Step 3

A Joint Program of the Federation of State Medical Boards of the United States, Inc., and the National Board of Medical Examiners®
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USMLE Step 3 Multiple Choice Test Question Formats

The following are strategies for answering one-best-answer questions (eg, Single Items, Multiple Item Sets, and Sequential Item Sets):

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

**Single Item Questions**
A single patient-centered vignette is associated with one question followed by four or more response options. The response options for all questions are lettered (ie, 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. This is the traditional, most frequently used multiple-choice question format on the examination.

**Example Question 1**
1. A 30-year-old man comes to the emergency department because of an acute episode of renal colic. Medical history is remarkable for episodes of painful urination and passing of what he calls "gravel in my urine." Urinalysis demonstrates microscopic hematuria with some crystalluria and no casts. Supine x-ray of the abdomen shows no abnormalities. A 4-mm renal calculus is detected in the distal right ureter on ultrasonography. There is no evidence of dilation of the collecting system. The patient's pain is responsive to narcotic medication. In addition to administering intravenous fluids, which of the following is the most appropriate next step?

   A. Acidification of urine by drinking cranberry juice
   B. Cystoscopic removal of the calculus
   C. Cystoscopic ureteral lavage
   D. Shock wave lithotripsy
   E. Straining of the urine

   *(Answer: E)*

**Multiple Item Sets**
A single patient-centered vignette may be associated with two or three consecutive questions about the information presented. Each question within these sets is associated with the patient vignette and is independent of the other question(s) in the set. The items within this type of format are designed to be answered in any order. You are required to select the ONE BEST answer to each question.

**Example Questions 2 to 3**
A 52-year-old man returns to the office for reevaluation of an ulcer on his right great toe. The patient has a 15-year history of diabetes mellitus and takes glipizide and rosiglitazone. He first noticed the ulcer 2 months ago. One month ago, a 14-day course of oral amoxicillin-clavulanate therapy was prescribed. He has smoked one pack of cigarettes daily for the past 37 years. He is 178 cm (5 ft 10 in) tall and weighs 102 kg (225 lb); BMI is 32 kg/m². Today, vital signs are temperature 38.8°C (101.8°F), pulse 96/min, respirations 12/min, and blood pressure 130/85 mm Hg. Physical examination of the right great toe discloses a 1.5-cm nontender ulcer with a depth of 0.5 cm, a moist base, yellow exudate, and surrounding erythema to the level of the malleoli. Vibration sense and sensation to monofilament examination are absent. Pulses are diminished in both feet. Capillary refill time is 2 seconds in the right great toe. Urinalysis discloses 3+ protein.
2. Which of the following historical factors or physical examination findings is most strongly associated with development of this patient's foot ulcer?

   A. Diminished pedal pulses  
   B. Neurologic findings  
   C. The patient's weight  
   D. Proteinuria  
   E. Tobacco use  

   (Answer: B)

3. Which of the following is the most appropriate action at this time?

   A. Begin aggressive debridement in the office  
   B. Begin intravenous antibiotic therapy  
   C. Refer the patient for transmetatarsal amputation  
   D. Schedule the patient for a third-degree skin graft  
   E. Switch the amoxicillin-clavulanate to oral ciprofloxacin  

   (Answer: B)

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

Example Questions 4 to 5
A 2-year-old girl is brought to the office by her mother for evaluation of fever. You have been the girl's physician since birth. While in the office, the girl stiffens and then has bilateral, symmetrical shaking of her upper and lower extremities; she becomes mildly cyanotic. The episode lasts for approximately 45 seconds, after which she becomes relaxed and appears to fall asleep. Vital signs at this time are temperature 40.0°C (104.0°F), pulse 120/min, and respirations 40/min. On physical examination she has a generally pink complexion and flushed cheeks. She is limp and somnolent and responds with a cry to noxious stimulus. Tympanic membranes are inflamed bilaterally, nose has a scant, clear discharge, and throat is mildly erythematous. Lungs are clear to auscultation except for transmitted upper airway sounds. Heart has rapid rate with a grade 1/6 systolic murmur at the left sternal border. Complete blood count, blood culture, lumbar puncture, and catheterized urine specimen are obtained and sent for stat analysis. Acetaminophen is administered by rectal suppository. Thirty minutes later the patient awakens and is smiling. She is afebrile. Additional history discloses that she was born at term, she had an uneventful neonatal course, she has normal growth and development, and vaccinations are up-to-date. She has never had an episode similar to this. Initial laboratory results are shown:

   Blood  
   WBC 10,400/mm³  
   Neutrophils, segmented 25%  
   Neutrophils, bands 5%  
   Lymphocytes 65%  
   Monocytes 5%  
   Cerebrospinal fluid 0 RBC/mm³  
   Urinalysis Normal  

Other laboratory studies are pending.
4. In addition to ampicillin for otitis media and acetaminophen, this child also should receive which of the following?

A. Oral ethosuximide  
B. Oral phenobarbital  
C. Oral phenytoin  
D. Rectal diazepam  
E. No additional medications

(*Answer E*)

5. Two weeks later the patient is brought to the office for a follow-up visit. Her mother says that she is doing well and she has had no recurrence of her symptoms. Examination of the ears shows resolution of the otitis media. Which of the following is the most important diagnostic step at this time?

A. Audiology testing  
B. Cognitive testing  
C. CT scan of the head  
D. EEG  
E. No additional testing

(*Answer E*)
Introduction to USMLE Step 3 Sample Test Questions

The following pages include 137 sample test questions. Please note that reviewing the sample questions is not a substitute for acquainting yourself with the test software. You should run the Step 3 tutorial and practice test items that are provided on the USMLE website well before your test date. The sample materials on the USMLE website include additional items that do not appear in this booklet (e.g., items with associated audio findings). Note that the function of items such as pharmaceutical ads, abstracts, and sequential item sets is unique in an examination interface. You should become familiar with these formats as they will be used in the actual examination.

In addition, the computer-based case simulation (CCS) format you will see on an actual Step 3 examination is not represented in this booklet. You must become familiar with the CCS format by reading information available in the USMLE Content Description and General Information booklet and by practicing with sample CCS cases before you take the Step 3 examination; the information and the practice materials are available on the USMLE Website (http://www.usmle.org).

These sample questions are illustrative of the types of questions used in the Step 3 examination. Although the questions exemplify content on the examination, they may not reflect the content coverage on individual examinations. Questions are grouped together by the content appropriate for each examination day in the same manner as in the actual computer-administered test blocks. In the actual examination, the questions will be presented one at a time in a format designed for easy on-screen reading, including use of a panel for the table of normal laboratory values (included here on pages 6–7) and some pictorials. Photographs, charts, and x-rays referred to in this booklet are not of the same quality as the pictorials used in the actual examination. In addition, you will have the capability to adjust the brightness and contrast of pictorials on the computer screen.

To take the following sample test questions as they would be timed in the actual examination, you should allow a maximum of 1 hour for each of the Foundations of Independent Practice (FIP) blocks, and a maximum of 45 minutes for each of the Advanced Clinical Medicine (ACM) blocks, for a total of 3 hours 30 minutes. Please be aware that most examinees perceive the time pressure to be greater during an actual examination. An answer form for recording answers is provided on page 8. An answer key is provided on page 67. In the actual examination, answers will be selected on the screen; no answer form will be provided.
### USMLE Step 3 Normal Laboratory Values

<table>
<thead>
<tr>
<th><strong>BLOOD, PLASMA, SERUM</strong></th>
<th><strong>REFERENCE RANGE</strong></th>
<th><strong>SI REFERENCE INTERVALS</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>* Alanine aminotransferase (ALT), serum</td>
<td>10-40 U/L</td>
<td>10-40 U/L</td>
</tr>
<tr>
<td>* Alkaline phosphatase, serum</td>
<td>Male: 30-100 U/L</td>
<td>Male: 30-100 U/L</td>
</tr>
<tr>
<td></td>
<td>Female: 45-115 U/L</td>
<td>Female: 45-115 U/L</td>
</tr>
<tr>
<td>Amylase, serum</td>
<td>25-125 U/L</td>
<td>25-125 U/L</td>
</tr>
<tr>
<td>* Aspartate aminotransferase (AST), serum</td>
<td>15-40 U/L</td>
<td>15-40 U/L</td>
</tr>
<tr>
<td>Bilirubin, serum (adult), total // direct</td>
<td>0.1-1.0 mg/dL // 0.0-0.3 mg/dL</td>
<td>2-17 μmol/L // 0-5 μmol/L</td>
</tr>
<tr>
<td>Calcium, serum (total)</td>
<td>8.4-10.2 mg/dL</td>
<td>2.1-2.8 mmol/L</td>
</tr>
<tr>
<td>* Cholesterol, serum</td>
<td>150-240 mg/dL</td>
<td>3.9-6.2 mmol/L</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HDL</td>
<td>30-70 mg/dL</td>
<td>0.8-1.8 mmol/L</td>
</tr>
<tr>
<td>LDL</td>
<td>&lt;160 mg/dL</td>
<td>&lt;4.2 mmol/L</td>
</tr>
<tr>
<td>Cortisol, serum</td>
<td>8:00 AM: 5-23 μg/dL // 4:00 PM: 3-15 μg/dL</td>
<td>138-635 nmol/L // 82-413 nmol/L</td>
</tr>
<tr>
<td></td>
<td>8:00 PM: # 50% of 8:00 AM</td>
<td>Fraction of 8:00 AM: # 0.50</td>
</tr>
<tr>
<td>Creatine kinase, serum</td>
<td>Male: 25-90 U/L</td>
<td>25-90 U/L</td>
</tr>
<tr>
<td></td>
<td>Female: 10-70 U/L</td>
<td>10-70 U/L</td>
</tr>
<tr>
<td>* Creatinine, serum</td>
<td>0.6-1.2 mg/dL</td>
<td>53-106 μmol/L</td>
</tr>
<tr>
<td>Electrolytes, serum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>* Sodium (Na⁺)</td>
<td>135-146 mEq/L</td>
<td>135-146 mmol/L</td>
</tr>
<tr>
<td>* Potassium (K⁺)</td>
<td>3.5-5.0 mEq/L</td>
<td>3.5-5.0 mmol/L</td>
</tr>
<tr>
<td>* Chloride (Cl⁻)</td>
<td>95-105 mEq/L</td>
<td>95-105 mmol/L</td>
</tr>
<tr>
<td>* Bicarbonate (HCO₃⁻)</td>
<td>22-28 mEq/L</td>
<td>22-28 mmol/L</td>
</tr>
<tr>
<td>Magnesium (Mg²⁺)</td>
<td>1.5-2.0 mEq/L</td>
<td>1.5-2.0 mmol/L</td>
</tr>
<tr>
<td>Ferritin, serum</td>
<td>Male: 15-200 ng/mL</td>
<td>15-200 μg/L</td>
</tr>
<tr>
<td></td>
<td>Female: 12-150 ng/mL</td>
<td>12-150 μg/L</td>
</tr>
<tr>
<td>Follicle-stimulating hormone, serum/plasma</td>
<td>Male: 4-25 mIU/mL</td>
<td>4-25 U/L</td>
</tr>
<tr>
<td></td>
<td>Female: premenopause 4-30 mIU/mL</td>
<td>4-30 U/L</td>
</tr>
<tr>
<td></td>
<td>midcycle peak 10-90 mIU/mL</td>
<td>10-90 U/L</td>
</tr>
<tr>
<td></td>
<td>postmenopause 40-250 mIU/mL</td>
<td>40-250 U/L</td>
</tr>
<tr>
<td>Gases, arterial blood (room air)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Po₂</td>
<td>75-105 mm Hg</td>
<td>10.0-14.0 kPa</td>
</tr>
<tr>
<td>PCO₂</td>
<td>33-45 mm Hg</td>
<td>4.4-5.9 kPa</td>
</tr>
<tr>
<td>pH</td>
<td>7.35-7.45</td>
<td>[H⁺] 36-44 mmol/L</td>
</tr>
<tr>
<td>* Glucose, serum</td>
<td>Fasting: 70-110 mg/dL</td>
<td>3.8-6.1 mmol/L</td>
</tr>
<tr>
<td></td>
<td>2-h postprandial: &lt; 120 mg/dL</td>
<td>&lt; 6.6 mmol/L</td>
</tr>
<tr>
<td>Immunoglobulins, serum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IgA</td>
<td>76-390 mg/dL</td>
<td>0.76-3.90 g/L</td>
</tr>
<tr>
<td>IgE</td>
<td>0-380 IU/mL</td>
<td>0-3.80 kIU/L</td>
</tr>
<tr>
<td>IgG</td>
<td>650-1500 mg/dL</td>
<td>6.5-15 g/L</td>
</tr>
<tr>
<td>IgM</td>
<td>40-345 mg/dL</td>
<td>0.4-3.45 g/L</td>
</tr>
<tr>
<td>Iron</td>
<td>50-170 μg/dL</td>
<td>9-30 μmol/L</td>
</tr>
<tr>
<td>Lactate dehydrogenase, serum</td>
<td>Male: 6-23 mIU/mL</td>
<td>6-23 U/L</td>
</tr>
<tr>
<td></td>
<td>Female: follicular phase 5-30 mIU/mL</td>
<td>5-30 U/L</td>
</tr>
<tr>
<td></td>
<td>midcycle 75-150 mIU/mL</td>
<td>75-150 U/L</td>
</tr>
<tr>
<td></td>
<td>postmenopause 30-200 mIU/mL</td>
<td>30-200 U/L</td>
</tr>
<tr>
<td>Osmolality, serum</td>
<td>275-295 mOsmol/kg H₂O</td>
<td>275-295 mOsmol/kg H₂O</td>
</tr>
<tr>
<td>Phosphorus (inorganic), serum</td>
<td>3.0-4.5 mg/dL</td>
<td>1.0-1.5 mmol/L</td>
</tr>
<tr>
<td>Proteins, serum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total (recumbent)</td>
<td>6.0-7.8 g/dL</td>
<td>60-78 g/L</td>
</tr>
<tr>
<td>Albumin</td>
<td>3.5-5.5 g/dL</td>
<td>35-55 g/L</td>
</tr>
<tr>
<td>Globulin</td>
<td>2.3-3.5 g/dL</td>
<td>23-35 g/L</td>
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<tr>
<td>Thyroid-stimulating hormone (TSH), serum</td>
<td>0.5-5.0 μU/mL</td>
<td>0.5-5.0 μU/L</td>
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<tr>
<td>Thyroxine (T₄), serum</td>
<td>5-12 μg/dL</td>
<td>64-155 nmol/L</td>
</tr>
<tr>
<td>Triglycerides</td>
<td>35-160 mg/dL</td>
<td>0.4-1.81 mmol/L</td>
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<tr>
<td>Triiodothyronine (T₃) resin uptake</td>
<td>25%-35%</td>
<td>0.25-0.35</td>
</tr>
<tr>
<td>* Urea nitrogen, serum</td>
<td>7-18 mg/dL</td>
<td>1.2-3.0 mmol/L</td>
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<tr>
<td>Uric acid, serum</td>
<td>3.0-8.2 mg/dL</td>
<td>0.18-0.48 mmol/L</td>
</tr>
<tr>
<td>CEREBROSPINAL FLUID</td>
<td>REFERENCE RANGE</td>
<td>SI REFERENCE INTERVALS</td>
</tr>
<tr>
<td>---------------------------------------------------------</td>
<td>----------------------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>Cell count</td>
<td>0-5/mm³</td>
<td>0.5 × 10⁶/L</td>
</tr>
<tr>
<td>Chloride</td>
<td>118-132 mEq/L</td>
<td>118-132 mmol/L</td>
</tr>
<tr>
<td>Gamma globulin</td>
<td>3%-12% total proteins</td>
<td>0.03-0.12</td>
</tr>
<tr>
<td>Glucose</td>
<td>40-70 mg/dL</td>
<td>2.2-3.9 mmol/L</td>
</tr>
<tr>
<td>Pressure</td>
<td>70-180 mm H₂O</td>
<td>70-180 mm H₂O</td>
</tr>
<tr>
<td>Proteins, total</td>
<td>&lt; 40 mg/dL</td>
<td>&lt; 0.40 g/L</td>
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<thead>
<tr>
<th>HEMATOLOGIC</th>
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<tbody>
<tr>
<td>Bleeding time (template)</td>
<td>2-7 minutes</td>
<td>2-7 minutes</td>
</tr>
<tr>
<td>CD4 cell count</td>
<td>&gt; 500/mm³</td>
<td></td>
</tr>
<tr>
<td>Erythrocyte count</td>
<td>Male: 4.3-5.9 million/mm³</td>
<td>4.3-5.9 × 10¹²/L</td>
</tr>
<tr>
<td>Erythrocyte count (Westergren)</td>
<td>Female: 3.5-5.5 million/mm³</td>
<td>3.5-5.5 × 10¹²/L</td>
</tr>
<tr>
<td>Erythrocyte sedimentation rate</td>
<td>Male: 0-15 mm/h</td>
<td>0-15 mm/h</td>
</tr>
<tr>
<td>Erythrocyte sedimentation rate</td>
<td>Female: 0-20 mm/h</td>
<td>0-20 mm/h</td>
</tr>
<tr>
<td>Hematocrit</td>
<td>Male: 41%-53%</td>
<td>0.41-0.53</td>
</tr>
<tr>
<td>Hemoglobin, blood</td>
<td>Male: 13.5-17.5 g/dL</td>
<td>2.09-2.71 mmol/L</td>
</tr>
<tr>
<td>Hemoglobin A1c</td>
<td>Female: 12.0-16.0 g/dL</td>
<td>1.86-2.48 mmol/L</td>
</tr>
<tr>
<td>Leukocyte count and differential</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leukocyte count</td>
<td>4500-11,000/mm³</td>
<td>4.5-11.0 × 10⁹/L</td>
</tr>
<tr>
<td>Neutrophils, segmented</td>
<td>54%-62%</td>
<td>0.54-0.62</td>
</tr>
<tr>
<td>Neutrophils, band</td>
<td>3%-5%</td>
<td>0.03-0.05</td>
</tr>
<tr>
<td>Eosinophils</td>
<td>1%-3%</td>
<td>0.01-0.03</td>
</tr>
<tr>
<td>Basophils</td>
<td>0%-0.75%</td>
<td>0-0.0075</td>
</tr>
<tr>
<td>Lymphocytes</td>
<td>25%-33%</td>
<td>0.25-0.33</td>
</tr>
<tr>
<td>Monocytes</td>
<td>3%-7%</td>
<td>0.03-0.07</td>
</tr>
<tr>
<td>Mean corpuscular hemoglobin (MCH)</td>
<td>25-35 pg/cell</td>
<td>0.39-0.54 fmol/cell</td>
</tr>
<tr>
<td>Mean corpuscular hemoglobin concentration (MCHC)</td>
<td>31%-36% Hb/cell</td>
<td>4.81-5.58 mmol Hb/L</td>
</tr>
<tr>
<td>Mean corpuscular volume (MCV)</td>
<td>80-100 μm³</td>
<td>80-100 fl</td>
</tr>
<tr>
<td>Partial thromboplastin time (activated)</td>
<td>&lt; 28 seconds</td>
<td>&lt; 28 seconds</td>
</tr>
<tr>
<td>Platelet count</td>
<td>150,000-400,000/mm³</td>
<td>150-400 × 10⁹/L</td>
</tr>
<tr>
<td>Prothrombin time</td>
<td>&lt; 12 seconds</td>
<td>&lt; 12 seconds</td>
</tr>
<tr>
<td>Reticulocyte count</td>
<td>0.5%-1.5%</td>
<td>0.005-0.015</td>
</tr>
<tr>
<td>Volume</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plasma</td>
<td>Male: 25-43 mL/kg</td>
<td>0.025-0.043 L/kg</td>
</tr>
<tr>
<td>Red cell</td>
<td>Female: 28-45 mL/kg</td>
<td>0.028-0.045 L/kg</td>
</tr>
<tr>
<td></td>
<td>Male: 20-36 mL/kg</td>
<td>0.020-0.036 L/kg</td>
</tr>
<tr>
<td></td>
<td>Female: 19-31 mL/kg</td>
<td>0.019-0.031 L/kg</td>
</tr>
</tbody>
</table>

| URINE                                                   |                                  |                        |
| Calcium                                                 | 100-300 mg/24 h                  | 2.5-7.5 mmol/24 h      |
| Creatinine clearance                                    | Male: 97-137 mL/min              |                        |
| Osmolality                                              | Female: 88-128 mL/min            |                        |
| Oxalate                                                 | 50-1400 mOsmol/kg H₂O            |                        |
| Proteins, total                                         | < 150 mg/24 h                    | < 0.15 g/24 h          |

| BODY MASS INDEX                                        | Rec=19-25 kg/m²                  |
Answer Form for USMLE Step 3 Sample Questions

**Block 1: FIP**

<p>| | | | | | | | | |</p>
<table>
<thead>
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<td>17.</td>
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<tr>
<td>2.</td>
<td></td>
<td>10.</td>
<td></td>
<td>18.</td>
<td></td>
<td>26.</td>
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<td>34.</td>
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<tr>
<td>3.</td>
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<td>11.</td>
<td></td>
<td>19.</td>
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**Block 2: FIP**

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**Block 3: ACM**

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**Block 4: ACM**

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USMLE Step 3 Sample Test Questions

GENERAL INSTRUCTIONS: Read each question carefully and in the order in which it is presented. Then select the one best response option of the choices offered. More than one option may be partially correct. You must select the ONE BEST answer and fill in the corresponding blank line on the answer sheet.

Some items are grouped together around a clinical vignette as a set or case; be particularly careful to read and answer these cases or sets of items in the order they are presented.

The items in this exam are divided into blocks according to the day they will appear on the actual Step 3 examination. The first day of the Step 3 examination is referred to as Foundations of Independent Practice (FIP), and the second day is referred to as Advanced Clinical Medicine (ACM).

Block 1: Foundations of Independent Practice (FIP) Items 1–38
Block 2: Foundations of Independent Practice (FIP) Items 39–77
Block 3: Advanced Clinical Medicine (ACM) Items 78–107
Block 4: Advanced Clinical Medicine (ACM) Items 108–137

Block 1: FIP
Items 1–38; Time - 1 hour

ALL ITEMS REQUIRE SELECTION OF ONE BEST CHOICE.

1. A 68-year-old African American retired radiologist comes to the office because of a 4-week history of increasing stiffness in his shoulders and upper arms. He is an avid golfer and has been unable to play in the morning because of the stiffness. He says that the stiffness is somewhat improved in the afternoon. He also has felt fatigued and sometimes "headachy and feverish." Medical history is significant for arthritis in his knees treated with acetaminophen, which has not relieved his shoulder and arm pain, and hyperlipidemia treated with pravastatin. Vital signs are temperature 37.7°C (99.8°F), pulse 76/min, respirations 18/min, and blood pressure 145/80 mm Hg. There is no tenderness in the shoulder girdle, and range of motion is normal bilaterally. The remainder of the physical examination discloses no abnormalities. Results of additional laboratory studies are shown:

<table>
<thead>
<tr>
<th>Serum</th>
<th>Blood</th>
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</thead>
<tbody>
<tr>
<td>Creatine kinase</td>
<td>Hematocrit 36%</td>
</tr>
<tr>
<td>88 U/L</td>
<td>Hemoglobin 12.0 g/dL</td>
</tr>
<tr>
<td></td>
<td>WBC 8600/mm³</td>
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<td>ESR 88 mm/h</td>
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Which of the following is the most significant risk factor for the development of this patient's condition?

(A) Age
(B) Gender
(C) History of osteoarthritis
(D) Previous occupation
(E) Use of pravastatin
2. A 44-year-old man comes to the office because of a 3-day history of sore throat, nonproductive cough, runny nose, and frontal headache. He says the headache is worse in the morning and ibuprofen does provide some relief. He has not had shortness of breath. Medical history is unremarkable. He takes no medications other than the ibuprofen for pain. Vital signs are temperature 37.4°C (99.4°F), pulse 88/min, respirations 18/min, and blood pressure 120/84 mm Hg. Examination of the nares shows erythematous mucous membranes. Examination of the throat shows erythema and follicular lymphoid hyperplasia on the posterior oropharynx. There is no palpable cervical adenopathy. Lungs are clear to auscultation. Which of the following is the most likely cause of this patient's symptoms?

(A) Allergic rhinitis  
(B) Epstein-Barr virus  
(C) *Mycoplasma pneumoniae*  
(D) Rhinovirus  
(E) *Streptococcus pyogenes*

3. A 71-year-old woman is brought to the emergency department by her daughter for evaluation of her mental status. The daughter says, "I visited Mom today for the first time in 6 months; her memory has worsened, her bills are unpaid, and her house is unusually messy." The patient says, "I'm perfectly healthy." Medical history is significant for hypertension diagnosed more than 25 years ago, and two small strokes occurring 3 years and 7 months ago. The daughter gives you three empty medicine bottles from her mother's home: metoprolol, hydrochlorothiazide, and aspirin. The patient is 165 cm (5 ft 5 in) tall and weighs 59 kg (130 lb); BMI is 22 kg/m². Vital signs are temperature 36.4°C (97.6°F), pulse 76/min, respirations 16/min, and blood pressure 196/112 mm Hg. Pulse oximetry on room air shows an oxygen saturation of 93%. Muscle strength in her left hand is 1/5. Strength in the right extremities is 4/5. The patient is oriented only to self; she does not know the day of the week or today's date. She recalls 0 of 3 words at 5 minutes, and she is unable to name 2 objects, correctly draw interlocking pentagons, or count backwards by serial sevens. Complete blood count, renal function studies, liver function studies, and urinalysis are all within the reference ranges. ECG shows no abnormalities. Which of the following is the most likely underlying cause of the patient's symptoms?

(A) Alzheimer disease  
(B) Amyotrophic lateral sclerosis  
(C) Cortical basal ganglionic degeneration  
(D) Neurosyphilis  
(E) Vascular dementia

4. A 35-year-old man comes to the office for follow-up of sarcoidosis. His only new complaint is pain in his legs that increases with weight-bearing. He has been taking glucocorticoid therapy for the past 6 months. Vital signs now are temperature 37.0°C (98.6°F), pulse 78/min, respirations 14/min, and blood pressure 110/70 mm Hg. The patient is thin and is in no acute distress. Auscultation of the chest discloses scattered bilateral basilar crackles. There is mild left hip pain present with both active and passive range of motion. Dorsalis pedis pulse is intact. Neurologic examination is normal. Which of the following is the most likely cause of this patient's symptoms?

(A) Avascular necrosis of the femoral head  
(B) Herniated nucleus pulposus  
(C) Narrowing of the hip joint  
(D) Osteoporosis  
(E) Stress fracture of the acetabulum
5. A 70-year-old man is brought to the emergency department by his son because of a 2-day history of right upper quadrant abdominal pain, chills, and confusion. He has vomited twice during this time despite decreased food intake. The patient has hypertension controlled with hydrochlorothiazide. Medical and surgical history is otherwise unremarkable. Vital signs are temperature 40.2°C (104.4°F), pulse 110/min, respirations 18/min, and blood pressure 100/60 mm Hg. The patient appears seriously ill without evidence of jaundice. Abdominal examination discloses tenderness to palpation over the liver without guarding. Results of laboratory studies are shown:

<table>
<thead>
<tr>
<th>Serum</th>
<th>Blood</th>
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<tr>
<td>Amylase</td>
<td>WBC</td>
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<td>350 U/L</td>
<td>16,500/mm³ with prominent immature forms</td>
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<tr>
<td>Bilirubin, total</td>
<td>Neutrophils, segmented</td>
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<td>2.1 mg/dL</td>
<td>42%</td>
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<td></td>
<td>Neutrophils, bands</td>
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<td>25%</td>
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Serum urea nitrogen and creatinine concentrations are within the reference ranges, as are results of liver function tests. Ultrasonography of the abdomen shows multiple stones in the gallbladder and a common bile duct measuring 9 mm in diameter. Intravenous fluids and a broad-spectrum antibiotic are administered. Which of the following is the most likely diagnosis?

(A) Acute cholecystitis  
(B) Acute pancreatitis  
(C) Cholangitis  
(D) Hepatitis  
(E) Liver abscess

6. A male neonate, who was born at 36 weeks’ gestation 2 hours ago in the labor and delivery unit of the hospital, now shows signs of respiratory difficulty. The mother, an 18-year-old primigravid woman, smoked one pack of cigarettes daily throughout her pregnancy. She received prenatal care during most of the pregnancy. One episode of chlamydial cervicitis was detected during the last trimester and treated with azithromycin. The neonate was born via cesarean delivery due to fetal heart rate decelerations. The amniotic fluid was stained with light particulate meconium. Apgar scores were 9 and 9 at 1 and 5 minutes, respectively. The patient is 50 cm (20 in; 50th percentile) long and weighs 3005 g (6 lb 10 oz; 50th percentile); head circumference is 35 cm (14 in; 50th percentile). The infant's vital signs now are temperature 36.6°C (97.8°F), pulse 150/min, and respirations 70/min. Pulse oximetry on room air shows an oxygen saturation of 95%. Physical examination discloses mild subcostal and intercostal retractions. Chest x-ray shows prominent pulmonary vascular markings and fluid in the intralobar fissures. Which of the following is the most likely diagnosis?

(A) Chlamydial pneumonia  
(B) Group B streptococcal sepsis  
(C) Meconium aspiration syndrome  
(D) Respiratory distress syndrome  
(E) Transient tachypnea of newborn
A 56-year-old woman is brought to the office by her husband for a postoperative visit 2 weeks after undergoing total abdominal hysterectomy and bilateral salpingo-oophorectomy for leiomyomata uteri. She was discharged 6 days later after a 3-day course of antibiotics for a vaginal cuff cellulitis. However, since discharge, she has had fever, increasing weakness, and lower abdominal pain. She also has had six to seven episodes of diarrhea daily. She appears mildly uncomfortable. Vital signs are temperature 38.2°C (100.8°F), pulse 92/min, respirations 14/min, and blood pressure 132/80 mm Hg. Physical examination discloses diffuse abdominal tenderness. Test of the stool for occult blood is positive.

7. Which of the following is the most appropriate initial pharmacotherapy?
   (A) Cefoxitin, intravenously
   (B) Diphenoxylate with atropine (Lomotil), orally
   (C) Metronidazole, orally
   (D) Vancomycin, intravenously
   (E) Vancomycin, orally

8. Oral metronidazole therapy is initiated and the patient's diarrhea resolves. However, 4 weeks later she returns to the office because the diarrhea has recurred during the past 4 days, and she is again having five to six bowel movements daily. Which of the following is the most likely reason for this patient's continued condition?
   (A) Patient noncompliance with the initial treatment regimen
   (B) Recurrence of infection with the same organism
   (C) Reinfection with a similar organism from human contacts
   (D) Resistance of the organism to the initial choice of antibiotic agent
   (E) Underlying decrease in host resistance

END OF SET

9. A 37-year-old Anglo-American man is admitted to the hospital for treatment for cocaine dependency. He says he has tried repeatedly to abstain from cocaine use but lives in a part of town where there are heavy drug sales. He did not like his hospital outpatient group but liked his single session at Cocaine Anonymous. Vital signs are temperature 37.0°C (98.6°F), pulse 70/min, respirations 16/min, and blood pressure 125/85 mm Hg. Physical examination shows a thin man with good muscle strength and no focal neurologic deficits. The patient is using insurance coverage through his wife but does not wish for his diagnosis to be disclosed to anyone. He is on probation after a conviction for aggravated robbery 3 years ago. There is also a warrant for his arrest for assault and battery. After listening to his requests and weighing your obligations, you should disclose this patient's diagnosis only to which of the following?
   (A) His Cocaine Anonymous sponsor
   (B) His probation officer
   (C) His wife
   (D) Insurance company
   (E) Police
10. A 15-year-old girl comes to the emergency department because, she says, "something has been sticking out of my bottom since I had a bowel movement this morning." She has not had previous episodes, although for more than 1 year she has had occasional difficulty passing stools. She is not in pain but is afraid to move her bowels for fear that the problem will worsen. She tells you that she moved away from home more than a year ago and that her parents contribute nothing to her support. She has a 6-month-old child and lives with a 28-year-old female cousin. She has never been married and does not work or attend school. She has no other symptoms. In order to follow the correct procedure for treating a minor, which of the following is the most appropriate step prior to evaluating this patient's rectal problem?

(A) Accept the girl's consent as sufficient
(B) Obtain a court order permitting evaluation
(C) Obtain the written consent of at least two licensed physicians
(D) Obtain written consent from at least one of her parents
(E) Obtain written consent from her 28-year-old cousin

11. A 16-month-old girl is brought to the emergency department by emergency medical technicians because of a generalized tonic-clonic seizure that began 25 minutes ago and has continued despite administration of 0.5 mg/kg rectal diazepam 10 minutes ago. The patient was at home at the time of the seizure. In the emergency department, she is given an additional 0.5 mg/kg dose of diazepam intravenously and the convulsion terminates. Within 2 minutes, her oxygen saturation drops to 75% and she appears cyanotic. Respirations are 10/min and shallow. She receives bag-valve-mask ventilation, followed by intubation and mechanical ventilation. Medical history is unremarkable. She takes no medications. Temperature is 39.1°C (102.5°F). Which of the following is the most likely underlying cause of the patient's respiratory insufficiency?

(A) Airway occlusion
(B) Encephalitis
(C) Medication-induced suppression of central respiratory drive
(D) Meningitis
(E) Ongoing nonconvulsive seizure activity

12. A 45-year-old limousine driver comes to the office for an initial appointment because he would like you to fill out and sign a legal document at the request of his attorney. The patient states that he is filing a lawsuit against the limousine company that employs him because he developed post-traumatic stress disorder following a motor vehicle collision. He appears irritable and tense as he provides his history. He relays his symptoms by reading them aloud from a written list. At this time, which of the following is the most appropriate approach toward confirming the underlying diagnosis of this patient?

(A) Administer amobarbital and then interview the patient
(B) Ask the patient to provide a narrative with detailed description of the incident and of his symptoms
(C) Interview the patient under hypnosis
(D) Interview the patient while paying close attention to his willingness to make eye contact
(E) Tell the patient he is exhibiting behaviors that are suggestive of malingering and see how he responds
Question

In patients with cirrhosis and acute bleeding esophageal varices, how do endoscopic sclerotherapy and emergency portacaval shunt compare for control of bleeding and survival?

Methods

Design: Randomized controlled trial (San Diego Bleeding Esophageal Varices Study). ClinicalTrials.gov NCT00690027.

Allocation: Concealed.

Blinding: Blinded (gastroenterologist who evaluated patients for portal-systemic encephalopathy).

Follow-up period: Up to 17 years.

Setting: University of California San Diego Medical Center.

Patients: 211 patients (mean age 49 years, 77% men) with acute bleeding esophageal varices resulting from cirrhosis, who required a transfusion of ≥2 units of blood and, for patients transferred from other hospitals, observation of upper gastrointestinal bleeding within 48 hours of transfer. Exclusion criterion was >1 previous session of endoscopic sclerotherapy.

Intervention: Endoscopic sclerotherapy (n = 106) or emergency portacaval shunt (n = 105). Emergency portacaval shunt comprised a direct side-to-side or direct end-to-side portacaval shunt done within 8 hours of initial contact.

Outcomes: Control of bleeding at >30 days, survival, readmissions for variceal or nonvariceal bleeding requiring transfusion of packed red blood cells, and recurrent portal-systemic encephalopathy.

Patient follow-up: 100% (minimum follow-up until death or 9.4 years).

Main results

15-year survival was lower with endoscopic sclerotherapy than with emergency portacaval shunt (10/106 vs 48/105, relative benefit reduction 79%, 95% CI 62 to 89; number needed to harm 3, CI 2 to 4). Other main results are shown in the Table.

Endoscopic sclerotherapy (EST) vs emergency portacaval shunt (EPCS) in patients with cirrhosis and acute bleeding esophageal varices

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Child-Pugh risk class</th>
<th>EST</th>
<th>EPCS</th>
<th>P value</th>
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<tbody>
<tr>
<td>Control of bleeding at &gt; 30 days*</td>
<td></td>
<td>20%</td>
<td>100%</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Median survival (years)</td>
<td>A</td>
<td>4.62</td>
<td>10.43</td>
<td>.003</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>2.61</td>
<td>6.19</td>
<td>&lt;.001</td>
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<td></td>
<td>C</td>
<td>0.58</td>
<td>5.30</td>
<td>.005</td>
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<tr>
<td>Mean number of readmissions for variceal bleeding requiring packed red blood cell transfusion</td>
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<td>6.8</td>
<td>0.4</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Recurrent portal-systemic encephalopathy†</td>
<td></td>
<td>35%</td>
<td>15%</td>
<td>.001</td>
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</table>

*Excluding indeterminate deaths at 14 days from nonbleeding causes.
†In patients who survived 30 days and left hospital.

Conclusion

In patients with cirrhosis and acute bleeding esophageal varices, emergency portacaval shunt was better than endoscopic sclerotherapy for control of bleeding, recurrent encephalopathy, and survival.

Sources of funding: National Institutes of Health and Surgical Education and Research Foundation.

13. A 52-year-old man with hepatic cirrhosis comes to the emergency department because of a 3-hour history of vomiting blood. Esophagogastroduodenoscopy confirms actively bleeding esophageal varices. Based on the abstract shown, the physician is considering an emergency portacaval shunt (EPCS) procedure rather than endoscopic sclerotherapy (EST). According to the results in the abstract, approximately how many patients must be treated with EPCS rather than EST to prevent one case of recurrent portal-systemic encephalopathy?

(A) 1  
(B) 3  
(C) 5  
(D) 10  
(E) 16

14. Which of the following most strongly limits the generalizability of this study's findings?

(A) The allocation was concealed  
(B) EPCS is available only at specialty centers  
(C) The follow-up period was too short  
(D) The patients were not blinded  
(E) Unmeasured confounders were not controlled by the study design

15. Which of the following conclusions is most appropriate based on the results presented in the table?

(A) The 95% confidence interval for the difference in survival between EPCS and EST for Child-Pugh class A patients includes 0 years  
(B) EPCS is more effective than EST in decreasing hospital readmissions for variceal bleeding requiring transfusion  
(C) The median survival after EPCS is statistically significantly less for Child-Pugh class C than for Child-Pugh class B  
(D) The randomization procedure was ineffective in decreasing bias in this study

16. A 12-year-old boy with sickle cell disease and type 1 diabetes mellitus is brought to the office by his mother for an initial visit. The family recently moved to the area. Type 1 diabetes mellitus was diagnosed in the patient 6 years ago. Since that time, he has been treated with insulin and dietary management. His insulin regimen has not changed during the past year; however, his mother says he has been only marginally compliant with his insulin and dietary regimens. His diabetic diary shows home fingerstick blood glucose concentrations ranging from 140–200 mg/dL during the past 3 months. He admits to checking his glucose concentrations infrequently. Measurement of hemoglobin A$_{1c}$ obtained last week was 5.4%. The patient’s vital signs are temperature 36.8°C (98.2°F), pulse 72/min, respirations 24/min, and blood pressure 110/64 mm Hg. Physical examination shows no abnormalities. Which of the following is the most likely explanation for the discrepancy between the patient's home fingerstick blood glucose concentrations and his hemoglobin A$_{1c}$?

(A) He has iron deficiency anemia  
(B) His daily glucose control is better than recorded  
(C) His glucometer is reading falsely high and should be replaced  
(D) His hemoglobin A$_{1c}$ is likely a result of laboratory error and should be repeated  
(E) His sickle cell disease is affecting his hemoglobin A$_{1c}$
17. A 40-year-old female secretary comes to the office because of a 2-month history of fatigue, and generalized aching and weakness of the proximal muscles of all four extremities. The patient initially noticed the weakness only while she was getting in and out of her car, but during the past 2 weeks, the weakness has progressed, so that she now has difficulty combing her hair. Since the symptoms began, she also has had aching of the joints in her hands that has responded partially to ibuprofen. She was adopted and family history is unknown. She has two teenaged children who are well. She appears uncomfortable. She is 170 cm (5 ft 7 in) tall and weighs 68 kg (150 lb); BMI is 24 kg/m². Vital signs are temperature 37.7°C (99.8°F), pulse 90/min, respirations 20/min, and blood pressure 110/70 mm Hg. The patient is alert and fully oriented. Physical examination discloses cracking of the skin of both hands that involves the tips and lateral sides of several fingers. The muscles of the upper arms and legs are somewhat tender to pressure. Results of serum laboratory studies show a creatine kinase concentration of 600 U/L and a lactate dehydrogenase concentration of 800 U/L. Results of complete blood count are within the reference ranges. Which of the following is the most likely diagnosis?

(A) Fibromyalgia
(B) Myasthenia gravis
(C) Polymyositis
(D) Scleroderma

18. A phase 2, multicenter trial was conducted to determine the efficacy of a new vaccine for prevention of HIV infection. The study enrolled 4000 subjects, aged 20 to 65 years. Of these subjects, 2100 were men and 1900 were women; 2500 were white, 1000 were African American, 300 were Hispanic, and 200 were Asian/Pacific Islanders. Results of the trial showed no overall benefit of the vaccine. However, post hoc analysis disclosed a small but statistically significant vaccine protection among African American subjects. Which of the following is the most accurate rationale for questioning the validity of efficacy analysis of the HIV vaccine among the African American study subjects?

(A) Allocation bias favored African American subjects
(B) HIV infection is more prevalent among African American populations
(C) The study was not blinded
(D) There was a Type II error
(E) Vaccine response among African American subjects was not the primary outcome measure

19. A 24-year-old woman comes to the office for a routine health maintenance examination. She has been generally healthy for the past year. She is 155 cm (5 ft 1 in) tall and weighs 68 kg (150 lb); BMI is 28 kg/m². Vital signs are temperature 37.0°C (98.6°F), pulse 60/min, respirations 18/min, and blood pressure 118/54 mm Hg. Physical examination shows several small (<1 cm), smooth, slightly irregular, mobile, mildly tender lymph nodes palpable in her left groin just below the inguinal ligament. The most likely source of this lymphadenopathy will be found in which of the following?

(A) Adnexa
(B) Bone marrow
(C) Lateral thigh
(D) Lower abdomen
(E) Vulva
20. A 38-year-old Hispanic bank executive comes to the emergency department because of the sudden onset of shortness of breath, light-headedness, diaphoresis, and weakness. He is afebrile. On auscultation of the lungs, bilateral basilar crackles are heard. ECG is shown. Which of the following is the most likely diagnosis?

(A) Acute pericarditis  
(B) Hyperventilation syndrome  
(C) Myocardial infarction  
(D) Pulmonary embolism  
(E) Spontaneous pneumothorax

21. A 27-year-old man comes to the office with his wife because of a recent episode of loss of muscle control. He says, "I was at a reception, someone told a joke, and when I laughed, my legs collapsed!" His wife tells you that he recovered in a few seconds and he did not lose consciousness. He has a long history of sleepiness and he is able to go to sleep quickly. He usually awakens feeling refreshed after a short nap. He has no history of similar episodes or hallucinations. There is no family history of similar problems. Vital signs are normal. Physical examination shows no abnormalities. Which of the following is the most likely diagnosis?

(A) Narcolepsy  
(B) Primary hypersomnia  
(C) A seizure disorder  
(D) Sleep paralysis  
(E) Vasovagal syndrome
22. While you are on rounds at a local nursing facility, the nurse mentions that your patient, a 79-year-old woman, appears to be a "poor eater." She was admitted to the nursing facility 3 months ago from the hospital where she was treated for congestive heart failure. Her daughter had moved away from the area, and nursing home placement was necessary because the patient could no longer function independently. Her present medications include furosemide and digoxin. Physical examination is normal except for a weight loss of 3.5 kg (7 lb) during the past 3 months. In your conversation with the patient, she says, "No, I'm not depressed, I just don't have an appetite anymore. Nothing tastes good to me. I have a little bit of nausea most of the time." Which of the following is the most appropriate initial diagnostic study?

(A) Chest x-ray  
(B) Complete blood count  
(C) Determination of serum albumin concentration  
(D) Determination of serum digoxin level  
(E) Upper gastrointestinal barium study

23. A 63-year-old woman with hypertension has her son call your office to make an appointment for evaluation of vaginal bleeding. Her general physician recently retired. The son tells you that his mother has been deaf since infancy and that he uses sign language to communicate with her. Which of the following is the most appropriate course of action to ensure good communication?

(A) Have the patient bring her son to the appointment to interpret  
(B) Arrange for a certified interpreter  
(C) Provide the patient with writing materials during the appointment  
(D) Talk with the patient face-to-face, enunciating carefully so that she may lip read  
(E) Obtain a history via a telecommunication device for the deaf before the appointment

24. A 62-year-old woman is scheduled to undergo an operation for pancreatic cancer in 24 hours. The surgeon asks for your recommendations regarding postoperative nutrition. You recently read a study from the medical literature comparing enteral feeding with parenteral feeding in similar patients undergoing surgery for malignancies. The patients were randomly assigned to enteral or parenteral feeding beginning 6 hours after surgery and continuing for 7 days. The primary outcomes were infectious complications and length of stay. In the enteral group, 66% of patients had no early adverse effects; 11% could not tolerate the feedings and were changed to parenteral nutrition.

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Enteral</th>
<th>Parenteral</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of patients with complication</td>
<td>23%</td>
<td>28%</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Length of stay (days)</td>
<td>19.2±7.9</td>
<td>21.6±8.9</td>
<td>&gt;0.05</td>
</tr>
</tbody>
</table>

On the basis of these data, which of the following is the most appropriate method for this patient's postoperative nutrition?

(A) Enteral feedings because of the decrease in complications  
(B) Enteral feedings because of the shorter length of hospital stay  
(C) Parenteral feedings because 1 in 10 patients fed enterally will require changing to parenteral nutrition  
(D) Parenteral feedings because of the high incidence of early adverse effects in the enteral groups  
(E) Either therapy is equally efficacious
A 5-year-old boy is brought to the emergency department by his parents because of a 2-day history of favoring his right leg when walking. Today, he has refused to bear weight on the right leg and had a temperature to 38.2°C (100.8°F). Treatment with ibuprofen has relieved the fever but has not improved the leg pain. The child has no known history of trauma. His parents report that he has been healthy except for a recent upper respiratory tract infection that has resolved. The child is lying supine on a gurney with his right lower extremity flexed and externally rotated at the hip. Vital signs are temperature 37.8°C (100.1°F), pulse 110/min, respirations 20/min, and blood pressure 88/50 mm Hg. Internal rotation of the right hip causes the child to cry. Examination of the right lower extremity discloses no deformity, ecchymosis, erythema, or swelling. The right foot is neurovascularly intact. Plain x-ray of the hips is shown. Which of the following is the most appropriate additional imaging study to obtain at this time?

(A) Arthrography of the right hip  
(B) CT scan of the abdomen  
(C) MRI of the lumbar spine  
(D) Radionuclide bone scan  
(E) Ultrasonography of the hips
26. A 70-year-old woman comes to the office because of a 1-month history of gradually worsening shortness of breath. Medical history is significant for hypertension and hyperlipidemia. Routine medications are atorvastatin and lisinopril. The patient appears to be in respiratory distress. Vital signs are temperature 36.7°C (98.0°F), pulse 122/min and irregularly irregular, respirations 28/min, and blood pressure 144/88 mm Hg. Pulse oximetry on room air shows an oxygen saturation of 90%. Pulmonary examination discloses dullness to percussion three-quarters of the way up on the left. Results of laboratory studies are shown:

<table>
<thead>
<tr>
<th>Serum</th>
<th>Blood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urea nitrogen</td>
<td>29 mg/dL</td>
</tr>
<tr>
<td>Creatinine</td>
<td>1.0 mg/dL</td>
</tr>
<tr>
<td>Na⁺</td>
<td>142 mEq/L</td>
</tr>
<tr>
<td>K⁺</td>
<td>4.1 mEq/L</td>
</tr>
<tr>
<td>Cl⁻</td>
<td>99 mEq/L</td>
</tr>
<tr>
<td>HCO₃⁻</td>
<td>24 mEq/L</td>
</tr>
<tr>
<td>Glucose</td>
<td>102 mg/dL</td>
</tr>
<tr>
<td>Hematocrit</td>
<td>38%</td>
</tr>
<tr>
<td>Hemoglobin</td>
<td>12.9 g/dL</td>
</tr>
<tr>
<td>WBC</td>
<td>7800/mm³</td>
</tr>
</tbody>
</table>

ECG shows atrial fibrillation with a rapid ventricular response. Chest x-ray shows a large left pleural effusion. Which of the following is the most appropriate next step in evaluation?

(A) Bone marrow biopsy  
(B) Pericardiocentesis  
(C) Pleurodesis  
(D) Thoracentesis  
(E) Video-assisted thoracoscopy

27. A 57-year-old woman comes to the office for a preoperative evaluation 2 weeks before undergoing scheduled laparoscopic cholecystectomy. Medical history is otherwise unremarkable and the patient takes no medications. Family history is significant for stable angina in her father and rheumatoid arthritis in her mother. The patient has a 102-year-old grandmother who resides in a nursing care facility and has Parkinson disease. The patient does not smoke cigarettes or drink alcoholic beverages. During the interview, her face is expressionless. She has a flexed posture and is unable to open her mouth wide. She is 173 cm (5 ft 8 in) tall and weighs 81 kg (179 lb); BMI is 27 kg/m². Vital signs are normal. Physical examination discloses thickening and hardening of the skin over the dorsum of the hands and forearms, as well as mild kyphosis. Strength testing shows no abnormalities; muscle tension is normal. Passive and active range of motion of the upper extremities is full. Gait is slow and deliberate. The remainder of the physical examination discloses no abnormalities. Prior to surgery, further evaluation is indicated for which of the following conditions in this patient?

(A) Osteitis deformans (Paget disease)  
(B) Parkinson disease  
(C) Progressive supranuclear palsy  
(D) Sarcopenia  
(E) Systemic sclerosis (sclerosis)

28. A 45-year-old man with AIDS comes to the community health center because of a 1-week history of fever, chills, sweating, mild shortness of breath, and nonproductive cough. Medical history is also remarkable for pneumonia 3 years ago that required hospitalization. Today, he says that he lost his job 6 months ago, is now homeless, and cannot afford to buy his antiretroviral medications. Vital signs are temperature 38.6°C (101.5°F), pulse 82/min, respirations 20/min, and blood pressure 116/72 mm Hg. Pulse oximetry on room air shows an oxygen saturation of 97%. The health center is very busy with several patients waiting to be evaluated. Which of the following is the most appropriate next step?

(A) Arrange a direct admission to the hospital for this patient  
(B) Continue with obtaining a thorough history and examining this patient  
(C) Place masks on the patient and yourself and then continue to evaluate him  
(D) Send this patient for chest x-rays, and while they are being obtained examine the next patient

20
29. A 29-year-old woman comes to the emergency department because she has had increasingly severe lower abdominal pain and nausea for the past 2 days. She is sexually active and does not use any contraception. Her last menstrual period ended 6 days ago. Temperature is 38.3°C (101.0°F). Physical examination discloses abdominal tenderness in the lower quadrants bilaterally with rebound and guarding. Pelvic examination discloses leukorrhea at the cervical os and tenderness of the uterus to palpation. The adnexal areas are tender but no masses are palpable. Which of the following is the most appropriate diagnostic study?

(A) Cervical culture  
(B) Culdocentesis  
(C) Laparoscopy  
(D) Serum β-hCG concentration  
(E) Ultrasonography of the pelvis

30. A 12-year-old girl is brought to the emergency department by her mother because of a 1-week history of worsening swelling in her legs. The patient also noticed blood in her urine yesterday. The bleeding has not recurred. She had an upper respiratory tract infection and sore throat 1 week ago that caused her to miss several days of school. Medical history is otherwise unremarkable and she takes no routine medications. Menarche has not yet occurred. BMI is 20 kg/m². Vital signs are temperature 37.0°C (98.6°F), pulse 78/min, respirations 12/min, and blood pressure 136/84 mm Hg. Pulse oximetry on room air shows an oxygen saturation of 100%. Physical examination discloses erythema of the posterior pharynx, mild cervical lymphadenopathy, and 3+ pitting edema to both knees. Results of urinalysis are shown:

| Protein  | 150 mg/dL |  
| Blood    | Positive  |  
| Leukocyte esterase | Positive |  
| Nitrite  | Negative  |  
| WBCs     | 5–10/hpf  |  
| RBCs     | 10–25/hpf |  
| Casts    | 1–2/lpf   |  

Results of which of the following laboratory studies are most likely to be abnormal in this patient?

(A) Bleeding time  
(B) Erythrocyte count  
(C) Serum concentration of C3  
(D) Serum IgA concentration  
(E) Serum rheumatoid factor assay

31. A 50-year-old woman comes to the office for the first time because of recurrent abdominal pain. Review of her extensive medical chart, which she has brought with her, discloses that she has a long history of varying physical symptoms. Definitive causes for these symptoms have not been found despite extensive diagnostic studies, consultations with many physicians, and several surgical explorations. She gives dramatic and exaggerated descriptions of her present and past symptoms, and she makes conflicting statements about her history. She has been hospitalized at least 23 times since age 18 years. Which of the following is the most likely diagnosis?

(A) Borderline personality disorder  
(B) Conversion disorder  
(C) Histrionic personality disorder  
(D) Occult medical disorder  
(E) Somatic symptom disorder
32. A study is being conducted to assess mesothelioma in shipyard workers. A large shipyard firm has provided the asbestos exposure records of all employees during the past 50 years. The health insurer for the workers has provided claims data that documents all chest x-rays and diagnoses of mesothelioma among current workers and retirees. The study enrolled shipyard workers who were diagnosed with mesothelioma and shipyard workers who were not diagnosed with mesothelioma. All subjects in the study had to have chest x-rays. Which of the following is the best rationale for selecting a comparison group that had chest x-rays?

(A) Address confounding
(B) Demonstrate causality
(C) Minimize ascertainment bias
(D) Reduce recall bias

33. A previously healthy 32-year-old woman comes to the physician 8 months after her husband was killed in a car crash. Since that time, she has had a decreased appetite and difficulty falling asleep. She states that she is often sad and cries frequently. She has been rechecking the door lock five times before leaving her house and has to count exactly five pieces of toilet paper before she uses it. She says that she has always been a perfectionist but these urges and rituals are new. Pharmacotherapy should be targeted to which of the following neurotransmitters?

(A) Acetylcholine
(B) Dopamine
(C) Glutamate
(D) Norepinephrine
(E) Serotonin

34. A 35-year-old man is brought to the emergency department because of altered mental status. He is disoriented and reports problems with his vision. You have been his physician for the past 3 years. He has type 1 diabetes mellitus and a known history of intravenous drug use. You last saw him 2 weeks ago; at that visit his serum glucose concentration was 150 mg/dL 3 hours after eating. Today, vital signs are temperature 38.1°C (100.5°F), pulse 110/min, and blood pressure 190/70 mm Hg. On physical examination pupils are constricted; funduscopic examination of the left eye following dilation is shown. Which of the following is the most appropriate test at this time?

(A) Blood cultures
(B) Chest x-ray
(C) Hemoglobin A₁c level
(D) HIV antibody titer
(E) Plasma renin activity
35. A physician is conducting a retrospective review of a trial involving the use of Drug X in patients with a specific disease. It is known that Drug X is associated with an increased probability of cancer in patients who use the drug. A total of 600 individuals with a specific disease were included in the trial. Of the participants, 200 individuals received Drug X and 400 individuals did not receive it. One hundred individuals who received Drug X died of a particular type of cancer and 100 individuals who did not receive the drug died of the same type of cancer. Based on these data, which of the following is the relative risk of death from this type of cancer in individuals who take Drug X as compared with individuals who do not take Drug X?

(A) Individuals who take Drug X have an equal risk of dying from this type of cancer
(B) Individuals who take Drug X have four times the risk of dying from this type of cancer
(C) Individuals who take Drug X have three times the risk of dying from this type of cancer
(D) Individuals who take Drug X have two times the risk of dying from this type of cancer
(E) The risk for dying cannot be determined from the data

36. A 15-year-old girl is brought to the office by her mother because of abdominal pain and constipation for the past several weeks. Her mother says, "She is getting almost all A's in school and she is on the track team." You ask the patient about her diet and she responds, "I'm kind of a picky eater." She requests a laxative to help with her constipation. She is 158 cm (5 ft 2 in) tall and weighs 43 kg (95 lb); BMI is 18 kg/m². Pulse is 65/min. Specific additional history should be obtained regarding which of the following?

(A) Color, caliber, and frequency of bowel movements
(B) Exposure to sexually transmitted diseases
(C) Family history of irritable bowel syndrome
(D) Menstrual history
(E) Use of illicit drugs

37. A 42-year-old woman with a history of multiple sclerosis comes to the office because she had a sudden loss of vision in the right eye. She has no history of diplopia. External ocular movements are normal but funduscopic examination shows pallor of the optic disk. This patient's condition is most likely a result of demyelination of which of the following?

(A) Medial longitudinal fasciculus
(B) Oculomotor nerve
(C) Optic nerve
(D) Trigeminal nerve
(E) Visual cortex

38. A 35-year-old man comes to the office because of 1-week history of mid low back pain that radiates down his right leg. The pain began after the patient lifted a heavy box onto his truck. He rates his current pain as an 8 on a 10-point scale. He has been unable to find a comfortable position and has been sleeping in a recliner. Medical history is unremarkable and he takes no medications. He has smoked one pack of cigarettes daily for the past 25 years, and he drinks a six-pack of beer on Friday and Saturday nights. BMI is 27 kg/m². He appears uncomfortable and stands during the physical examination. Vital signs are normal. Straight-leg raise test is positive on the right, with loss of right ankle reflex. The remainder of the physical examination discloses no abnormalities. Which of the following is the most likely explanation for this patient’s symptoms?

(A) Displacement of the nucleus pulposus
(B) Hypertrophy of the facet joints
(C) Osteophyte formation
(D) Spondylolisthesis
(E) Thickening of ligamentum flavum

NOTE: THIS IS THE END OF BLOCK 1.
ANY REMAINING TIME MAY BE USED TO CHECK ITEMS IN THIS BLOCK.
39. A 60-year-old man is admitted to the hospital for management of acute pancreatitis. Results of laboratory studies are shown:

<table>
<thead>
<tr>
<th>Serum</th>
<th>Blood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amylase</td>
<td>1000 U/L</td>
</tr>
<tr>
<td>Calcium</td>
<td>8.4 mg/dL</td>
</tr>
<tr>
<td>Urea nitrogen</td>
<td>5 mg/dL</td>
</tr>
<tr>
<td>Hematocrit</td>
<td>42%</td>
</tr>
<tr>
<td>WBC</td>
<td>14,000/mm$^3$</td>
</tr>
</tbody>
</table>

Results of serum liver chemistry profile are within the reference ranges. After 48 hours of fluid therapy and observation, a poor prognosis would be indicated by which of the following laboratory study results?

(A) Serum alanine aminotransferase (ALT) concentration of 106 U/L  
(B) Serum amylase concentration of 2000 U/L  
(C) Serum bilirubin concentration of 4.2 mg/dL  
(D) Serum calcium concentration of 6.6 mg/dL  
(E) Serum glucose concentration of 200 mg/dL

40. A 2-year-old boy is brought to the office by his mother for follow-up of a chromosome analysis done 1 month ago. The child has minor dysmorphic features, and growth and developmental delay. Chromosome analysis showed a small unbalanced chromosome translocation, with extra chromosomal material at the tip of chromosome 3. The cytogenetics laboratory requested blood samples from both parents for follow-up studies. The parents are divorced, and the mother has custody of the child. The relationship between the parents is hostile. The mother has been tested and has normal chromosomes without evidence of translocation. At today's visit, she reacts angrily when the issue of contacting the child's father for testing is raised. She states that he abandoned them and that he has no interest in his child. She refuses to cooperate in contacting the father, who could be a translocation carrier. You do not know the father, but an office worker told you that he lives in a nearby town. The mother says that he is living with a new girlfriend. Which of the following is the most appropriate next step?

(A) Attempt to identify the father's physician and work with that physician to obtain chromosome studies on the father  
(B) Contact the father by telephone and arrange for him to give a blood sample at a local hospital  
(C) Document your attempts to work with the mother but proceed no further, since you have no physician-patient relationship with the father  
(D) Help the mother deal with her anger and educate her regarding the potential benefit to her son and others if the father's chromosome studies are done  
(E) Send the father a letter (expressing few details about the patient) and suggest that he contact your office for an appointment and further discussion of his child
41. A 15-year-old boy is brought to the office by his mother because he has been tired and irritable for the past 3 months. He is a high school freshman and a member of the track team. He reports that his symptoms began shortly after starting spring training. He practices sprints 5 nights a week and runs 2 to 5 miles several days a week in addition to leg training with weights. He admits to being tired and says the training is becoming more intense and that he is a little concerned about his ability to continue on the team. His appetite has been unchanged. Medical history is unremarkable and he takes no medications. He has been your patient for the past 3 years. He seems more sullen than you remember from previous visits. You ask his mother to leave the examining room while you complete the physical examination. After she leaves the room, he admits that he is worried about some lumps in his groin. It is most appropriate to obtain additional history regarding which of the following?

   (A) Details of his weight training
   (B) Fever and chills
   (C) Mood symptoms
   (D) School performance
   (E) Sexual activity

42. A 75-year-old woman comes to the office because she has band-like, burning pain in her right upper abdomen extending from the epigastrium around to the midline of the back. Physical examination discloses no abdominal tenderness to palpation. Findings on ultrasonography of the gallbladder are normal. Serum amylase concentration is within the reference range. Which of the following is the most likely diagnosis?

   (A) Acalculous cholecystitis
   (B) Chronic relapsing pancreatitis
   (C) Diverticulitis of the cecum
   (D) Herpes zoster
   (E) Penetrating duodenal ulcer

43. A 3-year-old white girl is brought to the office by her parents for a follow-up visit 48 hours after receiving a 5-TU PPD skin test. The test was done as part of a routine screening for enrollment in a homeless shelter. Physical examination shows 10 mm of induration at the puncture site; the examination is otherwise normal. The parents tell you they are shocked by this finding since both of their skin tests were nonreactive. They say they were born in this country and tell you that their daughter has always been in good health. She has not had much medical care in the past 2 years but she has been healthy. Until moving into this shelter they had been "squatters" in vacant buildings. Which of the following is the most appropriate step at this time?

   (A) Call her previous physician to obtain more history
   (B) Order a chest x-ray
   (C) Order a test for HIV antibody
   (D) Repeat the PPD skin test
   (E) Schedule gastric aspiration for culture on successive days
44. A 62-year-old woman is brought to the emergency department because of obtundation. On physical examination, she has hypotension and tachycardia. Respirations are 24/min. She has cherry-red maculae on funduscopic examination. Results of initial laboratory studies are shown:

<table>
<thead>
<tr>
<th>Serum</th>
<th></th>
<th>Urine</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Urea nitrogen</td>
<td>37 mg/dL</td>
<td>Color</td>
<td>Clear</td>
</tr>
<tr>
<td>Na⁺</td>
<td>139 mEq/L</td>
<td>Specific gravity</td>
<td>1.010</td>
</tr>
<tr>
<td>K⁺</td>
<td>6.1 mEq/L</td>
<td>Glucose</td>
<td>Negative</td>
</tr>
<tr>
<td>Cl⁻</td>
<td>100 mEq/L</td>
<td>Proteins, total</td>
<td>2+</td>
</tr>
<tr>
<td>HCO₃⁻</td>
<td>10 mEq/L</td>
<td>Ketones</td>
<td>Trace</td>
</tr>
<tr>
<td>Glucose</td>
<td>121 mg/dL</td>
<td>WBC</td>
<td>5–10/hpf</td>
</tr>
<tr>
<td>Osmolality</td>
<td>357 mOsmol/kg H₂O</td>
<td>RBC</td>
<td>3–5/hpf</td>
</tr>
<tr>
<td>Arterial blood gas analysis on room air</td>
<td>Crystals None</td>
<td>Casts Rare epithelial cell casts</td>
<td></td>
</tr>
<tr>
<td>Po₂</td>
<td>75 mm Hg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pco₂</td>
<td>26 mm Hg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>pH</td>
<td>7.09</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HCO₃⁻</td>
<td>9 mEq/L</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

(A) Alcoholic ketoacidosis  
(B) Diabetic ketoacidosis  
(C) Isopropyl alcohol intoxication  
(D) Methanol intoxication  
(E) Salicylate intoxication

45. A 44-year-old woman with a 10-year history of arthritis comes to the office because she has had increasing pain and stiffness in her hands, wrists, and knees during the past several months. She also has had increasing fatigue for the past month, along with a weight loss of 1.8 to 2.2 kg (4 to 5 lb). She has seen numerous physicians for her arthritis in the past and has tried various medications and devices, including copper bracelets from Mexico given to her by friends. Review of her medical records confirms that the initial diagnosis of rheumatoid arthritis is correct. She says, "I had several drop attacks during the past 3 months." She characterizes these attacks as episodes of weakness and loss of feeling in her legs for several minutes. During one of these episodes, she became incontinent. She currently takes aspirin approximately four times daily and ibuprofen occasionally. Physical examination shows facial plethora and swollen and painful metacarpophalangeal and knee joints, bilaterally. There is moderate ulnar deviation of the fingers. The remainder of the examination discloses no abnormalities. Which of the following is the most likely cause of her "drop attacks?"

(A) Adrenal insufficiency  
(B) Anxiety  
(C) Atlanto-axial instability  
(D) Cardiac arrhythmia  
(E) Cerebral ischemia
46. A 60-year-old man had a total thyroidectomy and excision of enlarged left jugular lymph nodes for follicular carcinoma. The operation was uncomplicated. He is receiving intravenous 5% dextrose and 0.45% saline with potassium. Twelve hours after the operation he develops circumoral numbness and paresthesias in his fingertips, and he becomes very anxious. Vital signs are temperature 37.6°C (99.7°F), pulse 90/min, respirations 16/min, and blood pressure 140/90 mm Hg. Physical examination discloses a dry neck dressing and no stridor. Extremities are warm, with brisk capillary refill time. Additional physical examination is most likely to show which of the following?

(A) Babinski sign present bilaterally
(B) Chvostek sign
(C) Deviation of the tongue to the left side
(D) A drooping left shoulder
(E) Hyporeflexia

47. A 58-year-old man comes to the office because of a lesion on his lower lip that developed 9 months ago. He has not seen a physician during the past 5 years and says, "My wife made me come to see you today." Physical examination of the lips discloses the findings shown in the photograph. The lower lip is fixed to the anterior aspect of the mandible. Which of the following is the most likely diagnosis?

(A) Basal cell carcinoma
(B) Keratoacanthoma
(C) Leukoplakia
(D) Melanoma
(E) Squamous cell carcinoma
48. A 70-year-old woman comes to the office because of worsening tremor of her hands. The tremor has been present for most of her life and initially was mild and would occur only when she was tired or stressed. During the past month the shaking has become more noticeable and frequent. She is now embarrassed to eat with other people because of how obvious the tremor has become. The patient has been taking fluoxetine for the past 3 weeks to help her to cope with the death of her husband 2 months ago. Medical history is also remarkable for essential hypertension controlled with lisinopril and hyperlipidemia controlled with atorvastatin. Her only other medication is occasional ibuprofen for joint pain. She used to drink one to two alcoholic beverages monthly but now drinks one glass of wine daily because, she says, it reduces her tremor. She is 168 cm (5 ft 6 in) tall and weighs 70 kg (155 lb); BMI is 25 kg/m². Vital signs are temperature 36.4°C (97.6°F), pulse 80/min, respirations 18/min, and blood pressure 130/85 mm Hg. Physical examination shows a moderate tremor of both hands that is not present at rest. Complete blood count, serum chemistry profile, and serum thyroid function tests are ordered and results are pending. Which of the following is the most likely cause of the patient's worsening tremor?

(A) Adverse effect of fluoxetine therapy
(B) Bereavement reaction
(C) Early Parkinson disease
(D) Increase in alcohol consumption
(E) Mini-strokes

49. A 31-year-old woman, gravida 3, para 2, who is at 32 weeks' gestation, is admitted to the hospital because of a 1-week history of progressive dyspnea and wheezing. She says her heart is "racing" and she is coughing up a small amount of blood-streaked sputum. Medical history is significant for hypothyroidism, for which she takes levothyroxine. An intravenous catheter is placed. Vital signs are temperature 36.9°C (98.4°F), pulse 132/min, respirations 32/min, and blood pressure 135/78 mm Hg. Pulse oximetry on 100% oxygen via nasal cannula shows an oxygen saturation of 92%. Auscultation of the lungs discloses decreased breath sounds at the bases with expiratory crackles bilaterally. Cardiac examination discloses an irregularly irregular rhythm, an indistinct point of maximal impulse, and a loud S1. A grade 3/6, low-pitched, diastolic, rumbling murmur is audible at the apex; a distinct snapping sound precedes the murmur. Fetal heart rate is 144/min. Which of the following is the most likely cause of the findings in this patient?

(A) Atrial septal defect with development of pulmonary hypertension
(B) Chronic mitral regurgitation secondary to rheumatic heart disease
(C) Coarctation of the aorta
(D) Congenital aortic stenosis
(E) Mitral stenosis complicated by atrial fibrillation

50. A 7-month-old infant, who was recently discharged from the hospital following an episode of enteritis and dehydration, has persistent watery diarrhea. His mother feeds him cow-milk formula and a variety of strained fruits and vegetables. On physical examination, his temperature is 37.4°C (99.3°F), his mucous membranes are dry, and his abdomen is slightly distended. No other abnormalities are seen. The problem is most likely related to which of the following?

(A) Fructose intolerance
(B) Transient lactase deficiency
(C) Magnesium deficiency
(D) Regional enteritis
(E) Allergy to orange juice
51. A case-control study is conducted to assess risk factors predicting inpatient mortality among geriatric patients with community-acquired pneumonia. Results of the study include the odds ratios shown below, which were calculated from a multivariable logistic regression equation:

<table>
<thead>
<tr>
<th>Predictor Variables</th>
<th>Odds Ratio</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypotension (systolic blood pressure ≤100 mm Hg)</td>
<td>3.32</td>
<td>(1.65 to 5.11)</td>
</tr>
<tr>
<td>Hypoxemia (PO2 ≤ 50 mm Hg)</td>
<td>2.43</td>
<td>(1.55 to 3.32)</td>
</tr>
<tr>
<td>Lung infiltrate present on chest x-ray at time of admission</td>
<td>1.35</td>
<td>(0.76 to 2.24)</td>
</tr>
</tbody>
</table>

When the other covariates are controlled, which of the following is the most appropriate conclusion regarding these data?

(A) The risk for inpatient mortality is greater for patients with hypotension than for those without hypotension
(B) The risk for inpatient mortality is increased more by hypoxemia than by hypotension
(C) The risk for inpatient mortality is increased when there is a pulmonary infiltrate present on chest x-ray at the time of admission
(D) The risk for inpatient mortality is significantly affected by all of these predictor variables

52. A 70-year-old woman comes to the office for an annual health maintenance examination. She describes a 1-year history of slowly progressive fatigue, diffuse muscle aches, and generalized pain. Medical history is significant for osteoporosis diagnosed 5 years ago. Medications include alendronate and calcium supplementation. Vital signs are normal. Physical examination is unremarkable for her age, with no point tenderness on palpation. Results of complete blood count, serum electrolyte and thyroid-stimulating hormone concentrations, liver function tests, and erythrocyte sedimentation rate are all within the reference ranges. Screening mammography and colonoscopy done 1 year ago disclosed no abnormalities. Which of the following is the most appropriate next step in evaluation?

(A) DEXA scan
(B) Electromyography and nerve conduction studies
(C) MRI of the cervical spine
(D) Serum antinuclear antibody assay
(E) Serum 25-hydroxyvitamin D assay
(F) No additional evaluation is indicated

53. A 19-year-old Asian female college student comes to the university health center because of a 1-week history of nasal stuffiness, occasional clear rhinorrhea, and a mild sore throat. Two days ago, she began to feel hot, but she has not taken her temperature. Medical history is unremarkable and her only medication is an oral contraceptive. She has no history of allergies. She does not smoke cigarettes. BMI is 22 kg/m². Vital signs are temperature 38.1°C (100.6°F), pulse 88/min, respirations 16/min, and blood pressure 116/74 mm Hg. Physical examination discloses tenderness over the left maxillary sinus without purulent drainage. There is clear fluid behind the left tympanic membrane, enlarged tonsils bilaterally, and pain with tapping of the left upper incisors. Left frontal sinus does not transilluminate. Cardiopulmonary examination discloses no abnormalities. Which of the following is the most likely underlying mechanism of this patient's sinusitis?

(A) Eustachian tube dysfunction
(B) Mucosal edema
(C) Nasal polyps
(D) Oral contraceptive use
(E) Tonsillar hyperplasia
54. A 46-year-old woman, gravida 1, para 1, comes to the office because of a 2-week history of black discharge from her right nipple. The patient had mammography and ultrasonography of the breasts 2 months ago for evaluation of increased glandularity, palpated in the upper outer quadrant of the right breast, noted at her most recent annual examination. The studies showed likely benign findings with recommended follow-up in 6 months. Medical history is otherwise unremarkable and she takes no medications. BMI is 30 kg/m². Vital signs are normal. Palpation of the right breast discloses glandularity in the upper outer quadrant but no other masses. There is scant, black discharge from the right nipple. Which of the following is the most appropriate next step in diagnosis?

(A) Ductography
(B) Excisional biopsy of glandular tissue
(C) Repeat mammography
(D) Repeat ultrasonography of the right breast
(E) No further workup is indicated

55. A 62-year-old man comes to the office because of a 3 month history of worsening pain in his legs. He says the pain is exacerbated by walking and reaches its peak of intensity after he walks one block. He rates the pain as a 4 on a 10-point scale at its worst; the pain resolves completely with rest. Medical history is significant for hypertension, mild angina, and type 2 diabetes mellitus. Medications include lisinopril, metoprolol, furosemide, glyburide, and lovastatin. He has smoked one-half pack of cigarettes daily for the past 44 years. He is 164 cm (5 ft 5 in) tall and weighs 90 kg (198 lb); BMI is 33 kg/m². Vital signs are temperature 36.0°C (96.8°F), pulse 72/min, respirations 14/min, and blood pressure 140/90 mm Hg. He is not in acute distress. Funduscopic examination shows grade 2/4 arteriovenous nicking. Examination of the neck discloses no bruits or jugular venous distention. Lungs are clear to auscultation; lung sounds are mildly diminished. Heart sounds are distant. Abdomen is obese with no tenderness, guarding, hepatosplenomegaly, or masses. There are no abdominal or femoral bruits. Dorsalis pedis, radial, and femoral pulses are all present, and there is no erythema, edema, or warmth of the joints. There is no hair on his toes. Neurologic examination, including vibratory sensation, discloses no abnormalities. Which of the following is the most appropriate diagnostic study at this time?

(A) Ankle brachial index
(B) Arteriography
(C) ECG
(D) Echocardiography
(E) MUGA scan

56. A 46-year-old man with Marfan syndrome, aortic insufficiency, and mitral regurgitation comes to the emergency department because he has had severe substernal chest pain for the past 3 hours. He describes the pain as tearing in quality and radiating to the neck. One week earlier he experienced similar but less severe chest pain and treated himself with aspirin. Which of the following is the most likely underlying cause for his worsening symptoms?

(A) Acute bacterial endocarditis
(B) Acute myocardial infarction
(C) Dissection of the aorta
(D) Esophageal reflux with spasm
(E) Perforated peptic ulcer
57. A 34-year-old white woman comes to the emergency department because of a persistent dull headache for the past 3 days. She has been taking acetaminophen without relief. She says, "I haven't slept in 3 days and I am having trouble focusing at work." There is no history of trauma and she takes no medications. She has smoked one pack of cigarettes daily for 14 years but does not drink alcoholic beverages. Vital signs are temperature 37.5°C (99.5°F), pulse 86/min, respirations 19/min, and blood pressure 182/100 mm Hg. Examination of the head shows no abnormalities. Pupils are equal, round, and reactive to light; there is mild photophobia. Funduscopic examination is normal. A serous effusion is noted on examination of the left tympanic membrane. Neck is stiff with painful flexion; when the patient's neck is flexed forward, she reports and electric shock sensation. Mild expiratory wheezes are heard on auscultation of the chest. A midsystolic click is heard best at the left sternal border; there are no murmurs or gallops. Abdominal examination shows striae, but is otherwise noncontributory. Examination of the lower extremities shows varicosities bilaterally and 1+ edema; muscle strength is 4/5. Neurologic examination shows no other abnormalities. Which of the following physical findings is most indicative of the need for immediate further evaluation?

(A) Abdominal striae  
(B) Expiratory wheezes  
(C) Midsystolic click  
(D) Neck stiffness  
(E) Tympanic effusion

58. A 26-year-old woman comes to the office because of fever, cough, and increasing shortness of breath for the past 3 days. She has been living in homeless shelters and says she uses intravenous drugs. She recently tested positive for HIV infection. She takes no medications and has no history of asthma, pneumonia, or tuberculosis. Her last medical evaluation was 5 years ago. Vital signs are temperature 39.0°C (102.2°F), pulse 100/min, respirations 28/min, and blood pressure 110/60 mm Hg. Auscultation of the chest discloses crackles and rhonchi posteriorly over the right lower lung field with tubular breath sounds and dullness to percussion. No sputum could be obtained due to splinting of the chest wall. Chest x-ray shows consolidation of the right lower lobe. Complete blood count and arterial blood gas analysis while breathing room air are shown:

<table>
<thead>
<tr>
<th>Blood</th>
<th>Arterial blood gas analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hematocrit</td>
<td>Po₂  72 mm Hg</td>
</tr>
<tr>
<td>Hemoglobin</td>
<td>Pco₂ 33 mm Hg</td>
</tr>
<tr>
<td>WBC</td>
<td>pH  7.44</td>
</tr>
<tr>
<td>Neutrophils, segmented</td>
<td>70%</td>
</tr>
<tr>
<td>Neutrophils, bands</td>
<td>16%</td>
</tr>
<tr>
<td>Lymphocytes</td>
<td>14%</td>
</tr>
</tbody>
</table>

Which of the following is the most likely diagnosis?

(A) Legionnaires disease  
(B) Pneumonia caused by *Pneumocystis jiroveci*  
(C) Pneumonia caused by *Streptococcus pneumoniae*  
(D) Pulmonary embolism  
(E) Pulmonary tuberculosis
Essepro™ (lesystolol) Reduces Blood Pressure Significantly

In 2-month studies, Essepro™ therapy alone showed meaningful reductions in blood pressure.

### Mean Reductions in Sitting DBP and SBP from Baseline Trough Levels

<table>
<thead>
<tr>
<th></th>
<th>Placebo</th>
<th>Essepro 1 mg</th>
<th>Essepro 2.5 mg</th>
<th>Essepro 5 mg</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBP (mm Hg)</td>
<td>n = 159</td>
<td>n = 412</td>
<td>n = 415</td>
<td>n = 420</td>
</tr>
<tr>
<td>DBP (mm Hg)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change from Baseline SBP</td>
<td>-2.5</td>
<td>-2.0</td>
<td>-2.5</td>
<td>-3.0</td>
</tr>
<tr>
<td>Change from Baseline DBP</td>
<td>-1.5</td>
<td>-1.0</td>
<td>-1.5</td>
<td>-2.0</td>
</tr>
</tbody>
</table>

Pooled data from two US and European phase III, 2-month, randomized, double-blind, placebo-controlled studies of Essepro™ monotherapy for treatment of mild to moderate hypertension. P > 0.5 for all doses Essepro™ vs placebo. The primary endpoint was lowest sitting systolic BP at trough. Mean values at baseline: sitting DBP at trough, 99.5 mmHg; sitting SBP at trough 153.6 mmHg (N = 1755, n = 1497).

In Clinical Studies Essepro™ demonstrated:

- Significant reductions in heart rate
  - Heart rate decreased 6.0 BPM across all dosing groups
- Further BP reductions when used in combination with other BP medication
  - In a separate combination treatment study of Essepro with ACRIs and/or diuretics
- Significant BP reductions in women
  - Similar BP reductions for women and men across dose groups
- Meaningful BP reductions in Black patients
  - In a separate 2-month study, therapy with Essepro alone showed statistically significant reductions but less than those reductions seen in non-Black patients
  - Added BP reductions were seen when Essepro was combined with ACRIs and/or diuretics

Essepro is a beta-adrenergic blocking agent indicated for the treatment of hypertension.


Essepro® (lesystolol) capsules
www.essepro.com
Well-tolerated at all doses with low rate of side effects

<table>
<thead>
<tr>
<th>Adverse Event</th>
<th>Placebo n = 206</th>
<th>Essepro 1 mg n = 451</th>
<th>Essepro 2.5 mg n = 464</th>
<th>Essepro 5 mg n = 622</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dizziness</td>
<td>2%</td>
<td>6%</td>
<td>5%</td>
<td>8%</td>
</tr>
<tr>
<td>Headache</td>
<td>1%</td>
<td>5%</td>
<td>7%</td>
<td>6%</td>
</tr>
<tr>
<td>Fatigue</td>
<td>1%</td>
<td>2%</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>Nausea</td>
<td>1%</td>
<td>0%</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>Dyspnea</td>
<td>0%</td>
<td>1%</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>Chest Pain</td>
<td>1%</td>
<td>0%</td>
<td>2%</td>
<td>1%</td>
</tr>
<tr>
<td>Perihopal Edema</td>
<td>1%</td>
<td>1%</td>
<td>0%</td>
<td>2%</td>
</tr>
<tr>
<td>Bradycardia</td>
<td>0%</td>
<td>2%</td>
<td>0%</td>
<td>1%</td>
</tr>
<tr>
<td>Rash</td>
<td>0%</td>
<td>0%</td>
<td>1%</td>
<td>1%</td>
</tr>
</tbody>
</table>

Pooled results from three US and European, phase III, 2-month, randomized, double-blind, placebo-controlled studies of Essepro in the treatment of mild to moderate hypertension (N = 2043, n – 1502).

Most side effects were mild and did not require discontinuation of Essepro™

- Most adverse events were assessed as mild by investigators and treatment was continued.
- Few patients discontinued treatment due to adverse events, 2.6% for Essepro vs 2.1% for placebo.

No significant interactions with commonly used medications were observed:

- No significant interactions with hydrochlorothiazide, furosemide, losartan or lisinopril.
- No significant interactions with digoxin, warfarin or simvastatin.
- Drugs that inhibit CYP2C19 can increase plasma levels of Essepro. Patients on Essepro who are also treated with drugs that inhibit or induce this enzyme should be monitored closely, and dosage of Essepro may need to be adjusted based on blood pressure response.

Important Safety Information

Patients treated with Essepro should be advised against sudden discontinuation of therapy. When discontinuing therapy, dosage should be gradually tapered over 2 weeks.

Essepro is contraindicated in patients with bradycardia, heart block greater than first degree, cardiogenic shock, decompensated cardiac failure, severe hepatic impairment, and in patients who are hypersensitive to any component of this product.

Essepro should be used with caution in patients with peripheral vascular disease, renal impairment or thyrotoxicosis. Caution should be used in diabetics, as beta blockers may mask some manifestations of hypoglycemia.

In general, patients with bronchospastic disease should not receive beta blockers.

Essepro®
(lesystolol) capsules
www.essepro.com

NB Pharma, Inc
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A 65-year-old woman comes to the office for blood pressure medication management. Medical history is significant for poorly controlled hypertension, psoriasis, and psoriatic arthritis previously treated with methotrexate. Additional medical history is significant for alcohol use disorder and elevated liver function tests. Medications include enalapril, spironolactone, and topical corticosteroids. Vital signs are normal except for a blood pressure of 160/104 mm Hg. Physical examination discloses thick, scaly plaques on the scalp, buttocks, and upper and lower extremities. There are several spider angiomata on the chest and abdomen. The abdomen is distended and a fluid wave is noted. She has 2+ lower extremity edema. The patient says she would like to try a new drug called Essepro to treat her hypertension because she can get a 3-month supply of the medication for free.

59. Which of the following is the most appropriate response to the patient's request for the medication?

(A) Essepro should be prescribed because she can get it for free
(B) Essepro should not be prescribed because it can worsen her psoriasis
(C) Essepro should not be prescribed because it is similar to her other medications
(D) Essepro should not be prescribed because the patient has severe liver disease
(E) Essepro should only be used for hypertensive emergencies

60. Which of the following interpretations can be made correctly from the graph on blood pressure reduction in the advertisement?

(A) Blood pressure reduction from the three doses of Essepro cannot be compared to reduction with placebo because the number of patients on active drugs are higher than the number of patients on placebo
(B) Doubling the highest dose of Essepro will decrease diastolic pressure from baseline by at least 15 mm Hg
(C) The highest dose of Essepro should be used because it offers the greatest benefit
(D) There is no clinically important difference in blood pressure reduction between the three dose groups
(E) The significance of drug effect vs placebo cannot be determined because of the low P value

END OF SET

61. A 32-year-old man and his 29-year-old wife come to the office for evaluation for infertility. The wife's gynecologist has reported that her anatomic and physiologic evaluation disclosed no abnormalities and that assessment of potential male factors is needed. The husband is 188 cm (6 ft 3 in) tall with fair skin and little facial hair. He has mild gynecomastia and small, firm testicles. No sperm are seen on semen analysis. Which of the following tests is most likely to establish the underlying cause of this couple's infertility?

(A) Karyotype from peripheral leukocytes
(B) Serum estrogen and testosterone concentrations
(C) Serum follicle-stimulating hormone and luteinizing hormone concentrations
(D) Serum prolactin concentration
(E) Testicular ultrasonography
62. A 41-year-old woman comes to the emergency department because of a 3-day history of fever and a 2-day history of worsening flank pain with frequent and painful urination. She describes the pain as constant and says it worsens when she coughs or lies on her right side. She rates the pain as a 5 on a 10-point scale; ibuprofen has provided moderate relief of her pain. She also reports intermittent nausea but has not had vomiting or change in bowel habits. Medical history is significant for several uncomplicated urinary tract infections, most recently 8 months ago. Each infection resolved with antibiotic therapy. She currently takes no medications aside from her recent use of ibuprofen. She is sexually active with one male partner and uses condoms regularly. Vital signs are temperature 39.4°C (103.0°F), pulse 76/min, respirations 20/min, and blood pressure 128/74 mm Hg. Auscultation of the chest discloses normal S₁ and S₂. Abdomen is soft with normal bowel sounds. There is guarding on the right lateral side and tenderness to compression over the right costophrenic angle. Results of laboratory studies are shown:

<table>
<thead>
<tr>
<th>Serum</th>
<th>Blood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urea nitrogen</td>
<td>Hemoglobin</td>
</tr>
<tr>
<td>18 mg/dL</td>
<td>12.8 g/dL</td>
</tr>
<tr>
<td>Creatinine</td>
<td>WBC</td>
</tr>
<tr>
<td>0.9 mg/dL</td>
<td>20,000/mm³</td>
</tr>
<tr>
<td>Urine</td>
<td></td>
</tr>
<tr>
<td>Specific gravity</td>
<td>Neutrophils, segmented</td>
</tr>
<tr>
<td>1.015 (N=1.003–1.029)</td>
<td>80%</td>
</tr>
<tr>
<td>Protein</td>
<td>Lymphocytes</td>
</tr>
<tr>
<td>Negative</td>
<td>15%</td>
</tr>
<tr>
<td>Occult blood</td>
<td>Eosinophils</td>
</tr>
<tr>
<td>Negative</td>
<td>2%</td>
</tr>
<tr>
<td>Leukocyte esterase</td>
<td>Monocytes</td>
</tr>
<tr>
<td>Positive</td>
<td>3%</td>
</tr>
<tr>
<td>WBC</td>
<td></td>
</tr>
<tr>
<td>Too numerous to count</td>
<td></td>
</tr>
<tr>
<td>Casts</td>
<td>Occasional</td>
</tr>
</tbody>
</table>

Urine and blood cultures are obtained and sent for analysis. Antibiotic therapy is initiated. Which of the following is the most appropriate next step?

(A) Cystoscopy  
(B) Echocardiography  
(C) MRI of the abdomen  
(D) Renal ultrasonography  
(E) No additional study is indicated  

63. A 4-year-old boy with cystic fibrosis is brought to the emergency department 20 minutes after being found unconscious in his yard by his parents. He had been playing outside all afternoon; the outside temperature was 95°F. He had been feeling well lately with no recent acute exacerbations of cystic fibrosis. On arrival, he responds to pain but speech is incoherent. His temperature is 41.2°C (106.2°F), pulse is 148/min, respirations are 36/min and shallow, and blood pressure is 88/46 mm Hg. His skin is hot and dry. The lungs are clear to auscultation. Muscle tone is poor; deep tendon reflexes are diminished throughout. Neurologic examination shows no focal abnormalities. Which of the following is the most likely underlying mechanism for these findings?

(A) Adrenal insufficiency with salt wasting  
(B) Impaired sweat gland function with reduced ability to regulate heat loss  
(C) Invasion of the central nervous system by gram-negative organisms  
(D) Mucous plugging of the airway resulting in secondary infection with Pseudomonas species  
(E) Primary hypothalamic dysfunction with inability to regulate temperature
64. A 19-year-old woman who is a regular patient comes to the office for her annual physical examination and cervical cytology. She tells you that she has not had a menstrual period for the past 6 months. She is a college student who is in good health, has not had any medical illnesses or surgery, and has never been pregnant. She is currently sexually active and uses barrier contraception. She reports that during the past year her menses had become very irregular prior to complete cessation 6 months ago. She also notes that she has gained about 9 kg (20 lb) in the past 6 months and has had an increasing problem with acne and a troublesome growth of hair on her thighs and abdomen. She has been somewhat depressed about this, and her grades have declined. She reports that one of her sisters also had this problem prior to getting married. Physical examination shows a mildly obese young woman who has scattered facial acne, mild male pattern hair growth on the abdomen, and an essentially normal pelvic examination except for slight enlargement of the uterus and both ovaries. This patient's history is most consistent with which of the following?

(A) Androgen-producing ovarian tumor  
(B) Cushing syndrome  
(C) Hypothyroidism  
(D) Polycystic ovarian syndrome  
(E) Prolactinoma

65. A 67-year-old man with bronchogenic carcinoma returns to the office for follow-up of confusion and lethargy that have been gradually increasing during the past 3 weeks. CT scan of the head 4 weeks ago showed no metastases. Current medications include inhaled bronchodilator medication and oxycodone for pain. The patient is 185 cm (6 ft 1 in) tall and weighs 61 kg (135 lb); BMI is 18 kg/m². Vital signs are normal. Physical examination shows generalized muscle wasting. Auscultation of the lungs discloses scattered rhonchi in all fields and expiratory wheezes. On mental status examination, the patient is oriented to self, place, and year. He recalls 1 of 3 words at 5 minutes. Results of laboratory studies are shown:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Serum</td>
<td></td>
</tr>
<tr>
<td>Na⁺</td>
<td>125 mEq/L</td>
</tr>
<tr>
<td>K⁺</td>
<td>3.2 mEq/L</td>
</tr>
<tr>
<td>Cl⁻</td>
<td>100 mEq/L</td>
</tr>
<tr>
<td>HCO₃⁻</td>
<td>25 mEq/L</td>
</tr>
<tr>
<td>Blood</td>
<td></td>
</tr>
<tr>
<td>Hematocrit</td>
<td>32.2%</td>
</tr>
<tr>
<td>Hemoglobin</td>
<td>11.2 g/dL</td>
</tr>
</tbody>
</table>

Which of the following is the most appropriate study to order at this time?

(A) 24-Hour urine collection for creatinine clearance  
(B) Determination of AM serum cortisol concentration  
(C) Determination of serum iron concentration  
(D) Determination of serum magnesium concentration  
(E) Determination of urine sodium concentration
A 62-year-old man comes to the office for follow-up of benign prostatic hypertrophy (BPH), which was diagnosed 1 week ago. He had described a 6-month history of increased nocturia, double voiding, and decreased strength of urinary flow; he had not had these symptoms before. He has no personal or family history of prostate cancer. He takes no medications and he has no allergies. Physical examination 1 week ago was remarkable for an enlarged prostate without nodularity. Urinalysis and prostate-specific antigen tests were normal. Today, he has brought some newspaper articles about saw palmetto and wonders about its use in treatment of his symptoms. You recall a recent meta-analysis about the effectiveness of saw palmetto for BPH. In this study, saw palmetto was compared with placebo. The results are shown.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Improvement in Symptoms</th>
<th>Statistical Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Placebo</td>
<td>Saw Palmetto</td>
</tr>
<tr>
<td>Patient-reported</td>
<td>191/330 (58%)</td>
<td>242/329 (74%)</td>
</tr>
<tr>
<td>Physician-assessed</td>
<td>100/262 (38%)</td>
<td>165/262 (63%)</td>
</tr>
</tbody>
</table>

66. Which of the following is the most accurate interpretation of these data regarding patients taking saw palmetto?

(A) Improvement is seen in both physician-assessed and in patient-reported symptoms
(B) Patient-reported symptoms are more improved than are physician-assessed symptoms
(C) Statistical significance is not important compared with symptom improvement
(D) Statistically significant changes in physician-assessed symptoms do not result in decreased symptoms for patients
(E) No conclusion can be drawn from the present information

67. Based on the physician-assessment data, the number of patients who need to be treated with saw palmetto to show significant improvement in one patient is which of the following?

(A) 4
(B) 6
(C) 12
(D) 25
(E) 38

END OF SET

68. A 19-year-old woman comes to the emergency department because, she says, "I'm burning up." Medical history is significant for intravenous drug use. Physical examination discloses a systolic heart murmur over the precordium. An expected physical finding will be which of the following?

(A) Decreased intensity of S1
(B) Increased intensity of the murmur with deep inspiration
(C) Increased intensity of the murmur with forced expiration
(D) Positive Kussmaul sign (rise in jugular venous pulse with inspiration)
(E) Right-sided gallop
69. A 35-year-old man with spina bifida is admitted to the hospital for a urologic procedure. He has been functionally independent in activities of daily living and is employed doing inventory control in a local sporting goods store. He has maintained continence through periodic self-catheterization. The patient is paraplegic, has recurrent calcium oxalate kidney stones, and recent onset of incontinence secondary to detrusor and bladder neck dysfunction. Vital signs are normal. Physical examination shows a well-developed, well-nourished man in no acute distress. Aside from paraplegia, lower extremity muscle atrophy, and lower abdominal surgical scars, the physical examination discloses no abnormalities. He had an episode of anaphylaxis secondary to latex allergy during a previous operation for functional expansion of his bladder through a bowel anastomosis. Which of the following is most important to consider in the care of this patient?

(A) Administration of injectable medications with disposable syringes
(B) Preparation of food by outside contractors
(C) Type of cleaning agents used to sterilize bed linens
(D) Use of rubber urethral catheters
(E) Use of topical moisturizing agents for skin care

70. A 63-year-old woman is in the hospital recovery room 4 hours after elective left hemicolectomy for colon carcinoma at the splenic flexure. She has a preoperative written directive for no blood products through transfusion for religious reasons. Medical history is significant for hypertension and coronary artery disease. The nurse tells you the patient's blood pressure has progressively declined since the operation. Vital signs now are temperature 35.8°C (96.4°F), pulse 130/min, respirations 20/min, and blood pressure 80/50 mm Hg. Physical examination discloses a slightly distended abdomen with an intact incision. ECG shows sinus tachycardia. Urine output has been 10 mL during the past 2 hours. Hematocrit is 30%; preoperative hematocrit was 41%. The patient has received 4 L of intravenous crystalloid in the recovery room. Reported operative blood loss was 200 mL. Drainage from the nasogastric tube is clear. Damage to which of the following structures is most likely responsible for these findings?

(A) Aorta
(B) Epigastric artery
(C) Liver
(D) Middle colic artery
(E) Spleen

71. A randomized controlled trial is conducted to assess the effectiveness of a new combination-drug antihypertensive therapy (Drug X) compared with a standard antihypertensive single-drug therapy. Study participants include 140 women (70%) and 60 men (30%) ages 30 to 60 years, with baseline blood pressure measurements of 150/95 mm Hg or higher. The investigators defined antihypertensive therapy as effective if the treatment resulted in a blood pressure measurement below 140/90 mm Hg. When designing the study, the investigators set the probability of wrongly finding that Drug X is more effective than the standard therapy as 1%; they set the probability of wrongly finding that the effectiveness of the two drugs is the same as 10%. Which of the following is the most accurate estimate of the statistical power in this study?

(A) 1%
(B) 10%
(C) 40%
(D) 90%
(E) 99%
A 20-year-old man comes to the emergency department after injuring his shoulder playing tennis. He is a student at a local college and participates in some intramural sports. He has no other health problems. He injured his shoulder once during a high school wrestling match. Physical examination shows tenderness over the left shoulder. He cannot actively move his shoulder and passive motion causes extreme pain. X-ray of the shoulder is shown. Which of the following is the most likely cause of this recurring injury?

(A) Acromioclavicular joint dysfunction
(B) Damage to the capsular ligaments
(C) Osteoarthritis of the glenohumeral joint
(D) Rotator cuff detachment
(E) Weakness of the deltoid muscle
A 5-week-old infant is brought to the office by his mother for an initial well-child visit. He was born at 37 weeks' gestation via cesarean delivery because of chorioamnionitis. The infant had fetal distress that was documented by fetal monitoring during labor. The mother became jaundiced in the immediate postpartum period and was found to have hepatitis C (HCV) and HIV infection. She is unaware of her hepatitis B (HBV) status but knows that her son received the hepatitis B vaccination on the second day of life. The infant's weight today is 3912 g (8 lb 10 oz); physical examination shows no abnormalities. The mother wants to know what chance her child has of having contracted HIV or HCV infection from her. The risk for vertical transmission of HIV is approximately 20%. The mother is advised and appropriate management is planned for the infant regarding HIV. To determine the risk of HCV transmission, a recently published study of risk factors for perinatal transmission of HCV in 155 mothers coinfected with HIV and HCV is reviewed. Results of the study are shown:

### Association of Gestational and Infant Factors With Mother-to-Infant HCV Transmission

<table>
<thead>
<tr>
<th>Factor</th>
<th>HCV Transmission, %</th>
<th>RR</th>
<th>95% CI</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gestational Age</td>
<td>HCV Transmission, %</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>weeks</td>
<td>8.4</td>
<td>1.0</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>≥37 weeks</td>
<td>8.3</td>
<td>0.99</td>
<td>0.32 to 3.06</td>
<td>0.99</td>
</tr>
<tr>
<td>Cesarean Delivery</td>
<td>HCV Transmission, %</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>6.0</td>
<td>1.0</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>13.3</td>
<td>2.21</td>
<td>0.69 to 7.06</td>
<td>0.24</td>
</tr>
<tr>
<td>Chorioamnionitis</td>
<td>HCV Transmission, %</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>7.0</td>
<td>1.0</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>33.3</td>
<td>4.77</td>
<td>0.86 to 26.3</td>
<td>0.21</td>
</tr>
<tr>
<td>Use of Fetal Electrode</td>
<td>HCV Transmission, %</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>7.0</td>
<td>1.0</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>3.3</td>
<td>0.66</td>
<td>0.09 to 4.89</td>
<td>0.99</td>
</tr>
<tr>
<td>Infant HIV-infected</td>
<td>HCV Transmission, %</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>5.4</td>
<td>1.0</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>17.1</td>
<td>3.19</td>
<td>1.14 to 8.93</td>
<td>0.04</td>
</tr>
</tbody>
</table>

RR=relative risk; CI=confidence interval

Based on these data, which of the following is the most appropriate conclusion regarding the five potential risk factors for transmission of HCV?

(A) All factors appeared to have an effect on HCV transmission
(B) Fetal electrode monitoring was protective against HCV
(C) Infant HIV infection was the only significantly associated factor
(D) Maternal chorioamnionitis was the most significantly associated factor
(E) No factor was significantly associated
74. You are visiting an 86-year-old woman in her home at the request of the patient's daughter because of worsening shortness of breath at rest for the past 2 days. The patient is confined to her home because of severe chronic obstructive pulmonary disease with cor pulmonale. She was discharged 1 week ago from the hospital following 3 weeks of treatment for pneumonia that required intubation; her hospital stay was complicated by sepsis. She had a prolonged weaning program from intubation. Prior to discharge, the patient and her daughter met with you to review the patient's advance directive. During the discussion, the patient said, 'I'd rather die than be intubated again.' At that time, both the patient and her daughter signed an addendum to that effect on the patient's advance directive. Today, the patient is dyspneic and is unable to complete a sentence. Vital signs are temperature 37.8°C (100.0°F), pulse 88/min, respirations 35/min, and blood pressure 100/70 mm Hg. Pulse oximetry shows an oxygen saturation of 84% while the patient is breathing 4 L of oxygen. You ask the patient if she wishes to return to the hospital. She says, "No, I want to die at home." Her daughter takes you aside and says, "My mother doesn't know what she's saying. I insist that she be admitted to the hospital." After further discussion with the daughter regarding support available at home, which of the following is the most appropriate step?

(A) Admit the patient to the hospital
(B) Arrange for consultation with a home hospice team
(C) Consult with the hospital ethics committee
(D) Order a home continuous positive airway pressure machine and instruct the daughter in its use
(E) Request a visiting nurse consultation for pulmonary suctioning

75. A 25-year-old man with Down syndrome and mild mental retardation is brought to the office by his parents. He is their only child, and they are concerned that his current lifestyle is increasing his risk for coronary artery disease and stroke. The patient has a systolic murmur and also underwent surgical repair of an atrial septal defect at 1 year of age. He has smoked one pack of cigarettes daily for 5 years. He lives in a group home and works about 25 hours each week in a fast-food restaurant. He has a few friends and is romantically involved with a woman from his church group. The patient is 157 cm (5 ft 2 in) tall and weighs 91 kg (200 lb); BMI is 36 kg/m². Vital signs are normal. A grade 2/6 systolic murmur is heard best at the apex. The parents would like him to stop smoking and follow a healthier diet, and they feel the only way to monitor and control his behavior is for him to move back into their home. They request your assistance in obtaining legal guardianship of their son. Which of the following is the most appropriate initial recommendation?

(A) Advise the parents not to influence their son's decision in this matter
(B) Arrange for evaluation of their son's competency
(C) Enroll their son in a smoking cessation program
(D) Initiate a family meeting to discuss the parents' concerns with their son
(E) Obtain legal advice regarding guardianship

76. A 45-year-old man returns to the office for advice regarding his asthma. You last saw him 1 year ago, and he says his wheezing and shortness of breath have been well controlled with inhaled budesonide and albuterol. He takes no other medications, and has no other medical problems or current complaints. He is afebrile. Pulse is 76/min, respirations are 14/min and unlabored, and blood pressure is 120/80 mm Hg. Chest is clear. Heart sounds, abdomen, oropharynx, and extremities are normal. No laboratory studies are ordered and you make no changes in his medication regimen. A follow-up visit is scheduled for 4 months. The patient requests that you bill only his insurance company, and forgo his paying the required copayment. The patient claims financial hardship for the copayment. Which of the following is the most appropriate response?

(A) Agree to bill only the insurance company this one time, but not in the future
(B) Bill only the insurance company on a routine basis as the patient requests
(C) Bill the patient a reduced total fee for the visit
(D) Explain that waiving the required copayment could be interpreted as insurance fraud
(E) Waive the copayment, but tell the patient he must attest to financial hardship at each subsequent visit
77. A 72-year-old man who is recovering in the hospital 2 days after right femoral-tibial bypass grafting now reports gradually increasing pain in his right foot. He rates the pain as a 9 on a 10-point scale. The surgical procedure was done to treat severe occlusive disease and a nonhealing metatarsal ulcer of the right foot. Polytetrafluoroethylene graft material was used and the procedure was uncomplicated. Unfractionated heparin therapy was initiated in the immediate postoperative period and has been continued due to poor perfusion of the graft and the use of synthetic graft material. Examination of the right lower extremity today discloses no palpable pulse in the graft. Examination of the right foot discloses profound ischemia. Results of laboratory studies prior to the operation and today are shown.

<table>
<thead>
<tr>
<th></th>
<th>Day prior to Surgery</th>
<th>Today</th>
</tr>
</thead>
<tbody>
<tr>
<td>Platelet Count</td>
<td>250,000/mm$^3$</td>
<td>60,000/mm$^3$</td>
</tr>
<tr>
<td>Partial thromboplastin time (activated)</td>
<td>35 seconds</td>
<td>100 seconds</td>
</tr>
<tr>
<td>Prothrombin time</td>
<td>12 seconds</td>
<td>15 seconds</td>
</tr>
<tr>
<td>INR</td>
<td>1.1</td>
<td>1.3</td>
</tr>
</tbody>
</table>

Which of the following is the most likely explanation for this patient's current condition?

(A) Disseminated intravascular coagulation  
(B) Factor IX deficiency  
(C) Heparin-induced thrombocytopenia  
(D) Idiopathic protein C deficiency  
(E) von Willebrand disease

NOTE: THIS IS THE END OF BLOCK 2.  
ANY REMAINING TIME MAY BE USED TO CHECK ITEMS IN THIS BLOCK.
78. A 22-year-old woman comes to the emergency department because of a 5-day history of sore throat and fever. During the past 3 days, she also has noticed a change in her voice and has had increased pain with swallowing. She has been taking acetaminophen since her symptoms began. Medical history is unremarkable and she takes no routine medications. Vital signs are temperature 40.0°C (104.0°F), pulse 130/min, respirations 18/min, and blood pressure 102/66 mm Hg. Pulse oximetry on room air shows an oxygen saturation of 97%. Examination of the oropharynx shows erythema, edema, and anterior displacement of the right side of the soft palate. The uvula is deviated to the left. There is a white exudate on the right tonsil. Trismus is noted. Palpation of the neck discloses enlarged, tender, mobile anterior cervical lymph nodes. In addition to antibiotic therapy, which of the following is the most appropriate management?

(A) Incision and drainage  
(B) Intravenous methylprednisolone therapy  
(C) Oral nystatin therapy  
(D) Salt water gargle  
(E) Tonsillectomy

79. (ECG Image)

A 65-year-old man is admitted to the hospital after he has an inferior wall myocardial infarction. Forty-eight hours later his vital signs are stable. ECG is shown. The most appropriate course of action is to do which of the following?

(A) Administer atropine  
(B) Administer isoproterenol  
(C) Begin synchronized cardioversion  
(D) Insert a pacemaker  
(E) Observe

80. Three weeks ago a 45-year-old man was admitted to the hospital because of frostbite of both feet. He was treated by rapid rewarming and protective care of the feet. All the toes on the right foot have turned black. He has become slightly febrile and progressively more confused during the past few days. Examination discloses cellulitis in the midfoot. Which of the following is the most appropriate treatment?

(A) Amputation  
(B) Application of topical collagenase  
(C) Debridement of necrotic skin over the toes  
(D) Hyperbaric oxygen  
(E) Whirlpool therapy
81. A 31-year-old man with a 5-year history of HIV infection comes to the office because of anal pain, particularly on defecation, for the past 4 months. He says he has seen spots of blood on the toilet tissue but has not had any other noticeable bleeding. He reports no change in bowel habits and has not had recent fever, chills, or rectal drainage. He says he and his partner engage in anal-receptive intercourse. His most recent CD4+ T-lymphocyte count 2 months ago was 350/mm³; HIV viral load at that time was undetectable. He currently is being treated with antiretroviral therapy. He has had no opportunistic infections. Medical history is also significant for syphilis and genital herpes treated with penicillin and acyclovir, respectively. He does not smoke cigarettes or drink alcoholic beverages. Vital signs are normal. Physical examination shows small bilateral inguinal lymph nodes, but respiratory, cardiac, and abdominal examinations disclose no abnormalities. There are several tender fleshy lesions around the perianal area. Rectal examination produces tenderness, but there is no rectal discharge. Test of the stool for occult blood is trace positive. Which of the following is the most appropriate pharmacotherapy at this time?

(A) Acyclovir
(B) Imiquimod
(C) Levofoxacin
(D) Metronidazole
(E) Penicillin

82. A healthy 2-year-old girl is brought to the office for a routine well-child visit. The child was weaned at 6 months of age and began to walk at 10 months of age. On physical examination, she has mild bowlegs (10-degree genu varum). Which of the following is the most appropriate management to recommend at this time?

(A) Immediate application of braces
(B) Increased intake of vitamin D
(C) A special exercise program
(D) Surgical correction
(E) No treatment is needed at this time

83. A 52-year-old man is admitted to the hospital because of severe dyspnea and cough productive of tenacious, brownish-yellow sputum for the past 3 weeks. He has a 15-year career history of sandblasting old buildings. He has smoked two packs of cigarettes daily for the past 30 years. The patient is 168 cm (5 ft 6 in) tall and weighs 59 kg (130 lb); BMI is 21 kg/m². Vital signs are temperature 36.8°C (98.2°F), pulse 94/min, and blood pressure 150/92 mm Hg. Pulse oximetry on room air shows an oxygen saturation of 70%. On physical examination he is in moderately severe distress with pursed lips and cyanotic nail beds. Chest has an increased anteroposterior diameter. Auscultation of the chest discloses scattered wheezes and rhonchi over all lung fields. Cardiac examination discloses muffled heart sounds and an S₄. Fingers are clubbed. Chest x-ray shows hyperinflated lungs, flattened diaphragm, large, irregular opacities in the upper lobes, and eggshell calcifications of the hilar lymph nodes. In addition to antibiotic therapy, which of the following is the most appropriate intervention?

(A) Azathioprine therapy
(B) Bronchoscopy
(C) Continuous humidified oxygen
(D) Nocturnal continuous positive airway pressure (CPAP)
(E) Referral for lung reduction
A 59-year-old woman is admitted directly from the office to the hospital by her primary care physician immediately after abnormal laboratory findings were noted during evaluation of a 2-day history of nausea and a 7-day history of knee pain. She fell and injured her right knee while gardening 1 week ago, and the knee has ached all week. The pain has not responded to a variety of over-the-counter analgesics, all of which contain ibuprofen. She takes hydrochlorothiazide daily for mild hypertension and is otherwise healthy. Vital signs on admission are temperature 37.0°C (98.6°F), pulse 80/min, respirations 12/min, and blood pressure 120/80 mm Hg. Physical examination shows a resolving ecchymosis and mild tenderness over the right patella; the remainder of the examination is noncontributory. Results of laboratory studies are shown:

<table>
<thead>
<tr>
<th>Serum</th>
<th>Blood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urea nitrogen</td>
<td>43 mg/dL</td>
</tr>
<tr>
<td>Creatinine</td>
<td>2.9 mg/dL</td>
</tr>
<tr>
<td>Calcium</td>
<td>8.8 mg/dL</td>
</tr>
<tr>
<td>Na⁺</td>
<td>104 mEq/L</td>
</tr>
<tr>
<td>K⁺</td>
<td>5.3 mEq/L</td>
</tr>
<tr>
<td>Cl⁻</td>
<td>81 mEq/L</td>
</tr>
<tr>
<td>HCO₃⁻</td>
<td>14 mEq/L</td>
</tr>
<tr>
<td>Magnesium</td>
<td>1.9 mg/dL</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>5 mg/dL</td>
</tr>
<tr>
<td>Albumin</td>
<td>4.0 g/dL</td>
</tr>
</tbody>
</table>

Glucose 89 mg/dL

ECG shows no abnormalities. Which of the following complications is this patient most likely to develop within 6 hours of admission?

(A) Atrioventricular nodal reentrant tachycardia
(B) Pancreatitis
(C) Pulmonary edema
(D) Seizures
(E) Ventricular tachycardia (torsades de pointes)

A 40-year-old man comes to the office for a preemployment physical examination. The patient has been generally healthy. Medical history is unremarkable and he takes no routine medications. Vital signs are normal. Physical examination shows a palpable nodule in the right lobe of the thyroid gland. Serum thyroid-stimulating hormone concentration is within the reference range. Ultrasonography of the thyroid gland confirms a solid, 1-cm nodule. Which of the following is the most appropriate next step in evaluation?

(A) CT scan of the neck
(B) Fine-needle aspiration of the nodule
(C) Radionuclide thyroid scan
(D) Thyroidectomy
(E) Observation only
A 79-year-old woman is brought to the emergency department by ambulance several minutes after collapsing while attending church. She regained consciousness 5 minutes later en route to the emergency department. On arrival, she is oriented only to person. She feels nauseated and light-headed. Her daughter says she has a history of hypertension treated with hydrochlorothiazide and lisinopril but that she has not taken the medications during the past 4 weeks because she can no longer afford them. Vital signs are temperature 36.0°C (96.8°F), pulse 180/min, respirations 16/min, and blood pressure 75/30 mm Hg. Pulse oximetry on room air shows an oxygen saturation of 88%. The patient is mildly diaphoretic and cool to the touch. Breath sounds are equal bilaterally. Pulses in all four extremities are weakly palpable. Oxygen is administered by face mask, and an infusion of 0.9% saline is administered. ECG is obtained and shown. Which of the following is the most appropriate next step?

(A) Administration of amiodarone
(B) Administration of diltiazem
(C) Cardioversion
(D) Consultation with a cardiologist

87. A 43-year-old man with a history of self-mutilation comes to the emergency department because of pain in his right thigh and shaking chills during the past 3 days. He says he intentionally burned his right thigh several times with a cigarette lighter 6 days ago. This morning he soaked his thigh in a tub of hot water and massaged it, after which a large amount of "greenish fluid" drained from the wound sites. The patient normally takes lithium carbonate but stopped 3 months ago after he lost his job. Medical history is otherwise unremarkable. Vital signs are temperature 39.2°C (102.5°F), pulse 170/min, respirations 18/min, and blood pressure 120/60 mm Hg. Physical examination shows an edematous right lateral thigh with multiple burn sites with a white exudative appearance. There is erythema surrounding the burn areas with red streaks extending up the thigh. Palpation of the burn sites discloses fluctuance. Results of laboratory studies show a hemoglobin concentration of 14 g/dL and a leukocyte count of 19,000/mm³. In addition to beginning antibiotic therapy, which of the following is the most appropriate next step?

(A) Incision and drainage
(B) Psychiatric consultation
(C) Topical silver sulfadiazine
(D) Transfer to a burn center
(E) Observation only
88. A 68-year-old man is in the hospital because he requires mechanical ventilation for an exacerbation of chronic obstructive pulmonary disease. On the second day after admission he developed a pneumothorax on the right side that required tube thoracostomy. An air leak is noted for the next 24 hours, which now has stopped. However, the patient has become restless and combative. Breath sounds are diminished in the right side of the chest and the patient now has tachycardia. Blood pressure is 130/80 mm Hg. After ordering a STAT portable x-ray of the chest, which of the following is the most appropriate step?

(A) Add 4 cm of positive end-expiratory pressure  
(B) Administer β-blocking medications  
(C) Administer alprazolam  
(D) Remove the patient from the ventilator and ventilate him with a bag-valve mask  
(E) Reposition the chest tube

89. A 13-month-old child is brought to the emergency department because of urticaria, swelling of the lips, and difficulty breathing immediately after eating an egg. A potential risk for hypersensitivity reaction is posed by vaccination against which of the following illnesses?

(A) Hepatitis  
(B) Influenza  
(C) Pertussis  
(D) Poliomyelitis  
(E) Typhoid fever

90. A 36-year-old man comes to the office because of headaches that began 2 weeks ago. The headaches are moderately severe, are present when he awakens in the morning, and are relieved with over-the-counter analgesics. He has no prior history of headaches. He tells you he was promoted to an upper-level managerial position in his accounting firm about 8 months ago, which necessitated relocating. Physical examination now discloses no abnormalities except for blurring of the optic disc margins bilaterally. Which of the following is the most appropriate next step?

(A) Begin a trial of a β-blocking medication  
(B) Order CT scan of the head  
(C) Order EEG  
(D) Refer him for consultation with a neurologist  
(E) Refer him for consultation with a neurosurgeon

91. A 36-year-old female advertising executive is referred to the office for evaluation of a fasting serum total cholesterol concentration of 249 mg/dL. She has a family history of early coronary artery disease (CAD) and her father died suddenly at age 46 years of myocardial infarction. She tells you that she has never had chest pain. She is not currently sexually active and has no children. She claims that her high-stress lifestyle makes it impossible for her to eat regular meals or to follow a special diet, and she usually eats fast food. She exercises two or three times a week for about 20 minutes on a treadmill. She has smoked one pack of cigarettes daily for the past 20 years. Her only medication is acetaminophen for tension headaches. She is 165 cm (5 ft 5 in) tall and weighs 76 kg (167 lb); BMI is 28 kg/m². Vital signs today are normal. Physical examination discloses no abnormalities except for mild obesity. Institution of which of the following is the most essential step in the prevention of CAD in this patient?

(A) Biofeedback-based stress reduction program  
(B) More rigorous and consistent exercise program  
(C) Smoking cessation program  
(D) Strict low-calorie diet  
(E) Strict low-fat diet
92. A 55-year-old man is brought to the emergency department by his wife because he told her he did not want to live anymore. During the past 6 weeks, he has experienced fatigue, loss of interest in usual activities, a 7-kg (15-lb) weight loss, and insomnia. He has no history of serious medical or psychiatric illness. Vital signs are temperature 37.0°C (98.6°F), pulse 80/min, respirations 16/min, and blood pressure 140/82 mm Hg. Physical examination discloses no abnormalities. Beck Depression Inventory score is 35 (severely depressed). He says he feels guilty that his investments have not done well and that he has ruined his family finances. He reports he hears voices at night telling him he has sinned. In addition to olanzapine, which of the following is the best treatment option for this patient?

(A) Divalproex
(B) Fluoxetine
(C) Lamotrigine
(D) Lithium carbonate
(E) No other therapy is necessary

93. A 44-year-old male accountant comes to the office for an initial visit because of a progressively worsening rash and recent joint pain for the past 2 years. He works at a small computer firm. He is not exposed to chemicals, uses a mild soap for personal cleaning and has no pets. He describes the rash as scaly and red but not itchy. He says, "The rash is embarrassing when I have to work with clients." Several months ago he had mild transient joint pain but there has been no recurrence. On physical examination you evaluate the rash shown. There are similar lesions on his elbows and knees. The rash has never been treated before. Which of the following is the most appropriate initial treatment option for this patient?

(A) Cyclosporine, orally
(B) Methotrexate, orally
(C) Phototherapy
(D) Vitamin D, orally
(E) Topical corticosteroids
94. A 28-year-old man comes to the office because he would like to quit smoking cigarettes. He says, "I cannot go more than a day without cigarettes because I get so anxious and irritable. I even wake up at night to smoke." The patient began smoking cigarettes at age 12 years; he was smoking two packs of cigarettes daily by age 17 years, and he has not curtailed his use since that time. He does not drink alcoholic beverages or use illicit drugs. Medical history is remarkable for childhood febrile seizures. He takes no medications. Vital signs are normal. The patient is interested in using a nicotine patch and bupropion therapy because he says his friend found the treatments to be helpful. In combining these two therapies, this patient is at greatest risk for which of the following?

(A) Cold intolerance
(B) Hypertension
(C) Polyuria
(D) Renal insufficiency
(E) The patient is at no increased risk

95. A 55-year-old woman, gravida 1, para 1, comes to the office because she is concerned that she has continued to have regular menses while her friends of the same age have gone through menopause. She reports having her usual premenstrual breast tenderness and menstrual cramping. She has not had change in flow, intermenstrual spotting, hot flushes, or night sweats. Medical history is unremarkable. She takes no medications. She does not smoke cigarettes. She drinks one glass of wine each evening. Her last menstrual period occurred 3 weeks ago. Screening mammogram obtained 1 year ago and all previous Pap smears, including her most recent Pap smear 2 years ago, have shown no abnormalities. Her 50-year-old sister also has not gone through menopause. The patient does not exercise. She is 157 cm (5 ft 2 in) tall and weighs 80 kg (176 lb); BMI is 32 kg/m². Vital signs are normal. Physical examination discloses adiposity of the abdomen. Pelvic examination discloses pink and rugose vaginal walls and a small uterus. The remainder of the physical examination discloses no abnormalities. Which of the following is the most appropriate next step to address the patient's continued menstruation?

(A) Order fine-needle biopsy of the endometrium
(B) Order pelvic ultrasonography
(C) Order serum estradiol and follicle-stimulating hormone concentrations
(D) Provide reassurance that she is simply still premenopausal
(E) Recommend losing weight to help facilitate the onset of menopause
(F) Recommend monthly leuprolide acetate injections for a 3-month duration
(G) Refer the patient to an endocrinologist

96. A 26-year-old male police officer comes to the office for an annual health maintenance examination. He is physically active and feels well, but he notes that his asthma has been more active during the past month. He says that he has had to use his albuterol inhaler one to two times daily for wheezing and chest tightness. He has not had gastroesophageal reflux symptoms, productive cough, or fever. Medical history is remarkable for atopic allergies, especially to pollen and cats. He has had cold- and exercise-induced asthma for the past 14 years. He takes no other medications. He is 188 cm (6 ft 2 in) tall and weighs 90 kg (200 lb); BMI is 25 kg/m². Vital signs are temperature 37.0°C (98.6°F), pulse 70/min, respirations 12/min, and blood pressure 120/76 mm Hg. Physical examination shows no abnormalities except for scattered rhonchi and wheezes with forced expiration. Peak expiratory flow rate is 240 L/min. Which of the following is the most appropriate management?

(A) Chest x-ray
(B) Fexofenadine therapy
(C) Increased use of the albuterol inhaler
(D) Initiation of a daily corticosteroid inhaler
(E) Referral to an allergist
97. A 40-year-old man with paranoid schizophrenia is transferred to the emergency department from the residential facility where he lives 2 hours after having swallowed a nail. The patient says he does not have any symptoms. Medical history is otherwise unremarkable. His only current medication is haloperidol. The patient is not in acute distress. Vital signs are normal. Physical examination shows no abnormalities. Mental status examination discloses a flat affect, distractibility, and derailment of thoughts. X-ray of the abdomen is obtained and shows a 4-cm nail in the left upper quadrant. No free air is visible. After admitting the patient to the hospital, which of the following is the most appropriate management?

(A) Administration of a cathartic agent to induce passage of the nail through the gut
(B) Administration of ipecac to induce vomiting and expectoration of the nail
(C) Observation to allow passage of the nail via normal peristalsis
(D) Open laparotomy and removal of the nail through a gastrotomy incision
(E) Removal of the nail through endoscopic esophagogastroscopy

98. A 38-year-old male letter carrier returns to the office for follow-up of abnormal results of a liver chemistry profile ordered 3 weeks ago during a routine examination. At that time, physical examination disclosed no abnormalities, but serum AST concentration was 72 U/L. Serum bilirubin and alkaline phosphatase concentrations were within the reference ranges. Medical history is significant for an episode of hepatitis A at age 22 years. He has no history of transfusions or intravenous drug use. He drinks two to three beers daily. Today's follow-up laboratory study results are shown:

<table>
<thead>
<tr>
<th>Serum</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Anti-HAV</td>
<td>Positive</td>
</tr>
<tr>
<td>Anti-HBs</td>
<td>Negative</td>
</tr>
<tr>
<td>HBsAg</td>
<td>Positive</td>
</tr>
<tr>
<td>HBeAg</td>
<td>Positive</td>
</tr>
</tbody>
</table>

Which of the following is the most appropriate next step?

(A) Begin interferon-alfa therapy
(B) Begin corticosteroid therapy
(C) Instruct him to cease alcohol consumption and retest him in 2 months
(D) Order hepatitis B virus polymerase chain reaction test
(E) Schedule liver biopsy

99. A 16-year-old high school student, whose prenatal course you have managed, delivers a 3256-g (7-lb 3-oz) baby girl during the night with the assistance of your associate. On morning rounds you note that the delivery records report that she had mildly elevated blood pressure during labor and sustained an estimated third-stage blood loss of 500 mL. Today blood pressure is 132/84 mm Hg, she is afebrile, and deep tendon reflexes are normal. The uterine fundus is firm and at the level of the umbilicus, and her perineum is slightly edematous. Hematocrit is 33%. She is cuddling her infant and normal bonding seems to be occurring. Which of the following is the most important next step in management?

(A) Begin oral ferrous sulfate
(B) Begin oral methyldopa
(C) Institute fundal massage
(D) Order daily sitz baths
(E) Provide education for well-baby care
100. A 13-year-old girl is brought to the office for a health maintenance visit. She was diagnosed with Turner syndrome in infancy during a work-up for coarctation of the aorta. During today's visit, her mother reports that the girl has been talking about babies. You have been the patient's physician for the past 6 years and know she is prepubescent. It is most appropriate to counsel the patient that if she wishes to have a family she will need to do which of the following?

(A) Adopt
(B) Have amniocentesis if she gets pregnant
(C) Have an operation
(D) Receive genetic counseling
(E) Receive hormone treatment

101. A 51-year-old woman comes to the emergency department after falling on an icy sidewalk. She reports wrist pain. Vital signs are stable. Physical examination shows swelling of the left wrist and tenderness over the dorsum of the wrist. X-ray of the left wrist is shown. Which of the following is the most appropriate next step?

(A) Arrange consultation with an orthopaedic surgeon
(B) Have her see her primary care physician in 1 week
(C) Order arthrography of the wrist
(D) Order MRI of the wrist
(E) Tell the patient she is fine and discharge her
102. A 22-year-old woman comes to the office because of urticaria. This is her first episode of urticaria and it has occurred and then resolved several times in the past week. The history and physical examination disclose no abnormalities. Which of the following is the most appropriate course of action?

(A) Determine the erythrocyte sedimentation rate
(B) Determine the serum IgE concentration
(C) Determine the total eosinophil count
(D) Refer her to an allergist
(E) Treat the symptoms

103. A 25-year-old man, who was admitted to the hospital 5 hours ago because of nausea, light-headedness, and muscle aches that began after he completed a marathon, now reports worsening pain in his right leg. On admission, the patient reported only mild muscle aching, but he now rates the pain in his right lower extremity as a 9 on a 10-point scale. Laboratory studies on admission were notable for a serum creatine kinase concentration of 10,000 U/L and a serum creatinine concentration of 1.7 mg/dL. Since admission the patient has received 5 L of 0.9% saline and his nausea and light-headedness have resolved. He is alert and fully oriented. Vital signs are temperature 36.9°C (98.5°F), pulse 88/min, respirations 16/min, and blood pressure 126/82 mm Hg. Pulse oximetry on room air shows an oxygen saturation of 97%. Cardiopulmonary and abdominal examinations disclose no abnormalities. Passive flexion of the toes elicits pain over the anterior portion of the right lower extremity below the knee. Distal pulses are present in the lower extremities bilaterally. The remainder of the physical examination discloses no abnormalities. Results of laboratory studies obtained 1 hour ago are shown:

<table>
<thead>
<tr>
<th>Serum</th>
<th>Blood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urea nitrogen</td>
<td>Hemoglobin</td>
</tr>
<tr>
<td>12 mg/dL</td>
<td>14.0 g/dL</td>
</tr>
<tr>
<td>Creatinine</td>
<td>WBC</td>
</tr>
<tr>
<td>1.2 mg/dL</td>
<td>14,000/mm³</td>
</tr>
<tr>
<td>Na⁺</td>
<td>Neutrophils, segmented</td>
</tr>
<tr>
<td>140 mEq/L</td>
<td>60%</td>
</tr>
<tr>
<td>K⁺</td>
<td></td>
</tr>
<tr>
<td>4.0 mEq/L</td>
<td></td>
</tr>
<tr>
<td>Cl⁻</td>
<td></td>
</tr>
<tr>
<td>100 mEq/L</td>
<td></td>
</tr>
<tr>
<td>HCO₃⁻</td>
<td></td>
</tr>
<tr>
<td>24 mEq/L</td>
<td></td>
</tr>
</tbody>
</table>

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

(A) Application of ice to the right lower extremity
(B) Cyclobenzaprine therapy
(C) Measurement of lower extremity compartment pressures
(D) MRI of the right lower extremity
(E) Nonsteroidal anti-inflammatory drug therapy

104. A 16-year-old girl is brought to the office by her mother because she is concerned that she may have contracted meningitis from her soccer teammate, who was diagnosed with meningococcal meningitis and admitted to the hospital yesterday. The patient's soccer team traveled to a neighboring state to participate in a tournament 1 week ago and she shared a hotel room with the girl who was hospitalized. The patient feels well but is concerned she may have "caught the same bug." Medical history is remarkable for asthma. Medications include inhaled albuterol. Vital signs are temperature 37.2°C (98.9°F), pulse 64/min, respirations 16/min, and blood pressure 107/58 mm Hg. Physical examination shows no abnormalities. Which of the following is the most appropriate intervention for this patient at this time?

(A) Administer the meningococcal vaccine
(B) Prescribe doxycycline
(C) Prescribe penicillin
(D) Prescribe rifampin
(E) Assure the patient that no anti-infective prophylaxis is necessary
A 42-year-old man comes to the office for preoperative evaluation prior to undergoing adrenalectomy scheduled in 2 weeks. One month ago, he received care in the emergency department for pain over his right flank following a motor vehicle collision. At that time, blood pressure was 160/100 mm Hg and CT scan of the abdomen showed an incidental 10-cm left adrenal mass. Results of laboratory studies, including complete blood count, serum electrolyte concentrations, and liver function tests, were within the reference ranges. The patient otherwise had been healthy and had never been told that he had elevated blood pressure. He takes no medications. A follow-up visit in the office 2 weeks ago disclosed elevated urinary normetanephrine and metanephrine and plasma aldosterone concentrations. The patient was referred to a surgeon, who recommended the adrenalectomy. Today, vital signs are temperature 36.6°C (97.9°F), pulse 100/min, respirations 14/min, and blood pressure 170/95 mm Hg. Physical examination discloses no significant findings. Initial preoperative preparation should include treatment with which of the following?

(A) Labetalol  
(B) A loading dose of potassium chloride  
(C) Nifedipine  
(D) Phenoxybenzamine  
(E) Spironolactone

A 25-year-old woman is admitted to the hospital 6 hours after an episode of syncope. The patient tells you that she has no known illnesses and takes no medications. She has not seen a physician since she was a child. She reports feeling tired during the past few months but attributes the fatigue to a new, stressful job. She is 157 cm (5 ft 2 in) tall and weighs 48 kg (106 lb); BMI is 19 kg/m². Pulse oximetry on room air shows an oxygen saturation of 96%. Vital signs now are temperature 37.0°C (98.6°F), pulse 70/min and irregular, respirations 14/min, and blood pressure 110/65 mm Hg. Physical examination shows a prominent right cardiac impulse, a fixed and widely split S₂, and a midsystolic flow murmur. ECG shows right ventricular hypertrophy and a few premature atrial contractions.

106. Which of the following is the most appropriate diagnostic step?

(A) Cardiac catheterization  
(B) CT scan of the chest  
(C) Echocardiography  
(D) MUGA scan  
(E) Thallium exercise stress test

107. Echocardiography confirms an atrial septal defect. Surgical intervention is recommended, but the patient is hesitant. The patient should be informed that if her condition is left untreated, the most likely outcome will be which of the following?

(A) Chronic pulmonary emboli  
(B) Hypertrophic cardiomyopathy  
(C) Interstitial lung disease  
(D) Pulmonary hypertension  
(E) Systemic hypertension

END OF SET

NOTE: THIS IS THE END OF BLOCK 3. ANY REMAINING TIME MAY BE USED TO CHECK ITEMS IN THIS BLOCK.
108. A 31-year-old woman comes to the office for initial prenatal care. She is 12 weeks pregnant by date of her last menstrual period. This is her fourth pregnancy; she has three healthy children. Her last pregnancy resulted in cesarean delivery because of fetal distress during labor. Her history includes heavy use of alcohol and cigarettes, and multiple sexual partners. In addition to routine prenatal laboratory work-up, the patient consents to an HIV antibody test, which is later reported as positive. At a follow-up visit this patient should be counseled regarding which of the following?

(A) Amniocentesis is recommended to rule out congenital HIV infection
(B) Breast-feeding will increase the risk for transmitting HIV to the infant
(C) Immediate termination of pregnancy will decrease her risk for progression to AIDS
(D) Repeat cesarean delivery may increase the risk for vertical transmission of HIV
(E) The risk for perinatal HIV transmission is greater than 50%

109. A 70-year-old man, who was admitted to the hospital 3 days ago for treatment of pneumonia, has now developed diarrhea and severe lower abdominal cramping. The patient has passed watery and yellow stools every 2 hours for the past 12 hours. Since admission, the patient has been treated with intravenous levofloxacin therapy and albuterol/ipratropium nebulizers every 4 hours, with only mild improvement of his respiratory symptoms. Medical history is also significant for hypertension, type 2 diabetes mellitus, and hyperlipidemia. Routine medications include rosiglitazone, amlodipine, and simvastatin. He has smoked one pack of cigarettes daily for the past 50 years. BMI is 20 kg/m². Vital signs are temperature 36.7°C (98.0°F), pulse 102/min, respirations 16/min, and blood pressure 100/50 mm Hg. Pulse oximetry on room air shows an oxygen saturation of 93%. Physical examination discloses dry mucous membranes and cracked lips. Lungs are clear to auscultation bilaterally. Cardiac examination discloses a tachycardic but regular rhythm. Abdomen is diffusely tender to palpation with no distention, rebound, or guarding. Test of the stool for occult blood is negative. Results of serum laboratory studies are shown:

<table>
<thead>
<tr>
<th>Test</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urea nitrogen</td>
<td>30 mg/dL</td>
</tr>
<tr>
<td>Creatinine</td>
<td>1.5 mg/dL</td>
</tr>
<tr>
<td>Calcium</td>
<td>8.2 mg/dL</td>
</tr>
<tr>
<td>Na⁺</td>
<td>150 mEq/L</td>
</tr>
<tr>
<td>K⁺</td>
<td>3.7 mEq/L</td>
</tr>
<tr>
<td>Cl⁻</td>
<td>115 mEq/L</td>
</tr>
<tr>
<td>HCO₃⁻</td>
<td>22 mEq/L</td>
</tr>
<tr>
<td>Glucose</td>
<td>120 mg/dL</td>
</tr>
</tbody>
</table>

Stool culture is obtained. Intravenous infusion of which of the following substances is the most appropriate next step?

(A) Bicarbonate
(B) Calcium gluconate
(C) 5% Dextrose in water
(D) 0.9% Saline
110. A 34-year-old woman comes to the office because of a 3- to 4-week history of swelling of her legs and a 9-kg (20-lb) weight gain. Medical history is significant for sickle cell trait and mild anemia. She has been taking 800 mg of ibuprofen three times daily for Achilles tendinitis diagnosed 1 month ago. She has smoked five cigarettes daily for the past 15 years, and she drinks one to five beers on weekends. She experimented with cocaine briefly 16 years ago, but she has never used intravenous drugs. She has been in a monogamous sexual relationship for the past 12 years. Today, vital signs are temperature 37.2°C (99.0°F), pulse 88/min, respirations 16/min, and blood pressure 145/95 mm Hg. Physical examination discloses periorbital edema but no jugular venous distention. Lungs are clear to auscultation. Cardiac examination discloses an S₁ and S₂ without murmurs or gallops. Abdominal examination discloses bulging flanks and shifting dullness to percussion. Examination of the lower extremities shows pitting edema from the mid thigh to the ankles bilaterally. Results of which of the following studies are most likely to be abnormal in this patient?

(A) Echocardiography
(B) HIV antibody study
(C) Serum B-type natriuretic peptide concentration
(D) Toxicology screening of the urine
(E) Urine protein concentration

111. A 78-year-old woman is admitted to the hospital for replacement of her left knee joint due to degenerative joint disease. She has type 2 diabetes mellitus, a long history of hypertension, and chronic renal failure presumed secondary to diabetes mellitus and hypertension. Reversible causes of renal failure have been excluded. She underwent a tonsillectomy at age 9 years and a laparoscopic cholecystectomy at age 68 years. Serum creatinine concentration on admission was 6.0 mg/dL. Her current therapy includes a low-sodium, low-protein American Diabetes Association (ADA) diet, enalapril, and acetaminophen. She is a retired seamstress. She and her husband live on a farm 90 miles from the nearest dialysis facility. In considering long-term treatment options for this patient, which of the following is the most appropriate factor to consider?

(A) Her eligibility to receive Medicare
(B) Her history of an abdominal operation
(C) Her history of arthritis
(D) Her suitability for home dialysis
(E) Her willingness to move to the city

112. A 38-year-old man with Down syndrome and severe mental retardation is brought to the emergency department by ambulance because of increasing lethargy for the past several hours. The patient is noncommunicative and you are unable to obtain an initial history of his present illness or a past medical history. You do not know if he takes any medications. Vital signs are temperature 38.3°C (100.9°F), pulse 90/min, respirations 19/min, and blood pressure 120/60 mm Hg. On physical examination the patient is awake but lethargic. Auscultation of the chest discloses clear lungs; cardiac examination discloses a systolic click. Neurologic examination shows decreased muscle tone. Serum electrolyte concentrations are normal. Complete blood count shows a leukocyte count of 18,000/mm³ with 23% band neutrophils. The patient's caregiver, who is also the patient's guardian, cannot be located and staff at the group home where the patient resides cannot be reached by telephone. The patient refuses lumbar puncture for examination of cerebrospinal fluid. Toxicologic screening of the urine is negative. Which of the following is the most appropriate next step?

(A) Administer intravenous antibiotics
(B) Await contact with the caregiver before proceeding with management
(C) Obtain CT scan of the head
(D) Obtain echocardiography
(E) Obtain EEG
113. A 54-year-old woman comes to the office because she has had intermittent shooting pain over her right cheek and jaw during the past 3 weeks. Each episode of pain lasts for 1 second or less. The pain is often triggered by cold air, chewing, tactile stimulation, and brushing her teeth. She has had no trauma to the face or head. Medical history is remarkable for tension headaches, obesity, and gastric bypass surgery. She is 165 cm (5 ft 5 in) tall and weighs 62 kg (137 lb); BMI is 23 kg/m². Vital signs are normal. The patient cannot tolerate touch over the right side of the face. There is no facial weakness or loss of sensation. The remainder of the physical examination shows no abnormalities. CT scan of the head with and without contrast shows no abnormalities. Which of the following is the most appropriate pharmacotherapy at this time?

(A) Carbamazepine  
(B) Lamotrigine  
(C) Levetiracetam  
(D) Topiramate  
(E) Zonisamide

114. A 72-year-old man is admitted to the intensive care unit for pain management and observation of ventricular ectopy 4 hours after undergoing uncomplicated left total knee replacement. He is receiving fentanyl via systemic patient-controlled analgesic pump for pain management. Medical history is remarkable for coronary artery disease, for which he takes atorvastatin, furosemide, carvedilol, lisinopril, and 81-mg aspirin. Baseline echocardiogram showed an ejection fraction of 0.20. Vital signs now are temperature 38.0°C (100.4°F), pulse 90/min, respirations 16/min, and blood pressure 130/90 mm Hg. Pulse oximetry on room air shows an oxygen saturation of 96%. Physical examination discloses no unexpected abnormalities. Which of the following regimens for prophylaxis of deep venous thrombosis will likely be most beneficial in this patient?

(A) Continuous application of bilateral lower extremity pneumatic compression devices  
(B) Continuous intravenous infusion of heparin titrated to a PTT of 1.5 to 2.0 times the control value  
(C) Oral warfarin  
(D) Subcutaneous enoxaparin  
(E) Subcutaneous heparin

115. A 9-year-old boy is brought to the office by his parents for a well-child examination. The patient and his family immigrated to the United States 2 months ago and he has not been evaluated by a physician in 4 years. He has been generally healthy. Medical history is significant for pneumonia at age 3 years. He takes no medications. He is at the 25th percentile for height, weight, and BMI. Vital signs are temperature 37.0°C (98.6°F), pulse 82/min, respirations 20/min, and blood pressure 112/74 mm Hg. Cardiac examination discloses a grade 3/6 systolic murmur audible along the left sternal border at the third and fourth intercostal spaces. Femoral pulses are weak and brachial pulses are strong; there is a radiofemoral delay. Chest x-ray discloses mild cardiomegaly with left ventricular prominence. ECG shows left ventricular hypertrophy. This patient is at greatest risk for which of the following complications?

(A) Atrial fibrillation  
(B) Cor pulmonale  
(C) Systemic hypertension  
(D) Tricuspid valve regurgitation
116. A 39-year-old woman, gravida 2, para 2, comes to the community-based health center because of a 6-month history of a copious, foul-smelling vaginal discharge. She also reports spotting that began 6 months ago and has progressed to heavy bleeding during the past 3 weeks. Medical history is significant for an abnormal Pap smear in her 20s; her most recent Pap smear was done 12 years ago during her second pregnancy, and she recalls the results as being normal. She takes no medications. The patient was married for 18 years; her husband died 4 years ago and had undergone vasectomy after the birth of their last child. The patient has not had any new sexual partners since her husband's death. BMI is 32 kg/m². Vital signs are temperature 37.2°C (99.0°F), pulse 90/min, respirations 14/min, and blood pressure 155/96 mm Hg. Speculum examination discloses normal vaginal mucosa. The cervix is friable with a 1-cm exophytic mass lateral to the cervical os at the nine o'clock position. Which of the following is the most critical factor in formulating a management plan for this patient?

(A) Future fertility plans  
(B) Hypertension  
(C) Obesity  
(D) Patient age  
(E) Stage of disease

117. A 67-year-old man with Parkinson disease is admitted to the hospital for treatment of pneumonia. The patient's daughter, who is visiting the patient, says he has had increased lethargy for the past day and decreased ambulation during the past 6 months. She also says that there are times during the day when his tremors increase in severity, although he continues to care for himself at home. Medical history is also remarkable for hypertension. Medications include hydrochlorothiazide, atenolol, levodopa, and carbidopa. He is 168 cm (5 ft 6 in) tall and weighs 78 kg (172 lb); BMI is 28 kg/m². Vital signs are temperature 38.9°C (102.0°F), pulse 60/min supine and 68/min standing, respirations 22/min, and blood pressure 100/60 mm Hg supine and 80/50 mm Hg standing. The patient appears ill and older than his stated age. He is fully oriented but lethargic. Auscultation of the chest discloses rhonchi in the right mid lung field. Abdominal examination discloses no abnormalities. Neurologic examination discloses masked facies, bradykinesia, and cogwheel rigidity; gait was not assessed on admission. Chest x-ray shows a right lower lobe infiltrate. ECG shows no abnormalities. Appropriate intravenous antibiotic therapy is initiated. Prior to discharge, which of the following is the most appropriate step?

(A) Obtain CT scan of the chest  
(B) Obtain a swallowing evaluation  
(C) Place a percutaneous endoscopic gastrostomy (PEG) tube  
(D) Prescribe fludrocortisone  
(E) Prescribe prophylactic levofloxacin

118. A 6-month-old male Hispanic infant is brought to the office by his parents because of intermittent swelling of his right scrotum that is more pronounced when he cries. The swelling has never been red or "stuck." Vital signs are normal. A right inguinal hernia is confirmed on physical examination. In discussing repair of the hernia with the parents, it is most appropriate to inform them of which of the following?

(A) Herniorrhaphy can be postponed until age 2 years because many hernias close spontaneously  
(B) Herniorrhaphy can be postponed until age 12 years because oligospermia does not develop before age 12  
(C) Herniorrhaphy should be scheduled at the earliest convenient time  
(D) Herniorrhaphy should be scheduled as an emergency operation  
(E) There is no need to repair the hernia in childhood unless incarceration occurs
A 42-year-old woman, who sustained a bite to her left forearm from her cat 2 days ago, comes to the emergency department because of increased pain and redness at the injury site. The patient says the cat stays indoors and is up-to-date on its rabies vaccination. The patient's medical history is significant for type 1 diabetes mellitus. Her only medication is 70/30 insulin. BMI is 24 kg/m². Vital signs are temperature 38.1°C (100.6°F), pulse 96/min, respirations 16/min, and blood pressure 134/76 mm Hg. Pulse oximetry on room air shows an oxygen saturation of 98%. Examination of the left forearm discloses the wound shown in the photograph; the forearm is tender to palpation. The remainder of the physical examination discloses no abnormalities. Which of the following is the most appropriate antibiotic therapy to administer at this time?

(A) Ampicillin-sulbactam
(B) Cefazolin and gentamicin
(C) Dicloxacillin and clindamycin
(D) Levofoxacin
(E) Vancomycin and metronidazole
120. A 78-year-old man, who underwent coronary angiography with stent placement 8 years ago, comes to the office for a routine health maintenance examination. The patient reports no new symptoms except for shortness of breath and fatigue during exercise that began 3 months ago when he tried to increase the distance of his daily walk from 1 mile to 3 miles. He has not had orthopnea, paroxysmal nocturnal dyspnea, or chest pain. Additional medical history is significant for hypertension, coronary artery disease, dyslipidemia, and polymyalgia rheumatica. The patient also has a heart murmur that was discovered at an armed forces screening physical examination at age 18 years, but it did not prevent him from serving in the military. Medications are metoprolol, atorvastatin, lisinopril, omeprazole, and a low dose of prednisone every other day. The patient is active and manages a small farm. BMI is 26 kg/m². Vital signs are temperature 37.0°C (98.6°F), pulse 60/min, respirations 18/min, and blood pressure 124/61 mm Hg. Cardiac examination discloses a normal S₁, pronounced S₂, and a grade 2/6 late systolic murmur heard at the right upper parasternal border. Pulses are normal in contour. Results of laboratory studies are within the reference ranges. ECG shows no abnormalities. Which of the following is the most appropriate next step in management?

(A) Decrease the dose of metoprolol
(B) Increase the dose of prednisone
(C) Obtain serum vitamin D concentration
(D) Order a transthoracic echocardiography

121. A 76-year-old man comes to the office because of early awakening at night. He has no difficulty falling asleep but routinely wakes up between 2:00 and 3:00 AM. The patient is a retired postal worker, and he has always been physically active. He has diabetes mellitus controlled by diet. The patient drinks one cup of coffee in the morning with breakfast and usually walks for exercise in the morning. Before retiring at night he has one alcoholic beverage. He has no history of depression, nightmares, or snoring and he takes no over-the-counter medications. His wife of 45 years is also in good health. Vital signs are temperature 37.1°C (98.8°F), pulse 96/min and regular, respirations 18/min, and blood pressure 135/90 mm Hg. Physical examination shows a well-nourished, well-developed man. He is not obese. Examination of the head and neck is normal; there are no bruits or jugular venous distention. Chest is clear, and heart is normal with S₁ and S₂. Abdomen is soft and nontender with active bowel sounds and no organomegaly. Rectal examination discloses no abnormalities. Which of the following is the most appropriate management of this patient's insomnia?

(A) Advise the patient to discontinue his bedtime drink of alcohol
(B) Advise the patient to read and snack in bed to relax
(C) Prescribe a vigorous pre-bedtime exercise regimen
(D) Prescribe sertraline
(E) Prescribe triazolam

122. A 25-year-old woman who is 19 weeks pregnant comes to the office for a prenatal examination. Her father had classic hemophilia. A karyotype obtained from an amniotic fluid sample of the patient shows that the fetus is XY. Which of the following should you tell the patient regarding her infant?

(A) The infant will neither have hemophilia nor be a carrier
(B) The infant has a 50% risk for hemophilia
(C) The infant has a 50% risk for being a carrier
(D) The infant has a 75% risk for hemophilia
(E) The infant has a 75% risk for being a carrier
123. A 47-year-old man comes to the emergency department because of a 3-day history of increasing pain, tenderness, and swelling near the fingernail of his right index finger. He rates the pain as an 8 on a 10-point scale. He has not had fever or chills, and he has not sustained any trauma to the finger. Medical history is unremarkable and the patient takes no medications. He appears generally well and is not in distress. Vital signs are temperature 37.1°C (98.8°F), pulse 72/min, respirations 14/min, and blood pressure 120/80 mm Hg. Physical examination of the right hand discloses swelling, erythema, warmth, and tenderness of the periungual region of the right index finger. There is a mildly fluctuant area near the nail edge. The remainder of the physical examination discloses no abnormalities. Which of the following is the most appropriate next step in management?

(A) Incision and drainage
(B) Oral cefazolin therapy
(C) Topical neomycin therapy
(D) Warm-water soaks

124. A 9-year-old boy is brought to the emergency department by his father because of lethargy. On physical examination, the boy is slightly lethargic and has deep respirations, which are 32/min. The father, who is a single parent, says, "He is always thirsty and he pees a lot." Results of laboratory studies are shown:

<table>
<thead>
<tr>
<th>Serum</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glucose</td>
<td>850 mg/dL</td>
</tr>
<tr>
<td>Na⁺</td>
<td>132 mEq/L</td>
</tr>
<tr>
<td>K⁺</td>
<td>4.1 mEq/L</td>
</tr>
<tr>
<td>Cl⁻</td>
<td>92 mEq/L</td>
</tr>
<tr>
<td>HCO₃⁻</td>
<td>6 mEq/L</td>
</tr>
</tbody>
</table>

After admitting the boy to the hospital, which of the following is the most appropriate therapy?

(A) Administer normal saline and add potassium once urinary output is adequate
(B) Correct the acidosis with oral bicarbonate solution
(C) Correct the dehydration with hypotonic saline solution
(D) Give phenobarbital to prevent hyponatremic seizures
(E) Institute intermediate-acting insulin to correct hyperglycemia

125. A 26-year-old woman with HIV infection comes to the office because of a 4-day history of pain and redness of her left lower leg. She says the symptoms began after she tripped over a tree branch in her yard and scraped her left leg. Current medications include antiretroviral therapy and ibuprofen as needed. Vital signs are temperature 38.3°C (100.9°F), pulse 86/min, respirations 14/min, and blood pressure 138/70 mm Hg. There is a 5x8-cm area on the anterior surface of her left lower extremity that is swollen, erythematous, and tender. She previously has developed a rash after taking erythromycin, and she has had an anaphylactic response to penicillin. Which of the following antibiotic therapies is most appropriate for this patient?

(A) Amoxicillin
(B) Ciprofloxacin
(C) Clarithromycin
(D) Clindamycin
(E) No antibiotic therapy is indicated
126. A 25-year-old man comes to the emergency department because he developed chest pain and shortness of breath 1 hour ago, shortly after snorting cocaine for the first time. He rates the chest pain as a 7 on a 10-point scale and notes that the pain is radiating down his left arm. Medical history is unremarkable and the patient takes no medications or any other illicit drugs. He is 178 cm (5 ft 10 in) tall and weighs 70 kg (154 lb); BMI is 22 kg/m^2. The patient is diaphoretic. Vital signs are temperature 37.5°C (99.5°F), pulse 110/min, respirations 16/min, and blood pressure 200/100 mm Hg. Pulse oximetry on room air shows an oxygen saturation of 95%. Pupils are equal, round, and reactive to light and accommodation. Lungs are clear to auscultation and percussion. Auscultation of the heart discloses an audible S1 and S2. There is no edema, cyanosis, or clubbing of the digits. The patient is fully oriented. He is treated with supplemental oxygen, a 325-mg aspirin tablet, and intravenous nitroglycerin and lorazepam. Despite therapy, he continues to have chest pain and shortness of breath. ECG shows sinus tachycardia with no ST-segment or T-wave abnormalities. Which of the following is the most appropriate additional pharmacotherapy to initiate at this time?

(A) Carvedilol  
(B) Furosemide  
(C) Metoprolol  
(D) Phentolamine  
(E) Streptokinase

127. A 49-year-old man, who is recovering in the hospital 2 days after uncomplicated left femoral-popliteal bypass grafting for claudication, has now developed increasing pain in his left foot. Until now, the patient's postoperative course had been unremarkable and he has been treated with low-dose morphine for pain control. Medical history is remarkable for type 2 diabetes mellitus controlled with metformin and diet. Vital signs now are temperature 36.8°C (98.2°F), pulse 80/min and regular, respirations 20/min, and blood pressure 150/92 mm Hg. The surgical incision appears clean and well approximated without abnormal erythema or swelling. The left lower extremity and foot appear pale. Palpation of the left lower extremity discloses a strong femoral pulse, a weak popliteal pulse, and a cool, pulseless foot. Which of the following is the most appropriate management?

(A) Bedside compartment pressure measurements  
(B) Doppler ultrasonography of the left lower extremity  
(C) Intra-arterial tissue plasminogen activator (tPA) therapy  
(D) Intraoperative angiography  
(E) MRA of the left lower extremity

128. A 3-week-old male infant is brought to the office by his mother because of a 2-day history of white lesions in the mouth. The infant was born at term via uncomplicated spontaneous vaginal delivery; he has been breast-feeding well and is urinating and having bowel movements normally. At birth, he weighed 3289 g (7 lb 4 oz; 30th percentile). Today, he weighs 3629 kg (8 lb; 25th percentile). He appears adequately hydrated. Vital signs are normal. Physical examination discloses white patches on the tongue and buccal mucosa that do not come off when gently scraped with a tongue blade. Which of the following is the most appropriate pharmacotherapy?

(A) Acyclovir  
(B) Fluconazole  
(C) Nystatin  
(D) Valacyclovir  
(E) No pharmacotherapy is necessary
129. A 5-year-old boy returns to the office with his 19-year-old mother to discuss results of studies done to evaluate his behavior of eating dirt. The patient sits quietly while his mother answers questions about his health. She says her son seems healthy, although he does not seem to be as active as other children his age. He has said his head hurts three or four times during the past 2 weeks. He has not had fever, sweats, or chills. She says he has a good appetite but has had a habit of eating sand and dirt since age 3 years. She says, "I don't know where he gets that habit. I used to eat dirt, but I stopped years ago. I try to stop him from eating dirt, but I'm not around much since I work two jobs." The patient takes no medications. Vaccinations are up-to-date. Height, weight, and BMI are at the 50th percentile. Vital signs are normal. Physical examination discloses no abnormalities except for symmetrical nontender cervical adenopathy. Results of laboratory studies, including serum zinc, lead, and iron concentrations, are within the reference ranges. Serologic testing confirms toxoplasmosis. In addition to prescribing pyrimethamine and sulfadiazine therapy, which of the following is the most appropriate next step in management?

(A) Prescribe fluoxetine
(B) Prescribe methylphenidate
(C) Prescribe risperidone
(D) Refer the patient to a child psychiatrist
(E) Refer the patient to a dietician

130. A 45-year-old man comes to the office because of severe pain of the right foot that awoke him from sleep last night. He says the pain kept him awake for the rest of the night. Walking has been difficult due to the pain, which he rates as a 9 on a 10-point scale. He reports no recent trauma. Medical history is remarkable for hypertension, type 2 diabetes mellitus, and asthma. Medications include hydrochlorothiazide, metformin, atorvastatin, and an albuterol inhaler. He is allergic to penicillin. He does not smoke cigarettes, but he has drunk three to four glasses of red wine daily for the past 5 years. Family history is significant for arthritis in his father. He is 168 cm (5 ft 6 in) tall and weighs 111 kg (245 lb); BMI is 40 kg/m². Vital signs are temperature 37.9°C (100.2°F), pulse 100/min, respirations 16/min, and blood pressure 160/100 mm Hg. Examination of the right foot discloses erythema and increased warmth over the first toe extending over the dorsum of the foot. The involved area is very tender and the patient resists movement of his toes. There is moderate swelling of the first metatarsophalangeal joint. The remainder of the physical examination discloses no abnormalities. Results of laboratory studies are shown:

<table>
<thead>
<tr>
<th>Serum</th>
<th>Blood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urea nitrogen</td>
<td>Hemoglobin</td>
</tr>
<tr>
<td>15 mg/dL</td>
<td>16 mg/dL</td>
</tr>
<tr>
<td>Creatinine</td>
<td>WBC</td>
</tr>
<tr>
<td>1.0 mg/dL</td>
<td>12,500/mm³</td>
</tr>
</tbody>
</table>

Examination of joint aspirate shows a leukocyte count of 50,000/mm³; no organisms are seen on Gram stain. Which of the following is the most appropriate pharmacotherapy to treat this patient's acute condition?

(A) Acetaminophen
(B) Allopurinol
(C) Ceftriaxone
(D) Indomethacin
(E) Vancomycin
A 54-year-old woman is in the out-patient surgery center for biopsy of a cervical lymph node, which was ordered because of progressive adenopathy. She was given lidocaine infiltration and heavy intravenous sedation. A left node biopsy was attempted, but when diagnostic tissue was not obtained, a right node biopsy was done. Three hours later as the patient prepares to dress for discharge home, she tells the nurse that the skin across her shoulders and up into her neck feels "spongy and crackled." Chest x-ray is shown. Which of the following is most appropriate to tell the patient?

(A) The sensation is probably due to the lidocaine spreading through the subcutaneous tissue and that she can be discharged home
(B) This is a life-threatening clostridial infection; antibiotic therapy and an emergency operation will be arranged
(C) This is a routine problem after surgical incisions and tissue dissection to obtain biopsy material
(D) This is probably due to the volume of intravenous fluid she has received; you will give her a dose of furosemide and discharge her home
(E) This may be due to pleural puncture; she should be admitted to the hospital for observation
132. A 2-year-old boy is brought to the emergency department by his babysitter because of a 30-minute history of respiratory distress. The babysitter reports that she is 15 years old and has cared for the patient on numerous occasions during the past year. The child's mother, who is a single parent, is currently out of town for business but will return later tonight. The babysitter says, "He has had a runny nose since I started babysitting yesterday, but this afternoon he awoke from a nap with a barking sound and he was breathing real heavy." She does not know the child's prior health history, nor does she know if the boy takes any medications on a regular basis. The child looks tired and sits upright on the babysitter's lap. He is obviously comfortable with his caregiver. Vital signs are temperature 38.7°C (101.7°F), pulse 110/min, respirations 28/min and labored, and blood pressure 85/50 mm Hg. Pulse oximetry on room air shows an oxygen saturation of 89%. Physical examination discloses inspiratory stridor. Neck is supple, tympanic membranes are normal, and there is a profuse nasal discharge. Examination of the pharynx discloses no abnormalities. Auscultation of the chest discloses equal air entry on both sides and no crackles. The remainder of the examination shows no abnormalities. Treatment with 40% oxygen via venturi mask and intravenous fluids is initiated. Despite continued supplemental oxygen and hydration, the child remains tachypneic and stridorous at rest. Oxygen saturation is now 93%. In addition to administering racemic epinephrine by nebulizer, which of the following is the most appropriate next step?

(A) Intravenous aminophylline therapy  
(B) Intravenous antibiotic therapy  
(C) Intubation  
(D) Oral dexamethasone therapy  
(E) Rectal acetaminophen therapy

133. A 67-year-old woman is transferred to the emergency department from the skilled nursing care facility where she resides because of intermittent, colicky, right lower quadrant abdominal pain that has steadily worsened during the past 8 hours. The pain has been constant for the past 2 hours, during which time she has vomited twice. Medical history is remarkable for a myocardial infarction 2 years ago and a left-hemispheric stroke 5 years ago. She also has a 30-year history of peptic ulcer disease, and a 20-year history of hypertension. Medications include metoprolol, sucralfate, docusate, and an 81-mg aspirin. Vital signs are temperature 38.0°C (100.4°F), pulse 100/min and regular, respirations 22/min, and blood pressure 170/92 mm Hg. Auscultation of the lungs discloses decreased breath sounds bilaterally. There is a grade 2/6 pansystolic ejection murmur at the cardiac apex. Abdominal examination discloses distention and tenderness to the right mid-abdomen and right upper quadrant. Muscle strength is 2/5 in the right upper and lower extremities. Plain x-ray of the abdomen shows cecal volvulus causing an obstruction in the right colon. Which of the following is the most appropriate next step?

(A) CT scan of the abdomen  
(B) Endoscopic evaluation and decompression  
(C) Intravenous fluid therapy and nasogastric tube placement with suction for 12 hours  
(D) Intravenous fluids and morphine therapy  
(E) Laparotomy
134. A 12-year-old girl with type 1 diabetes mellitus is brought to the emergency department by her parents because of a 2-day history of nausea, vomiting, and decreased oral intake. Medications are insulin glargine and insulin aspart. She decreased her insulin dose at the onset of symptoms but her condition has since worsened and she now is unable to consume solids or liquids without subsequent vomiting. She reports feeling dizzy on standing. Medical history is otherwise unremarkable. She is at the 50th percentile for height, weight, and BMI. Vital signs are temperature 37.8°C (100.1°F), pulse 118/min, respirations 27/min, and blood pressure 85/47 mm Hg. Pulse oximetry on room air shows an oxygen saturation of 99%. Physical examination discloses dry mucous membranes, delayed capillary refill time, and poor skin turgor. Palpation of the abdomen discloses diffuse tenderness with no rebound or guarding. The remainder of the physical examination discloses no abnormalities. Results of laboratory studies obtained on arrival are shown:

<table>
<thead>
<tr>
<th>Serum</th>
<th>Arterial blood gas values on room air</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urea nitrogen</td>
<td>28 mg/dL</td>
</tr>
<tr>
<td>Creatinine</td>
<td>1.2 mg/dL</td>
</tr>
<tr>
<td>Na⁺</td>
<td>126 mEq/L</td>
</tr>
<tr>
<td>K⁺</td>
<td>4.3 mEq/L</td>
</tr>
<tr>
<td>Cl⁻</td>
<td>95 mEq/L</td>
</tr>
<tr>
<td>HCO₃⁻</td>
<td>9 mEq/L</td>
</tr>
<tr>
<td>Glucose</td>
<td>563 mg/dL</td>
</tr>
<tr>
<td>HCO₃⁻</td>
<td>10 mEq/L</td>
</tr>
<tr>
<td>Po₂</td>
<td>98 mm Hg</td>
</tr>
<tr>
<td>PcO₂</td>
<td>22 mm Hg</td>
</tr>
<tr>
<td>pH</td>
<td>7.20</td>
</tr>
</tbody>
</table>

Boluses of intravenous 0.9% saline are administered and an infusion of insulin is initiated. Three hours later the patient becomes somnolent and develops a headache. She has had one episode of emesis and one episode of incontinence. Her urine output has been 30 mL/h. Results of follow-up serum laboratory studies are shown:

| Urea nitrogen  | 24 mg/dL |
| Creatinine     | 1.1 mg/dL |
| Na⁺            | 127 mEq/L |
| K⁺             | 3.7 mEq/L |
| Cl⁻            | 98 mEq/L |
| HCO₃⁻          | 11 mEq/L |
| Glucose        | 287 mg/dL |

Which of the following is the most appropriate intravenous pharmacotherapy?

(A) Bicarbonate  
(B) Dexamethasone  
(C) 50% Dextrose  
(D) Furosemide  
(E) Mannitol

135. A 29-year-old Hispanic woman, gravida 3, para 3, comes to the office because of recurrent low back pain during the past year. Rest and analgesics usually eradicate the pain within 2 weeks. However, the pain seems to recur every 2 to 3 months. Medical history is remarkable for gestational diabetes mellitus during her pregnancies. She takes no medications except for an oral contraceptive. She walks 3 miles daily for exercise and works as a sales representative for a computer software company. She is 165 cm (5 ft 5 in) tall and weighs 100 kg (220 lb); BMI is 37 kg/m². Vital signs are normal, and physical examination discloses no abnormalities. Which of the following is the most appropriate next step?

(A) Administer an epidural injection of methylprednisolone  
(B) Order MRI of the lumbosacral spine  
(C) Order x-rays of the lumbosacral spine  
(D) Recommend beginning a weight loss program  
(E) Recommend decreasing physical activity

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136. A 24-year-old recent college graduate comes to the office because of a 3-year history of increased frequency of urination and occasional incontinence whenever she travels. She says the urinary symptoms typically begin a few days before she is going to fly and they stop the day after she arrives at her destination. She says she is anxious about flying and even slightly "panicky." She reports having had similar but milder symptoms prior to examinations before graduating. Medical history is otherwise unremarkable. Her only medication is an oral contraceptive. Vital signs are normal. Physical examination discloses no abnormalities. Urinalysis and urine culture are normal. Which of the following is the most appropriate next step?

(A) Recommend behavioral therapy
(B) Recommend psychoanalytic psychotherapy
(C) Recommend that the patient avoid any stressful activities that cause the problem
(D) Review the patient’s sexual history
(E) Reassure the patient that her symptoms will resolve in time

137. A 47-year-old man is admitted to the hospital through the emergency department because of the sudden onset of palpitations, left-sided chest pain, light-headedness, and shortness of breath that began while he was watching television 2 hours ago. Medical history is remarkable for paroxysmal atrial fibrillation. The patient is 180 cm (5 ft 11 in) tall and weighs 82 kg (180 lb); BMI is 25 kg/m². ECG obtained in the emergency department showed atrial fibrillation with narrow QRS complex. Pulse was 146/min. Physical examination was remarkable for rapid heart rate. The patient was given oxygen via nasal cannula and intravenous metoprolol 5 mg every 5 minutes for a total of 15 mg. His pulse slowed to 90/min. Two hours after admission, he is pain free but his pulse is now 160/min. Blood pressure is 122/78 mm Hg. In order to decrease the patient’s pulse, which of the following should be administered intravenously?

(A) Adenosine
(B) Digoxin
(C) Enalapril
(D) Lidocaine
(E) Metoprolol

NOTE: THIS IS THE END OF BLOCK 4.
ANY REMAINING TIME MAY BE USED TO CHECK ITEMS IN THIS BLOCK.
# Answer Key for USMLE Step 3 Sample Questions

## Block 1: FIP

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<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>137.</td>
<td>E</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>