



Sample Test Questions

Step 1

A Joint Program of the Federation of State Medical
Boards of the United States, Inc. (FSMB), and National
Board of Medical Examiners (NBME)

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CONTENTS

USMLE Step 1 Test Question Formats	3
Introduction to USMLE Step 1 Sample Test Questions	6
USMLE Laboratory Values	7
USMLE Step 1 Sample Test Questions.....	10
Block 1, Items 1–20	10
Block 2, Items 21–40	17
Block 3, Items 41–60	25
Block 4, Items 61–80	33
Block 5, Items 81–100	41
Block 6, Items 101–119	48
Answer Form for USMLE Step 1 Sample Test Questions.....	55
Answer Key for USMLE Step 1 Sample Test Questions.....	56

Patient Scenario Formats and Single-Item Questions

Patient scenarios for any single test item may be provided in either vignette (paragraph) format, or in chart/tabular format, followed by four or more response options. The response options are lettered (A, B, C, D, E). You are required to select the best answer to the question. Other options may be partially correct, but there is only ONE BEST answer.

The vignette format is the traditional, most frequently used multiple-choice question format on the examination. Test items using the chart/tabular format are designed to resemble patient charts but are not intended to be an exact representation of a patient chart. Questions written in chart/tabular format will contain relevant patient information in list form, organized in clearly marked sections for ease of review. Familiar medical abbreviations may be used within chart/tabular format questions.

A portion of the questions require interpretation of graphic or pictorial materials.

Strategies for Answering Single One-Best-Answer Test Questions

The following are strategies for answering one-best-answer items:

- Read each patient scenario and question carefully. It is important to understand what is being asked.
- Try to generate an answer and then look for it in the response option list.
- Alternatively, read each response 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 best to guess since unanswered questions are automatically counted as wrong answers.

Example Item 1 (Vignette format)

A 32-year-old woman with type 1 diabetes mellitus has had progressive renal failure during the past 2 years. She has not yet started hemodialysis. Examination shows no abnormalities. Hemoglobin concentration is 9.0 g/dL, hematocrit is 28%, and mean corpuscular volume is 94 μm^3 . Peripheral blood smear shows normochromic, normocytic cells. Which of the following is the most likely cause of this patient's current condition?

- (A) Acute blood loss
- (B) Chronic lymphocytic leukemia
- (C) Erythrocyte enzyme deficiency
- (D) Erythropoietin deficiency
- (E) Immuno-hemolysis

(Answer: D)

Example Item 2 (Chart format)

Patient Information

Age: 82 years

Gender: F, self-identified

Race/Ethnicity: Chinese, self-identified

Site of Care: urgent treatment center

History

Reason for Visit/Chief Concern: "My lower left side hurts."

History of Present Illness:

- 2-day history of moderate left lower quadrant abdominal pain
- pain associated with fever, chills, nausea, and decreased appetite
- has not had diarrhea or constipation
- no history of similar symptoms

Past Medical History:

- hypertension
- hypercholesterolemia
- most recent colonoscopy 10 years ago showed no abnormalities

Medications:

- lisinopril
- atorvastatin

Allergies:

- no known drug allergies

Family History:

- father: deceased from stroke at age 78 years
- mother: deceased, had hypertension

Psychosocial History:

- does not smoke cigarettes, drink alcoholic beverages, or use other substances

Physical Examination

Temp	Pulse	Resp	BP	O ₂ Sat	Ht	Wt	BMI
38.5°C (101.3°F)	100/min	22/min	164/72 mm Hg	98% on RA	155 cm (5 ft 1 in)	54 kg (119 lb)	23 kg/m ²

- Appearance: anxious because of pain
- Pulmonary: clear to auscultation
- Cardiac: regular rhythm without murmurs, rubs, or gallops
- Abdominal: hypoactive bowel sounds; tenderness to palpation of left lower quadrant
- Rectal: normal anal sphincter tone; no masses or lesions; test of stool for occult blood negative

Example Item 2 (continued)

Diagnostic Studies

Serum	
Na ⁺	148 mEq/L
K ⁺	4.2 mEq/L
Cl ⁻	99 mEq/L
HCO ₃ ⁻	30 mEq/L
Urea nitrogen	20 mg/dL
Creatinine	1.4 mg/dL
Glucose, nonfasting	100 mg/dL
ALT	20 U/L
AST	18 U/L
Blood	
Hematocrit	36%
Hemoglobin	13.0 g/dL
WBC	12,000/mm ³
Neutrophils, segmented	60%
Neutrophils, bands	6%
Lymphocytes	30%
Monocytes	4%
Platelet count	350,000/mm ³
Urine	
Leukocyte esterase	Negative
Nitrite	Negative
WBCs	2/hpf
RBCs	0/hpf

- CT scan of abdomen and pelvis: obtained; results pending

Question: Which of the following is the most likely diagnosis?

- (A) Appendicitis
- (B) Colorectal cancer
- (C) Crohn disease
- (D) Diverticulitis
- (E) Pseudomembranous colitis

(Answer: D)

NOTE: When additional question formats are added to the examination, notice will be provided on the USMLE website (www.usmle.org). You must monitor the website to stay informed about the types of questions that occur in the examination, and you must practice with the downloadable sample test questions available on the USMLE website in order to be fully prepared for the examination.

INTRODUCTION TO USMLE STEP 1 SAMPLE TEST QUESTIONS

The following pages include 119 sample test questions. Please note that reviewing the sample questions as they appear on pages 10–54 is not a substitute for acquainting yourself with the test software. You should run the Step 1 interactive testing experience tutorial and practice test items that are provided on the USMLE website (www.usmle.org) well before your test date. The Step 1 interactive testing experience on the USMLE website includes an additional item with associated audio findings that does not appear in this booklet. You should become familiar with this item format that will be used in the actual examination.

Although the sample questions exemplify content on the Step 1 examination overall, they may not reflect the content coverage on individual examinations. In the actual examination, questions will be presented in random order; they will not be grouped according to specific content. The questions will be presented one at a time in a format designed for easy on-screen reading, including use of the USMLE Laboratory Values table (included here on pages 7–9) and some pictorials. Photographs, charts, and x-rays 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 30 minutes for each 20-item block, and a maximum of 28 minutes, 30 seconds, for the 19-item block, for a total of 2 hours, 58 minutes, 30 seconds. Please note that the third block has 19 items instead of 20 because the multimedia item has been removed, and the recommended time to complete the block has been adjusted accordingly. Please be aware that most examinees perceive the time pressure to be greater during an actual examination. All examinees are strongly encouraged to practice with the downloadable version to become familiar with all item formats and exam timing. An answer form for recording answers is provided on page 55. An answer key is provided on page 56. In the actual examination, answers will be selected on the screen; no answer form will be provided.

USMLE Laboratory Values

	<u>Reference Range</u>	<u>SI Reference Intervals</u>
SERUM		
General Chemistry:		
Electrolytes		
Sodium (Na ⁺)	136–146 mEq/L	136–146 mmol/L
Potassium (K ⁺)	3.5–5.0 mEq/L	3.5–5.0 mmol/L
Chloride (Cl ⁻)	95–105 mEq/L	95–105 mmol/L
Bicarbonate (HCO ₃ ⁻)	22–28 mEq/L	22–28 mmol/L
Urea nitrogen	7–18 mg/dL	2.5–6.4 mmol/L
Creatinine	0.6–1.2 mg/dL	53–106 μmol/L
Glucose	Fasting: 70–100 mg/dL Random, non-fasting: <140 mg/dL	3.8–5.6 mmol/L <7.77 mmol/L
Calcium	8.4–10.2 mg/dL	2.1–2.6 mmol/L
Magnesium (Mg ²⁺)	1.5–2.0 mg/dL	0.75–1.0 mmol/L
Phosphorus (inorganic)	3.0–4.5 mg/dL	1.0–1.5 mmol/L
Hepatic:		
Alanine aminotransferase (ALT)	10–40 U/L	10–40 U/L
Aspartate aminotransferase (AST)	12–38 U/L	12–38 U/L
Alkaline phosphatase	25–100 U/L	25–100 U/L
Bilirubin, total // direct	0.1–1.0 mg/dL // 0.0–0.3 mg/dL	2–17 μmol/L // 0–5 μmol/L
Proteins, total	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
Other, serum:		
Amylase	25–125 U/L	25–125 U/L
Lipase	13–60 U/L	13–60 U/L
Creatinine clearance	Male: 97–137 mL/min Female: 88–128 mL/min	97–137 mL/min 88–128 mL/min
Creatine kinase	Male: 25–90 U/L Female: 10–70 U/L	25–90 U/L 10–70 U/L
Lactate dehydrogenase	45–200 U/L	45–200 U/L
Osmolality	275–295 mOsmol/kg H ₂ O	275–295 mOsmol/kg H ₂ O
Troponin I	≤0.04 ng/mL	≤0.04 μg/L
Uric acid	3.0–8.2 mg/dL	0.18–0.48 mmol/L
Lipids:		
Cholesterol		
Total	Normal: <200 mg/dL High: >240 mg/dL	<5.2 mmol/L >6.2 mmol/L
HDL	40–60 mg/dL	1.0–1.6 mmol/L
LDL	<160 mg/dL	<4.2 mmol/L
Triglycerides	Normal: <150 mg/dL Borderline: 151–199 mg/dL	<1.70 mmol/L 1.71–2.25 mmol/L
Iron Studies:		
Ferritin	Male: 20–250 ng/mL Female: 10–120 ng/mL	20–250 μg/L 10–120 μg/L
Iron	Male: 65–175 μg/dL Female: 50–170 μg/dL	11.6–31.3 μmol/L 9.0–30.4 μmol/L
Total iron-binding capacity	250–400 μg/dL	44.8–71.6 μmol/L
Transferrin	200–360 mg/dL	2.0–3.6 g/L

USMLE Laboratory Values (continued)

	<u>Reference Range</u>	<u>SI Reference Intervals</u>
Endocrine:		
Follicle-stimulating hormone	Male: 4–25 mIU/mL Female: premenopause 4–30 mIU/mL midcycle peak 10–90 mIU/mL postmenopause 40–250 mIU/mL	4–25 IU/L 4–30 IU/L 10–90 IU/L 40–250 IU/L
Luteinizing hormone	Male: 6–23 mIU/mL Female: follicular phase 5–30 mIU/mL midcycle 75–150 mIU/mL postmenopause 30–200 mIU/mL	6–23 IU/L 5–30 IU/L 75–150 IU/L 30–200 IU/L
Growth hormone - arginine stimulation	Fasting: <5 ng/mL Provocative stimuli: >7 ng/mL	<5 µg/L >7 µg/L
Prolactin (hPRL)	Male: <17 ng/mL Female: <25 ng/mL	<17 µg/L <25 µg/L
Cortisol	0800 h: 5–23 µg/dL 1600 h: 3–15 µg/dL 2000 h: <50% of 0800 h	138–635 nmol/L 82–413 nmol/L Fraction of 0800 h: <0.50
TSH	0.4–4.0 µU/mL	0.4–4.0 mIU/L
Triiodothyronine (T ₃) (RIA)	100–200 ng/dL	1.5–3.1 nmol/L
Triiodothyronine (T ₃) resin uptake	25%–35%	0.25–0.35
Thyroxine (T ₄)	5–12 µg/dL	64–155 nmol/L
Free T ₄	0.9–1.7 ng/dL	12.0–21.9 pmol/L
Thyroidal iodine (¹²³ I) uptake	8%–30% of administered dose/24 h	0.08–0.30/24 h
Intact PTH	10–60 pg/mL	10–60 ng/L
17-Hydroxycorticosteroids	Male: 3.0–10.0 mg/24 h Female: 2.0–8.0 mg/24 h	8.2–27.6 µmol/24 h 5.5–22.0 µmol/24 h
17-Ketosteroids, total	Male: 8–20 mg/24 h Female: 6–15 mg/24 h	28–70 µmol/24 h 21–52 µmol/24 h
Immunoglobulins:		
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	6.5–15.0 g/L
IgM	50–300 mg/dL	0.5–3.0 g/L
GASES, ARTERIAL BLOOD (ROOM AIR)		
Po ₂	75–105 mm Hg	10.0–14.0 kPa
Pco ₂	33–45 mm Hg	4.4–5.9 kPa
pH	7.35–7.45	[H ⁺] 36–44 nmol/L
CEREBROSPINAL FLUID		
Cell count	0–5/mm ³	0–5 × 10 ⁶ /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 ₂ O	70–180 mm H ₂ O
Proteins, total	<40 mg/dL	<0.40 g/L

USMLE Laboratory Values (continued)

	<u>Reference Range</u>	<u>SI Reference Intervals</u>
HEMATOLOGIC		
Complete Blood Count:		
Hematocrit	Male: 41%–53% Female: 36%–46%	0.41–0.53 0.36–0.46
Hemoglobin, blood	Male: 13.5–17.5 g/dL Female: 12.0–16.0 g/dL	135–175 g/L 120–160 g/L
Mean corpuscular hemoglobin (MCH)	25–35 pg/cell	0.39–0.54 fmol/cell
Mean corpuscular hemoglobin conc. (MCHC)	31%–36% Hb/cell	4.8–5.6 mmol Hb/L
Mean corpuscular volume (MCV)	80–100 μm^3	80–100 fL
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
Leukocyte count (WBC)	4500–11,000/ mm^3	$4.5\text{--}11.0 \times 10^9/\text{L}$
Neutrophils, segmented	54%–62%	0.54–0.62
Neutrophils, bands	3%–5%	0.03–0.05
Lymphocytes	25%–33%	0.25–0.33
Monocytes	3%–7%	0.03–0.07
Eosinophils	1%–3%	0.01–0.03
Basophils	0%–0.75%	0.00–0.0075
Platelet count	150,000–400,000/ mm^3	$150\text{--}400 \times 10^9/\text{L}$
Coagulation:		
Partial thromboplastin time (PTT/aPTT) (activated)	25–40 seconds	25–40 seconds
Prothrombin time (PT)	11–15 seconds	11–15 seconds
D-dimer	$\leq 250 \text{ ng/mL}$	$\leq 1.4 \text{ nmol/L}$
Other, Hematologic:		
Reticulocyte count	0.5%–1.5%	0.005–0.015
Erythrocyte count (RBC)	Male: 4.3–5.9 million/ mm^3 Female: 3.5–5.5 million/ mm^3	$4.3\text{--}5.9 \times 10^{12}/\text{L}$ $3.5\text{--}5.5 \times 10^{12}/\text{L}$
Erythrocyte sedimentation rate (Westergren)	Male: 0–15 mm/h Female: 0–20 mm/h	0–15 mm/h 0–20 mm/h
CD4+ T-lymphocyte count	$\geq 500/\text{mm}^3$	$\geq 0.5 \times 10^9/\text{L}$
Endocrine:		
Hemoglobin A _{1c}	$\leq 6\%$	$\leq 42 \text{ mmol/mol}$
URINE		
Calcium	100–300 mg/24 h	2.5–7.5 mmol/24 h
Osmolality	50–1200 mOsmol/kg H ₂ O	50–1200 mOsmol/kg H ₂ O
Oxalate	8–40 $\mu\text{g/mL}$	90–445 $\mu\text{mol/L}$
Proteins, total	$< 150 \text{ mg/24 h}$	$< 0.15 \text{ g/24 h}$
BODY MASS INDEX (BMI)		
	Adult: 19–25 kg/m^2	

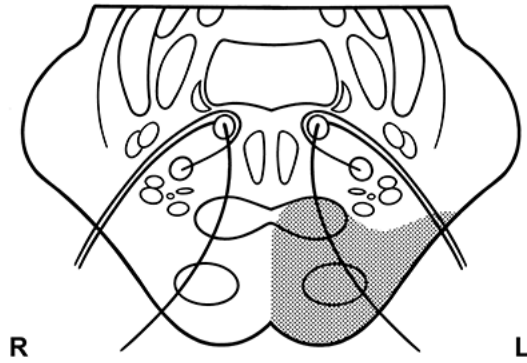
USMLE STEP 1 SAMPLE TEST QUESTIONS

BLOCK 1, ITEMS 1-20

1. A 27-year-old woman comes to the emergency department because of a 1-hour history of severe shortness of breath. She has just returned from a cross-country flight. She has a history of borderline hypertension. Temperature is 36.9°C (98.5°F), pulse is 113/min, respirations are 28/min, and blood pressure is 138/85 mm Hg. Oxygen saturation is 89% on room air. Lungs are clear. The right calf has an increased circumference compared with the left calf, and there is tenderness behind the right knee. Which of the following is the most likely underlying cause of this patient's condition?
- (A) Antithrombin III deficiency
 - (B) Factor V Leiden mutation
 - (C) Glanzmann thrombasthenia
 - (D) Protein C deficiency
 - (E) von Willebrand disease



2. A 53-year-old woman comes to the office because of a 6-year history of stiffness and pain of her hands. She has difficulty buttoning her clothes because of the symptoms. She takes no medications. Physical examination shows the findings in the photograph. An abnormality of which of the following is most likely to confirm the diagnosis in this patient?
- (A) Anti-citrullinated peptide antibody
 - (B) Antimitochondrial antibody assay
 - (C) Human leukocyte antigen-DQ2 antibody assay
 - (D) Precursor of the erythroid cell line
 - (E) Precursor of the thrombopoietic line
-



3. An 80-year-old woman is evaluated in a subacute rehabilitation facility 6 months after she sustained a cerebral infarction. Her vital signs are within normal limits. When the patient is asked to look to the right, the right eye abducts and the left eye adducts. When she is asked to look to the left, the right eye adducts and the left eye remains midline. There is right-sided hemiparesis. Deep tendon reflexes are 3+ in the right biceps and quadriceps. Babinski sign is present on the right. Sensation to vibration and two-point discrimination are decreased on the right. The area affected by the cerebral infarction is indicated by the shaded area in the drawing of the brain stem shown. Which of the following additional findings is most likely in this patient?

- (A) Anesthesia of the left side of the face
- (B) Asymmetric smile
- (C) Hoarseness
- (D) Loss of accommodation
- (E) Paralysis of the tongue

4. A 32-year-old man comes to the office because of a 2-week history of fever and throat pain. He is 173 cm (5 ft 8 in) tall and weighs 63 kg (140 lb); BMI is 21 kg/m². His pulse is 110/min, respirations are 16/min, and blood pressure is 98/68 mm Hg. Physical examination shows scattered 2- to 4-cm lymph nodes in the neck, axillae, and inguinal regions. There is a bilateral tonsillar exudate but no ulcerations. Results of laboratory studies are shown:

Hemoglobin	9.6 g/dL
Hematocrit	29%
Leukocyte count	1500/mm ³
Platelet count	60,000/mm ³

A heterophile antibody test result is negative. Which of the following is the most likely diagnosis?

- (A) Epstein-Barr virus infection
- (B) Gonococcal pharyngitis
- (C) HIV infection
- (D) Lymphogranuloma venereum infection
- (E) Streptococcal pharyngitis

5. A 60-year-old woman is brought to the emergency department because of a 4-day history of fever, joint aches, and rash. Three weeks ago, she was admitted to the hospital for treatment of *Staphylococcal aureus* endocarditis. She has received 21 days out of a prescribed 42-day course of intravenous oxacillin. Currently, she appears to be in mild distress. Temperature is 38.0°C (100.4°F), pulse is 115/min, respirations are 24/min, and blood pressure is 120/70 mm Hg. Pulse oximetry on room air shows an oxygen saturation of 97%. Physical examination shows a diffuse maculopapular rash over the trunk and upper and lower extremities. There is no pus or erythema at the skin insertion site of the peripherally inserted central catheter line initially placed on the day of hospital discharge. Results of laboratory studies are shown:

Hemoglobin	11.1 g/dL
Hematocrit	33%
Leukocyte count	12,100/mm ³
Segmented neutrophils	78%
Eosinophils	9%
Lymphocytes	7%
Monocytes	6%
Platelet count	341,000/mm ³
Serum	
Na ⁺	133 mEq/L
K ⁺	6.5 mEq/L
Cl ⁻	100 mEq/L
HCO ₃ ⁻	15 mEq/L
Urea nitrogen	65 mg/dL
Glucose	96 mg/dL
Creatinine	5.7 mg/dL

Urine microscopy shows eosinophils and WBC casts. Which of the following is the most likely underlying cause of this patient's condition?

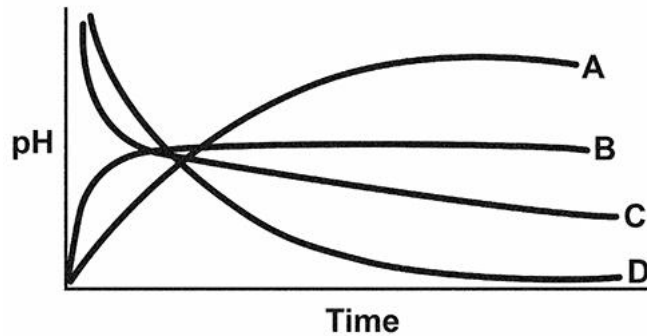
- (A) Collapsing focal segmental glomerulosclerosis
 - (B) Glomerular hypertrophy with hemorrhage and necrosis
 - (C) Interstitial inflammatory infiltrate
 - (D) Mesangial expansion with glomerular basement membrane thickening
 - (E) Proximal tubular dilation with loss of brush border
-

6. A 20-year-old woman is brought to the urgent care center because of a 2-month history of progressive weakness of her arms. She also has a 1-week history of moderate back pain and headache. Her only medication is ibuprofen as needed for pain. Muscle strength is 3/5 in the upper extremities. Sensation to pinprick is decreased over the upper extremities. MRI of the spine shows a central syrinx in the cervical spinal cord. It is most appropriate to obtain specific additional history regarding which of the following in this patient?

- (A) Diet
- (B) Family illness
- (C) Recent travel
- (D) Trauma
- (E) Unintended weight loss

7. A 68-year-old man comes to the office because of a 6-month history of pain and cramping of his right and left lower legs. He says the pain is more severe with walking but improves with rest. He has a history of coronary artery disease, dyslipidemia, hypertension, and type 2 diabetes mellitus with nephropathy. Current medications are aspirin, insulin, lisinopril, metoprolol, and atorvastatin. Pulse is 65/min, respirations are 16/min, and blood pressure is 145/82 mm Hg. Cardiopulmonary examination shows no abnormalities. Examination of the lower extremities shows little to no hair, atrophic skin, and feet that are cool to the touch. Posterior tibial and dorsalis pedis pulses are absent bilaterally. Which of the following is the most likely mechanism causing this patient's symptoms?
- (A) Fibromuscular dysplasia
 - (B) Giant cell arteritis
 - (C) Hyaline arteriosclerosis
 - (D) Segmental inflammation of medium-sized vessels
 - (E) Vascular obstruction by lipid-rich plaques
8. A 58-year-old man with chronic obstructive pulmonary disease comes to the clinic with his wife for a follow-up examination. He has smoked one pack of cigarettes daily for 35 years. He has tried to quit smoking twice but was unsuccessful both times. At today's visit, when the physician asks the patient about smoking cessation, he says he is not ready to do so. The patient's wife states her husband's smoking makes her cough and gives her chest tightness. Which of the following is the most appropriate physician statement?
- (A) "Are there any reasons why you might want to quit smoking?"
 - (B) "Are you aware that your lung condition is chronic at this point?"
 - (C) "I'm sure you don't want your wife to suffer as a result of your smoking."
 - (D) "The majority of your health issues would improve if you quit smoking."
 - (E) "Why haven't you been able to stay off cigarettes?"
9. An 18-month-old girl is brought to the physician for a well-child examination. Her parents say that she has been healthy since her last visit at 15 months of age, and they have no specific concerns. Developmental milestones are appropriate for age. Her diet consists of two 8-ounce bottles of cow's milk-based formula and small amounts of table food. She has consistently been at the 25th percentile for length and weight for the first 12 months of age but is currently at the 25th percentile for length and below the 5th percentile for weight. Her mother is 168 cm (5 ft 6 in) tall, and her father is 183 cm (6 ft) tall. The patient appears thin. Examination shows no other abnormalities. Which of the following is the most likely cause of this patient's growth pattern?
- (A) Adrenal insufficiency
 - (B) Caloric insufficiency
 - (C) Constitutional growth delay
 - (D) Familial short stature
 - (E) Growth hormone deficiency
10. Investigators are planning to conduct a prospective cohort study to determine the association between dietary calcium consumption and the risk for osteoporosis. A total of 256 women aged 45 to 65 years will be enrolled. Bone mineral density will be measured with a DEXA scan. Participants will self-report their dietary calcium consumption with a food frequency questionnaire. After reviewing the initial draft of the questionnaire, the investigators notice that yogurt is missing from the list of items and add it to the list. Which of the following factors is most likely to be improved by including yogurt in the questionnaire?
- (A) Internal validity
 - (B) Inter-rater reliability
 - (C) Response rate
 - (D) Type I error

11. A 40-year-old woman comes to the office after a serum study of her donated blood showed positive results for *Trypanosoma cruzi*. She immigrated to the USA from El Salvador at the age of 20 years. She has no history of major medical illness, and she has no cardiac or gastrointestinal symptoms. Vital signs are within normal limits. Physical examination shows no abnormalities. This patient most likely acquired the organism causing her condition via a bite from which of the following?
- (A) Bedbug
 - (B) Black fly
 - (C) Mosquito
 - (D) Reduviid bug
 - (E) Tick
12. A 40-year-old man comes to the office because of a 3-day history of lower abdominal pain. This is his third visit to the physician for similar symptoms during the past 6 months. Previous evaluations have been consistent with the diagnosis of irritable bowel syndrome. He has been drinking herbal tea from his grandmother, which has not improved his pain. He does not believe in taking medication and has refused it at the previous visits. Examination discloses no abnormalities. Which of the following is the most appropriate physician response?
- (A) "Help me to understand what you are hoping I can do for you today."
 - (B) "I'd like to prescribe some medication if you'd reconsider your decision."
 - (C) "I'm not sure why you keep coming to see me."
 - (D) "Let's talk about the herbal tea you have been drinking."
 - (E) "There is nothing I can do for you if you continue to refuse medication."
13. A 72-year-old man comes to the office because of a 2-month history of increased urinary frequency, frequent nighttime urination, and a slow urinary stream. He has no history of serious illness and takes no medications. Temperature is 37.0°C (98.6°F), pulse is 66/min, respirations are 12/min, and blood pressure is 130/78 mm Hg. Physical examination shows no abnormalities. Digital rectal examination shows a diffusely enlarged, symmetric prostate gland without nodules or induration. The most appropriate pharmacotherapy for this patient has which of the following mechanisms of action?
- (A) α_1 -Adrenergic agonism
 - (B) α_1 -Adrenergic antagonism
 - (C) α_2 -Adrenergic agonism
 - (D) α_2 -Adrenergic antagonism
 - (E) β_1 -Adrenergic agonism
 - (F) β_1 -Adrenergic antagonism
14. A previously healthy 33-year-old woman is brought to the emergency department by the Secret Service for stalking the president of the USA for 2 months. She claims to be married to the president's twin brother and states that the president just had his twin kidnapped to avoid competition. She speaks rapidly and is difficult to interrupt. Her associations are often loose. She says, "I haven't slept for days, but I won't even try to sleep until my husband is rescued. God has been instructing me to take over the White House. I can't wait to be reunited with my husband. I hear his voice telling me what to do." When asked about drug use, she says she uses only natural substances. She refuses to permit blood or urine tests, saying, "I don't have time to wait for the results." Which of the following is the most likely diagnosis?
- (A) Bipolar disorder, manic, with psychotic features
 - (B) Brief psychotic disorder
 - (C) Delusional disorder
 - (D) Psychotic disorder due to general medical condition
 - (E) Schizophrenia



15. A 63-year-old woman with a 2-year history of indigestion and heartburn volunteers for a research study in which a variety of drugs are administered and her gastric pH is measured. Which of the following sets of curves best represents the results in this patient after administration of cimetidine and omeprazole?

	Cimetidine	Omeprazole
(A)	A	D
(B)	B	A
(C)	B	D
(D)	C	A
(E)	C	D
(F)	D	A

16. A 65-year-old woman comes to the office for a follow-up examination 1 year after she underwent operative resection of the right colon and chemotherapy for stage III colon cancer. She reports fatigue. Physical examination shows no abnormalities. A staging CT scan of the chest and abdomen shows five new 2- to 3-cm masses in the liver and both lungs. This patient's cancer most likely spread to the lungs via which of the following structures?

- (A) Inferior mesenteric vein
- (B) Inferior vena cava
- (C) Left colic vein
- (D) Middle colic artery
- (E) Pulmonary vein
- (F) Superior mesenteric artery
- (G) Superior vena cava

17. A 4-year-old boy is brought to the physician by his mother because of a 3-week history of progressively severe itching of his hands and inner thighs. Physical examination shows multiple short, thin, elevated serpiginous tracks in the superficial epidermis over the axillae, in the webbed spaces between the digits, encircling the waist, and over the inner thighs. Small vesicles are seen at the ends of some of these tracks. Which of the following is the most likely diagnosis?

- (A) Chickenpox
- (B) Ehrlichiosis
- (C) Lyme disease
- (D) Pediculosis
- (E) Scabies

18. An 18-year-old woman with sickle cell disease is brought to the emergency department by her parents because of a 2-hour history of severe abdominal pain and nausea. Her parents say that she had a cheeseburger, milk shake, and chocolate bar for lunch. Her temperature is 37°C (98.6°F). Physical examination shows tenderness over the right upper quadrant of the abdomen, radiating to the right shoulder. Ultrasonography of the right upper quadrant of the abdomen shows gallstones. Which of the following is the most likely underlying cause of this patient's current condition?

- (A) Decreased hepatic secretion of lecithin
- (B) Decreased reabsorption of bile salts
- (C) High ratio of cholesterol to bile acids in bile
- (D) Infestation with parasites secreting β -glucuronidase
- (E) Overload of unconjugated bilirubin

19. A 34-year-old man comes to the office because of a 1-month history of diarrhea. He has a history of pheochromocytoma treated 2 years ago. His mother is being treated for a tumor of her parathyroid gland. He has no other history of major medical illness and takes no medications. His temperature is 37.0°C (98.6°F), pulse is 84/min, respirations are 10/min, and blood pressure is 120/75 mm Hg. Pulse oximetry on room air shows an oxygen saturation of 97%. Physical examination shows a 3-cm, palpable mass on the right side of the neck. A biopsy specimen of the mass shows a neuroendocrine neoplasm of parafollicular cell origin. The most likely cause of the findings in this patient is a mutation in which of the following types of genes?

- (A) Cell cycle regulation gene
- (B) DNA mismatch repair gene
- (C) Metastasis suppressor gene
- (D) Proto-oncogene
- (E) Tumor suppressor gene

20. A 6-year-old girl is brought to the office because of two episodes of vaginal bleeding during the past 2 months. She has no history of serious illness and receives no medications. She does not appear to be in distress. She is at the 60th percentile for height, 40th percentile for weight, and 35th percentile for BMI. Vital signs are within normal limits. Physical examination discloses palpable breast buds and minimal coarse, pigmented hair on the labia. The remainder of the examination shows no abnormalities. Results of serum studies are shown:

Thyroid-stimulating hormone	2.1 mU/mL (N=0.5–5.0)
Testosterone	680 ng/dL (N=0.17–0.7)
Adrenocorticotrophic hormone	18 pg/mL (N=9–52)
Estradiol	185 pg/mL (N<20)
Follicle-stimulating hormone	15 mIU/mL (N<6.7)
Luteinizing hormone	3.0 mIU/mL (N<0.2)

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

- (A) Central activation of neurons
 - (B) Ectopic prolactin secretion
 - (C) Exogenous sex steroid secretion
 - (D) Germline *GNAS* activating mutation
 - (E) 21-Hydroxylase deficiency
-

USMLE STEP 1 SAMPLE TEST QUESTIONS

BLOCK 2, ITEMS 21-40

21. Patient Information

Age: 16 years

Gender: M, self-identified

Race/Ethnicity: unspecified

Site of Care: clinic

History

Reason for Visit/Chief Concern: "I haven't started puberty yet."

History of Present Illness:

- absence of pubic and facial hair
- small penis and testicle size

Past Medical History:

- no serious illness

Medications:

- none

Allergies:

- no known drug allergies

Psychosocial History:

- does not smoke cigarettes, drink alcoholic beverages, or use other substances

Physical Examination

Temp	Pulse	Resp	BP	O ₂ Sat	Ht	Wt	BMI
36.0°C (96.8°F)	76/min	13/min	108/61 mm Hg	98% on RA	184 cm (6 ft) 90th %ile	90 kg (198 lb) 97th %ile	27 kg/m ² 94th %ile

- Appearance: long extremities
- Skin: no facial or axillary hair
- HEENT: PERRLA
- Chest: bilateral gynecomastia
- Pulmonary: clear to auscultation
- Cardiac: normal S₁ and S₂
- Abdominal: normoactive bowel sounds; no tenderness to palpation; no hepatosplenomegaly
- Genitourinary: small testicular and penile size; minimal pubic hair; SMR 2
- Neurologic: muscle strength 5/5 throughout

Diagnostic Studies:

Serum

Follicle-stimulating hormone	45 mIU/mL
Luteinizing hormone	34 mIU/mL
Testosterone	45 ng/dL (N=270–950)
TSH	2.2 μU/L

Question: Which of the following is the most likely underlying cause of this patient's condition?

- (A) Constitutional delay in puberty
- (B) Hypoplasia of hypothalamic gonadotropin-releasing hormone neurons

- (C) Inactivating mutation of the follicle-stimulating hormone-receptor
 - (D) Mutation in the 21-hydroxylase gene
 - (E) Nondisjunction of X chromosome during meiosis
-

22. A newborn delivered at 36 weeks' gestation to a 22-year-old woman, gravida 1, para 1, has difficulty feeding and listlessness. The mother received no prenatal care. Spontaneous vaginal delivery was uncomplicated. The mother's only medication was a prenatal vitamin. The newborn's length is 49 cm (19 in; 39th percentile), and weight is 3100 g (6 lb 13 oz; 30th percentile); head circumference is 33 cm (13 in; 12th percentile). Temperature is 37.0°C (98.6°F), pulse is 134/min, respirations are 38/min, and blood pressure is 73/50 mm Hg. Physical examination shows ambiguous genitalia. Results of serum studies are shown:

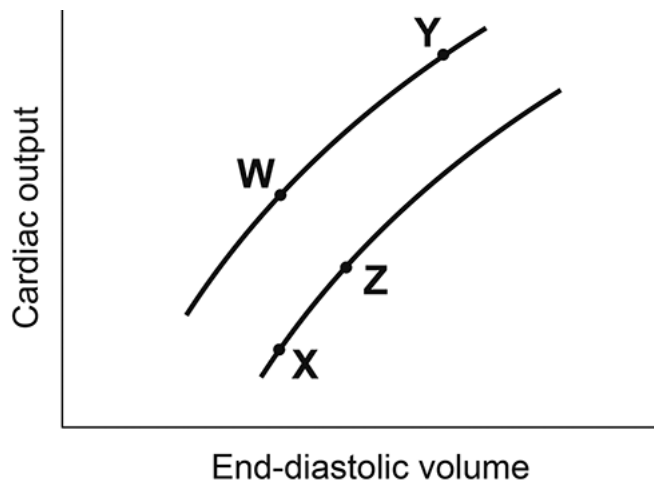
Na ⁺	133 mEq/L
K ⁺	5.0 mEq/L (N=3.2–5.5)
Cl ⁻	103 mEq/L
HCO ₃ ⁻	17 mEq/L
Glucose	42 mg/dL (N=30–60)

The most appropriate pharmacotherapy for this patient targets which of the following receptors?

- (A) Adrenocorticotrophic hormone
 - (B) Aldosterone
 - (C) Androgen
 - (D) Gonadotropin-releasing hormone
 - (E) Growth hormone
-

23. A 59-year-old man with type 2 diabetes mellitus and chronic kidney disease comes to the office for a follow-up examination. His renal function has gradually deteriorated despite aggressive management. He appears chronically ill. Serum studies show a urea nitrogen concentration of 65 mg/dL and creatinine concentration of 4.2 mg/dL. The development of which of the following in this patient would most likely necessitate immediate hemodialysis?

- (A) Increasingly severe anemia
- (B) Moderate pedal edema
- (C) Pericardial friction rub
- (D) Persistent hypertension despite medication use
- (E) Recurrent episodes of hypoglycemia

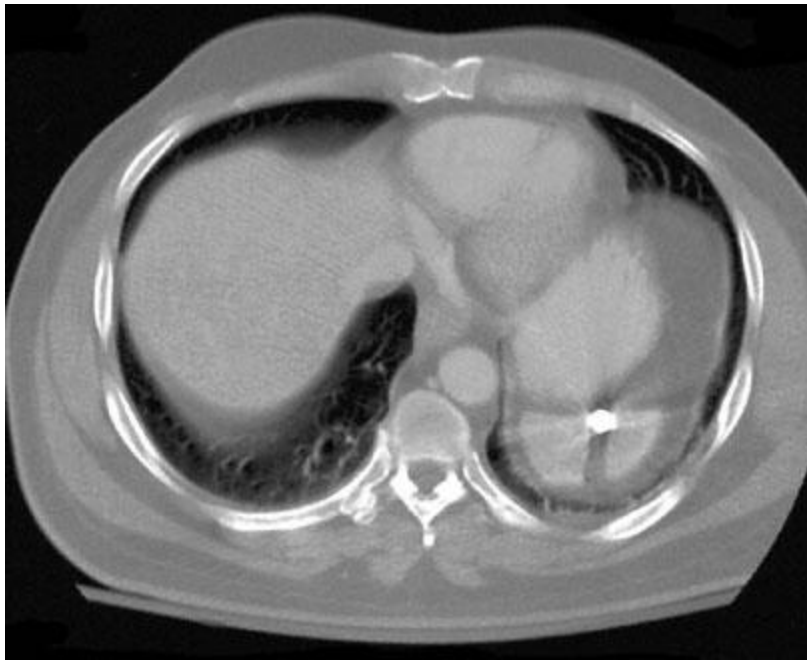


24. A 65-year-old woman is brought to the emergency department because of a 10-minute history of chest tightness and severe pain of her left arm. Physical examination shows jugular venous distention. Crackles are heard over the lung fields. An ECG shows ST-segment elevation greater than 1 mm in leads V₄ through V₆ and new Q waves. Serum studies show an increased troponin I concentration. Which of the following labeled points in the graph best represents the changes in cardiac function that occurred during the first 10 seconds after the onset of pain in this patient?

- (A) W → X
- (B) W → Y
- (C) W → Z
- (D) X → W
- (E) X → Y
- (F) X → Z
- (G) Z → W
- (H) Z → X
- (I) Z → Y

25. A 66-year-old man who was recently diagnosed with Parkinson disease comes to the physician for a follow-up examination. Carbidopa-levodopa therapy was initiated at the time of diagnosis. The patient tells the physician that he still has episodes during which he "freezes." He has a clumsy gait, and there is rigidity of his upper extremities and hands. An adjunct therapy designed to inhibit which of the following enzymes is most likely indicated in this patient?

- (A) Aromatic L-amino acid decarboxylase
- (B) Dopamine β-hydroxylase
- (C) Monoamine oxidase B
- (D) Phenylethanolamine *N*-methyltransferase
- (E) Tyrosine hydroxylase

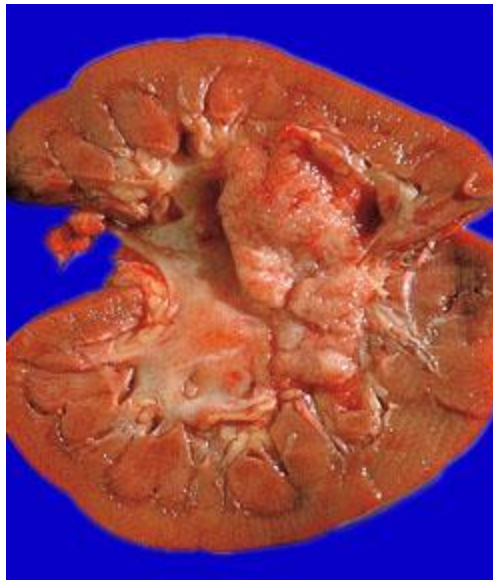


26. A 25-year-old man is brought to the emergency department via ambulance 15 minutes after he sustained a gunshot wound to his back during a robbery. On arrival, he is conscious but appears confused. Temperature is 37.0°C (98.6°F), pulse is 120/min and weak, respirations are 20/min, and blood pressure is 110/50 mm Hg. Pulse oximetry on room air shows an oxygen saturation of 96%. Physical examination shows pale, cold, clammy skin and a single bullet entry wound in the posterior 10th intercostal space on the left side. Abdominal CT scan is shown. The bullet is most likely lodged in which of the following structures in this patient?

- (A) Adrenal gland
- (B) Colon
- (C) Kidney
- (D) Lung
- (E) Spleen

27. A 33-year-old man is transferred to the emergency department from an inpatient psychiatric facility because of a 3-hour history of fever preceded by a 1-day history of confusion and agitation. The patient was admitted to the psychiatric facility 5 days ago because of hallucinations and strange behavior. On admission, olanzapine and clonazepam therapy were initiated, and the patient's condition initially had been improving. Medical history otherwise is unremarkable, and the patient took no medications prior to admission to the psychiatric facility. He has smoked one pack of cigarettes daily for 15 years. He typically drank one to two beers daily prior to his psychiatric admission. He uses no other substances. He is unemployed. He is 175 cm (5 ft 9 in) tall and weighs 83 kg (183 lb); BMI is 27 kg/m². Temperature is 40.3°C (104.5°F), pulse is 127/min, respirations are 28/min, and blood pressure is 176/109 mm Hg. Oxygen saturation is 97% on room air. Physical examination of this patient is most likely to show which of the following?

- (A) Hyperreflexia
- (B) Muscle rigidity
- (C) Mydriasis
- (D) Petechial rash
- (E) Unilateral hemiparesis



28. A 68-year-old man with alcohol use disorder comes to the office because of a 3-month history of intermittent blood in his urine; he has had no pain. He is a retired laboratory technician from a company that produces naphthylamine. He has smoked 1½ packs of cigarettes daily for 45 years. A CT scan of the abdomen shows a mass in the pelvis of the left kidney. A photograph of the surgically resected kidney is shown. The neoplastic process in this kidney is most likely to be which of the following?

- (A) Angiomyolipoma
- (B) Metastatic melanoma
- (C) Nephroblastoma
- (D) Oncocytoma
- (E) Urothelial carcinoma



29. A 37-year-old woman comes to the clinic because of a 3-year history of facial redness that intermittently expands in surface area, intensifies in color, and feels warm. She says the rash also sometimes causes a burning sensation. These symptoms occur approximately once monthly and are precipitated by stress. She has treated the rash with an over-the-counter hydrocortisone cream, but she is unsure of whether the cream provided any symptom relief. She previously did not seek medical attention for the symptoms because she assumed the condition would resolve spontaneously. Medical history is remarkable for type 1 diabetes mellitus. Her only routine medication is insulin administered via pump for the past 5 years. She has no known drug allergies. She drinks three glasses of red wine weekly; she does not smoke cigarettes or use any other substances. She is 162 cm (5 ft 4 in) tall and weighs 61 kg (134 lb); BMI is 23 kg/m². Vital signs are within normal limits. Examination of the skin discloses the findings shown. The remainder of the physical examination discloses no abnormalities. At this time, it is most appropriate to obtain specific additional history regarding which of the following?

- (A) Effect of alcohol on the condition
- (B) Excessive sweating
- (C) Family history of adenomas
- (D) Numbness of the fingers and toes
- (E) Poor healing of skin lacerations

30. A 5-year-old girl is brought to the office by her mother for an examination prior to attending kindergarten. The mother reports no concerns. The child's medical history is noncontributory. At all previous examinations, the mother declined all recommended vaccinations for her daughter, saying that she is concerned that vaccines could harm her daughter. Physical examination today shows no abnormalities. The mother continues to decline all recommended vaccinations today, saying that her daughter has never had a vaccine-preventable illness. Which of the following is the most likely explanation for this patient's history of good health?
- (A) Community eradication of vaccine-preventable disease
 - (B) Herd immunity
 - (C) Lingering protection of maternal antibodies
 - (D) A normal immune system
 - (E) Underdiagnosis of vaccine-preventable conditions
31. A 28-year-old woman, gravida 2, para 1, comes to the office after a home pregnancy test result was positive. Her last menstrual period was 12 weeks ago. Laboratory studies performed during her first pregnancy showed that she is blood group A, Rh-negative. Her husband is blood group A, Rh-positive. Their first child, a girl, was delivered via spontaneous vaginal delivery. Laboratory studies performed after delivery showed an indirect antiglobulin (Coombs) titer of 1:32. Temperature is 36.8°C (98.2°F), pulse is 68/min, respirations are 15/min, and blood pressure is 120/75 mm Hg. Physical examination shows a uterus consistent in size with a 12-week gestation. A urine pregnancy test result is positive. The most appropriate pharmacotherapy to prevent complications in the newborn has which of the following mechanisms of action?
- (A) Binding to the D antigen on fetal erythrocytes
 - (B) Blockade of complement binding to fetal erythrocytes
 - (C) Induction of class switching by maternal B lymphocytes
 - (D) Inhibition of production of fetal blood group A erythrocytes
 - (E) Prevention of fetal erythrocytes from entering maternal blood circulation
32. A 40-year-old man comes to the office because of a 1-day history of severe pain in his right great toe. He has not sustained any trauma to the area. He has no history of serious illness and takes no medications. Three days ago, he attended a wedding at which he ate lobster and drank multiple bottles of beer. Vital signs are within normal limits. Examination of the right great toe discloses edema, erythema, and exquisite tenderness to palpation. The most likely cause of this patient's condition is accumulation of intermediates during which of the following processes?
- (A) Chylomicron processing pathway
 - (B) Methionine regeneration pathway
 - (C) Pentose phosphate pathway
 - (D) Purine degradation pathway
 - (E) Urea cycle
33. A 34-year-old woman comes to the clinic for a routine examination. She has hypertension. Her only medication is lisinopril. She has no known drug allergies. During the interview, she mentions that she is stressed because she recently received a citation for driving under the influence and must appear in court. She says she was driving home from an office party where she "drank a bit more than usual." Her electronic health record indicates that the patient drinks socially. She does not smoke cigarettes or use other substances. Physical examination discloses no abnormalities. Which of the following is the most appropriate initial response by the physician?
- (A) "Do you have any concerns about your alcohol use?"
 - (B) "How has your alcohol use been this week compared to last week: more, less, or about the same?"
 - (C) "So you're here because you're concerned about your alcohol use. Is that correct?"
 - (D) "When was your last drink?"
 - (E) "Would you be willing to go through a detoxification program?"

34. A 4-year-old girl is brought to the office because of a 6-month history of slowly progressive swelling of her right leg. She has no history of major medical illness. She is at the 81st percentile for height and 64th percentile for weight. Her vital signs are within normal limits. Physical examination shows peripheral edema of the right lower extremity to the mid thigh. Lymphoscintigraphy shows anomalous development of the lymphatic vessels. The defect in this patient most likely arose from which of the following embryonic tissues during development?

- (A) Ectoderm
- (B) Endoderm
- (C) Mesoderm
- (D) Neural crest
- (E) Neuroectoderm

35. A 50-year-old man comes to the office because of a 2-month history of increasing daytime somnolence. He has obstructive sleep apnea for which he has only intermittently used a continuous positive airway pressure device. He is 170 cm (5 ft 7 in) tall and weighs 181 kg (400 lb); BMI is 63 kg/m². His temperature is 37°C (98.6°F), pulse is 100/min, respirations are 12/min, and blood pressure is 135/80 mm Hg. Physical examination shows a gray-blue tinge to the lips, earlobes, and nail beds. Cardiac examination shows no other abnormalities. Arterial blood gas analysis on room air shows a pH of 7.31, PCO₂ of 70 mm Hg, and PO₂ of 50 mm Hg. Which of the following additional findings would be most likely in this patient?

- (A) Decreased serum bicarbonate concentration
- (B) Increased hemoglobin concentration
- (C) Increased total lung capacity
- (D) Left ventricular hypertrophy

36. A 5-year-old girl is brought to the office by her mother because of a 6-hour history of bloody diarrhea. She is interactive and in no acute distress. Her blood pressure is 90/55 mm Hg. Abdominal examination shows normoactive bowel sounds. Stool cultures are obtained, and the patient's mother is advised to give the girl plenty of fluids. Five days later, the patient develops decreased urine output and is brought back to the office. Her blood pressure is now 135/88 mm Hg. Physical examination shows pallor. Laboratory studies show:

Hemoglobin	8.5 g/dL (N=11–15)
Hematocrit	26% (N=28%–45%)
Platelet count	45,000/mm ³ (N=150,000–400,000)
Serum creatinine	3.3 mg/dL (N=0.3–0.7)

Which of the following infectious agents is the most likely cause of these findings?

- (A) *Campylobacter jejuni*
- (B) *Escherichia coli*
- (C) Rotavirus
- (D) *Salmonella enterica* serovar *enteritidis*
- (E) *Yersinia pestis*

37. A 52-year-old woman comes to the office because of a 6-month history of intermittent headaches. Sometimes the pain improves when the patient lies down in a quiet room. Her temperature is 37.5°C (99.5°F), pulse is 86/min, respirations are 16/min, and blood pressure is 154/100 mm Hg. The lungs are clear. Cardiac examination shows the point of maximal impulse displaced to the left and occasional skipped beats; there are no murmurs or rubs. There is no S₃. Resting electrocardiography shows left axis deviation with R waves greater than 30 mm in leads V₅ through V₆. Which of the following processes best explains the development of the left ventricular abnormalities in this patient?

- (A) Excessive accumulation of glycogen
- (B) Fibrosis of intraventricular conduction pathways

- (C) Increased synthesis of contractile filaments
 - (D) Misfolding and aggregation of cytoskeletal proteins
 - (E) Myocyte hyperplasia as a result of induction of embryonic genes
38. An investigator is studying the genetic predisposition to development of lung cancer associated with occupational exposure to benzene combined with smoking. It is found that single-nucleotide polymorphisms in genes encoding enzymes involved in metabolic activation seem to increase the risk of cancer development in smokers exposed to benzene. Which of the following enzymes is most likely to be involved with this increased risk?
- (A) Aldehyde dehydrogenase
 - (B) Cytochrome P450
 - (C) Glutathione S-transferase
 - (D) Methyltransferase
 - (E) Succinate dehydrogenase
39. An investigator studying a new drug for malaria is assessing maximum tolerated dose and pharmacokinetic properties of the drug in a group of 80 healthy volunteers as part of the Food and Drug Administration's drug approval process. Which of the following best describes this phase of drug development?
- (A) Phase 0
 - (B) Phase 1
 - (C) Phase 2
 - (D) Phase 3
 - (E) Phase 4
40. A 21-year-old man is brought to the emergency department 30 minutes after he was found unresponsive in their apartment by his roommate. He has a 5-year history of type 1 diabetes mellitus treated with scheduled infusion of insulin lispro via insulin pump. The patient has been training for a marathon, and he decreases his insulin pump rate when he exercises. He has no other history of serious illness and takes no other medications. On arrival, he is unresponsive and appears lethargic. Temperature is 35.6°C (96.0°F), pulse is 130/min, respirations are 15/min, and blood pressure is 143/72 mm Hg. Physical examination shows cool and clammy skin. Serum glucose concentration is 25 mg/dL. A glucagon injection is administered. Twenty minutes later, his serum glucose concentration is 25 mg/dL. Which of the following best explains the lack of change in the serum glucose concentration in this patient?
- (A) Depletion of glycogen stores
 - (B) Downregulation of glucagon receptors by exercise
 - (C) Impairment of glycogenolysis caused by an increased circulating concentration of catecholamines
 - (D) Inhibition of gluconeogenesis caused by an increased circulating insulin concentration

USMLE STEP 1 SAMPLE TEST QUESTIONS

BLOCK 3, ITEMS 41-60

41. A 72-year-old woman is brought to the emergency department because of a 1-week history of yellowish skin and a 2-month history of intermittent, mild abdominal pain. She also has had a 4.5-kg (10-lb) weight loss during the past 8 weeks. She has no history of serious illness and takes no medications. Vital signs are within normal limits. Physical examination discloses mild jaundice. There is mild tenderness to palpation of the right upper quadrant. No masses are palpated. CT scan of the abdomen shows a mass in the head of the pancreas and lesions in the liver. The patient is admitted to the hospital for pain management and further workup. The radiologist reports that the patient most likely has cancer but recommends biopsy of a liver lesion to be certain. The patient has not yet been told about the results of her CT scan. After assessing her understanding of the situation and telling her that there is a mass in the pancreas and that biopsy is recommended, which of the following is the most appropriate next remark by the physician?

- (A) "I suspect you have a malignant mass in the pancreas, but I'll need the biopsy results to confirm my suspicion."
- (B) "I'm concerned the mass could be cancer. The biopsy will provide more information."
- (C) "This could be something serious, but let's not worry about that until we know for sure."
- (D) "This mass could be benign or malignant. I'd like to wait for the biopsy results before I share the suspected diagnosis."
- (E) "We don't know what this mass is yet, but the biopsy should give us some answers."

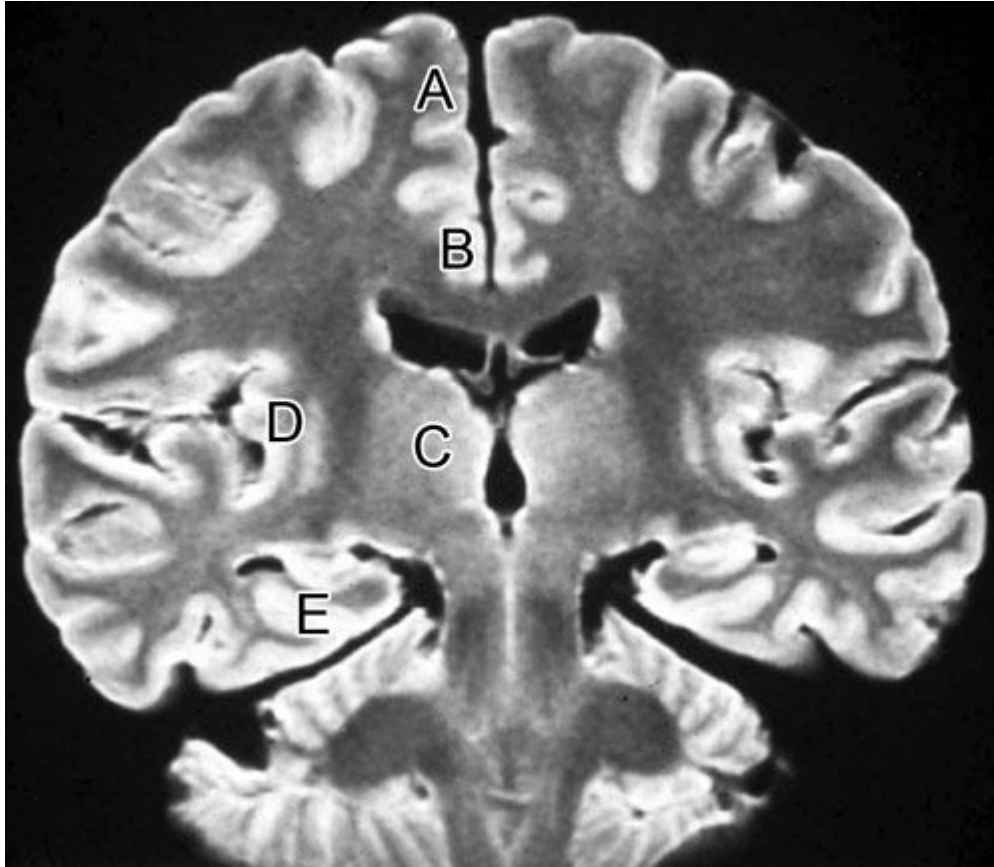
42. A 56-year-old man comes to the office because of a 6-week history of headaches and fatigue. He has no history of major medical illness and takes no medications. He has never smoked. He drinks one alcoholic beverage weekly. His pulse is 80/min, and blood pressure is 138/86 mm Hg. The spleen is palpated 2 cm below the left costal margin. Results of laboratory studies are shown:

Hemoglobin	19.5 g/dL
Hematocrit	59%
Leukocyte count	7500/mm ³
Platelet count	450,000/mm ³

Genetic studies are most likely to show a mutation of which of the following?

- (A) G protein
 - (B) Janus kinase 2
 - (C) Platelet-derived growth factor
 - (D) Retinoic acid receptor
 - (E) Thrombopoietin receptor
-

43. A 34-year-old woman with epilepsy comes to the physician for a follow-up examination. She has a 3-year history of seizures characterized by olfactory auras of "burning rubber" followed by lip smacking and emotional shouting. These episodes last 3 to 5 minutes and have increased in frequency during the past 4 months. Treatment with anticonvulsant medications has not alleviated her symptoms, and she is being considered for operative intervention. To determine whether a seizure focus can be found, the patient is scheduled to undergo an intraoperative EEG. When applying the intracranial electrodes in this patient, it is most appropriate for the physician to focus on which of the following labeled regions of the photograph of a coronal section of the brain?



44. Seven days after admission to the psychiatric unit for treatment of eating disorders, a hospitalized 20-year-old woman has a 2-day history of moderate mouth pain on the inside of both cheeks. She also reports feeling "worthless and fat." Fluoxetine was started on admission. She appears distressed. She is 170 cm (5 ft 7 in) tall and weighs 77 kg (170 lb); BMI is 27 kg/m². Vital signs are within normal limits. Physical examination shows bilateral swelling of the parotid and submandibular glands, discoloration of several teeth, and scarring on the dorsum of the right hand. Mental status examination shows no suicidal ideation or intent. Results of laboratory studies are within the reference ranges. A medication with which of the following mechanisms of action is most appropriate to treat this patient's current symptoms?
- (A) Binding to muscarinic acetylcholine receptors
 - (B) Binding to nicotinic acetylcholine receptors
 - (C) Inhibition of protein synthesis via binding to 50S ribosomal subunits and preventing peptide bond formation
 - (D) Inhibition of protein synthesis via loss of DNA helical structure
 - (E) Interference with bacterial wall synthesis



45. A 42-year-old man comes to the physician because of a 3-day history of a severely itchy rash. The rash began 1 day after he cut weeds from his backyard and carried them to the garbage can. A photograph of the rash is shown. Which of the following types of hypersensitivity reactions best explains this patient's rash?

- (A) Type I (immediate)
 - (B) Type II (complement-mediated cytotoxic)
 - (C) Type III (immune complex-mediated)
 - (D) Type IV (delayed)
-

46. A previously healthy 45-year-old woman who works as a park ranger comes to the physician because of a 1-week history of shortness of breath, even at rest. She has lived in the mountains at 10,000 feet above sea level for 2 years; the physician's office is located at sea level. Her pulse is 85/min, respirations are 18/min, and blood pressure is 125/90 mm Hg. Physical examination while sitting upright shows jugular venous distention and 2+ pedal edema. During the past 2 years, which of the following has most likely decreased in this patient?

- (A) Height of P waves in lead I of the patient's ECG
- (B) Height of R waves in lead V₁ of the patient's ECG
- (C) Hematocrit
- (D) Pulmonary vascular resistance
- (E) Right ventricular diastolic compliance
- (F) Right ventricular wall thickness

47. A 7-year-old boy is brought to the office by his mother for an annual well-child examination. He has no history of major medical illness and receives no medications. He appears happy. He is at the 75th percentile for height and 50th percentile for weight. His temperature is 37.0°C (98.6°F), pulse is 82/min, respirations are 22/min, and blood pressure is 135/85 mm Hg in the right upper extremity and 80/40 mm Hg in the right lower extremity. Pulse oximetry on room air shows an oxygen saturation of 99% in both arms. Lungs are clear. Cardiac examination shows a grade 1/6 systolic ejection murmur that is best heard at the left sternal border and in the left paravertebral intrascapular area. There is no hepatosplenomegaly. The remainder of the physical examination is most likely to show which of the following in this patient?

- (A) Delayed femoral pulses
- (B) Increased jugular venous pressure
- (C) Nontender mass in the inguinal area
- (D) Pulsatile abdominal mass
- (E) Pulsus paradoxus

48. A previously healthy 52-year-old woman comes to the physician because of a 2-month history of fatigue, constipation, and frequent urination. Her temperature is 37.1°C (98.8°F), pulse is 80/min, respirations are 14/min, and blood pressure is 140/90 mm Hg. Diffuse crackles are heard bilaterally. Her serum calcium concentration is 11.1 mg/dL, and serum parathyroid hormone concentration is decreased. A chest x-ray shows bilateral hilar lymphadenopathy and interstitial infiltrates. Which of the following is the most likely cause of this patient's hypercalcemia?

- (A) Calcitriol production by activated macrophages
- (B) Local resorption of bone by metastases
- (C) Parathyroid hormone-related peptide secretion
- (D) Secretion of parathyroid hormone
- (E) Secretion of thyroid-stimulating hormone

49. **Patient Information**

Age: 34 years

Gender: M, self-identified

Race/Ethnicity: unspecified

Site of Care: office

The patient presents because of a 2-year history of recurrent abdominal pain and diarrhea; he also has had an 11-kg (25-lb) weight loss during this period. He describes his stools as copious, loose, oily and foul-smelling. His bowel movements occur six to eight times daily, often immediately after meals, and are associated with bloating and cramping. Since the age of 21 years, he has had several episodes of acute pancreatitis. He has not had fevers or bloody stools. He is 178 cm (5 ft 10 in) tall and weighs 57 kg (125 lb); BMI is 18 kg/m². Physical examination shows a flat abdomen with hyperactive bowel sounds and diffuse mild tenderness. Digital rectal examination shows no abnormalities. Test of the stool for occult blood is negative. Treatment with which of the following enzymes is most likely to be beneficial in this patient?

- (A) Amylase
- (B) Lactase
- (C) Lipase
- (D) Protease
- (E) Trypsin

50. A 46-year-old man comes to the emergency department because of a 2-day history of fever and a 2-week history of fatigue, malaise, increasingly severe right-sided abdominal pain, and nausea. He is originally from India and last traveled there 2 months ago. Temperature is 38.2°C (100.8°F), pulse is 84/min, respirations are 18/min, and blood pressure is 120/80 mm Hg. Abdominal examination discloses tenderness to deep palpation of the right upper quadrant. Abdominal ultrasonography shows a 4-cm, hypoechoic lesion on the right lobe of the liver. Treatment with metronidazole and paromomycin is initiated. Which of the following best explains the rationale for including paromomycin in this patient's treatment regimen?
- (A) Avoidance of drug resistance development
 - (B) Effective penetration into the liver
 - (C) Eradication of intestinal organisms
 - (D) Prevention of central nervous system infection
51. A 3-year-old boy is brought to the office because of a 2-day history of bulging of his left eye. He says his eye hurts. He has no history of major medical illness or recent trauma to the area, and he receives no medications. Vital signs are within normal limits. Physical examination shows exophthalmos of the left eye. MRI of the brain shows a 2-cm mass involving the ocular muscles of the left eye. A biopsy specimen of the mass shows malignant cells, some of which have striations. Which of the following is the most likely diagnosis?
- (A) Neuroblastoma
 - (B) Pheochromocytoma
 - (C) Retinoblastoma
 - (D) Rhabdomyosarcoma
 - (E) Thyroid cancer
52. A 37-year-old man who is a carpenter is brought to the emergency department 45 minutes after the sudden onset of fever, shortness of breath, and palpitations. Four days ago, he sustained a puncture wound to his left hand; he treated the wound with antibacterial cream and a bandage. His temperature is 39°C (102.2°F), pulse is 120/min, respirations are 28/min, and blood pressure is 100/60 mm Hg. Examination of the left hand shows diffuse swelling, erythema, and a 2-cm, necrotic puncture wound. His leukocyte count is 14,000/mm³. Arterial blood gas analysis on room air shows a PCO₂ of less than 32 mm Hg. Which of the following is the most likely infectious agent in this patient?
- (A) *Clostridium tetani*
 - (B) *Mycobacterium abscessus*
 - (C) *Pasteurella multocida*
 - (D) *Pseudomonas aeruginosa*
 - (E) *Staphylococcus aureus*
53. A 24-year-old woman is brought to the physician 1 month after she was involved in a motor vehicle collision that left her weak and unable to walk. Physical examination shows weakness of both hands and atrophy of the intrinsic hand muscles bilaterally. There is weakness and increased muscle tone of the lower extremities on passive range of motion. Deep tendon reflexes are normal at the biceps and triceps bilaterally and are increased at the knees and ankles. Babinski sign is present bilaterally. Sensation to pinprick is absent at and below the level of the clavicles. The lesion in this patient is most likely located at which of the following spinal cord levels?
- (A) C5
 - (B) C7
 - (C) T1
 - (D) T3
 - (E) T5

54. A 33-year-old man comes to the office because of progressive shortness of breath on exertion. He has not had chest pain, fever, chills, or cough. He takes no medications. He does not smoke cigarettes. He is 183 cm (6 ft) tall and weighs 153 kg (338 lb); BMI is 46 kg/m². His pulse is 88/min, respirations are 16/min, and blood pressure is 140/90 mm Hg. Pulse oximetry on room air shows an oxygen saturation of 98%. The lungs are clear to auscultation. The abdomen is protuberant; there are no masses. There is no edema of the extremities. Pulmonary function testing is most likely to show which of the following findings?

	FEV₁ (% of Predicted)	FVC (% of Predicted)	Total Lung Capacity (% of Predicted)	Diffusing Capacity of Lung for Carbon Monoxide (% of Predicted)
(A)	19	40	110	35
(B)	43	40	40	28
(C)	65	76	96	70
(D)	84	78	78	92
(E)	95	102	98	89

55. A 67-year-old woman, gravida 2, para 2, comes to the physician because of a 6-month history of decreased libido. She had two vaginal deliveries more than 30 years ago. Her last menstrual period occurred at the age of 51 years. She had hot flashes for 2 years, which resolved 10 years ago. Bowel movements are normal, and there are no urinary symptoms. She says that she has a happy marriage and fulfilling work. She is sexually active with her husband only. Which of the following findings is most likely on pelvic examination in this patient?

- (A) Bulging of anterior vaginal wall through the introitus
- (B) Bulging of posterior vaginal wall through the introitus
- (C) Decreased vaginal rugation
- (D) Palpable ovaries bilaterally
- (E) Uterine size of 8 cm

56. A 47-year-old woman with a 35-year history of type 1 diabetes mellitus comes to the physician for an initial examination. Physical examination shows no abnormalities. Her hemoglobin A_{1c} is 12%. The patient says, "I hope that's okay. I haven't been able to get it lower." Which of the following is the most appropriate initial response by the physician?

- (A) "Do you ever skip a dose of insulin?"
- (B) "Noncompliance in your disease can be deadly."
- (C) "Please inform me of any recent traumas or stresses that would be contributing to your poor compliance."
- (D) "Tell me about the kinds of foods you eat."
- (E) "What is your understanding of what your hemoglobin A_{1c} should be?"

57. Investigators conduct a study that evaluates the effect of finasteride on the incidence of prostate cancer in 500 patients. The investigators recruit an additional 1000 patients for the study. Which of the following effects will this have on the research study?

- (A) Greater chance of a Type I error
- (B) Greater chance of a Type II error
- (C) Less chance of a Type I error
- (D) Less chance of a Type II error
- (E) Impossible to predict

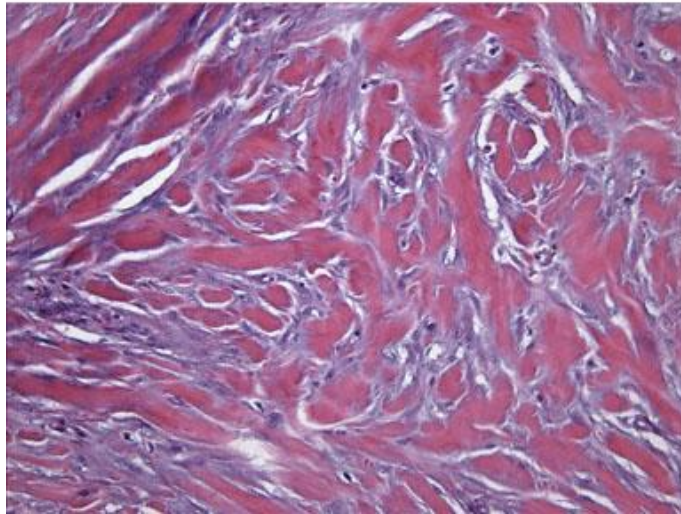
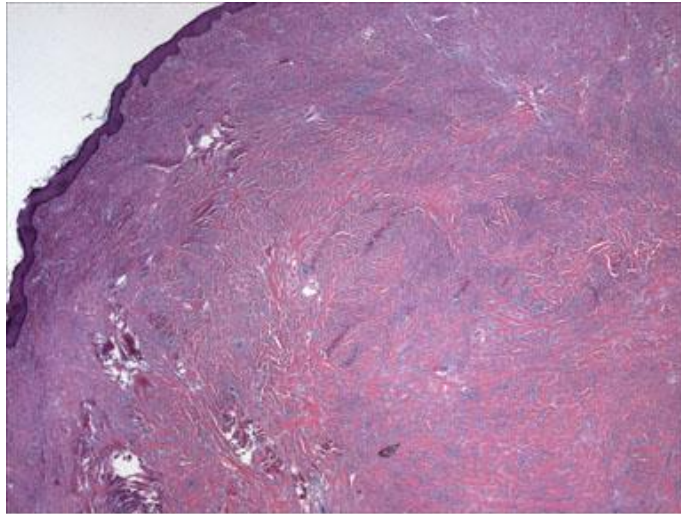


58. A 56-year-old woman comes to the physician because of a 2-year history of recurrent urinary tract infections accompanied by left flank pain. Physical examination shows no abnormalities. Renal ultrasonography shows left-sided hydronephrosis. A T₂-weighted coronal MRI of the abdomen is shown; the arrow indicates the hydronephrosis. The left renal collecting system is most likely obstructed at which of the following anatomic locations in this patient?

- (A) Bladder neck
- (B) Mid ureter
- (C) Renal calyx
- (D) Ureteropelvic junction
- (E) Ureterovesical junction

59. A 13-year-old boy is brought to the office because of a 2-week history of moderate pain in his left hip and right knee. He has no history of major medical illness and takes no medications. He is not sexually active. His temperature is 38.2°C (100.7°F), pulse is 80/min, respirations are 12/min, and blood pressure is 110/70 mm Hg. Physical examination shows warmth of the right knee with a small effusion. The remainder of the examination shows no abnormalities. The result of an HIV antibody test is negative. A T₂-weighted MRI of the pelvis shows a discrete area of hyperintensity in the left ischium. A biopsy specimen of the left ischium shows osteomyelitis. Cultures of the biopsy specimen and synovial fluid obtained via arthrocentesis of the right knee grow *Mycobacterium avium* complex. Immunologic testing is most likely to show which of the following abnormalities in this patient?

- (A) Absent expression of C5
- (B) Bilobed neutrophil nuclei with abnormal granule morphology
- (C) Decreased absolute CD8⁺ T-lymphocyte count
- (D) Decreased serum concentration of IgG
- (E) Dysfunctional interferon- γ receptors



60. A 53-year-old woman comes to the clinic because of a 2-year history of an enlarging lump under the skin of her chest. Three years ago, she underwent resection of a lesion in the same area. Vital signs and oxygen saturation on room air are within normal limits. Physical examination discloses a 2-cm, subcutaneous mass at the previous biopsy site. Photomicrographs of the biopsy specimen of the current mass are shown. Which of the following cell types most likely caused the development of the mass in this patient?

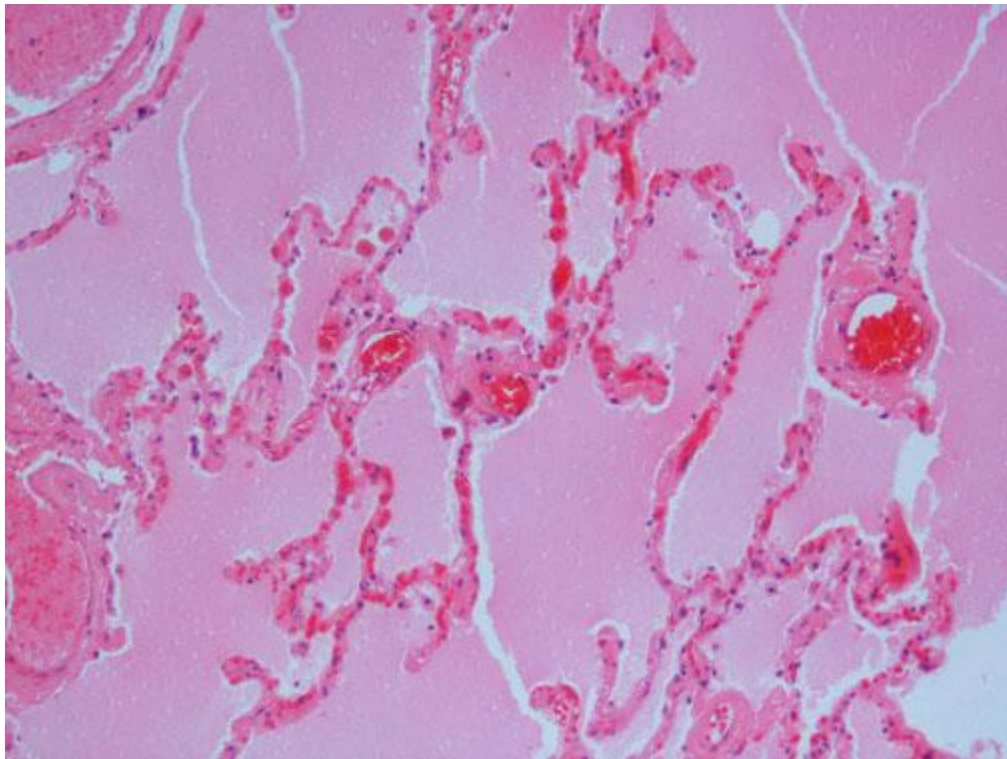
- (A) Macrophages
- (B) Mast cells
- (C) Melanocytic cells
- (D) Mesothelial cells
- (E) Myeloblasts
- (F) Myocytes
- (G) Myofibroblasts

USMLE STEP 1 SAMPLE TEST QUESTIONS

BLOCK 4, ITEMS 61-80

61. A 36-year-old woman with hypertension comes to the office because she thinks she may be “going through early menopause.” She has not had a menstrual period since her most recent office visit 6 months ago. During this time, she also has been “gaining weight around the middle” despite increased exercise; she has had a 6.3-kg (14-lb) weight gain. She has no other history of major medical illness. Her only medication is lisinopril. She does not smoke, drink alcohol, or use illicit drugs. She is 168 cm (5 ft 6 in) tall and weighs 107 kg (236 lb); BMI is 38 kg/m². Vital signs are within normal limits. Examination shows a uterus consistent in size with a 24-week gestation. Pelvic ultrasonography shows oligohydramnios and a fetus with a misshapen cranium, pericardial effusion, small bladder, and echogenic bowel. The most likely cause of the fetal abnormalities in this patient’s pregnancy is interference with which of the following?

- (A) Fetal lung/epithelial differentiation
- (B) Fetal lung/surfactant development
- (C) Fetal renal hemodynamics
- (D) Maternal placental perfusion
- (E) Maternal prostaglandin synthesis



62. Despite appropriate care in the ambulance, a 64-year-old woman dies en route to the emergency department 30 minutes after the sudden onset of respiratory distress. Her medical history is unknown. A photomicrograph of lung tissue obtained at autopsy is shown. Based on these findings, which of the following is the most likely underlying cause of this patient's death?

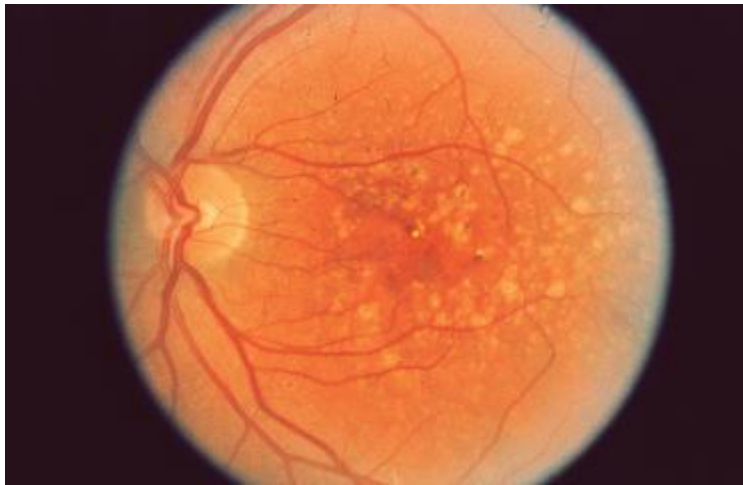
- (A) Bilateral bronchopneumonia
- (B) Bronchial asthma
- (C) Massive myocardial infarction
- (D) Thromboembolus in bronchial artery
- (E) Viral pneumonia

63. A 78-year-old man comes to the office for a follow-up examination. He was discharged from the hospital 1 week ago after being treated for a nontuberculous mycobacterial infection. He started treatment with ciprofloxacin and rifampin at that time. He also has hypertension and underwent placement of a mechanical aortic valve 6 years ago for aortic stenosis. Other current medications are hydrochlorothiazide, lisinopril, and warfarin. His warfarin dose was doubled 4 days ago. He says that he is trying to follow a healthier diet. He drinks two 12-oz beers daily. Results of laboratory studies done 4 days ago and today are shown

	4 Days Ago	Today
Prothrombin time	11 sec (INR=1)	11.2 sec (INR=1.1)
Partial thromboplastin time	29 sec	27 sec

Which of the following is the most likely cause of this patient's laboratory findings?

- (A) Decreased protein binding
- (B) Eradication of gut flora
- (C) Increased alcohol intake
- (D) Increased vegetable consumption
- (E) Induction of cytochrome enzymes



64. **Patient Information**

Age: 80 years

Gender: F, self-identified

Race/Ethnicity: African American, self-identified

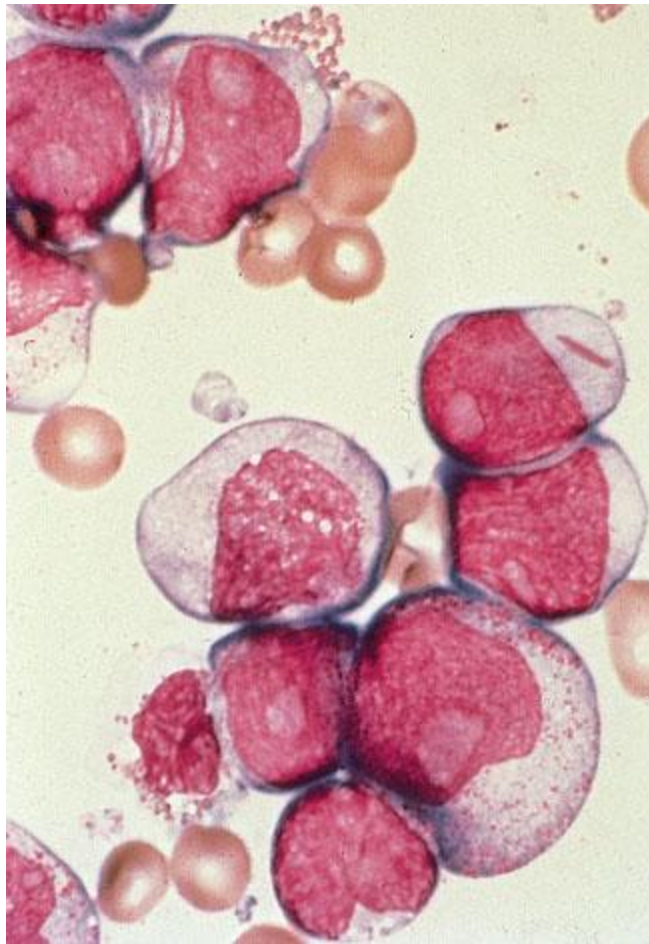
Site of Care: office

The patient presents because of a 5-month history of reduced vision that she notices especially when reading and driving. She says that the vision in her right eye is worse than in her left eye. She also now requires brighter light while doing her sewing and quilting hobbies. She reports no eye pain. Medical history is remarkable for hypertension and hypercholesterolemia. Medications are amlodipine, hydrochlorothiazide, and atorvastatin. Family history is remarkable for glaucoma in her mother and type 2 diabetes mellitus in her father. The patient drinks one glass of wine with dinner three times weekly. She has never smoked cigarettes or used any other substances. She wears prescription eye glasses; she was last evaluated by her optometrist 8 months ago. She is 168 cm (5 ft 6 in) tall and weighs 68 kg (150 lb); BMI is 24 kg/m². Temperature is 37.0°C (98.6°F), pulse is 68/min, respirations are 12/min, and blood pressure is 125/75 mm Hg. Visual acuity is 20/140 in the right eye and 20/100 in the left eye. Dilated funduscopic examination of the left eye discloses the findings shown; there are similar findings in the right eye. The remainder of the physical examination discloses no abnormalities. Which of the following factors in this patient's history most increased her risk for developing this condition?

- (A) Age
- (B) Alcohol consumption

- (C) Ethnicity
 - (D) Family history
 - (E) Hypertension
-

65. A 4-year-old boy develops fever 3 weeks after being admitted to the hospital for induction chemotherapy for treatment of acute lymphoblastic leukemia. Chemotherapy medications are L-asparaginase, dexamethasone, doxorubicin, and vincristine. His temperature is 38.2°C (100.8°F), pulse is 122/min, and respirations are 24/min. Physical examination shows pallor, alopecia, and ulcerations over the gums. A central venous catheter with entry site in the right upper chest is present but has no surrounding erythema. A blood culture grows gram-negative rods after 36 hours. Which of the following underlying mechanisms is the most likely cause of this patient's susceptibility to infection?
- (A) Deficiency of terminal complement
 - (B) Hypogammaglobulinemia
 - (C) Impaired T-lymphocyte function
 - (D) Inhibition of tumor necrosis factor α function
 - (E) Neutropenia
66. A randomized clinical trial is conducted to compare wound healing and cosmetic differences between two surgical procedures for closing skin wounds following cesarean delivery. A total of 1000 women undergoing cesarean delivery during a 6-month period are enrolled in the study, which was 85% of the total number of patients undergoing the procedure. The results show a wound infection rate of 12 cases per 1000 women for Procedure A and 18 cases per 1000 women for Procedure B. Which of the following is the best estimate of the absolute risk reduction for wound infection following Procedure A compared with Procedure B?
- (A) $(18/1000) - (12/1000)$
 - (B) $0.85 \times (12/1000)$
 - (C) $0.85 \times (18/1000)$
 - (D) $[0.85 \times (18/1000 - 12/1000)]$
 - (E) $[(1.2/100) - (1.8/100)] / (1.8/100)$



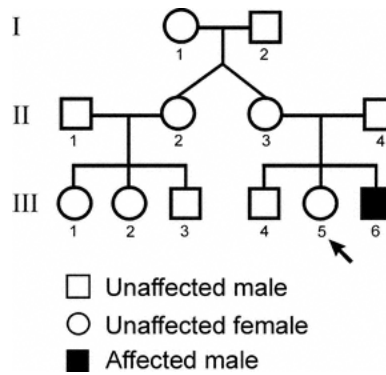
67. A 67-year-old man is brought to the emergency department because of a 2-day history of increasingly severe fever, bleeding gums, cough, and chest pain. He also has a 3-week history of fatigue and easy bruising. He takes no medications. He has smoked 2 packs of cigarettes daily for 40 years. Temperature is 38.4°C (101.2°F), and respirations are 24/min; other vital signs are within normal limits. Physical examination shows petechiae around the eyes and over the lower extremities, and ecchymoses over the forearms. Results of laboratory studies are shown:

Hemoglobin	10 g/dL
Hematocrit	32%
Leukocyte count	24,500/mm ³
Segmented neutrophils	5%
Eosinophils	5%
Lymphocytes	40%
Monocytes	50%
Platelet count	18,000/mm ³

Chest x-ray shows a right lower lobe infiltrate. A photomicrograph of a peripheral blood smear is shown. Which of the following is the most likely diagnosis?

- (A) Acute lymphocytic leukemia
- (B) Acute myelogenous leukemia
- (C) Chronic lymphocytic leukemia
- (D) Chronic myelogenous leukemia

68. A 45-year-old man is brought to the emergency department 30 minutes after the sudden onset of crushing chest pain. His father, maternal aunt, and paternal uncle all died of myocardial infarctions under the age of 50 years. Physical examination shows tendinous xanthomas on the hands and thickened Achilles tendons. Serum lipid studies show a total cholesterol concentration of 410 mg/dL, HDL-cholesterol concentration of 30 mg/dL, and triglyceride concentration of 140 mg/dL. The diagnosis of myocardial infarction is made. This patient most likely has a deficiency of which of the following?
- (A) Apo B48
 - (B) Apo C
 - (C) HMG-CoA reductase activity
 - (D) LDL receptor
 - (E) Lipoprotein lipase activity
69. A 5-year-old boy is brought to the office by his father because of bed-wetting. The patient began toilet training at age 3 years and achieved daytime continence within 6 months. However, he continues to have bed-wetting episodes at night 2 to 3 times weekly and has never achieved full bladder control. He has not had fever, polydipsia, abdominal pain, dysuria, or constipation. He has no history of serious illness and receives no medications. He is currently in pre-kindergarten and has adjusted well to his new school environment. Growth and development have been normal; he is at the 50th percentile for height, weight, and BMI. Vital signs are within normal limits. Physical examination shows no abnormalities. Results of dipstick urinalysis are within the reference ranges. Which of the following is the most likely underlying cause of this patient's condition?
- (A) Abnormal insertion of the terminal ureter
 - (B) Bladder colonization leading to recurrent urinary tract infection
 - (C) Delayed maturation of detrusor and sphincter control
 - (D) Occult neurologic lesion leading to disruption of bladder innervation
 - (E) Retrograde flow of urine from the bladder into the ureter
70. A 5-year-old boy is brought to the emergency department by his mother because of an episode of bloody stool 3 hours ago. The mother says the stool was hard "like pebbles" and she noted bright red blood on the tissue when the patient cleaned himself. His previous bowel movement was 5 days ago. The patient has no abdominal or rectal pain now, but he did have abdominal pain during his bowel movement 5 days ago. He has no history of major medical illness and receives no medications. Vaccinations are up-to-date. The patient has no recent history of travel. He is at the 5th percentile for height and the 10th percentile for weight; BMI is at the 50th percentile. Vital signs are within normal limits. Abdominal examination shows hypoactive bowel sounds and a soft, slightly distended abdomen that is not tender to palpation. Rectal examination shows 1 cm of bright red rectal mucosa protruding from the right side of the anus; there is no rectal bleeding. The remainder of the examination shows no abnormalities. Which of the following is the most likely cause of this patient's physical findings?
- (A) Constipation
 - (B) Cystic fibrosis
 - (C) Hirschsprung disease
 - (D) Hookworm infestation
 - (E) Intussusception



71. A 27-year-old nulligravid woman (individual III-5 in the pedigree shown) comes to the physician for counseling prior to conception. She is concerned about her risk for having a child with cystic fibrosis because her 20-year-old brother has this disease. Which of the following best approximates the risk for this patient to be a carrier of cystic fibrosis?
- (A) 1 of 2
 (B) 1 of 3
 (C) 1 of 4
 (D) 2 of 3
 (E) 3 of 4
-
72. A 45-year-old woman is brought to the emergency department 30 minutes after the sudden onset of crushing chest pain. She rates the pain as 10 on a 10-point scale. She takes no medications and uses no substances. Pulse is 136/min, and systolic blood pressure is 70 mm Hg. ECG shows sinus tachycardia with ST-segment elevation in leads V₁ through V₃ and ST-segment depression in leads II, III, and aVF. The physician plans to administer a drug to increase this patient's blood pressure without increasing her pulse. The most appropriate pharmacotherapy for this patient is from which of the following drug classes?
- (A) α -Adrenergic agonist
 (B) α -Adrenergic antagonist
 (C) β -Adrenergic agonist
 (D) β -Adrenergic antagonist
 (E) Dopamine agonist
73. A 5-year-old girl is brought to the emergency department because of a 2-day history of fever, urinary urgency, and burning pain with urination. She has had four similar episodes during the past year. A diagnosis of urinary tract infection is made. Subsequent renal ultrasonography shows one large U-shaped kidney. Which of the following is the most likely embryologic origin of this patient's condition?
- (A) Failure of the kidneys to rotate 90 degrees medially
 (B) Failure of normal kidney ascent
 (C) Failure of one ureteric bud to develop normally
 (D) Fusion of the inferior poles of the metanephros during ascent

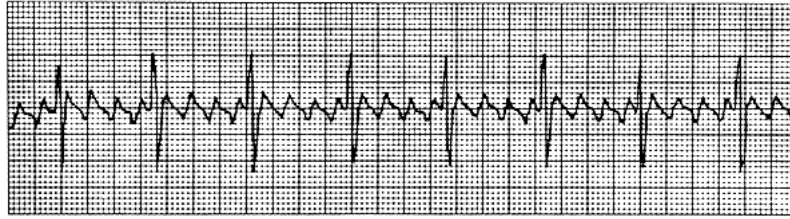
74. A 16-year-old boy comes to the clinic because of a "pimple" on his scrotum for the past 3 days. He tells the physician that he is worried he might have a sexually transmitted infection. Which of the following is the most appropriate initial response by the physician?
- (A) "Are you sexually active with men, women, or both?"
 - (B) "Does your mother know you are sexually active?"
 - (C) "I'm glad you came in today and told me about this."
 - (D) "What kind of protection do you use when you have sex?"
 - (E) "When was your last sexual experience?"
75. A 54-year-old woman comes to the physician because she would like to lose weight. She has been on numerous diets in the past with limited success. Both her parents have type 2 diabetes mellitus. She is 160 cm (5 ft 3 in) tall and weighs 69 kg (152 lb); BMI is 27 kg/m². Her blood pressure is 140/90 mm Hg. Fasting serum glucose concentration is 102 mg/dL. Compared with a woman of the same age whose weight is normal, which of the following serum abnormalities is most likely in this patient?
- (A) Decreased cholesterol excretion
 - (B) Decreased estrone concentration
 - (C) Decreased leptin concentration
 - (D) Increased fasting insulin concentration
 - (E) Increased growth hormone concentration
 - (F) Increased thyroid-stimulating hormone concentration
76. A 17-year-old boy is brought to the clinic for a follow-up examination. He has been evaluated for three episodes of full-body weakness at the ages of 13, 16, and 17 years. Each episode occurred when he lay down after playing in a football scrimmage. The weakness improved spontaneously during the next 6 hours; he was asymptomatic by the time he was evaluated by medical personnel. The patient attributes the episodes to eating "a lot of pasta and salty foods" prior to playing football. Results of a complete blood count and comprehensive metabolic profile following each episode have been within the reference ranges. He has no history of serious illness and takes no medications. Vital signs are within normal limits. Physical and neurologic examinations disclose no abnormalities. Which of the following serum concentrations is most likely to be abnormal if measured during one of this patient's episodes?
- (A) Calcium
 - (B) Chloride
 - (C) Magnesium
 - (D) Potassium
 - (E) Sodium
77. A 26-year-old man comes to the office because of a 1-week history of increased urinary frequency accompanied by excessive thirst. He says he has been urinating hourly. Physical examination shows no abnormalities. Serum chemistry studies are within the reference ranges. Urine osmolality is 50 mOsmol/kg H₂O. After administration of ADH (vasopressin), his urine osmolality is within the reference range. The most likely cause of this patient's symptoms is dysfunction of which of the following structures?
- (A) Anterior pituitary gland
 - (B) Bowman capsule
 - (C) Glomerulus
 - (D) Hypophysial portal system
 - (E) Loop of Henle
 - (F) Supraoptic nucleus

78. A 25-year-old man comes to the physician 1 month after he noticed a painless lump on his right testicle. Physical examination shows a 3-cm, nontender, firm nodule in the right testis. Testicular ultrasonography shows a solid mass. The testicle is removed, and microscopic examination of the tumor shows round cells with clear cytoplasm and a prominent, centrally placed nucleus. This patient most likely has which of the following testicular neoplasms?
- (A) Embryonal carcinoma
 - (B) Seminoma
 - (C) Sertoli cell tumor
 - (D) Teratoma
 - (E) Yolk sac tumor
79. A 2-week-old male newborn is brought to the office for a well-child examination. He was delivered following an uncomplicated, spontaneous vaginal delivery at 41 weeks' gestation. The mother has no history of serious illness and did not receive prenatal care. Her only medication is a prenatal vitamin. She has consumed large amounts of vodka nightly for 10 years. Which of the following examination findings is most likely to be present in this patient?
- (A) Hypospadias
 - (B) Limb hypoplasia
 - (C) Neck webbing
 - (D) Short palpebral fissures
 - (E) Spasticity
80. A 25-year-old woman, gravida 1, para 1, comes to the office because of a 2-week history of palpitations and heat intolerance. She delivered her child 3 months ago following an uncomplicated pregnancy and delivery. She is breast-feeding. She has no history of serious illness and takes no medications. She is 163 cm (5 ft 4 in) tall and weighs 54 kg (120 lb); BMI is 21 kg/m². Temperature is 37°C (98.6°F), pulse is 106/min, respirations are 20/min, and blood pressure is 124/68 mm Hg. Examination shows moist palms and bilateral lid lag. No exophthalmos is noted. The thyroid gland is enlarged and nontender. No murmurs are heard on cardiac examination. Deep tendon reflexes are 3+. Serum studies show an undetectable TSH concentration, thyroxine (T₄) concentration of 20 µg/dL, and triiodothyronine (T₃) concentration of 275 ng/dL. Which of the following is the most likely mechanism of this patient's symptoms?
- (A) Activation of mutations of TSH receptors
 - (B) Increased serum thyroglobulin concentration
 - (C) Ischemic injury to the hypothalamus
 - (D) Lymphocytic infiltration of the thyroid
 - (E) Presence of TSH receptor autoantibodies

USMLE STEP 1 SAMPLE TEST QUESTIONS

BLOCK 5, ITEMS 81-100

81. A screening test for breast cancer is administered to 1000 women with biopsy-proven breast cancer and to 1000 women without breast cancer. The test results are positive for 250 of the subjects with breast cancer and 100 of the subjects without breast cancer. The screening test is now to be used on a population of 100,000 women with a known prevalence rate of breast cancer of 80 per 100,000. Which of the following is the expected number of false-positives?
- (A) 20
 - (B) 80
 - (C) 8993
 - (D) 9992
 - (E) 10,012
82. A 73-year-old man is brought to the emergency department by his family 1 hour after he walked into the left side of a door frame when leaving his bedroom and then tripped over a chair that was on his left side. Visual field testing shows left lower quadrantanopia. When tactile stimuli are presented on both the left and right sides simultaneously, the patient correctly identifies only the ones on the right. Further examination shows no motor or language deficits. Proprioception is intact. This patient most likely has a brain lesion in which of the following lobes?
- (A) Left frontal
 - (B) Left parietal
 - (C) Left temporal
 - (D) Right frontal
 - (E) Right parietal
 - (F) Right temporal
83. A female newborn born at term is found to have ocular hypertelorism, a short philtrum, and micrognathia. One day later, she develops cyanosis and labored breathing. Echocardiography shows an interrupted aortic arch. An immediate balloon septostomy is done. Two days later, she develops hypocalcemic tetany. The most likely cause of this patient's condition is a defect in which of the following chromosomes?
- (A) 13
 - (B) 14
 - (C) 18
 - (D) 21
 - (E) 22



84. A 75-year-old man comes to the office because of a 2-month history of episodes of palpitations accompanied by light-headedness, shortness of breath, and fatigue. He has a history of alcohol use disorder and has been hospitalized twice in the past 3 years for episodes of acute pancreatitis. He has no other history of serious illness and he takes no medications. He is 173 cm (5 ft 8 in) tall and weighs 51 kg (112 lb); BMI is 17 kg/m². Temperature is 37.0°C (98.6°F), pulse is 75/min, respirations are 15/min, and blood pressure is 140/90 mm Hg. Physical examination shows no other abnormalities. ECG is shown. This patient most likely has abnormal electrical activity originating in which of the following structures?

- (A) Atrioventricular node
- (B) Bundle of His
- (C) Left ventricle
- (D) Purkinje fibers
- (E) Right atrium
- (F) Sinoatrial node

85. A 52-year-old woman comes to the emergency department 30 minutes after an episode of vomiting blood. She has osteoarthritis of the knees. Current medications are topical 1% diclofenac applied to both knees and oral ibuprofen. Family history is noncontributory. The patient does not smoke cigarettes, drink alcoholic beverages, or use other substances. She is divorced and has one adult child. The patient is 170 cm (5 ft 7 in) tall and weighs 122 kg (270 lb); BMI is 42 kg/m². Temperature is 37.0°C (98.6°F), pulse is 120/min, respirations are 12/min, and blood pressure is 90/50 mm Hg. Physical examination discloses epigastric tenderness. No other abnormalities are noted. Test of the stool for occult blood is positive. Which of the following is the most likely underlying cause of this patient's condition?

- (A) Generation of nitric oxide
- (B) Increased prostaglandin production
- (C) Induction of pro-inflammatory cytokines
- (D) Inhibition of cyclooxygenase-1
- (E) Pre-absorptive topical injury to gastric epithelial cells

86. A male newborn is delivered in the hospital via cesarean delivery at 38 weeks' gestation to a 23-year-old primigravid woman. Pregnancy was complicated by oligohydramnios caused by uteroplacental insufficiency and discovered on prenatal ultrasonography at 37 weeks' gestation. Apgar scores are 7 and 9 at 1 and 5 minutes, respectively. The newborn appears small for gestational age. Physical examination shows short feet that point downwards and are turned inwards at the ankle. The remainder of the physical examination shows no abnormalities. Which of the following disorders of development is the most likely cause of the findings in this patient?

- (A) Deformation
- (B) Disruption
- (C) Dysplasia
- (D) Malformation

87. A 19-year-old man who is in the US Army is brought to the emergency department 45 minutes after he sustained a knife wound to the right side of his chest during an altercation. He has no history of major medical illness and takes no medications. His temperature is 36.9°C (98.4°F), pulse is 110/min, respirations are 24/min, and blood pressure is 114/76 mm Hg. Pulse oximetry on room air shows an oxygen saturation of 94%. On physical examination, the trachea appears to be shifted to the left. Pulmonary examination of the right chest is most likely to show which of the following findings?

	Fremitus	Percussion	Breath Sounds
(A)	Decreased	Dull	Decreased
(B)	Decreased	Hyperresonant	Decreased
(C)	Decreased	Hyperresonant	Dull
(D)	Increased	Dull	Bronchial
(E)	Increased	Dull	Decreased

88. A previously healthy 22-year-old man is brought to the emergency department 30 minutes after being involved in a motor vehicle collision. Physical examination shows multiple superficial and deep lacerations. His blood loss is estimated to be 20% of total volume. He is taken to the operating room, and his bleeding is immediately controlled. A peripheral blood smear is most likely to show which of the following erythrocyte morphologic findings in 10 days?

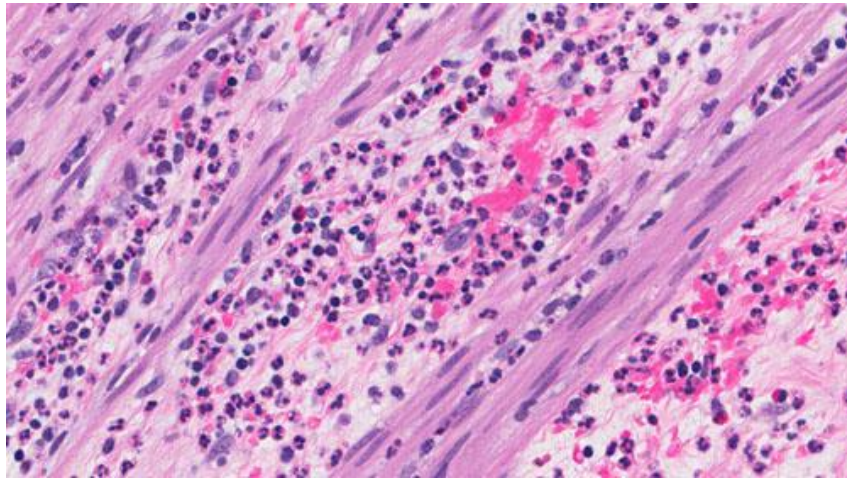
- (A) Heinz bodies
- (B) Hypochromia
- (C) Microspherocytosis
- (D) Polychromasia
- (E) Siderotic granules

89. A 53-year-old man comes to the physician because of a dry scaly rash on his body for the past year. He has had a 15-kg (33-lb) weight loss during the past year. He is 178 cm (5 ft 10 in) tall and now weighs 54 kg (120 lb); BMI is 17 kg/m². His stools have a large volume and float. Which of the following nutrient deficiencies is most likely?

- (A) Magnesium
- (B) Vitamin A
- (C) Vitamin B₁₂ (cobalamin)
- (D) Vitamin C
- (E) Zinc

90. A 22-year-old woman with sickle cell disease comes to the emergency department because of a 3-day history of blood in her urine. She does not have pain with urination, increased urinary frequency, nausea, or vomiting. Her temperature is 37°C (98.6°F), pulse is 90/min, respirations are 18/min, and blood pressure is 128/88 mm Hg. Physical examination shows no abnormalities. A spiral CT scan shows findings suggestive of papillary necrosis. Which of the following sets of renal medullary findings most likely increased this patient's risk for her condition?

	Oxygen Tension	Osmolality
(A)	Increased	Increased
(B)	Increased	Decreased
(C)	Decreased	Increased
(D)	Decreased	Decreased



91. A 34-year-old woman is brought to the emergency department because of a 6-hour history of nausea, vomiting, and increasingly severe abdominal pain. She has no history of serious illness and takes no medications. She appears acutely ill. Temperature is 40.0°C (104.0°F), pulse is 121/min, respirations are 15/min, and blood pressure is 130/85 mm Hg. Pulse oximetry on room air shows an oxygen saturation of 98%. Physical examination shows rebound tenderness over the right lower quadrant. She undergoes an appendectomy. A photomicrograph of the resected specimen is shown. Which of the following is the most likely cause of the microscopic findings in this patient?
- (A) Bradykinin
 - (B) Histamine
 - (C) Leukotriene
 - (D) Lipoxin
 - (E) Thromboxane
-

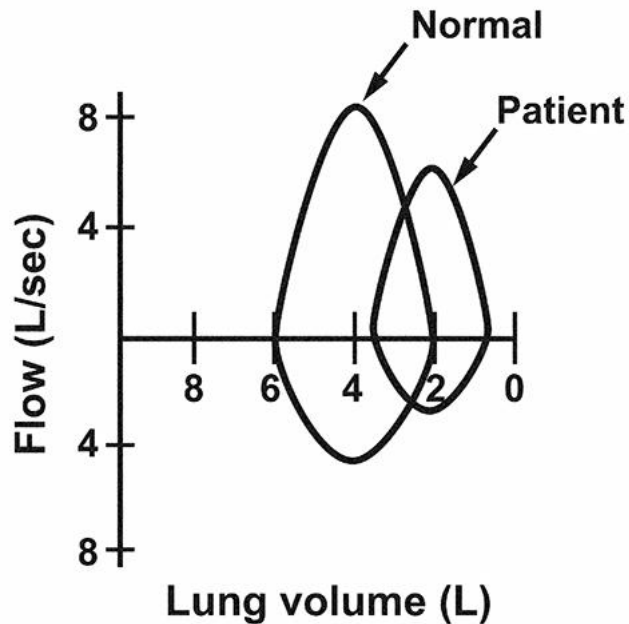
92. A 15-year-old boy is brought to the emergency department by his mother because he was expelled from school that day for carrying several knives. He seems agitated and fearful. His speech is intermittently incoherent. His mother says, "He has been very upset since hearing about a school shooting last week in another part of the city. He was fine before then, both at school and with his friends." After his mother leaves the examination room to wait in the reception area, the patient says, "I know I'm going to be hurt at school because the voice tells me so. The dark eyes I see at night are also warning me, but they scare me." He adds, "Sometimes I think my mother will stab me in my sleep." His pulse is 88/min, and respirations are 18/min. Routine laboratory studies show no abnormalities. Urine toxicology screening is negative. Which of the following is the most likely diagnosis?
- (A) Adjustment disorder with anxiety
 - (B) Brief psychotic disorder
 - (C) Post-traumatic stress disorder
 - (D) Schizophrenia
 - (E) Schizotypal personality disorder

93. A 10-year-old boy is brought to the emergency department in the middle of summer because of fever, headache, and photophobia. Several of his camp mates have had a similar illness. Physical examination shows mild nuchal rigidity. A lumbar puncture is performed. Laboratory studies show:

Serum glucose	90 mg/dL
Cerebrospinal fluid	
Pressure, opening	50 mm H ₂ O
Glucose	65 mg/dL
Total protein	70 mg/dL
Leukocyte count	43/mm ³ (95% lymphocytes)

Which of the following infectious agents is the most likely cause of these findings?

- (A) Adenovirus
- (B) Enterovirus
- (C) Herpes simplex virus
- (D) *Neisseria meningitidis*
- (E) *Streptococcus pneumoniae*



94. An 85-year-old woman is brought to the office because of a 4-month history of progressive shortness of breath. She is 163 cm (5 ft 4 in) tall and weighs 40 kg (88 lb); BMI is 15 kg/m². Her temperature is 37.8°C (100°F), pulse is 80/min, respirations are 12/min, and blood pressure is 135/85 mm Hg. Pulmonary and cardiac examinations show no abnormalities. Diaphragmatic excursion is 1.5 cm on percussion. Pulmonary function testing shows:

FEV ₁	26% of predicted
FVC	26% of predicted
FEV ₁ /FVC	1.0
Total lung capacity	54% of predicted
Functional residual capacity	87% of predicted
Residual volume	120% of predicted
Diffusing capacity for carbon monoxide	100% of predicted

Arterial blood gas analysis on room air shows:

pH	7.33
PCO ₂	48 mm Hg
PO ₂	70 mm Hg
HCO ₃ ⁻	25 mEq/L
O ₂ saturation	92%

A flow-loop diagram is shown. Based on these findings, which of the following is the most likely cause of this patient's condition?

- (A) Decreased lung elasticity
 - (B) Decreased respiratory muscle strength
 - (C) Decreased surfactant production
 - (D) Increased alveolar surface tension
 - (E) Increased bronchial mucous secretions
 - (F) Increased lung compliance
-

95. A 25-year-old woman comes to the physician because of a long history of pain with menses. The pain occurs on the first day of her 5-day menstrual period and lasts all day. She rates the pain as 10 on a 10-point scale. The most appropriate initial pharmacotherapy to relieve this patient's pain has which of the following mechanisms of action?

- (A) Inhibition of estrogen synthesis
- (B) Inhibition of 11 β -hydroxylase activity
- (C) Inhibition of prostaglandin synthesis
- (D) Stimulation of follicle-stimulating hormone synthesis
- (E) Stimulation of luteinizing hormone synthesis

96. A 60-year-old woman is brought to a medical tent 2 minutes after she collapsed after running 32.2 km (20 mi) of a 42.2-km (26-mi) marathon. On arrival, the patient is awake but appears lethargic. She felt fatigued and confused immediately before the collapse. The ambient outdoor temperature is 90.0°F. The patient drank fluids along the route. She has no history of serious illness and has trained regularly for marathons during the past 12 months. She takes no medications. Temperature is 38.3°C (100.9°F), pulse is 110/min, respirations are 22/min, and blood pressure is 90/60 mm Hg. Physical examination shows dry mucous membranes and decreased skin turgor. Which of the following changes most likely occurred in this patient's kidneys until her collapse?

- (A) Decreased ADH (vasopressin) receptors
- (B) Decreased renin production
- (C) Decreased urine osmolality
- (D) Increased aquaporin expression
- (E) Increased glomerular filtration rate
- (F) Increased reabsorption of albumin

97. A 19-year-old man who is a college freshman comes to the office because of a 4-day history of tender, swollen glands. He also has a 6-day history of fever, malaise, and decreased appetite. His temperature is 38.7°C (101.7°F). Physical examination shows swelling of the parotid glands. Which of the following infectious agents is the most likely cause of these findings?
- (A) Epstein-Barr virus
 - (B) Hepatitis B virus
 - (C) Measles virus
 - (D) Mumps virus
 - (E) Rubella virus
98. A 64-year-old man who was recently diagnosed with melanoma comes to the office to discuss treatment. During previous examination, multiple metastatic lesions were identified for which surgical resection is not possible. He is 185 cm (6 ft 1 in) tall and weighs 79 kg (175 lb); BMI is 23 kg/m². His temperature is 36.4°C (97.5°F), pulse is 72/min, respirations are 18/min, and blood pressure is 130/80 mm Hg. Physical examination shows no changes since the previous visit. Antibody blockade targeting which of the following molecules is most likely to provide the most benefit to this patient?
- (A) B7
 - (B) CD28
 - (C) CD40
 - (D) CTLA4
 - (E) FcγR
99. A 78-year-old woman is admitted to the hospital because of a 1-week history of jaundice. CT scan of the abdomen shows a mass suggestive of pancreatic cancer. Three hours later, the on-call physician enters the patient's room to discuss the prognosis and obtain consent for a biopsy scheduled for the next morning. On entering the room, the physician greets the patient and her husband. The physician then learns that the patient speaks only Mandarin. Her husband is fluent in Mandarin and English. The hospital interpreter is not available until tomorrow morning. The patient's husband appears anxious and insists that the physician speaks to him and allows him to serve as an interpreter for his wife. Which of the following is the most appropriate next step in management?
- (A) Allow the patient's husband to serve as an interpreter
 - (B) Consult the hospital ethics committee
 - (C) Explain to the husband that information cannot be provided until the hospital interpreter arrives in the morning
 - (D) Use a telephone interpreter service
100. A 5-month-old boy is brought to the clinic by his mother because of a 10-day history of “coughing spells” that occur several times daily and last 1 to 2 minutes; he often vomits afterward. He was delivered at term to a 20-year-old primigravid patient following an uncomplicated pregnancy and spontaneous vaginal delivery. He has no history of major medical illness and receives no medications. He has never been to a physician for a well-child examination and has not received any vaccinations. He appears well. Vital signs and oxygen saturation on room air are within normal limits. During the physical examination, he coughs uncontrollably for 2 minutes, after which there is a gasping sound and subsequent vomiting. Afterwards, he appears exhausted. Physical examination shows no nasal flaring or intercostal or subcostal retractions. The lungs are clear; no wheezes or crackles are heard. A drug from which of the following classes is most appropriate for this patient?
- (A) Cephalosporin
 - (B) Fluoroquinolone
 - (C) Macrolide
 - (D) Penicillin
 - (E) Sulfonamide

USMLE STEP 1 SAMPLE TEST QUESTIONS

BLOCK 6, ITEMS 101-119

101. A 25-year-old man comes to the office because of a 4-hour history of irritability, restlessness, tremor, and palpitations. He is a known user of amphetamines. His pulse is 120/min, respirations are 25/min, and blood pressure is 150/100 mm Hg. Physical examination shows no abnormalities. The most likely cause of this patient's symptoms is sympathomimetic activity arising from which of the following?
- (A) Decreased intracellular metabolism of biogenic amines
 - (B) Decreased monoamine oxidase activity
 - (C) Decreased presynaptic receptor activation
 - (D) Increased intracellular metabolism of biogenic amines
 - (E) Increased presynaptic receptor activation
 - (F) Increased release of biogenic amines
102. A previously healthy 19-year-old man is brought to the emergency department 30 minutes after he collapsed while playing softball. He had severe, sharp, upper back pain prior to the game. He is 196 cm (6 ft 5 in) tall. His temperature is 37°C (98.6°F), pulse is 130/min, respirations are 24/min, and blood pressure is 80/50 mm Hg. Physical examination shows pallor and no jugular venous distention. Breath sounds are clear. The carotid pulses are weak. A grade 4/6, late diastolic murmur is heard at the lower left sternal border. Which of the following is the most likely cause of this patient's cardiac findings?
- (A) Atrial septal defect
 - (B) Mitral stenosis
 - (C) Papillary muscle rupture
 - (D) Perforated tricuspid valve
 - (E) Stretched aortic anulus
103. A 78-year-old woman with bronchogenic carcinoma undergoes an operation for a pathologic fracture of the left humerus. She says she had muscle weakness before the operation. Sevoflurane and pancuronium are used perioperatively. Postoperatively, the patient has profound residual neuromuscular block. An intercostal muscle biopsy specimen is obtained as part of a clinical trial, and electrophysiologic evaluation is done. Results show:

	EPP Amplitude (mV)	MEPP Amplitude (mV)	Response to Acetylcholine (mV)
Healthy muscle	10	1	1
Patient muscle	3	1	1

EPP=end-plate potential; MEPP=miniature EPP; 1 μM acetylcholine was applied to the muscle surface by iontophoresis

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

- (A) Adverse effect of pancuronium
- (B) Adverse effect of sevoflurane
- (C) Cholinergic crisis
- (D) Myasthenia gravis
- (E) Myasthenic (Lambert-Eaton) syndrome

104. A 28-year-old man comes to the office for laboratory testing after learning that several of his first-degree family members have abnormal serum calcium concentrations. He has no symptoms. He has no history of serious illness, including no renal calculi, fractures, or hypocalcemia. He takes no medications. Vital signs are within normal limits. Physical examination shows no abnormalities. Results of laboratory studies are shown:

Serum	
Ca ²⁺	11.3 mg/dL
Parathyroid hormone, intact	112 pg/mL (N=10–65)
Urine calcium	42 mg/24 h
	(fractional excretion of calcium in the urine is less than 1%)

The most likely underlying cause of the laboratory findings in this patient is a mutation of which of the following?

- (A) Calcitonin gene-related peptide receptor
 - (B) Calcitonin receptor
 - (C) Calcium-sensing receptor
 - (D) Parathyroid hormone receptor
 - (E) Receptor activator of nuclear factor κ B
 - (F) Vitamin D receptor
-
105. A 32-year-old woman with stage IV breast cancer is admitted to the hospital for management of malignant right-sided pleural effusion. This is her third admission during the past month for management of pleural effusion. During each admission, she underwent several large-volume thoracenteses over several days. Her cancer has progressed despite trials of multiple chemotherapy regimens. She is not a candidate for curative treatment. The patient lives with her wife and two young children. Today, the patient says she is "done" with being in the hospital and does not want to undergo thoracentesis again. Which of the following is the most appropriate physician response?
- (A) "I am so sorry to hear that you're giving up."
 - (B) "I imagine that this must be very difficult, but you should try to endure this for your wife and children."
 - (C) "I'd like to hear about your goals for the time you have remaining."
 - (D) "I'd like you to speak to one of my colleagues before making any decisions to ensure that you aren't depressed."
 - (E) "It's common for patients to hate thoracentesis procedures. You are not alone."
106. A 3800-g (8-lb 6-oz) newborn is delivered vaginally at 39 weeks' gestation after an uncomplicated pregnancy. Apgar scores are 9 and 9 at 1 and 5 minutes, respectively. The newborn is crying, has pink skin, and appears vigorous. Physical examination shows a vagina and also a structure that appears to be a penis, with the urethra located at the base near the opening of the vagina. Chromosomal analysis is ordered. Which of the following is the most likely cause of the intersex findings in this newborn if the karyotype is found to be 46,XX?
- (A) 17 α -Hydroxyprogesterone deficiency
 - (B) Increased concentration of müllerian-inhibiting substance
 - (C) Maternal androgen exposure
 - (D) Presence of the sex-determining region Y gene
 - (E) 5 α -Reductase deficiency



107. A 37-year-old man comes to the office because of a 3-week history of itchy patches of skin and a burning sensation in his feet. He works as a dishwasher and says he frequently works in wet shoes and socks. Vital signs are within normal limits. Physical examination shows the findings in the photograph; these findings are also present on the soles of both feet. The most appropriate pharmacotherapy for this patient will inhibit the activity of which of the following enzymes?
- (A) Chitin synthase
 - (B) 1,3- β -D-Glucan synthase complex
 - (C) Phospholipase D
 - (D) Squalene monooxygenase
 - (E) Thymidylate synthase
-
108. A 27-year-old woman is brought to the emergency department because of a 2-week history of double vision. Neurologic examination shows that the left eye does not adduct past the midline on horizontal gaze when the patient looks to the right. Leftward horizontal gaze is normal. This patient's ocular movement deficit is most likely caused by damage to which of the following structures?
- (A) Left abducens nerve
 - (B) Left medial longitudinal fasciculus
 - (C) Left nucleus of the abducens nerve
 - (D) Right abducens nerve
 - (E) Right medial longitudinal fasciculus
 - (F) Right nucleus of the abducens nerve
109. A 50-year-old man comes to the office for a follow-up examination. He has a 2-month history of headache and shortness of breath with exertion. He also has hypertension treated with hydrochlorothiazide for the past 2 years. His blood pressure is 180/105 mm Hg. Ophthalmoscopic examination is most likely to show which of the following in this patient?
- (A) Arteriovenous nicking
 - (B) Melanocytes in the uvea
 - (C) Optic neuritis
 - (D) Posterior subcapsular cataracts
 - (E) Tractional retinal detachment

110. A 16-day-old male newborn is brought to the office by his parents because of a 2-day history of yellow-tinged skin and dark urine in his diapers. He was delivered via spontaneous vaginal delivery at 36 weeks' gestation. He weighed 3799 g (8 lb 6 oz; 75th percentile) at birth. He was discharged from the hospital after successfully breast-feeding for 24 hours with normal growth and weight gain. At that time, physical examination showed no abnormalities. Since then, appetite has been normal. Today, he is 51 cm (20 in; 25th percentile) long and weighs 3600 g (7 lb 15 oz; 25th percentile); head circumference is 36 cm (14 in; 75th percentile). Vital signs are within normal limits. Physical examination shows conjunctival icterus. Neurologic examination shows no focal findings. Results of complete blood count are within the reference ranges. Results of serum studies are shown:

Bilirubin, total	20 mg/dL
Direct	14 mg/dL
Alkaline phosphatase	162 U/L
AST	102 U/L (N=22–71)
ALT	70 U/L (N=10–40)
γ -Glutamyltransferase [GGT]	165 U/L (N=13–147)

Which of the following is the most likely underlying cause of the findings in this patient?

- (A) Deficiency of UDP glucuronosyltransferase
 - (B) Hemolysis
 - (C) Low activity of bile canalicular MRP transporter
 - (D) Obstruction of bile flow
-

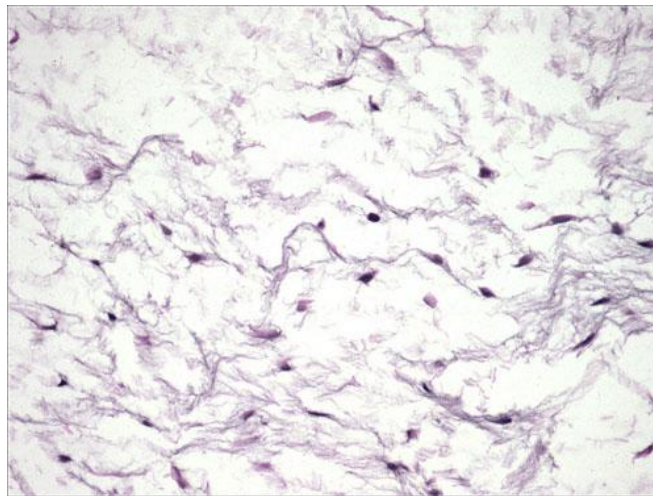
111. A 21-year-old woman comes to the office for an initial examination. Pulse is 80/min, respirations are 14/min, and blood pressure is 220/100 mm Hg. Pulse oximetry on room air shows an oxygen saturation of 99%. Physical examination discloses a faint abdominal bruit. ECG shows left ventricular hypertrophy. Complete blood count and serum concentrations, including electrolytes, urea nitrogen, and creatinine, are within the reference ranges. Which of the following is the most likely cause of this patient's condition?

- (A) Extrinsic arterial compression
- (B) Fibromuscular dysplasia
- (C) Mid-aortic syndrome
- (D) Premature atherosclerosis
- (E) Spontaneous renal artery dissection

112. In a sample of 100 individuals, the mean leukocyte count is $7500/\text{mm}^3$, with a standard deviation of $1000/\text{mm}^3$. If the leukocyte counts in this population follow a normal (gaussian) distribution, approximately 50% of individuals will have which of the following total leukocyte counts?

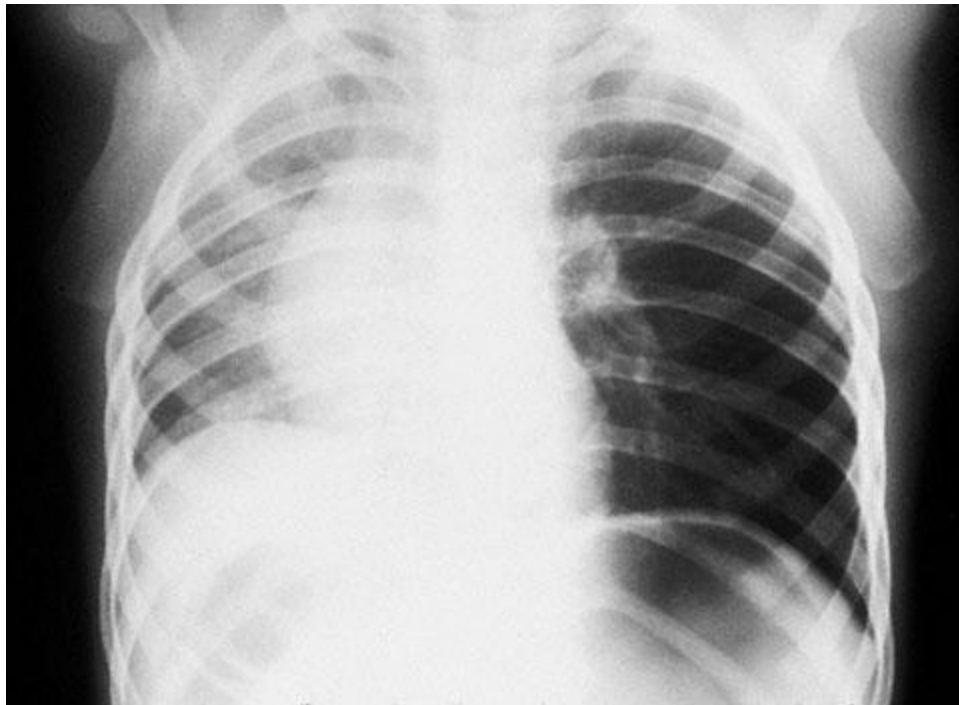
- (A) $5500\text{--}9500/\text{mm}^3$
- (B) $<6500/\text{mm}^3$ or $>8500/\text{mm}^3$
- (C) $6500\text{--}8500/\text{mm}^3$
- (D) $<7500/\text{mm}^3$
- (E) $>9500/\text{mm}^3$

113. A 10-year-old boy is brought to the physician because of a 3-week history of nosebleeds and easy bruisability. His older brother has had similar episodes. He is at the 30th percentile for height and weight. Physical examination shows nasal and gingival bleeding and several ecchymoses over the trunk and upper and lower extremities in various stages of healing. Laboratory studies show a platelet count of $300,000/\text{mm}^3$ ($N=150,000\text{--}400,000$). Platelet adhesion testing shows a normal response to ristocetin, but aggregation does not occur in response to thrombin; platelet morphology is normal. Prothrombin time and activated partial thromboplastin time are within the reference ranges. A defect in which of the following is the most likely cause of the findings in this patient?
- (A) Factor VII (proconvertin)
 - (B) Fibrinogen
 - (C) Glycoprotein IIb-IIIa
 - (D) Granule storage pool
 - (E) von Willebrand factor
114. A 36-year-old woman of Icelandic descent comes to the physician for genetic counseling after she was diagnosed with invasive ductal carcinoma of the breast. She has no family history of breast cancer. Genetic analysis shows a 999del5 mutation in the BRCA2 gene. This mutation is the cause of 9% of all breast cancers in Iceland. Which of the following best explains the prevalence of this mutation in Iceland?
- (A) A bottleneck reduction in population due to breast cancer occurrences
 - (B) Genetic heterogeneity of inherited breast/ovarian cancer
 - (C) Geographically isolated population
 - (D) Heterozygote advantage due to the mutation
 - (E) Random mating in a very large population



115. A previously healthy 65-year-old woman comes to the physician because of several episodes of fainting during the past 2 months. Each episode lasted several minutes. Her pulse is 82/min, respirations are 20/min, and blood pressure is 135/87 mm Hg. Cardiac examination shows S₃ and S₄. Echocardiography shows a pedunculated intracardiac mass. The lesion is resected. A photomicrograph of the resected lesion is shown. This lesion was most likely obtained from which of the following locations?
- (A) Interventricular septum
 - (B) Left atrium
 - (C) Left ventricle
 - (D) Right atrium
 - (E) Right ventricle

116. A 45-year-old woman with end-stage renal disease as a result of IgA glomerulopathy is about to receive a kidney transplant. She has been undergoing hemodialysis for 2 years. She also has hypertension well controlled with an ACE inhibitor. Her temperature is 37.5°C (99.5°F), pulse is 88/min, respirations are 14/min, and blood pressure is 138/78 mm Hg. During the operation, the renal vessels are anastomosed, and blood is released into the transplanted kidney. Within 10 minutes, this organ becomes swollen and shows multiple areas of hemorrhage. Which of the following is the most likely cause of these findings in the transplanted kidney?
- (A) Perfusate hypersensitivity in the donor
 - (B) Perfusate hypersensitivity in the recipient
 - (C) Preformed antibodies in the donor
 - (D) Preformed antibodies in the recipient
 - (E) Sensitized CD8+ T lymphocytes in the donor
 - (F) Sensitized CD8+ T lymphocytes in the recipient
117. A 65-year-old man comes to the emergency department 30 minutes after the sudden onset of severe pain in his right thigh. He recalls no trauma to the area. He has a 2-year history of multiple myeloma. He is treated with a bisphosphonate medication. Examination of the right thigh shows tenderness and displacement of the femur. X-ray of the right lower extremity shows a midshaft femoral fracture. The most likely cause of this patient's injury is an underlying abnormality of which of the following?
- (A) Bone remodeling
 - (B) Osteoblast generation
 - (C) Serum calcium concentration
 - (D) Serum 25-hydroxycholecalciferol concentration
 - (E) Serum parathyroid hormone concentration
118. A 45-year-old man comes to the emergency department because of a 4-hour history of left ankle pain and swelling. He recalls twisting his left foot after tripping over one of his children's toys as he walked to the bathroom last night. He cannot bear weight on the left ankle because of pain. Examination of the left ankle shows edema with decreased range of motion in all directions. There is tenderness to palpation just distal to the lateral malleolus. Which of the following is the most likely mechanism of this injury?
- (A) Dorsiflexion
 - (B) Eversion
 - (C) Inversion
 - (D) Plantar flexion



119. A previously healthy 3-year-old boy is brought to the emergency department by his parents 30 minutes after the sudden onset of severe coughing and gagging; he had been eating candy. He has vomited once since then. On arrival, he is alert and mildly anxious. He is at the 50th percentile for height and 75th percentile for weight. His temperature is 36.9°C (98.4°F), pulse is 136/min, respirations are 38/min, and blood pressure is 90/48 mm Hg. Pulse oximetry on room air shows an oxygen saturation of 93%. Breath sounds are decreased on the left. The remainder of the examination shows no abnormalities. An x-ray of the chest is shown. Which of the following is the most likely explanation for this patient's oxygen saturation?
- (A) Decreased chest wall compliance
 - (B) Diffusion defect
 - (C) Extrapulmonary right-to-left shunt
 - (D) Increased chest wall compliance
 - (E) Ventilation-perfusion mismatch

ANSWER FORM FOR USMLE STEP 1 SAMPLE TEST QUESTIONS

Block 1 (Questions 1–20)

1.	___	4.	___	7.	___	10.	___	13.	___	16.	___	19.	___
2.	___	5.	___	8.	___	11.	___	14.	___	17.	___	20.	___
3.	___	6.	___	9.	___	12.	___	15.	___	18.	___		

Block 2 (Questions 21–40)

21.	___	24.	___	27.	___	30.	___	33.	___	36.	___	39.	___
22.	___	25.	___	28.	___	31.	___	34.	___	37.	___	40.	___
23.	___	26.	___	29.	___	32.	___	35.	___	38.	___		

Block 3 (Questions 41–60)

41.	___	44.	___	47.	___	50.	___	53.	___	56.	___	59.	___
42.	___	45.	___	48.	___	51.	___	54.	___	57.	___	60.	___
43.	___	46.	___	49.	___	52.	___	55.	___	58.	___		

Block 4 (Questions 61–80)

61.	___	64.	___	67.	___	70.	___	73.	___	76.	___	79.	___
62.	___	65.	___	68.	___	71.	___	74.	___	77.	___	80.	___
63.	___	66.	___	69.	___	72.	___	75.	___	78.	___		

Block 5 (Questions 81–100)

81.	___	84.	___	87.	___	90.	___	93.	___	96.	___	99.	___
82.	___	85.	___	88.	___	91.	___	94.	___	97.	___	100.	___
83.	___	86.	___	89.	___	92.	___	95.	___	98.	___		

Block 6 (Questions 101–119)

101.	___	104.	___	107.	___	110.	___	113.	___	116.	___	119.	___
102.	___	105.	___	108.	___	111.	___	114.	___	117.	___		
103.	___	106.	___	109.	___	112.	___	115.	___	118.	___		

ANSWER KEY FOR USMLE STEP 1 SAMPLE TEST QUESTIONS

Block 1 (Questions 1–20)

1. B	4. C	7. E	10. A	13. B	16. B	19. D
2. A	5. C	8. A	11. D	14. A	17. E	20. A
3. B	6. D	9. B	12. A	15. B	18. E	

Block 2 (Questions 21–40)

21. E	24. C	27. B	30. B	33. A	36. B	39. B
22. B	25. C	28. E	31. A	34. C	37. C	40. A
23. C	26. E	29. A	32. D	35. B	38. B	

Block 3 (Questions 41–60)

41. B	44. A	47. A	50. C	53. C	56. E	59. E
42. B	45. D	48. A	51. D	54. D	57. D	60. G
43. E	46. E	49. C	52. E	55. C	58. D	

Block 4 (Questions 61–80)

61. C	64. A	67. B	70. A	73. D	76. D	79. D
62. C	65. E	68. D	71. D	74. C	77. F	80. D
63. E	66. A	69. C	72. A	75. D	78. B	

Block 5 (Questions 81–100)

81. D	84. E	87. B	90. C	93. B	96. D	99. D
82. E	85. D	88. D	91. C	94. B	97. D	100. C
83. E	86. A	89. B	92. B	95. C	98. D	

Block 6 (Questions 101–119)

101. F	104. C	107. D	110. D	113. C	116. D	119. E
102. E	105. C	108. B	111. B	114. C	117. A	
103. E	106. C	109. A	112. D	115. B	118. C	