthy 42-year-old man is brought to the emergency department 1 day after the sudden onset of shortness of breath and chest pain at rest; the pain is exacerbated by deep inspiration. His pulse is 100/min, respirations are 22/min, and blood pressure is 140/90 mm Hg. Breath sounds are normal. The remainder of the examination shows no abnormalities. Arterial blood gas analysis on room air shows:

pH	7.49
PCO <sub>2</sub>	30 mm Hg
PO <sub>2</sub>	64 mm Hg
O <sub>2</sub> saturation	91%

An x-ray of the chest shows no abnormalities. Which of the following is the most likely mechanism of these findings?

- (A) Carbon monoxide poisoning
- (B) Congenital heart disease
- (C) Depressed alveolar ventilation
- (D) Interstitial edema
- (E) Interstitial fibrosis
- (F) Low oxygen-carrying capacity of the blood
- (G) Ventilation-perfusion mismatch

44. A 27-year-old woman comes to the physician because she wants to begin a sex change process. She explains that she has always felt "more like a boy than a girl." Since childhood, she has dressed in masculine clothes and has preferred to participate in traditionally male-dominated activities. She says that she is sexually attracted to men despite her masculine tendencies. Physical examination shows no abnormalities. On mental status examination, she is calm with a euthymic mood and full range of affect. Her thought process is organized. Which of the following is the most likely diagnosis?
- (A) Body dysmorphic disorder
  - (B) Delusional disorder
  - (C) Female orgasmic disorder
  - (D) Gender identity disorder
  - (E) Transvestic fetishism
45. A previously healthy 19-year-old college student comes to student health services 24 hours after the onset of headache, stiff neck, and sensitivity to light. She does not recall any sick contacts. She had chickenpox at the age of 7 years. Her most recent examination 1 year ago included PPD skin testing and showed no abnormalities. She takes a daily multivitamin and an herbal weight-loss preparation. She received all appropriate immunizations during childhood but has not received any since then. She does not smoke, drink alcohol, or use illicit drugs. There is no family history of serious illness. She appears lethargic. Her temperature is 39.1°C (102.4°F), pulse is 112/min, respirations are 20/min, and blood pressure is 100/68 mm Hg. Examination shows diffuse petechiae. Kernig and Brudzinski signs are present. The remainder of the examination shows no abnormalities. A lumbar puncture is performed. Cerebrospinal fluid (CSF) analysis shows numerous segmented neutrophils and a decreased glucose concentration. A Gram stain of the CSF shows gram-negative cocci. Which of the following is the most appropriate pharmacotherapy?
- (A) Ceftriaxone
  - (B) Clindamycin
  - (C) Erythromycin
  - (D) Metronidazole
  - (E) Vancomycin
46. A previously healthy 17-year-old girl comes to the physician because of a 2-month history of exercise-induced cough and nasal congestion. She plays field hockey and has noticed she coughs when running up and down the field. The cough is nonproductive and resolves with rest. She has not had chest pain or palpitations. She takes no medications and does not smoke. Her sister has asthma. The patient appears well. Her pulse is 68/min, respirations are 16/min, and blood pressure is 100/75 mm Hg. Pulse oximetry on room air shows an oxygen saturation of 99%. Cardiopulmonary examination shows no abnormalities. An x-ray of the chest shows no abnormalities. Spirometry shows an FEV<sub>1</sub>:FVC ratio of 90% and an FEV<sub>1</sub> of 90% of predicted. Which of the following is the most likely diagnosis?
- (A) Asthma
  - (B) Chronic bronchitis
  - (C) Gastroesophageal reflux disease
  - (D) Postnasal drip syndrome
  - (E) Variable endobronchial upper airway obstruction

47. A 57-year-old woman is brought to the emergency department 45 minutes after she fell after an episode of lightheadedness. She has a 6-month history of progressive fatigue, tingling sensations in her fingers and toes, and loss of balance. She underwent a partial gastrectomy for peptic ulcer disease 10 years ago. She has type 2 diabetes mellitus. She has smoked one pack of cigarettes daily for 40 years. Her only medication is insulin. She appears pale. Her temperature is 37°C (98.6°F), pulse is 105/min, respirations are 20/min, and blood pressure is 124/76 mm Hg. The abdomen is soft with a well-healed surgical scar. Sensation to vibration and position is absent over the upper and lower extremities. She has a broad-based gait. Laboratory studies show:

Hemoglobin	8.3 g/dL
Mean corpuscular volume	105 $\mu\text{m}^3$
Leukocyte count	4800/mm <sup>3</sup>
Platelet count	100,000/mm <sup>3</sup>
Serum	
Bilirubin, total	2.1 mg/dL
Direct	0.2 mg/dL
Lactate dehydrogenase	320 U/L

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

- (A) Amyotrophic lateral sclerosis
  - (B) Diabetes mellitus
  - (C) History of gastrectomy
  - (D) Meniere disease
  - (E) Multiple sclerosis
  - (F) Vertebrobasilar deficiency
48. A 4-year-old boy with a displaced supracondylar fracture of the humerus without neurovascular complication is placed in skeletal traction. Six hours later, he has severe pain in the forearm and increased pain on passive extension of the wrist and fingers. Which of the following is the most appropriate next step in management?
- (A) Increased weight on the traction apparatus
  - (B) Administration of analgesic medication
  - (C) Exploration of the fracture and fasciotomy of the flexor compartment of the forearm
  - (D) Closed reduction with the patient under anesthesia
  - (E) Open reduction and internal fixation of the fracture
49. A 42-year-old woman comes to the physician because of a 1-year history of vaginal bleeding for 2 to 5 days every 2 weeks. The flow varies from light to heavy with passage of clots. Menses previously occurred at regular 25- to 29-day intervals and lasted for 5 days with normal flow. She has no history of serious illness and takes no medications. She is sexually active with one male partner, and they use condoms inconsistently. Her mother died of colon cancer, and her maternal grandmother died of breast cancer. She is 163 cm (5 ft 4 in) tall and weighs 77 kg (170 lb); BMI is 29 kg/m<sup>2</sup>. Her temperature is 36.6°C (97.8°F), pulse is 90/min, respirations are 12/min, and blood pressure is 100/60 mm Hg. The uterus is normal sized. The ovaries cannot be palpated. The remainder of the examination shows no abnormalities. Test of the stool for occult blood is negative. Which of the following is the most appropriate next step in diagnosis?
- (A) Barium enema
  - (B) Progesterone challenge test
  - (C) Colposcopy
  - (D) Cystoscopy
  - (E) Endometrial biopsy

50. A previously healthy 32-year-old man is brought to the emergency department after being found unconscious on the floor at his workplace. On arrival, he is obtunded. He is intubated and mechanical ventilation is begun. Examination shows flaccid paralysis on the right. A CT scan of the head shows a large evolving cerebral infarction on the left. Carotid duplex ultrasonography shows dissection of the left carotid artery. After receiving intensive medical care for 6 hours, the patient develops decerebrate posturing and becomes hemodynamically unstable. Vasopressor therapy is begun. A second CT scan of the head shows a massive left hemispheric cerebral infarction with severe edema and herniation. The physician determines that surgical intervention is not indicated because of the patient's poor prognosis. The patient's driver's license indicates that he wishes to be an organ donor. The physician meets with the patient's family and informs them about the patient's prognosis, and they are devastated. During the meeting, they say that they were unaware of his willingness to be an organ donor and agree that he should not receive cardiopulmonary resuscitation. Which of the following is the most appropriate next step with respect to organ donation?

- (A) Arrange for the regional organ procurement organization to address the issue with the patient's family
- (B) Delay further consideration of the issue until after 24 hours of aggressive care
- (C) Delay further consideration of the issue until the family seems ready
- (D) Initiate organ donation at this time

51. An 18-year-old man with a 12-year history of type 1 diabetes mellitus comes to the physician for a follow-up examination. Medications include 25 U of NPH insulin and 10 U of regular insulin in the morning and 10 U of NPH insulin and 10 U of regular insulin before dinner. His hemoglobin A<sub>1c</sub> was 14.5% 12 weeks ago. His current pulse is 80/min, respirations are 20/min, and blood pressure is 145/95 mm Hg. Examination shows scattered retinal microaneurysms bilaterally. The remainder of the examination shows no other abnormalities. Laboratory studies show:

Hemoglobin A <sub>1c</sub>	13%
Serum	
Na <sup>+</sup>	130 mEq/L
K <sup>+</sup>	3.2 mEq/L
Cl <sup>-</sup>	101 mEq/L
HCO <sub>3</sub> <sup>-</sup>	23 mEq/L
Glucose	325 mg/dL
Creatinine	1.5 mg/dL
Cholesterol	350 mg/dL
Urine	
Blood	negative
Glucose	4+
Protein	1+
Ketones	negative

Which of the following is the most likely renal diagnosis?

- (A) Cholesterol renal emboli
- (B) Diabetic nephropathy
- (C) Hypertensive glomerulosclerosis
- (D) Hypokalemic nephropathy
- (E) Sodium-losing nephropathy

52. A 37-year-old woman comes to the physician for a routine health maintenance examination for insurance purposes. During the past 2 years, she has been tired most of the time, sleeps approximately 9 hours nightly, and occasionally naps on weekends. Three years ago she needed only 7 hours of sleep nightly to feel rested. She has had a 9-kg (20-lb) weight gain during the past 2 years with no change in her diet. She used to swim two to three times weekly; she stopped several months ago because it seemed like too much work to get to the pool. She lives with her mother who has had Parkinson disease for 5 years. The patient has had one serious boyfriend; they dated in college but drifted apart once he moved away after graduation. She has two women friends at work whom she sees occasionally. She works as a grade school secretary and has received negative performance assessments during the past year for the number of clerical errors in her work. For 15 years, she has taken an oral contraceptive to regulate her menstrual cycle. She takes no other medications. She does not drink alcohol or use illicit drugs. She is 173 cm (5 ft 8 in) tall and weighs 75 kg (165 lb); BMI is 25 kg/m<sup>2</sup>. Vital signs are within normal limits. Physical examination shows no abnormalities. On mental status examination, she appears withdrawn but is cooperative. She describes her mood as low. There is no evidence of visual or auditory hallucinations. She says she does not have suicidal ideation but adds, "It doesn't matter. My life isn't worth very much anyway, and nothing is going to change." Results of laboratory studies are within the reference range. Which of the following is the most likely diagnosis?
- (A) Avoidant personality disorder
  - (B) Dysthymic disorder
  - (C) Primary hypersomnia
  - (D) Schizoid personality disorder
  - (E) Social phobia
  - (F) Substance-induced mood disorder
53. A 25-year-old woman comes to the physician because of a 2-month history of numbness in her right hand. During this period, she has had tingling in the right ring and small fingers most of the time. She has no history of serious illness and takes no medications. She is employed as a cashier and uses a computer at home. She played as a pitcher in a softball league for 5 years until she stopped 2 years ago. Vital signs are within normal limits. Examination shows full muscle strength. Palpation of the right elbow produces a jolt of severe pain in the right ring and small fingers. Sensation to pinprick and light touch is decreased over the medial half of the right ring finger and the entire small finger. The most likely cause of these findings is entrapment of which of the following on the right?
- (A) Brachial plexus at the axilla
  - (B) Median nerve at the wrist
  - (C) Musculocutaneous nerve at the forearm
  - (D) Radial nerve at the forearm
  - (E) Ulnar nerve at the elbow
54. A 22-year-old man is brought to the emergency department 30 minutes after he sustained a gunshot wound to the abdomen. His pulse is 120/min, respirations are 28/min, and blood pressure is 70/40 mm Hg. Breath sounds are normal on the right and decreased on the left. Abdominal examination shows an entrance wound in the left upper quadrant at the midclavicular line below the left costal margin. There is an exit wound laterally in the left axillary line at the 4th rib. Intravenous fluid resuscitation is begun. Which of the following is the most appropriate next step in management?
- (A) Upright x-ray of the chest
  - (B) CT scan of the chest
  - (C) Intubation and mechanical ventilation
  - (D) Peritoneal lavage
  - (E) Left tube thoracostomy

55. A 3-year-old girl is brought to the physician because of fever and left ear pain for 3 days. She has been treated with amoxicillin for the past 5 days for left otitis media. Her temperature is 38.5°C (101.3°F), pulse is 100/min, respirations are 20/min, and blood pressure is 80/60 mm Hg. Examination shows the left ear displaced forward and laterally from the head. There is edema and tenderness behind the left ear. Otoscopic examination shows a red, dull, left tympanic membrane that does not move. Which of the following is the most likely diagnosis?
- (A) Acoustic neuroma
  - (B) Labyrinthitis
  - (C) Lateral sinus thrombosis
  - (D) Mastoiditis
  - (E) Rhabdomyosarcoma
56. A 37-year-old woman is brought to the emergency department 45 minutes after she was found unconscious on her apartment floor. Her coworkers became concerned when she did not arrive for work. On arrival, she is unable to provide a history. Her pulse is 96/min, respirations are 12/min, and blood pressure is 124/58 mm Hg. Examination shows erythema, warmth, and induration of the upper back, buttocks, and posterior thighs. Her serum creatine kinase activity is 10,300 U/L. Urine toxicology screening is positive for opiates and cocaine. Urine dipstick is strongly positive for blood. Microscopic examination of the urine shows pigmented granular casts and rare erythrocytes. This patient is at increased risk for which of the following conditions over the next 24 hours?
- (A) Acute respiratory distress syndrome
  - (B) Acute tubular necrosis
  - (C) Cerebral edema
  - (D) Cerebral hemorrhage
  - (E) Cocaine-induced cardiomyopathy
57. A 4-year-old boy is brought to the physician because of temperatures to 39.4°C (102.9°F) for 8 days. Examination shows anterior cervical lymphadenopathy, nonexudative conjunctivitis bilaterally, a strawberry tongue, an erythematous truncal rash, and edema of the hands and feet. Which of the following is the most appropriate pharmacotherapy to prevent complications of this illness?
- (A) Intravenous immune globulin
  - (B) Intravenous penicillin
  - (C) Intravenous prednisone
  - (D) Oral isoniazid
  - (E) Oral rifampin
58. A 4-year-old boy is brought for a follow-up examination. He has a history of chronic recurrent otitis media and recently completed a 10-day course of antibiotics. His vital signs are within normal limits. Examination shows clear ear canals and intact tympanic membranes; a brown, irregular mass is visualized behind the tympanic membrane. Which of the following is the most likely explanation for these findings?
- (A) Epithelial tissue proliferation
  - (B) Lingual papillae loss
  - (C) Middle ear effusion
  - (D) Midface hypoplasia
  - (E) Nerve entrapment
  - (F) Olfactory hair cell degeneration
  - (G) Semicircular canal edema
  - (H) Tympanic membrane rupture



59. A 67-year-old woman comes to the physician 1 month after noticing a nontender nodule on the back of her left hand. She initially thought it was an insect bite, but it has grown in size over the past week. It bleeds when she picks at it. She has no history of serious illness. She lives in a retirement community in Florida and frequently plays golf and tennis. Examination of the dorsum of the left hand shows a 2.5-cm lesion. Photographs of the lesion are shown. Which of the following is the most appropriate next step in management?
- (A) Observation
  - (B) Topical application of fluorouracil
  - (C) Sentinel lymph node biopsy
  - (D) Cryosurgery
  - (E) Excision of the lesion

60. A 30-year-old woman comes to the physician because of intermittent throbbing headaches, sweating, and pallor over the past 3 months. She has had several blood pressure measurements that fluctuate from 110/80 mm Hg to 160/108 mm Hg. Her pulse is 100/min, and blood pressure now is 138/88 mm Hg. Serum studies show:

Na <sup>+</sup>	140 mEq/L
Cl <sup>-</sup>	110 mEq/L
K <sup>+</sup>	4.5 mEq/L
HCO <sub>3</sub> <sup>-</sup>	26 mEq/L
Urea nitrogen	14 mg/dL
Creatinine	1 mg/dL

Which of the following is the most likely location of the abnormality?

- (A) Adrenal cortex
- (B) Adrenal medulla
- (C) Aorta
- (D) Renal arterioles
- (E) Renal glomeruli
- (F) Thyroid gland



61. A previously healthy 47-year-old man comes to the physician because of a 6.8-kg (15-lb) weight loss over the past 6 months. He spent 2 weeks in Mexico 3 months ago. Since returning, he has noticed that his stools have changed in size and consistency. He has not had fever, night sweats, or change in appetite. He takes no medications. He has smoked one pack of cigarettes daily for 20 years. He appears healthy and well nourished. His temperature is 37°C (98.6°F), pulse is 105/min, respirations are 16/min, and blood pressure is 130/78 mm Hg. Examination shows pale conjunctivae. The abdomen is soft with no organomegaly. Rectal examination shows a normal prostate with no masses. Test of the stool for occult blood is positive. Laboratory studies show:

Hemoglobin	11 g/dL
Mean corpuscular volume	72 $\mu\text{m}^3$
Platelet count	300,000/ $\text{mm}^3$
Red cell distribution width	16% (N=13%–15%)

Which of the following is the most appropriate next step in diagnosis?

- (A) Second complete blood count in 3 months
  - (B) CT scan of the abdomen
  - (C) Colonoscopy
  - (D) Esophagogastroduodenoscopy
  - (E) Sigmoidoscopy
62. A 47-year-old woman with end-stage renal disease comes to the physician because of increased shortness of breath since her last hemodialysis 2 days ago. Her pulse is 88/min and regular, respirations are 26/min and slightly labored, and blood pressure is 176/110 mm Hg. Examination shows jugular venous distention and pitting edema below the knees. Diffuse crackles are heard. Cardiac examination shows no murmurs, rubs, or gallops. Laboratory studies show:

Serum	
Na <sup>+</sup>	138 mEq/L
Cl <sup>-</sup>	100 mEq/L

Arterial blood gas analysis on room air:

pH	7.30
PCO <sub>2</sub>	28 mm Hg
PO <sub>2</sub>	88 mm Hg
HCO <sub>3</sub> <sup>-</sup>	14 mEq/L

Which of the following is the most likely acid-base status of this patient?

- (A) Metabolic acidosis, respiratory compensation
- (B) Metabolic acidosis, uncompensated
- (C) Metabolic alkalosis, respiratory compensation
- (D) Metabolic alkalosis, uncompensated
- (E) Respiratory acidosis, renal compensation
- (F) Respiratory acidosis, uncompensated
- (G) Respiratory alkalosis, renal compensation
- (H) Respiratory alkalosis, uncompensated
- (I) Normal acid-base balance

63. A 52-year-old man comes to the physician with his wife because of a 1-year history of excessive daytime sleepiness. He does not think the symptoms are problematic, but his wife is concerned because he sometimes falls asleep on the sofa early in the evening when guests are present. He also fell asleep while driving at night and drove off the road, narrowly avoiding injury. His wife says that he has always snored loudly, and over the past year, he has had episodes of choking or gasping for breath while sleeping. He is 178 cm (5 ft 10 in) tall and weighs 105 kg (231 lb); BMI is 33 kg/m<sup>2</sup>. His pulse is 76/min, respirations are 14/min, and blood pressure is 150/76 mm Hg. Physical and neurologic examinations show no other abnormalities. Which of the following is most likely to confirm the diagnosis?

- (A) 24-Hour ambulatory ECG monitoring
- (B) Multiple sleep latency test
- (C) Polysomnography
- (D) CT scan of the head
- (E) Laryngoscopy

64. A 19-year-old college student comes to the physician because of progressive hair growth over her face and body since the age of 16 years. She also has acne and oily skin. Menses have occurred at 30- to 90-day intervals since menarche at the age of 14 years. She has no history of serious illness and takes no medications. She is 168 cm (5 ft 6 in) tall and weighs 88 kg (193 lb); BMI is 31 kg/m<sup>2</sup>. Her temperature is 37.2°C (99°F), pulse is 72/min, respirations are 16/min, and blood pressure is 120/80 mm Hg. Physical examination shows coarse, pigmented hair over the chin and upper lip, around both nipples, and along the midline of the lower abdomen. The remainder of the examination, including pelvic examination, shows no abnormalities. Serum studies show:

Fasting glucose	95 mg/dL
Fasting insulin	7.5 μU/mL (N=11–240)
Dehydroepiandrosterone sulfate	3 μg/mL (N=0.5–5.4)
Follicle-stimulating hormone	8 mIU/mL
17α-Hydroxyprogesterone	160 ng/dL (N=20–300)
Luteinizing hormone	10 mIU/mL
Testosterone	4.2 nmol/L (N<3.5)

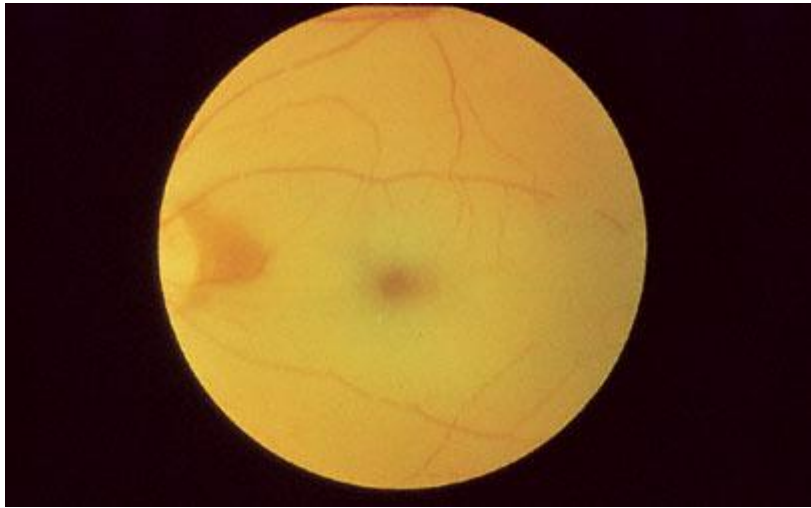
Which of the following is the most appropriate pharmacotherapy?

- (A) Bromocriptine
- (B) Clomiphene
- (C) Combination oral contraceptive
- (D) Dexamethasone
- (E) Gonadotropin-releasing hormone agonist

65. A 67-year-old man with chronic cough comes to the emergency department after he coughed up 1 cup of bright red blood this morning. He has a 3-week history of increasingly severe cough productive of whitish yellow sputum and a 1-week history of fever. Over the past 3 days, the sputum has contained small amounts of blood. He has not had chest pain. He has type 2 diabetes mellitus and hypertension. He has a 40-year history of alcoholism and drinks eight alcoholic beverages daily. He had tuberculosis 15 years ago treated for 1 year with isoniazid and rifampin. His temperature is 37.8°C (100°F), pulse is 108/min, respirations are 22/min, and blood pressure is 130/84 mm Hg. Scattered rhonchi are heard that move with coughing; there are no wheezes. Cardiac examination shows a normal rhythm and no murmurs or gallops. There is trace pedal edema bilaterally. An x-ray of the chest shows a single cavitory lesion. A CT scan of the chest shows a soft tissue mass within the cavity. Which of the following is the most likely diagnosis?

- (A) Aspergilloma
- (B) Bacterial lung abscess
- (C) Bronchogenic carcinoma
- (D) Histoplasmosis
- (E) Tuberculosis

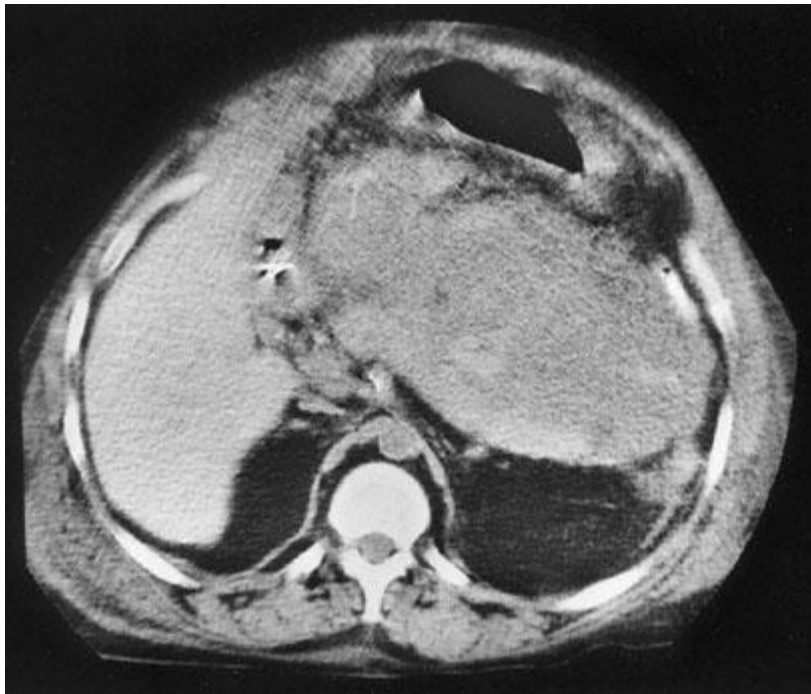
66. A 42-year-old man comes to the physician for a routine follow-up examination. He has a 15-year history of type 1 diabetes mellitus and an 8-year history of hypertension. Current medications include insulin, lisinopril, and hydrochlorothiazide. He is 173 cm (5 ft 8 in) tall and weighs 68 kg (150 lb); BMI is 23 kg/m<sup>2</sup>. His pulse is 80/min, and blood pressure is 124/74 mm Hg. Examination of the lower extremities shows hair loss over the shins. No other abnormalities are noted. His hemoglobin A<sub>1c</sub> is 6.3%. Which of the following is most appropriate to reduce diabetic complications in this patient?
- (A) Reduction of systolic blood pressure to less than 120 mm Hg
  - (B) Annual ophthalmologic examination
  - (C) Annual exercise stress test
  - (D) Add metformin to the regimen
  - (E) Switch from lisinopril to atenolol
67. An 18-year-old man is brought to the emergency department 10 minutes after he sustained a stab wound to his chest. On arrival, he is unresponsive to painful stimuli. His pulse is 130/min, respirations are 8/min and shallow, and palpable systolic blood pressure is 60 mm Hg. He is intubated and mechanically ventilated, and infusion of 0.9% saline is begun. After 5 minutes, his pulse is 130/min, and blood pressure is 70/40 mm Hg. Examination shows a 2-cm wound at the left sixth intercostal space at the midclavicular line. There is jugular venous distention. Breath sounds are normal. The trachea is at the midline. Heart sounds are not audible. Which of the following is the most appropriate next step in management?
- (A) Chest x-ray
  - (B) Echocardiography
  - (C) Bronchoscopy
  - (D) Pericardiocentesis
  - (E) Placement of a right chest tube
68. A 36-year-old nulligravid woman with primary infertility comes for a follow-up examination. She has been unable to conceive for 10 years; analysis of her husband's semen during this period has shown normal sperm counts. Menses occur at regular 28-day intervals and last 5 to 6 days. She is asymptomatic except for severe dysmenorrhea. An endometrial biopsy specimen 5 days before menses shows secretory endometrium. Hysterosalpingography 1 year ago showed normal findings. Pelvic examination shows a normal vagina and cervix. Bimanual examination shows a normal-sized uterus and no palpable adnexal masses. Rectal examination is unremarkable. Which of the following is the most likely diagnosis?
- (A) Anovulation
  - (B) Endometriosis
  - (C) Intrauterine synechiae
  - (D) Male factor
  - (E) Tubal obstruction



69. A 72-year-old woman is brought to the emergency department 2 hours after the sudden onset of visual loss in her right eye. Visual acuity is limited to light perception on the right. Examination of the right eye shows an afferent papillary defect. The anterior structures of both eyes appear normal. Fundusoscopic findings of the right eye are shown. Which of the following is the most likely diagnosis?
- (A) Age-related macular degeneration
  - (B) Background diabetic retinopathy
  - (C) Central artery occlusion
  - (D) Central vein occlusion
  - (E) Proliferative diabetic retinopathy
- 
70. A 32-year-old man is brought to the emergency department 30 minutes after he drove his motorcycle into a guardrail at a high speed. He was riding without a helmet. On arrival, his pulse is 100/min, respirations are 14/min, and blood pressure is 120/80 mm Hg. Examination shows a deep perineal laceration. There is mild suprapubic tenderness. He voids 25 mL of bloody urine. An x-ray of the pelvis shows a widened pubic symphysis. Which of the following is the most appropriate next step in diagnosis?
- (A) Measurement of urine hemoglobin concentration
  - (B) Cystography
  - (C) Urethrography
  - (D) Placement of a urinary catheter
  - (E) Intravenous pyelography
71. A 5-year-old boy is brought to the physician by his mother because of a 2-day history of a low-grade fever, cough, and runny nose. His temperature is 38°C (100.4°F). Examination findings are consistent with a diagnosis of a common cold. The physician refers to a randomized, double-blind, placebo-controlled clinical trial that evaluated the effectiveness of a new drug for the treatment of the common cold. The mean time for resolution of symptoms for patients receiving the new drug was 6.4 days, compared with a mean time of 6.7 days for patients receiving the placebo ( $p=0.04$ ). Which of the following is the most appropriate interpretation of these study results?
- (A) The findings are clinically and statistically significant
  - (B) The findings are clinically insignificant but statistically significant
  - (C) The findings are clinically significant but statistically insignificant
  - (D) The findings are neither clinically nor statistically significant

72. A previously healthy 27-year-old man comes to the physician 4 weeks after noticing three nontender lesions on his penis. He says they have not changed in size. He is sexually active with multiple male and female partners and uses condoms inconsistently. He takes no medications. He drinks two to five beers on social occasions. He occasionally smokes marijuana. His temperature is 36.9°C (98.4°F). There is no lymphadenopathy. Examination shows three sessile, flesh-colored lesions on the shaft of the penis that are 10 mm in diameter. On application of a dilute solution of acetic acid, the lesions turn white. The remainder of the examination shows no abnormalities. Which of the following is the most appropriate next step in management?
- (A) Topical ganciclovir therapy
  - (B) Oral acyclovir therapy
  - (C) Oral doxycycline therapy
  - (D) Intramuscular penicillin therapy
  - (E) Cryotherapy
73. A 46-year-old man comes to the physician because of intermittent lower abdominal pain over the past 3 months. There is no family history of cancer. Examination shows no other abnormalities. His hematocrit is 38%. Test of the stool for occult blood is positive. Colon contrast studies show a 1.5-cm polyp in the descending colon. An upper gastrointestinal series shows no abnormalities. Which of the following is the most appropriate next step in management?
- (A) CT scan of abdomen
  - (B) Repeat test of the stool for occult blood after 3 days on a meat-free diet
  - (C) Measurement of serum carcinoembryonic antigen (CEA) concentration
  - (D) Colonoscopy with polypectomy
  - (E) Total colectomy
74. A 6-year-old boy is brought to the emergency department 2 hours after injuring his arm when he fell out of a tree. His mother says that he is extremely active and likes to climb. During the past year, he fractured his right tibia after falling off a trampoline and sustained a concussion after falling off his bicycle. She says that his teachers reprimand him frequently for running wildly in the classroom, talking excessively, and getting out of his seat; he often forgets to turn in his homework. His parents are currently divorcing. His father has a history of illicit drug use. The patient is at the 50th percentile for height and weight. His pulse is 80/min, and blood pressure is 100/80 mm Hg. Physical examination shows a dislocated left shoulder, healing abrasions over the elbows, and ecchymoses in various stages of healing over the knees. Mental status examination shows a neutral affect. He says that he likes to run and climb trees. Which of the following is the most likely explanation for these findings?
- (A) Attention-deficit/hyperactivity disorder
  - (B) Conduct disorder
  - (C) Learning disorder
  - (D) Seizure disorder
  - (E) Age-appropriate behavior
75. A 32-year-old woman, gravida 3, para 2, at 41 weeks' gestation is admitted to the hospital in active labor. Pregnancy has been complicated by mild asthma treated with inhaled bronchodilators. At the beginning of the second stage of labor, the cervix is 100% effaced and 10 cm dilated; the vertex is at -1 station. The fetal heart rate is reactive with no decelerations. After 10 minutes of pushing, there is a prolonged deceleration to 60/min. The patient has the acute onset of shortness of breath, rapidly develops cyanosis, and becomes unresponsive. Her pulse and blood pressure cannot be detected. Immediate resuscitation is started. Five minutes later, there is bleeding from the nose, mouth, and intravenous sites. Which of the following is the most likely diagnosis?
- (A) Amniotic fluid embolism
  - (B) Intracerebral hemorrhage
  - (C) Myocardial infarction
  - (D) Status asthmaticus
  - (E) Toxic shock syndrome

76. A previously healthy 17-year-old girl comes to the physician because of a 1-week history of itching and progressive rash. She has no history of skin problems or associated symptoms. She takes no medications. Her sister with whom she shares a room had similar symptoms during the previous week. The patient's temperature is 36.8°C (98.2°F). There are multiple 2- to 5-mm erythematous papules over the trunk, especially at the waistline, and over the forearms, hands, and fingers. There is no lymphadenopathy or hepatosplenomegaly. Which of the following is the most likely causal organism?
- (A) Epstein-Barr virus
  - (B) Group A streptococcus
  - (C) Measles virus
  - (D) *Sarcoptes scabiei*
  - (E) Varicella-zoster virus
77. A 77-year-old man is brought to the physician because of a 12-hour history of word-finding difficulty and weakness and sensory loss of the right arm and leg. He has no history of similar symptoms. He has type 2 diabetes mellitus, hypertension, and atrial fibrillation. Current medications include metformin, lisinopril, and aspirin. He is alert. His pulse is 80/min and irregular, respirations are 16/min, and blood pressure is 170/90 mm Hg. He follows commands but has nonfluent aphasia. There is moderate weakness and decreased sensation of the right upper and lower extremities. Deep tendon reflexes are 2+ bilaterally. Babinski sign is present on the right. His serum glucose concentration is 162 mg/dL. Which of the following is the most appropriate next step in diagnosis?
- (A) Carotid duplex ultrasonography
  - (B) CT scan of the head
  - (C) EEG
  - (D) Lumbar puncture
  - (E) Cerebral angiography
78. A 60-year-old man has had painful skin with exfoliation of the skin and mucous membranes for 1 day. He has been taking allopurinol and probenecid for 2 weeks because of gouty arthritis. There is diffuse exfoliation of the skin with oozing of serous fluid. The mucous membranes of the mouth are erythematous and exfoliated. There are no target lesions. Which of the following is the most likely diagnosis?
- (A) Bullous pemphigoid
  - (B) Erythema multiforme
  - (C) Pemphigus erythematosus
  - (D) Staphylococcal scalded-skin syndrome
  - (E) Toxic epidermal necrolysis
79. A 32-year-old woman, gravida 2, para 1, at 8 weeks' gestation comes to the physician for her first prenatal visit. She delivered her first child spontaneously at 34 weeks' gestation; pregnancy was complicated by iron deficiency anemia. She has no other history of serious illness. Her blood pressure is 100/70 mm Hg. Examination shows no abnormalities. Ultrasonography shows a dichorionic-diamniotic twin intrauterine pregnancy consistent in size with an 8-week gestation. This patient is at increased risk for which of the following complications?
- (A) Abruptio placentae
  - (B) Fetal chromosome abnormality
  - (C) Hyperthyroidism
  - (D) Preterm labor and delivery
  - (E) Twin transfusion syndrome



80. A 52-year-old man with alcoholism is brought to the emergency department because of a 2-day history of nausea, vomiting, and increasingly severe abdominal pain that radiates to his left shoulder and back. He appears extremely dehydrated and is short of breath. His temperature is 37.8°C (100°F), pulse is 120/min, respirations are 18/min, and blood pressure is 80/60 mm Hg. Abdominal examination shows distention with epigastric tenderness. Bowel sounds are decreased. Rectal examination shows no abnormalities. Test of the stool for occult blood is negative. Laboratory studies show:

Hemoglobin	5.5 g/dL
Leukocyte count	15,500/mm <sup>3</sup>
Serum	
Ca <sup>2+</sup>	7.5 mg/dL
Amylase	750 U/L

A CT scan of the abdomen is shown. Which of the following is the most likely diagnosis?

- (A) Acute portal vein thrombosis
  - (B) Hemorrhagic pancreatitis
  - (C) Perforated posterior gastric ulcer
  - (D) Ruptured gastric varices
  - (E) Splenic artery rupture
- 
81. A 57-year-old man comes to the emergency department because of cramping in his hands and feet and numbness and tingling around his lips and in his fingers; these symptoms occurred intermittently for 6 months but have been progressively severe during the past 2 weeks. He also has had a 13-kg (30-lb) weight loss and bulky, foul-smelling stools that do not flush easily. He has a 10-year history of drinking 8 to 10 beers daily. He has been hospitalized twice for severe abdominal pain 4 and 6 years ago. His pulse is 80/min, and blood pressure is 105/65 mm Hg. He appears cachectic and chronically ill. The abdomen is nontender. Deep tendon reflexes are 4+ bilaterally. Chvostek and Trousseau signs are present. His serum calcium concentration is 6.5 mg/dL. Which of the following is the most likely diagnosis?
- (A) Hypomagnesemia
  - (B) Hypoparathyroidism
  - (C) Osteomalacia
  - (D) Vitamin D deficiency

82. A 15-year-old boy is brought to the physician because of fatigue since starting his freshman year of high school 3 months ago. He often falls asleep during class. He urinates four to five times nightly and often has difficulty falling asleep again. He has no history of serious illness and takes no medications. He is at the 20th percentile for height and above the 95th percentile for weight and BMI. Vital signs are within normal limits. Examination shows a velvety, hyperpigmented, macular rash over the neck and axillae. The remainder of the examination shows no abnormalities. Results of a complete blood count and serum electrolyte concentrations show no abnormalities. Additional laboratory studies show:

Serum glucose	134 mg/dL
Urine	
pH	5.5
Specific gravity	1.028
Glucose	1+
Ketones	negative

In addition to dietary counseling, which of the following is the most appropriate initial treatment?

- (A) Exercise program
- (B) Increased fluid intake
- (C) Cyclosporine therapy
- (D) Insulin therapy
- (E) Oral hypoglycemic agent

**The response options for the next 2 items are the same. Select one answer for each item in the set.**

- (A) Factor VIII deficiency
- (B) Factor IX deficiency
- (C) Fibrinogen deficiency
- (D) Protein C deficiency
- (E) Protein S deficiency
- (F) Thrombocytopenia
- (G) Vitamin K deficiency
- (H) von Willebrand factor deficiency

For each patient with excessive bleeding, select the most likely cause.

83. A 17-year-old girl comes to the physician 5 days after she was found to have a hemoglobin concentration of 9 g/dL during a school blood drive. She has a history of frequent nosebleeds. Menarche began at the age of 15 years, and her menses have occurred at regular 28-day intervals and last 9 to 10 days; she has heavy bleeding on all but the last day. Her mother and older sister have similar symptoms. Physical and pelvic examinations show no abnormalities. Today, her hemoglobin concentration is 9 g/dL, leukocyte count is  $8000/\text{mm}^3$ , and platelet count is  $300,000/\text{mm}^3$ .
84. A 5-year-old boy is brought to the physician because of a 1-week history of excessive bruising and bleeding from minor cuts. He also has had a 2-week history of pain in his extremities. He appears pale. His temperature is  $38.3^\circ\text{C}$  ( $100.9^\circ\text{F}$ ). Examination shows bleeding gums and scattered petechiae and purpura over the trunk and extremities. There is generalized lymphadenopathy and splenomegaly.



The response options for the next 2 items are the same. Select one answer for each item in the set.

- (A) Coronary artery thrombosis
- (B) Coronary artery vasospasm
- (C) Costochondritis
- (D) Dissecting aortic aneurysm
- (E) Esophageal spasm
- (F) Pericarditis
- (G) Pleuritis
- (H) Pneumonia
- (I) Pneumothorax
- (J) Postmyocardial infarction syndrome
- (K) Pulmonary infarction

For each patient with chest pain, select the most likely cause.

85. A previously healthy 25-year-old woman comes to the physician because of substernal chest tightness and shortness of breath for 2 hours. Twenty minutes before the onset of the pain, she had smoked crack cocaine. Her pulse is 110/min, and blood pressure is 170/100 mm Hg. Bilateral basilar crackles are heard. There is an S<sub>4</sub> gallop. A nonradiating, grade 2/6, systolic ejection murmur is heard at the upper right sternal border.
86. A previously healthy 57-year-old man comes to the physician because of shortness of breath for 5 days. At a recent health fair, he was told that his blood pressure and cholesterol were high. He takes no medications. His pulse is 85/min, respirations are 16/min, and blood pressure is 200/110 mm Hg. The lungs are clear to auscultation. Antihypertensive therapy with hydrochlorothiazide is initiated, and a follow-up visit is scheduled in 1 week. The next day, he comes to the emergency department because of severe substernal chest pain radiating to the jaw. He has diaphoresis and dyspnea. His temperature is 37°C (98.6°F), pulse is 110/min, respirations are 20/min, and blood pressure is 175/100 mm Hg. Bilateral basilar crackles are heard. There is an S<sub>4</sub> gallop.

## Sample Questions

### Block 3 (Questions 87-131)

87. A 22-year-old woman comes to the physician in October for a follow-up examination. She feels well. She has a 2-year history of type 1 diabetes mellitus controlled with insulin. She had a normal Pap smear 3 months ago and saw her ophthalmologist 6 months ago. Her 67-year-old grandmother has breast cancer. She is 168 cm (5 ft 6 in) tall and weighs 57 kg (125 lb); BMI is 20 kg/m<sup>2</sup>. Her hemoglobin A<sub>1c</sub> is 6.2%, and fingerstick blood glucose concentration is 118 mg/dL. Which of the following health maintenance recommendations is most appropriate at this time?
- (A) Begin running for exercise
  - (B) Dietary modification for weight loss
  - (C) Human papillomavirus testing
  - (D) Mammography
  - (E) Influenza virus vaccine
  - (F) Supplementation with vitamins C and D
88. A 5-year-old boy is brought to the physician because of a 2-day history of fever and painful swelling of the left ankle. He has had recurrent cervical lymphadenitis and pneumonia since infancy. Two years ago, a culture from an abscess in the cervical region grew *Staphylococcus aureus*. His temperature is 38°C (100.4°F). Examination shows a tender, erythematous, edematous left ankle; there is point tenderness over the medial malleolus. A bone scan shows increased uptake in the left lower tibial metaphysis. Culture of bone aspirate grows *Serratia marcescens*. Nitroblue tetrazolium test shows no color change. Which of the following is the most likely mechanism for these findings?
- (A) Adenosine deaminase deficiency
  - (B) Consumption of complement
  - (C) Defective opsonization
  - (D) Destruction of CD4+ T lymphocytes
  - (E) Developmental arrest of maturation of B lymphocytes
  - (F) Dymorphogenesis of the third and fourth pharyngeal pouches
  - (G) Impaired chemotaxis
  - (H) Impaired phagocytic oxidative metabolism
89. A 19-year-old man is brought to the emergency department by a friend because of strange behavior during the past 2 hours at a party. The patient has seemed confused and has been insisting that someone is following him. On arrival, he is alert but confused. He says that he is angry because his friend had promised that the ride to the hospital would only take 5 minutes, but it seemed to take several hours. He states that he has been hungry all evening, and he asks if there is anywhere he can get something to eat. He is dressed casually in baggy pants and a T-shirt. His temperature is 37.2°C (99°F), pulse is 107/min, respirations are 12/min, and blood pressure is 120/85 mm Hg. Examination shows injected conjunctivae. Deep tendon reflexes are decreased. There is ataxia on finger-nose testing. On mental status examination, he has a mildly anxious affect. His speech is slow, and his thought process is disorganized. He looks out the door of the examination room frequently during the examination. Which of the following is the most likely cause of these findings?
- (A) Alcohol
  - (B) Heroin
  - (C) Inhalant
  - (D) LSD
  - (E) Marijuana
  - (F) Methamphetamine
  - (G) PCP (phencyclidine)

90. A 19-year-old man comes to the physician because of a 3-week history of malaise, generalized fatigue, swelling of his legs, and dark urine. He has no known sick contacts. There is no personal or family history of serious illness. He takes no medications. His temperature is 37°C (98.6°F), pulse is 82/min, respirations are 14/min, and blood pressure is 152/91 mm Hg. Examination shows 2+ pretibial edema bilaterally. The remainder of the examination shows no abnormalities. Laboratory studies show:

Hemoglobin	10.4 g/dL
Leukocyte count	5000/mm <sup>3</sup>
Platelet count	250,000/mm <sup>3</sup>
Serum	
Na <sup>+</sup>	135 mEq/L
K <sup>+</sup>	4.9 mEq/L
Cl <sup>-</sup>	101 mEq/L
HCO <sub>3</sub> <sup>-</sup>	19 mEq/L
Urea nitrogen	68 mg/dL
Creatinine	4.6 mg/dL
Urine	
Blood	3+
Protein	3+
RBC	5–7/hpf with dysmorphic features
RBC casts	numerous

Serum complement concentrations are within the reference ranges. Renal ultrasonography shows no abnormalities. A renal biopsy specimen shows a crescent formation in the glomeruli and immune complex deposition along the basement membrane. The most appropriate next step in management is administration of which of the following?

- (A) Oral azathioprine
  - (B) Oral lisinopril
  - (C) Intravenous fluids
  - (D) Intravenous furosemide
  - (E) Intravenous methylprednisolone
91. A 67-year-old woman has had fatigue, dry skin, brittle hair, swelling of the ankles, and cold intolerance for 1 year; she has gained 9 kg (20 lb) during this period. Her pulse is 55/min, and blood pressure is 150/90 mm Hg. She appears lethargic. Examination shows dry skin and a nontender thyroid gland that is enlarged to two times its normal size. There is mild edema of the ankles bilaterally. The relaxation phase of the Achilles reflex is greatly prolonged. Which of the following is the most likely diagnosis?
- (A) Chronic lymphocytic thyroiditis (Hashimoto disease)
  - (B) Defect in thyroxine (T<sub>4</sub>) biosynthesis
  - (C) Graves disease
  - (D) Multinodular goiter
  - (E) Riedel thyroiditis
  - (F) Thyroid cyst
  - (G) Thyroid lymphoma
  - (H) Thyroiditis

92. A 10-year-old boy is brought for a follow-up examination 2 days after he was seen in the emergency department because of hives, hoarseness, and light-headedness. His symptoms began 15 minutes after he was stung by a bee and lasted approximately 60 minutes; they resolved before he was treated. He has been stung by bees three times over the past year, and each reaction has been more severe. Examination shows no abnormalities. Which of the following is the most appropriate recommendation to prevent future morbidity and mortality from this condition?

- (A) Avoid areas known to have bees
- (B) Avoid wearing colorful clothing outside
- (C) Carrying diphenhydramine tablets
- (D) Carrying self-injectable epinephrine
- (E) Seek immediate medical attention following any future sting

93. A previously healthy 22-year-old college student is brought to the emergency department by her parents 20 minutes after they observed her having a seizure. After the seizure, she was confused and had difficulty thinking of some words. She has had a headache, cough, and fever for 3 days treated with acetaminophen and dextromethorphan. Her temperature is 38.9°C (102°F). Neurologic examination shows diffuse hyperreflexia. On mental status examination, she is confused and has short-term memory deficits. She has difficulty naming objects and makes literal paraphasic errors. An MRI of the brain shows bitemporal hyperintensities. A lumbar puncture is done; cerebrospinal fluid analysis shows an erythrocyte count of 340/mm<sup>3</sup>, a leukocyte count of 121/mm<sup>3</sup> (88% monocytes), and a protein concentration of 78 mg/dL. Which of the following is the most likely diagnosis?

- (A) Bacterial meningitis
- (B) Dextromethorphan intoxication
- (C) Herpes simplex encephalitis
- (D) HIV encephalopathy
- (E) Reye syndrome
- (F) Syphilis

94. A 27-year-old nulligravid woman comes to the physician because of a 1-year history of irregular heavy menstrual bleeding. She has been otherwise healthy. Menses occur at irregular 15- to 45-day intervals and last 3 to 7 days; menses had previously occurred at regular 28-day intervals with moderate flow. Her last menstrual period was 4 weeks ago. She is sexually active and does not use contraception. Her temperature is 37°C (98.6°F), pulse is 80/min, respirations are 20/min, and blood pressure is 120/80 mm Hg. Physical examination shows no abnormalities. Pelvic examination shows clear cervical mucus. Serum studies show:

Thyroid-stimulating hormone	3 μU/mL
Follicle-stimulating hormone	5 mIU/mL
Prolactin	18 ng/mL
Progesterone	0.5 ng/mL (menstrual cycle day 30: follicular N<3; luteal N>3–5)

Pelvic ultrasonography shows no abnormalities. Which of the following is the most likely diagnosis?

- (A) Adenomyosis
- (B) Anovulation
- (C) Endometrial polyp
- (D) Leiomyoma uteri
- (E) Pregnancy

95. A 62-year-old man comes to the physician because of a 2-month history of progressive fatigue and ankle swelling. He had an anterior myocardial infarction 3 years ago and has had shortness of breath with mild exertion since then. Current medications include labetalol and daily aspirin. He has smoked one-half pack of cigarettes daily for 30 years. His pulse is 100/min and regular, respirations are 20/min, and blood pressure is 130/75 mm Hg. There are jugular venous pulsations 5 cm above the sternal angle. Crackles are heard at both lung bases. Cardiac examination shows an S<sub>3</sub> gallop. There is edema from the midtibia to the ankle bilaterally. Further evaluation of this patient is most likely to show which of the following findings?
- (A) Decreased pulmonary capillary wedge pressure
  - (B) Impaired contractility of the left ventricle
  - (C) Prolapse of the mitral valve
  - (D) Thrombosis of the superior vena cava
  - (E) Ventricular septal defect
96. A 27-year-old woman comes to the physician for a follow-up examination. She has a 10-week history of persistent nonproductive cough that is worse at night and a 1-month history of a hoarse voice. She otherwise feels well. She has not had loss of appetite or change in exercise tolerance. She has never smoked. Empiric treatment with an oral decongestant and albuterol inhaler has not improved her symptoms. She has no history of serious illness. Her temperature is 37°C (98.6°F), pulse is 68/min, respirations are 12/min, and blood pressure is 110/76 mm Hg. Cardiopulmonary examination and an x-ray of the chest show no abnormalities. Her FEV<sub>1</sub> is normal. Which of the following is the most appropriate next step in management?
- (A) 24-Hour monitoring of esophageal pH
  - (B) Echocardiography
  - (C) CT scan of the chest
  - (D) Inhaled corticosteroid therapy
  - (E) Nitroglycerin therapy
97. A 22-year-old man with a seizure disorder has had increasing cough and shortness of breath for 3 days and fever for 1 day. He has foul-smelling sputum. He had a generalized tonic-clonic seizure 1 week ago. His temperature is 39.4°C (103°F). Crackles are heard on auscultation of the chest. An x-ray of the chest shows a right upper-lobe infiltrate of the lung. Which of the following is the most likely cause?
- (A) Chemical pneumonitis
  - (B) Pneumonia secondary to anaerobes
  - (C) Pneumonia secondary to gram-negative aerobes
  - (D) Pneumonia secondary to gram-positive aerobes
  - (E) Pneumonia secondary to *Mycoplasma pneumoniae*
98. Three days after hospitalization for diabetic ketoacidosis, an 87-year-old woman refuses insulin injections. She says that her medical condition has declined so much that she no longer wishes to go on living; she is nearly blind and will likely require bilateral leg amputations. She reports that she has always been an active person and does not see how her life will be of value anymore. She has no family and most of her friends are sick or deceased. On mental status examination, she is alert and cooperative. She accurately describes her medical history and understands the consequences of refusing insulin. There is no evidence of depression. She dismisses any attempts by the physician to change her mind, saying that the physician is too young to understand her situation. She says, "I know I will die, and this is what I want." Which of the following is the most appropriate next step in management?
- (A) Discharge the patient after she has signed an "against medical advice" form
  - (B) Seek a court order to appoint a legal guardian
  - (C) Offer insulin but allow the patient to refuse it
  - (D) Admit to the psychiatric unit
  - (E) Administer insulin against the patient's wishes

99. A 72-year-old woman with advanced ovarian cancer metastatic to the liver is brought to the physician by her son because she cries all the time and will not get out of bed. On a 10-point scale, she rates the pain as a 1 to 2. She also has hypertension and major depressive disorder. She has received chemotherapy for 2 years. Current medications also include oxycodone (10 mg twice daily), hydrochlorothiazide (25 mg/d), and fluoxetine (20 mg/d). She is 165 cm (5 ft 5 in) tall and weighs 66 kg (145 lb); BMI is 24 kg/m<sup>2</sup>. Her temperature is 37°C (98.6°F), pulse is 110/min, respirations are 12/min, and blood pressure is 120/80 mm Hg. Examination shows a firm, distended abdomen with moderate tenderness over the liver. On mental status examination, she is oriented to person, place, and time. She has good eye contact but appears sad and cries easily. Which of the following is the most appropriate next step in management?
- (A) Reassurance
  - (B) Assess for suicidal ideation
  - (C) Begin dextroamphetamine therapy
  - (D) Increase oxycodone dosage
  - (E) Restart chemotherapy
100. A 67-year-old woman comes to the physician because of easy bruising for 4 months. She has a history of lung cancer treated with radiation therapy 6 months ago. She has a 2-year history of hypertension treated with a thiazide diuretic and an angiotensin-converting enzyme (ACE) inhibitor. Examination, including neurologic examination, shows no abnormalities except for multiple ecchymoses. Her hemoglobin concentration is 13 g/dL, leukocyte count is 5000/mm<sup>3</sup>, and platelet count is 35,000/mm<sup>3</sup>. A serum antiplatelet antibody assay is negative. Which of the following is the most appropriate next step in diagnosis?
- (A) Bone scan
  - (B) CT scan of the abdomen
  - (C) CT scan of the chest
  - (D) Bronchoscopy
  - (E) Bone marrow aspiration
101. An asymptomatic 72-year-old man comes to the physician for a routine examination. He has had several episodes of gout over the past 6 years. His only medication is allopurinol. During a visit 2 months ago, his blood pressure was 172/96 mm Hg. During a visit 1 month ago for an uncomplicated upper respiratory tract infection, his blood pressure was 170/94 mm Hg. Today, his pulse is 76/min, and blood pressure is 166/98 mm Hg. Examination shows no other abnormalities. Laboratory findings are within the reference range. An ECG shows borderline left ventricular hypertrophy. Which of the following is the most appropriate next step in management?
- (A) Repeat blood pressure measurement in 3 months
  - (B) Order renal Doppler ultrasonography
  - (C) Add atenolol to the regimen
  - (D) Add hydrochlorothiazide to the regimen
  - (E) Discontinue allopurinol therapy
102. A 19-year-old college student comes to the physician because of vaginal irritation and pain with urination for 5 days. Two weeks ago, she had streptococcal pharyngitis treated with amoxicillin. She has been sexually active with two partners over the past year; she uses condoms for contraception. Her last menstrual period was 1 week ago. Her temperature is 37.2°C (99°F), and blood pressure is 90/60 mm Hg. Pelvic examination shows erythema of the vulva and vagina and a thick white vaginal discharge. The pH of the discharge is 4. Which of the following is the most likely cause of these findings?
- (A) Bacterial vaginosis
  - (B) Candidiasis
  - (C) *Chlamydia trachomatis* infection
  - (D) *Escherichia coli* infection
  - (E) *Neisseria gonorrhoeae* infection
  - (F) Trichomoniasis

103. A 37-year-old woman comes to the physician because of shortness of breath for 3 months. Her symptoms increase with exertion. She also has had difficulty walking because of ankle pain. Two months ago, she had painful red spots on her legs for several weeks. She has not had a sore throat. She takes acetaminophen for aches and pains. Her temperature is 37.4°C (99.3°F), pulse is 90/min, respirations are 18/min, and blood pressure is 140/90 mm Hg. The lungs are clear to auscultation, and cardiac examination shows no abnormalities. An x-ray of the chest shows bilateral hilar adenopathy. Which of the following is the most likely diagnosis?
- (A) Cat-scratch disease
  - (B) Chronic lymphocytic leukemia
  - (C) Hodgkin disease
  - (D) Rubella
  - (E) Sarcoidosis
  - (F) Syphilis
  - (G) Systemic lupus erythematosus
  - (H) Tuberculosis
104. A 22-year-old man comes to the physician for a routine health maintenance examination. He feels well. He has had a painless left scrotal mass since childhood. Examination shows a 6-cm, soft, nontender left scrotal mass that transilluminates; there are no bowel sounds in the mass. Examination of the testis shows no abnormalities. Which of the following is the most likely cause of the mass?
- (A) Accumulation of scrotal adipose tissue
  - (B) Cryptorchidism of the left testis
  - (C) Dilation of the pampiniform plexus of veins around the testis
  - (D) Persistence of a patent processus vaginalis
  - (E) Torsion of the left testis
105. A 67-year-old man is brought to the emergency department because of headache and decreased level of consciousness over the past hour. He has a 20-year history of poorly controlled hypertension. He is unresponsive to verbal stimuli. With painful stimulation, he moves the left extremities semipurposely but not the right extremities. The left pupil is larger than the right and reacts sluggishly to light. Babinski sign is present on the right. A CT scan of the head shows a large hyperintense mass in the left basal ganglia with compression of the left lateral ventricle and shift of the midline structures. Which of the following is the most likely diagnosis?
- (A) Acute cerebral infarction
  - (B) Arteriovenous malformation
  - (C) Astrocytoma
  - (D) Bacterial abscess
  - (E) Carotid cavernous fistula
  - (F) Epidural abscess
  - (G) Epidural hematoma
  - (H) Fungal abscess
  - (I) Glioblastoma multiforme
  - (J) Intracerebral hemorrhage
  - (K) Medulloblastoma
  - (L) Meningioma
  - (M) Metastatic carcinoma
  - (N) *Mycobacterium avium-intracellulare* granuloma
  - (O) Sturge-Weber syndrome
  - (P) Subarachnoid hemorrhage
  - (Q) Subdural hematoma

106. A 9-month-old boy is brought to the physician because of discharge from the left ear for 1 day. He has had frequent infections since the age of 4 months. He had *Streptococcus pneumoniae* bacteremia at 4 months of age, *Haemophilus influenzae* meningitis at 5½ months of age, and *S. pneumoniae* pneumonia at 7 months of age. He also has had two episodes of otitis media during this period. He is an only child, and there is no family history of frequent infections. His immunizations are up-to-date. He is at the 20th percentile for length and 3rd percentile for weight. He is not in acute distress. Examination shows no abnormalities other than a purulent drainage from the left ear canal. Which of the following is the most likely diagnosis?

- (A) Chronic granulomatous disease of childhood
- (B) Severe combined immunodeficiency
- (C) Thymic-parathyroid dysplasia (DiGeorge syndrome)
- (D) Transient hypogammaglobulinemia of infancy
- (E) X-linked agammaglobulinemia

107. A 67-year-old man is brought to the emergency department because of a 1-week history of nausea, generalized weakness, and malaise. He has congestive heart failure, hypertension, and coronary artery disease. Current medications include lisinopril, digoxin, isosorbide, spironolactone, and metoprolol. His temperature is 37.2°C (99°F), pulse is 88/min, and blood pressure is 140/90 mm Hg. Examination shows a soft abdomen. There is 2+ edema in the lower extremities. Laboratory studies show:

Hematocrit	36%
Leukocyte count	10,000/mm <sup>3</sup>
Serum	
Na <sup>+</sup>	140 mEq/L
K <sup>+</sup>	7.3 mEq/L
HCO <sub>3</sub> <sup>-</sup>	18 mEq/L
Urea nitrogen	40 mg/dL
Creatinine	1.8 mg/dL
AST	20 U/L

Urinalysis shows no abnormalities. Which of the following is the most likely explanation for this patient's hyperkalemia?

- (A) Adverse effect of medications
- (B) Laboratory error
- (C) Metabolic acidosis
- (D) Renal failure
- (E) Rhabdomyolysis

108. A 52-year-old woman has had dyspnea and hemoptysis for 1 month. She has a history of rheumatic fever as a child and has had a cardiac murmur since early adulthood. Her temperature is 36.7°C (98°F), pulse is 130/min and irregularly irregular, respirations are 20/min, and blood pressure is 98/60 mm Hg. Jugular venous pressure is not increased. Bilateral crackles are heard at the lung bases. There is an opening snap followed by a low-pitched diastolic murmur at the third left intercostal space. An x-ray of the chest shows left atrial enlargement, a straight left cardiac border, and pulmonary venous engorgement. Which of the following is the most likely explanation for these findings?

- (A) Aortic valve insufficiency
- (B) Aortic valve stenosis
- (C) Mitral valve insufficiency
- (D) Mitral valve stenosis
- (E) Tricuspid valve insufficiency



109. A 27-year-old woman, gravida 2, para 1, at 12 weeks' gestation comes to the physician for a prenatal visit. She feels well. Pregnancy and delivery of her first child were uncomplicated. Medications include folic acid and a multivitamin. Her temperature is 37.2°C (99°F), and blood pressure is 108/60 mm Hg. Pelvic examination shows a uterus consistent in size with a 12-week gestation. Urine dipstick shows leukocyte esterase; urinalysis shows WBCs and rare gram-negative rods. Which of the following is the most appropriate next step in management?
- (A) Recommend drinking 8 oz of cranberry juice daily
  - (B) Oral amoxicillin therapy
  - (C) Oral metronidazole therapy
  - (D) Intravenous cefazolin therapy
  - (E) Intravenous pyelography
  - (F) Cystoscopy
110. A 45-year-old woman has a 2-week history of increased anxiety, abdominal discomfort, irritability, and difficulty concentrating; she was robbed at knifepoint in a parking lot 3 weeks ago. She takes levothyroxine for hypothyroidism and uses an over-the-counter inhaler as needed for exercise-induced asthma. Her blood pressure is 140/80 mm Hg, and pulse is 100/min. Examination shows dry skin and hair. She is cooperative but appears anxious, glancing around quickly when a loud noise is heard outside the office. Leukocyte count is 12,000/mm<sup>3</sup>, and serum thyroid-stimulating hormone concentration is 5.0 µU/mL. An ECG shows sinus tachycardia. Which of the following is the most likely diagnosis?
- (A) Acute stress disorder
  - (B) Agoraphobia
  - (C) Generalized anxiety disorder
  - (D) Hypothyroidism
  - (E) Panic disorder
111. A 42-year-old woman is brought to the emergency department 10 minutes after being involved in a high-speed motor vehicle collision in which she was a restrained passenger. On arrival, she has shortness of breath and abdominal pain. Her pulse is 135/min, respirations are 30/min, and blood pressure is 80/40 mm Hg. Breath sounds are decreased at the left lung base. An x-ray of the chest shows opacification of the left lower lung field with loss of the diaphragmatic shadow. Placement of a chest tube yields a small amount of air followed by greenish fluid. Which of the following is the most appropriate next step in management?
- (A) CT scan of the abdomen
  - (B) CT scan of the chest
  - (C) Thoracoscopy
  - (D) Laparotomy
  - (E) Thoracotomy
112. A 37-year-old woman, gravida 5, para 4, at 34 weeks' gestation comes to the emergency department because of vaginal bleeding for 2 hours. She has had no prenatal care. Her second child was delivered by lower segment transverse cesarean section because of a nonreassuring fetal heart rate; her other three children were delivered vaginally. Her pulse is 92/min, respirations are 18/min, and blood pressure is 134/76 mm Hg. The abdomen is nontender, and no contractions are felt. There is blood on the vulva, the introitus, and on the medial aspect of each thigh. The fetus is in a transverse lie presentation. The fetal heart rate is 144/min. Which of the following is the most likely diagnosis?
- (A) Abruptio placentae
  - (B) Amniotic fluid embolism
  - (C) Latent phase of labor
  - (D) Placenta previa
  - (E) Ruptured uterus
  - (F) Ruptured vasa previa



113. A 56-year-old man has had the painful weeping rash shown for 2 days. He underwent chemotherapy for non-Hodgkin lymphoma 1 year ago. His temperature is 36.7°C (98°F), pulse is 80/min, and blood pressure is 138/76 mm Hg. Examination shows no other abnormalities. Which of the following is the most likely diagnosis?

- (A) Herpes zoster
- (B) Impetigo
- (C) Pyoderma gangrenosum
- (D) Syphilis
- (E) Systemic lupus erythematosus

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114. A 27-year-old woman comes to the physician because she has been unable to move the left side of her face for the past 2 days. Two weeks ago, she had a 3-day episode of flu-like symptoms that resolved without treatment. She has a history of impaired glucose tolerance. She is sexually active with one male partner and uses an oral contraceptive; they do not use condoms. She says she sometimes eats too much and occasionally consumes raw shellfish. She lives in Minnesota and hikes a wooded path with her dog daily to go swimming in a lake. She is 157 cm (5 ft 2 in) tall and weighs 77 kg (170 lb); BMI is 31 kg/m<sup>2</sup>. Examination shows an inability to wrinkle the left side of the forehead and an asymmetric smile. The remainder of the examination shows no abnormalities. Which of the following is the strongest predisposing factor for this patient's condition?

- (A) Hiking
- (B) Oral contraceptive use
- (C) Overeating
- (D) Shellfish ingestion
- (E) Swimming in a lake
- (F) Unprotected sexual intercourse

115. A 27-year-old man comes to the physician for a routine health maintenance examination. He says he feels well and has not had any problems. He has no history of serious illness. He occasionally takes acetaminophen for headaches. His brother had kidney failure at the age of 32 years. There is no family history of liver disease. The patient does not smoke. He occasionally drinks a beer or a glass of wine. He has never used intravenous illicit drugs. He has had 10 lifetime male sexual partners and uses condoms consistently. He has been in a monogamous relationship for the past 3 years. His temperature is 37°C (98.6°F), pulse is 72/min, and blood pressure is 118/70 mm Hg. Examination shows no abnormalities except for mild scleral icterus. Laboratory studies show:

Hematocrit	44%
Leukocyte count	5000/mm <sup>3</sup>
Prothrombin time	11 sec (INR=1)
Serum	
Na <sup>+</sup>	141 mEq/L
K <sup>+</sup>	4.2 mEq/L
Cl <sup>-</sup>	104 mEq/L
HCO <sub>3</sub> <sup>-</sup>	24 mEq/L
Urea nitrogen	14 mg/dL
Creatinine	0.8 mg/dL
Bilirubin, total	3.0 mg/dL
Direct	0.2 mg/dL
AST	14 U/L
ALT	15 U/L

Serologic testing for hepatitis A and B is negative. Abdominal ultrasonography shows no abnormalities. Which of the following is the most likely cause of these findings?

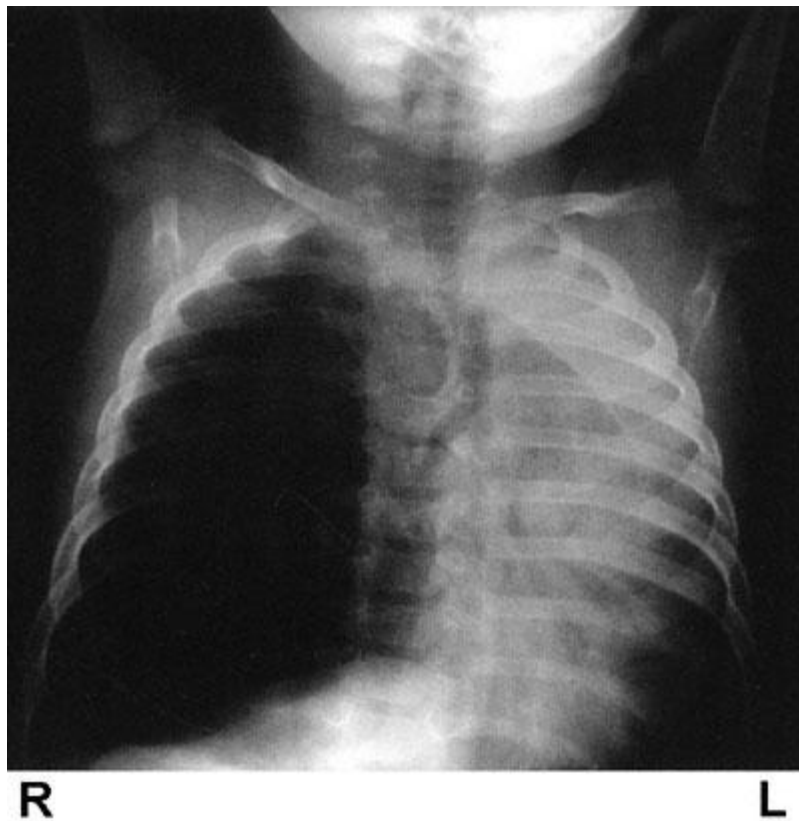
- (A) Decreased conjugation of bilirubin
  - (B) Decreased excretion of bilirubin by hepatocytes
  - (C) Decreased intracellular storage of bilirubin
  - (D) Delayed uptake of bilirubin
  - (E) Hemolysis
116. A previously healthy 42-year-old woman comes to the physician because of a 6-month history of difficulty swallowing and regurgitation of undigested food. She also has had color changes and pain in her fingertips when they are exposed to cold temperatures. She has not had nausea, abdominal pain, diarrhea, or constipation. Examination of the face shows thick, tightly bound skin. The fingertips are tapered and covered with ischemic ulcerations. There are telangiectasias diffusely distributed over the trunk and upper extremities. Fundoscopic examination shows retinal hemorrhages bilaterally. Which of the following is the most appropriate pharmacotherapy for this patient's pain and ulcerations?
- (A) Enalapril
  - (B) Methotrexate
  - (C) Nifedipine
  - (D) Prednisone
  - (E) Propranolol

117. A hospitalized 57-year-old man has had severe progressive pain in his left knee since awakening 2 hours ago. He was admitted to the hospital 2 days ago for an acute myocardial infarction. Cardiac catheterization showed occlusion of the left anterior descending artery, and he underwent placement of a stent. Current medications include aspirin, metoprolol, lisinopril, simvastatin, clopidogrel, and heparin. Vital signs are within normal limits. Examination of the knee shows a large effusion. The knee is hot to touch and erythematous. He holds the knee in 30 degrees of flexion; the pain is exacerbated with further flexion or extension. Laboratory studies show:

Hematocrit	40%
Leukocyte count	13,000/mm <sup>3</sup>
Serum	
Ca <sup>2+</sup>	9.2 mg/dL
Urea nitrogen	15 mg/dL
Creatinine	1.0 mg/dL
Albumin	3.6 g/dL

An x-ray of the left knee shows calcification of the synovium. Which of the following is the most likely diagnosis?

- (A) Deep venous thrombosis
  - (B) Gonorrhea
  - (C) Gout
  - (D) Hemarthrosis
  - (E) Pseudogout
  - (F) Septic arthritis
118. A previously healthy 20-year-old college student comes to the emergency department because she has been unable to urinate for 8 hours. She has a 2-day history of fever, fatigue, severe burning with urination, and pain in the genital area. She is sexually active and uses a diaphragm for contraception. She takes no medications. She appears uncomfortable. Her temperature is 38.7°C (101.7°F), pulse is 110/min, and blood pressure is 110/70 mm Hg. Abdominal examination shows a large, cystic, midline pelvic mass. The groin nodes are enlarged and tender. Pelvic examination shows erythematous external genitalia with extensive ulceration. The lesions extend into the vagina. Internal examination is not possible due to patient discomfort. Which of the following is the most appropriate initial step in management?
- (A) Measurement of serum urea nitrogen concentration
  - (B) Vaginal cultures
  - (C) Intravenous pyelography
  - (D) Renal ultrasonography
  - (E) Placement of a Foley catheter



119. A 4-year-old boy with asthma becomes limp during treatment with inhaled albuterol in the emergency department. Ten minutes ago, he received intravenous methylprednisolone for an acute exacerbation, and he was alert and oriented at that time. He received the diagnosis of asthma 2 years ago and has been admitted to the hospital for acute exacerbations eight times since then. Current medications include albuterol and montelukast. He appears pale and gasps and moans as he attempts to breathe. He responds to voice. His temperature is 36°C (96.8°F), pulse is 160/min and thready, respirations are 18/min, and blood pressure is 50/20 mm Hg. The skin is cold to the touch. Pulmonary examination shows poor air movement, especially on the left. No wheezes are heard. The point of maximal impulse is 2 cm to the left of the midclavicular line in the sixth intercostal space. A chest x-ray is shown. Which of the following is the most likely underlying cause of this patient's hypotension?
- (A) Adverse effect of albuterol
  - (B) Adverse effect of methylprednisolone
  - (C) Atelectasis of the left lung
  - (D) Decrease in cardiac output
  - (E) Severe bronchospasm

120. A 67-year-old woman comes to the physician for a follow-up examination. She had a pulmonary embolism and required treatment in the hospital for 3 weeks. She had a retroperitoneal hemorrhage; anticoagulant therapy was temporarily discontinued, and she underwent placement of an inferior vena cava (IVC) filter. She had a hematoma that was resolving on discharge from the hospital 2 weeks ago. Today, she says she has had a persistent sensation of tingling and numbness of her left thigh that she did not report in the hospital because she thought it would go away; the sensation has improved somewhat during the past week. Her only medication is warfarin. Vital signs are within normal limits. Examination of the skin shows no abnormalities. Muscle strength is normal. Sensation to light touch is decreased over a 5 x 5-cm area on the lateral aspect of the left anterior thigh. Which of the following is the most likely cause of this patient's decreased sensation?

- (A) Cerebral infarction during the hospitalization
- (B) Complication of the IVC filter placement
- (C) Compression of the lateral femoral cutaneous nerve
- (D) Hematoma of the left thigh
- (E) Spinal cord infarct
- (F) Vitamin B<sub>12</sub> (cobalamin) deficiency

121. A 2-week-old newborn is brought to the physician because his lips have turned blue on three occasions during feeding; he also sweats during feeding. He was born at 38 weeks' gestation and weighed 2466 g (5 lb 7 oz); he currently weighs 2778 g (6 lb 2 oz). His temperature is 37.8°C (100°F), pulse is 170/min, respirations are 44/min, and blood pressure is 75/45 mm Hg. A grade 3/6 harsh systolic ejection murmur is heard at the left upper sternal border. An x-ray of the chest shows a small boot-shaped heart and decreased pulmonary vascular markings. Which of the following is the most likely diagnosis?

- (A) Anomalous coronary vessels
- (B) Atrial septal defect
- (C) Endocardial fibroelastosis
- (D) Tetralogy of Fallot
- (E) Total anomalous pulmonary venous return

122. A 62-year-old woman comes to the physician for a routine health maintenance examination. On questioning, she has had fatigue, constipation, and a 9-kg (20-lb) weight gain during the past year. She receives estrogen replacement therapy. Serum lipid studies were within the reference range 5 years ago. She is 157 cm (5 ft 2 in) tall and weighs 77 kg (170 lb); BMI is 31 kg/m<sup>2</sup>. Physical examination shows no other abnormalities. Serum lipid studies today show:

Total cholesterol	269 mg/dL
HDL-cholesterol	48 mg/dL
LDL-cholesterol	185 mg/dL
Triglycerides	180 mg/dL

Which of the following is the most likely cause?

- (A) Alcohol
- (B) Diabetes mellitus
- (C) Estrogen deficiency
- (D) Estrogen replacement therapy
- (E) Hypothyroidism
- (F) Thiazide diuretic therapy

123. A 47-year-old man is brought to the emergency department 2 hours after the sudden onset of shortness of breath, severe chest pain, and sweating. He has no history of similar symptoms. He has hypertension treated with hydrochlorothiazide. He has smoked one pack of cigarettes daily for 30 years. His pulse is 110/min, respirations are 24/min, and blood pressure is 110/50 mm Hg. A grade 3/6, diastolic blowing murmur is heard over the left sternal border and radiates to the right sternal border. Femoral pulses are decreased bilaterally. An ECG shows left ventricular hypertrophy. Which of the following is the most likely diagnosis?
- (A) Acute myocardial infarction
  - (B) Aortic dissection
  - (C) Esophageal rupture
  - (D) Mitral valve prolapse
  - (E) Pulmonary embolism
124. A 57-year-old woman comes to the physician because of an 8-week history of difficulty sleeping, fatigue, and muscle tension. During this period, she also has had memory lapses, difficulty concentrating, and has been reprimanded at work for arriving late. Over the past 2 weeks, she has had three episodes of palpitations and shortness of breath that have awakened her from sleep. Her pulse is 80/min, and blood pressure is 110/90 mm Hg. Physical examination shows no abnormalities. Mental status examination shows a depressed mood and constricted affect. She says that she is no longer interested in activities that she used to enjoy. She has suicidal ideation without a plan. Her hemoglobin concentration is 11 g/dL, and serum ferritin concentration is 140 ng/mL. Which of the following is the most appropriate initial step in treatment?
- (A) Acupuncture
  - (B) Diazepam therapy
  - (C) Donepezil therapy
  - (D) Ferrous sulfate therapy
  - (E) Ginkgo biloba extract therapy
  - (F) Paroxetine therapy
125. A 27-year-old woman, gravida 2, para 1, at 10 weeks' gestation comes to the physician for a routine prenatal visit. She is concerned about the risk for Down syndrome in her fetus because her first child has Down syndrome. She would like to be tested as soon as possible. There is no personal or other family history of serious illness. Examination shows a uterus consistent in size with a 10-week gestation. Which of the following is the most appropriate diagnostic test for this syndrome in this patient at this time?
- (A) Measurement of fetal nuchal fold
  - (B) Measurement of maternal serum  $\alpha$ -fetoprotein concentration
  - (C) Chorionic villus sampling
  - (D) Amniocentesis
  - (E) Cordocentesis
126. A 27-year-old nurse comes to the emergency department because of nervousness, dizziness, palpitations, and excess perspiration for the past 3 hours. She has had similar episodes over the past 6 months. The symptoms improve following ingestion of orange juice or soft drinks. She says that she has had a great deal of stress. She has been drinking two alcoholic beverages daily for the past month; before this time, she seldom drank alcohol. Examination shows no abnormalities. Her serum glucose concentration is 30 mg/dL. Intravenous glucose is administered, and the patient's symptoms improve. Which of the following is the most appropriate next step in diagnosis?
- (A) Liver tests
  - (B) Measurement of serum proinsulin and insulin antibodies
  - (C) Measurement of serum cortisol and ACTH concentrations
  - (D) Measurement of serum growth hormone and plasma somatomedin-C concentrations
  - (E) Measurement of serum insulin and C-peptide concentrations

127. A 19-year-old woman noticed a mass in her left breast 2 weeks ago while doing monthly breast self-examination. Her mother died of metastatic breast cancer at the age of 40 years. Examination shows large dense breasts; a 2-cm, firm, mobile mass is palpated in the upper outer quadrant of the left breast. There are no changes in the skin or nipple, and there is no palpable axillary adenopathy. Which of the following is the most likely diagnosis?
- (A) Fibroadenoma
  - (B) Fibrocystic changes of the breast
  - (C) Infiltrating ductal carcinoma
  - (D) Intraductal papilloma
  - (E) Lobular carcinoma

**The response options for the next 2 items are the same. Select one answer for each item in the set.**

- (A) *Clostridium tetani*
- (B) Cytomegalovirus
- (C) *Escherichia coli*
- (D) Group B streptococcus
- (E) Herpes simplex virus
- (F) *Listeria monocytogenes*
- (G) Parvovirus B19
- (H) Rubella virus
- (I) *Toxoplasma gondii*
- (J) *Treponema pallidum*

For each newborn with an infection, select the most likely pathogen.

128. A 2500-g (5-lb 9-oz) full-term newborn has opacities obscuring the fundi and a continuous murmur heard over the left hemithorax. He was born to a 21-year-old primigravid woman following an uncomplicated labor and delivery. The mother received no prenatal care, and pregnancy was complicated by an erythematous rash during the first trimester. She has had five sexual partners during the past year.
129. A full-term newborn is brought to the emergency department at 5 days of age because of abnormal extremity movements for 6 hours. The newborn was delivered at home to a 21-year-old primigravid woman who received no prenatal care. The infant is alert, afebrile, hypertonic, and hyperreflexic. Complete blood count, serum electrolyte concentrations, and cerebrospinal fluid analysis are within normal limits.



The response options for the next 2 items are the same. Select one answer for each item in the set.

- (A) Autoimmune disorder
- (B) Bacterial infection
- (C) Metabolic process
- (D) Obstruction
- (E) Physiologic process
- (F) Toxin exposure
- (G) Viral infection

For each patient with jaundice, select the most likely mechanism.

130. A 3-year-old girl is brought to the physician because of a 3-day history of dark urine and a 1-day history of yellow skin and pale stools. One week ago, she had mild abdominal pain, vomiting, and diarrhea that have now resolved. Several other children at the day care she attends had similar symptoms 2 weeks ago. She has received her complete hepatitis B immunization series. She is at the 50th percentile for height and weight. Examination shows pale yellow skin and mild scleral icterus. There is mild tenderness of the liver to palpation.
131. A previously healthy 3-week-old newborn is brought to the emergency department because of a 2-day history of irritability and yellow skin. During this period, he has had dark urine and pale stools. He was born at term following an uncomplicated pregnancy and delivery. His mother was immunized against hepatitis B prior to conception. He is at the 50th percentile for length, weight, and head circumference. His temperature is 37.3°C (99.1°F), pulse is 120/min, respirations are 40/min, and blood pressure is 70/30 mm Hg. His skin is diffusely pale yellow. Abdominal examination shows mild distention and a subhepatic mass.

## Answer Key for Step 2 CK Sample Questions

### Block 1 (Questions 1-41)

1. F	11. A	21. B	31. B	41. G
2. C	12. D	22. A	32. E	
3. A	13. C	23. A	33. D	
4. F	14. F	24. B	34. E	
5. D	15. A	25. B	35. D	
6. D	16. B	26. D	36. F	
7. B	17. D	27. A	37. C	
8. D	18. A	28. A	38. D	
9. B	19. E	29. D	39. H	
10. A	20. F	30. E	40. B	

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### Block 2 (Questions 42-86)

42. B	52. B	62. A	72. E	82. A
43. G	53. E	63. C	73. D	83. H
44. D	54. E	64. C	74. A	84. F
45. A	55. D	65. A	75. A	85. B
46. A	56. B	66. B	76. D	86. A
47. C	57. A	67. D	77. B	
48. C	58. A	68. B	78. E	
49. E	59. E	69. C	79. D	
50. A	60. B	70. C	80. B	
51. B	61. C	71. B	81. D	

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### Block 3 (Questions 87-131)

87. E	97. B	107. A	117. E	127. A
88. H	98. C	108. D	118. E	128. H
89. E	99. B	109. B	119. D	129. A
90. E	100. E	110. A	120. C	130. G
91. A	101. C	111. D	121. D	131. D
92. D	102. B	112. D	122. E	
93. C	103. E	113. A	123. B	
94. B	104. D	114. A	124. F	
95. B	105. J	115. A	125. C	
96. A	106. E	116. C	126. E	