COMPREHENSIVE PATHOLOGY EXAM

Time: 3 hours

Prepared by Edward F. Goljan, M.D.

1. Which of the following biochemical events is most likely occurring in tissue that has a significant reduction in arterial blood flow?
   A. \( \beta \)-Oxidation of fatty acids
   B. Conversion of pyruvate to lactate
   C. Conversion of pyruvate to acetyl CoA
   D. Synthesis of ATP in the mitochondria
   E. Electron transfer in the oxidative pathway

2. Which of the following clinicopathologic findings is only present in respiratory acidosis rather than in carbon monoxide poisoning, anemia, or methemoglobinemia?
   A. Decreased oxygen content
   B. Low oxygen saturation (SaO2)
   C. Left shifted oxygen dissociation curve
   D. Inhibition of cytochrome oxidase (cyto a + a3)
   E. Low partial pressure of arterial oxygen (PaO2)

3. The growth alteration expected in the endometrial mucosa of a postmenopausal woman who is on unopposed estrogen therapy is the same type of growth alteration you would expect in which of the following clinicopathologic conditions?
   A. Kidneys in a patient with essential hypertension
   B. Brain in a patient with carotid artery atherosclerosis
   C. Left ventricle in a patient with essential hypertension
   D. Distal esophageal mucosa in a patient with acid reflux
   E. Prostate gland in an elderly man with urinary retention

4. The type of tissue necrosis that is expected in the brain of a patient with an atherosclerotic stroke is the same type of necrosis expected in which of the following clinicopathologic conditions?
   A. Mitral valve vegetations in rheumatic fever
   B. Ischemic acute tubular necrosis
   C. Tuberculous granuloma
   D. Pulmonary infarction
   E. Cerebral abscess

5. Inactivation of the p53 suppressor gene is associated with which of the following cell cycle alterations?
   A. Unrestricted passage of the cell from the G1 into the S phase
   B. Decreased synthesis of cyclin D in the G1 phase
   C. Inactivation of cyclin-D-dependent kinase
   D. Decrease in the mitotic rate of the cell
   E. Inhibition of the Rb suppressor gene
6. The pathogenesis of inflammation associated with *Corynebacterium diphtheriae* infections involving the oropharynx is similar to the pathogenesis and appearance of inflammation associated with...
   A. *Clostridium difficile*-induced colitis
   B. acetaminophen hepatotoxicity
   C. fibrinous pericarditis
   D. acute appendicitis
   E. rheumatic fever

7. A 2-month-old infant has failure of separation of the umbilical cord. The cord is surgically removed and histologic sections show an absence of neutrophil margination and emigration into the interstitial tissue. The clinical and histologic findings in the umbilical cord are most closely associated with a defect in...
   A. leukocyte synthesis of lysosomal enzymes
   B. activation of the complement system
   C. leukocyte synthesis of β2-integrins
   D. leukocyte microbicidal activity
   E. leukocyte phagocytic activity

8. The rubor, calor, and tumor of acute inflammation is most closely associated with a chemical mediator released by...
   A. mast cells
   B. neutrophils
   C. eosinophils
   D. plasma cells
   E. endothelial cells

9. Which of the following groups of cells is most important in the pathogenesis of a tuberculous granuloma?
   A. Natural killer cells and cytotoxic T cells
   B. Macrophages and helper T cells
   C. Helper T cells and neutrophils
   D. Eosinophils and mast cells
   E. B cells and macrophages

10. Which of the following anti-inflammatory activities occurs in patients who are being treated with either corticosteroids or aspirin?
    A. Decreased adhesion molecule synthesis
    B. Decreased synthesis of prostaglandins
    C. Inactivation of thromboxane synthase
    D. Decreased release of arachidonic acid
    E. Decreased synthesis of leukotrienes

11. A newborn child with cyanotic congenital heart disease has an absent thymic shadow on a routine chest-ray and clinical evidence of tetany. The pathogenesis of this patient's disorder most closely relates to a...
    A. deficiency of adenine deaminase in lymphocytes
    B. defect in the maturation of pre-B cells into mature B cells
    C. defect in T cells preventing B cells from synthesizing IgA
    D. defect in the maturation of mature B cells into plasma cells
    E. defect in the development of the 3rd and 4th pharyngeal pouches
12. Which of the following clinical disorders has a hypersensitivity reaction that is the same as the reaction causing Goodpasture's syndrome?
   A. Penicillin-induced maculopapular rash
   B. Lung disease secondary to sarcoidosis
   C. Post-streptococcal glomerulonephritis
   D. Warm autoimmune hemolytic anemia
   E. Anaphylactic reaction to a bee sting

13. Which of the following clinical disorders has a hypersensitivity reaction that is the same as the reaction causing the rash of poison ivy?
   A. Hay fever
   B. Myasthenia gravis
   C. Positive PPD skin reaction
   D. Rh hemolytic disease of the newborn
   E. Henoch-Schönlein vasculitis and glomerulonephritis

14. Which of the letters depicted in the schematic shown below best represents the expected plasma osmolality (POsm) and serum antidiuretic hormone levels (ADH) in a patient who is being infused with 3% hypertonic saline?

```
    POsm
   /     \
  B      C
 /       \
A       D
        Serum ADH
```

15. Which of the following edema disorders represents a transudate secondary to an increase in hydrostatic pressure and a decrease in oncotic pressure?
   A. Cirrhosis with ascites
   B. Nephrotic syndrome with ascites
   C. Swelling of the arm after a bee sting
   D. Pleural effusion in congestive heart failure
   E. Angioedema in C1 esterase inhibitor deficiency

16. In a patient who develops polyuria and increased thirst after head trauma, which of the following plasma osmolality (POsm) and urine osmolality (UOsm) findings are expected findings after water deprivation?

```
    POsm
   /     \
  B      C
 /       \
A       D
        UOsm
```
17. In a patient with diabetic ketoacidosis and clinical signs of volume depletion, which of the following plasma osmolality (POsm) and extracellular fluid (ECF) and intracellular fluid (ICF) compartment alterations is expected?

<table>
<thead>
<tr>
<th>POsm</th>
<th>ECF</th>
<th>ICF</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Low</td>
<td>Expanded</td>
</tr>
<tr>
<td>B.</td>
<td>Low</td>
<td>Contracted</td>
</tr>
<tr>
<td>C.</td>
<td>Low</td>
<td>Contracted</td>
</tr>
<tr>
<td>D.</td>
<td>High</td>
<td>Contracted</td>
</tr>
<tr>
<td>E.</td>
<td>Normal</td>
<td>Contracted</td>
</tr>
</tbody>
</table>

18. A 59-year-old woman with a long history of smoking cigarettes presents with mental status abnormalities. A chest x-ray exhibits a centrally located mass. A MRI of the brain is reported as negative for metastatic disease. A sputum cytology report indicates the presence of cells consistent with a primary small cell carcinoma of the lung. Which of the following changes in plasma osmolality (POsm) and volume status in the extracellular fluid (ECF) and intracellular fluid (ICF) compartments is expected?

<table>
<thead>
<tr>
<th>POsm</th>
<th>ECF</th>
<th>ICF</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Low</td>
<td>Expanded</td>
</tr>
<tr>
<td>B.</td>
<td>Low</td>
<td>Contracted</td>
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<tr>
<td>C.</td>
<td>High</td>
<td>Contracted</td>
</tr>
<tr>
<td>D.</td>
<td>High</td>
<td>Expanded</td>
</tr>
<tr>
<td>E.</td>
<td>Normal</td>
<td>Expanded</td>
</tr>
</tbody>
</table>

19. A 62-year-old man has a sudden onset of left flank pain. Physical exam reveals hypotension and a pulsatile mass in the abdomen. Which of the following Swan-Ganz catheter findings best represents this patient's clinical condition?

<table>
<thead>
<tr>
<th>MVO₂</th>
<th>PCWP</th>
<th>SVR</th>
<th>Cardiac output</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Normal</td>
<td>Normal</td>
<td>Normal</td>
</tr>
<tr>
<td>B.</td>
<td>Decreased</td>
<td>Increased</td>
<td>Increased</td>
</tr>
<tr>
<td>C.</td>
<td>Decreased</td>
<td>Decreased</td>
<td>Increased</td>
</tr>
<tr>
<td>D.</td>
<td>Increased</td>
<td>Decreased</td>
<td>Increased</td>
</tr>
</tbody>
</table>

MVO₂ = mixed venous oxygen content, PCWP = pulmonary capillary wedge pressure (measure of left ventricular end-diastolic pressure), SVR = systemic vascular resistance (synonymous with peripheral arteriolar resistance)
<table>
<thead>
<tr>
<th></th>
<th>pH  (7.35–7.45)</th>
<th>PCO₂  (33–45 mm Hg)</th>
<th>HCO₃⁻  (22–28 mEq/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>7.00</td>
<td>52</td>
<td>12</td>
</tr>
<tr>
<td>B</td>
<td>7.27</td>
<td>60</td>
<td>26</td>
</tr>
<tr>
<td>C</td>
<td>7.25</td>
<td>80</td>
<td>34</td>
</tr>
<tr>
<td>D</td>
<td>7.26</td>
<td>26</td>
<td>11</td>
</tr>
<tr>
<td>E</td>
<td>7.38</td>
<td>70</td>
<td>40</td>
</tr>
<tr>
<td>F</td>
<td>7.42</td>
<td>22</td>
<td>14</td>
</tr>
<tr>
<td>G</td>
<td>7.56</td>
<td>24</td>
<td>21</td>
</tr>
<tr>
<td>H</td>
<td>7.58</td>
<td>49</td>
<td>39</td>
</tr>
</tbody>
</table>

Each set of options relating to arterial blood gas disorders is followed by several numbered items. For each numbered item, select the **ONE** lettered option that is most closely associated with it. Each lettered option may be selected once, more than once, or not at all.

20. A 23-year-old obese woman post-cholecystectomy for a gangrenous cholecystitis develops tachypnea, dyspnea, and pleuritic type chest pain on her fifth postoperative day. A ventilation/perfusion scan shows a perfusion defect in the right lower lobe.

21. A 21 year old woman, who is a type I insulin dependent diabetic, stopped taking her insulin injections for 3 days owing to an argument with her fiancée. Physical exam reveals volume depletion.

22. A 56 year old woman, who is taking anti-inflammatory agents for rheumatoid arthritis, develops tinnitus, abdominal pain, and hearing loss.

23. A 62 year old man, who is taking a loop diuretic for chronic congestive heart failure, develops generalized weakness and postural hypotension.

24. A 29-year-old alcoholic, while in the emergency room for a bullet wound to the shoulder, is infused with 5% dextrose plus normal saline. He develops an acute onset of confusion, nystagmus, and ophthalmoplegia. Which of the following biochemical reactions is dysfunctional in this patient?
   A. Alanine → Pyruvate
   B. Pyruvate → Acetyl CoA
   C. Pyruvate → Oxaloacetate
   D. Oxaloacetate → Aspartate
   E. Methylmalonyl CoA → Succinyl CoA
25. A 70 year old woman, who complains of fatigue, is noted to have a severe macrocytic anemia, with pancytopenia, and hypersegmented neutrophils. A notable finding on physical exam is decreased vibratory sensation and proprioception in the lower extremities. Which of the following biochemical reactions is dysfunctional in this patient?
   A. Alanine → Pyruvate
   B. Pyruvate → Acetyl CoA
   C. Pyruvate → Oxaloacetate
   D. Oxaloacetate → Aspartate
   E. Methylmalonyl CoA → Succinyl CoA

26. A 35-year-old man, who is receiving prophylactic drug therapy for a positive PPD, develops a microcytic anemia. A bone marrow exam reveals numerous ringed sideroblasts. Which of the following biochemical reactions is most likely dysfunctional in this patient?
   A. Oxaloacetate → Malate
   B. Methylmalonyl CoA → Succinyl CoA
   C. Glucose 6-PO₄ → 6-Phosphogluconate
   D. Oxidized glutathione → Reduced glutathione
   E. Succinyl CoA + glycine → δ-Aminolevulinic acid

27. Which of the following laboratory test alterations distinguishes pernicious anemia from folate deficiency and other causes of B₁₂ deficiency?
   A. Schilling's test corrected with intrinsic factor
   B. Increased plasma homocysteine
   C. Urine for methylmalonic acid
   D. Hypersegmented neutrophils
   E. Pancytopenia

28. Which of the following clinicopathologic findings is expected in a patient with long-standing celiac disease?
   A. Peripheral neuropathy
   B. Normal prothrombin time
   C. Perifollicular hemorrhages
   D. Secondary hyperparathyroidism
   E. Hemorrhage into the mamillary bodies
29. The following pedigree is most consistent with which one of the following genetic disorders?

A. Glucose 6-phosphate dehydrogenase deficiency
B. Type II diabetes mellitus
C. Familial polyposis
D. Sickle cell disease
E. Phenylketonuria

30. A 42 year old woman delivers a full-term baby that has persistent vomiting of bile-stained material and failure to pass meconium. During her pregnancy, she had a low serum \( \alpha \)-fetoprotein. Chromosome studies are performed and reveal 46 chromosomes in the father, 45 chromosomes in the mother, and 46 chromosomes in the baby. Which of the following best explains the mechanism of the child's disease?

A. Microdeletion disorder
B. Nondisjunction in mitosis
C. Nondisjunction in meiosis
D. Robertsonian translocation
E. Point mutation of a nucleotide

31. The following pedigree is most compatible with which one of the following disorders?

A. Galactosemia
B. Cystic fibrosis
C. Neurofibromatosis
D. Coronary artery disease
E. Mitochondrial DNA disorder
32. Progressive worsening of a disease in future generations is commonly associated with which one of the following genetic disorders?
   A. Phenylketonuria
   B. Familial polyposis
   C. Marfan's syndrome
   D. Fragile X syndrome
   E. Duchenne's muscular dystrophy

33. In one family, there is a 14-year-old boy who is obese, mentally retarded, and has clinical evidence of hypogonadism. Another family has a mentally retarded 4-year-old girl who is always happy and giggling, however, she is unable to respond to questions. A high resolution chromosome study in both children uncovers a defect on the same chromosome. Which of the following terms best describes the clinical disorder that is present in both children?
   A. Genetic heterogeneity
   B. Variable expressivity
   C. Genomic imprinting
   D. Dominant negative
   E. Anticipation

34. In which of the following sites is the most common primary cancer an adenocarcinoma?
   A. Distal esophagus
   B. Urinary bladder
   C. Mid-esophagus
   D. Cervix
   E. Vulva

35. A primary cancer in a non-smoker would most likely be located in the...
   A. urinary bladder
   B. kidney
   C. larynx
   D. brain
   E. lung

36. A colonoscopy performed on a 62 year old man with weight loss and guaiac positive stool reveals an annular 3 cm mass located in the sigmoid colon. Multiple biopsies of the mass are reported to show a poorly differentiated adenocarcinoma. A colectomy is performed. During surgery, the surgeon notes a few nodular lesions on the surface of the liver. A frozen section of one of these lesions also shows a poorly differentiated adenocarcinoma. Gross and microscopic findings of the colectomy specimen reveal invasion of tumor out into the serosal fat. There is metastasis to 3 out of 15 mesenteric lymph nodes directly beneath the tumor. Which of the following most influences the ultimate prognosis in this patient?
   A. Age
   B. Male sex
   C. Extent of invasion
   D. Liver involvement
   E. Lymph node involvement
37. Arrange the following numbered cancers in men and women in decreasing order of incidence and mortality.

<table>
<thead>
<tr>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Colon</td>
<td>1. Breast</td>
</tr>
<tr>
<td>2. Lung</td>
<td>2. Colon</td>
</tr>
<tr>
<td>3. Prostate</td>
<td>3. Lung</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Incidence</th>
<th>Mortality</th>
<th>Incidence</th>
<th>Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. 2-3-1</td>
<td>3-2-1</td>
<td>3-1-2</td>
<td>1-3-2</td>
</tr>
<tr>
<td>B. 3-2-1</td>
<td>2-3-1</td>
<td>3-1-2</td>
<td>1-3-2</td>
</tr>
<tr>
<td>C. 2-3-1</td>
<td>3-2-1</td>
<td>1-3-2</td>
<td>3-1-2</td>
</tr>
<tr>
<td>D. 3-2-1</td>
<td>2-3-1</td>
<td>1-3-2</td>
<td>3-1-2</td>
</tr>
<tr>
<td>E. 3-1-2</td>
<td>2-1-3</td>
<td>1-2-3</td>
<td>3-2-1</td>
</tr>
</tbody>
</table>

38. A tumor that could potentially produce secondary polycythemia or hypercalcemia is most likely located in the...
   A. thyroid
   B. kidney
   C. breast
   D. liver
   E. lung

39. A 25 year old man presents with unilateral gynecomastia and cough. A chest x-ray shows multiple nodular masses in both lung fields consistent with metastasis. The primary cancer is most likely located in the...
   A. bone marrow
   B. testicle
   C. kidney
   D. colon
   E. liver

40. A 35 year old woman, who is comatose, has the following arterial blood gas results while breathing room air: (Note: PAO₂ = % oxygen (713) - PaCO₂/0.8)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>7.14</td>
</tr>
<tr>
<td>PaCO₂</td>
<td>80 (33–45 mm Hg)</td>
</tr>
<tr>
<td>PaO₂</td>
<td>40 (75–105 mm Hg)</td>
</tr>
<tr>
<td>Bicarbonate</td>
<td>28 (22–28 mEq/L)</td>
</tr>
</tbody>
</table>

Based on this data, which of the following best explains her clinical condition and laboratory findings?
   A. Chronic obstructive lung disease
   B. Diabetic ketoacidosis
   C. Barbiturate overdose
   D. Chronic renal failure
   E. Pulmonary embolus
41. The pulmonary function studies in a 36 year old man with dyspnea and non-productive cough reveal mild hypoxemia, low PaCO₂, a decreased total lung capacity, and an increased FEV₁/FVC ratio. Based on this data, the patient most likely has...
   A. sarcoidosis
   B. bronchiectasis
   C. bronchial asthma
   D. chronic bronchitis
   E. severe pulmonary edema

42. An 8 year old boy presents with recurrent epistaxis and multiple, non-palpable petechiae on his chest approximately one week after an upper respiratory infection. Pertinent physical exam findings include the absence of lymphadenopathy and hepatosplenomegaly. The CBC is unremarkable except for a platelet count of <10,000 cells/μL. The pathogenesis of this patient's thrombocytopenia is similar to which of the following clinical disorders?
   A. Mild hemophilia A
   B. Patient taking aspirin
   C. Von Willebrand's disease
   D. Hemolytic uremic syndrome
   E. Thrombocytopenia in systemic lupus erythematosus

43. A septic 65-year-old man with urinary retention from prostate hyperplasia has oozing of blood from every venipuncture site, extensive ecchymoses, and widespread mucosal bleeding. A CBC reveals a low absolute neutrophil count, left shift, and toxic granulation. Schistocytes are noted in the peripheral blood. Thrombocytopenia is present. Both the prothrombin time (PT) and partial thromboplastin time (PTT) are prolonged. D-dimers are present. He has a positive blood culture for Escherichia coli. The mechanism for this patient's hemostatic disorder is best described as a...
   A. platelet adhesion disorder
   B. platelet aggregation disorder
   C. platelet consumption disorder
   D. coagulation factor production disorder
   E. coagulation factor consumption disorder

44. Which of the following laboratory test findings is present in classical von Willebrand's disease, mild hemophilia A, and vitamin K deficiency?
   A. Thrombocytopenia
   B. Prolonged bleeding time
   C. Normal prothrombin time
   D. Abnormal ristocetin cofactor assay
   E. Prolonged partial thromboplastin time
45. The following are the serologic findings in a mother, father, and one of their three children.

<table>
<thead>
<tr>
<th></th>
<th>Test antiserum reactions against individual's RBCs</th>
<th>Individual's serum reactions against group A and B test RBCs</th>
<th>Individual's serum reactions against test Rh antigens</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>anti-A</td>
<td>anti-B</td>
<td>A RBCs</td>
</tr>
<tr>
<td>Mother</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Father</td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Child</td>
<td>-</td>
<td>-</td>
<td>+</td>
</tr>
</tbody>
</table>

Which of the following is a correct conclusion concerning the serologic findings in this family?
A. Father is blood group A
B. Mother is blood group B
C. Child is blood group AB
D. Child can only receive O blood
E. Mother and father can receive AB blood

46. A blood group O, Rh negative woman is pregnant with her first baby. Her antibody screen is negative. She receives Rh immune globulin during her 28th week. She delivers a blood group A, Rh positive baby. The baby has a positive direct Coombs test on cord RBCs and develops unconjugated hyperbilirubinemia a few hours after birth. The pathogenesis of the baby's jaundice is most closely related to...

A. anti-D in Rh immune globulin destroying fetal Rh positive RBCs
B. physiologic jaundice of the newborn due to immature liver conjugating enzymes
C. intravascular hemolysis in the newborn of RBCs coated by maternally-derived anti-B IgM antibodies
D. intravascular hemolysis of RBCs in the newborn coated by maternally-derived anti-A IgM antibodies
E. extravascular hemolysis in the newborn of RBCs previously coated by maternally-derived anti-A,B IgG antibodies

47. Which of the following best describes the importance of the major crossmatch in a patient who is about to receive 2 units of packed RBCs?
A. Prevents post-transfusion hepatitis
B. Excludes the possibility of a febrile transfusion reaction
C. Improves the chances of donor RBC survival in the patient
D. Prevents patient antibodies developing against donor RBC antigens
E. Prevents antibodies in the donor blood from destroying patient RBCs
48. A 7 day postpartum 32 year old woman is currently recovering at home after delivery of her third child. Immediately after delivery of her third child, she experienced uterine hemorrhaging for which she received 3 units of packed red blood cells prior to surgical removal of a retained placenta. Her pretransfusion antibody screen was negative and all units of blood were compatible. She states that a similar obstetrical mishap occurred during her first pregnancy 12 years previously and also required 3 units of packed RBCs. On the morning of the 7th postpartum day, the patient develops fever, low back pain, and a yellow discoloration in her eyes. A CBC reveals a 2 g/dL drop in her hemoglobin concentration when compared to the posttransfusion level while in the hospital 7 days ago. Both a direct and indirect Coombs test are positive. A pink discoloration is noted in her serum in a spun down sample of her blood. The total bilirubin is 3.5 mg/dL (0.1–1.0 mg/dL) with predominantly unconjugated bilirubin present on fractionation. The serum alanine aminotransferase (SGPT) concentration is 20 U/L (8–20 U/L). The pathogenesis of her jaundice most closely relates to...
A. posttransfusion hepatitis due to hepatitis C
B. donor IgG antibodies reacting against a patient RBC antigen
C. patient IgG antibodies reacting against a donor RBC antigen
D. donor IgG antibodies reacting against the patient's leukocytes
E. posttransfusion fever due to cytomegalovirus in one of the donor units

49. An afebrile alcoholic has tender hepatomegaly. A CBC is reported as normal. The expected histologic abnormality in the patient's liver is most closely related to which one of the following biochemical reactions?
A. Pyruvate → Lactate
B. Pyruvate → Acetyl-CoA
C. Pyruvate → Oxaloacetate
D. Methylmalonyl CoA → Succinyl CoA
E. Dihydroxyacetone phosphate → Glycerol 3-phosphate

50. A hospitalized 52 year old alcoholic is being treated with intravenous antibiotics for a severe lobar pneumonia. He has known cirrhosis and chronic pancreatitis. While in the hospital, he develops multiple ecchymoses and gastrointestinal bleeding. His prothrombin time (PT) is prolonged and does not correct to normal after receiving an intramuscular injection of vitamin K. Which of the following best explains the pathogenesis of the patient's hemorrhagic diathesis?
A. Bile salt deficiency
B. Vitamin K malabsorption
C. Antibiotic destruction of colonic bacteria
D. Decreased synthesis of coagulation factors
E. Increased destruction of coagulation factors

51. A 42 year old man presents with increased skin pigmentation, chronic diarrhea, and diabetes mellitus. There is a family history hepatocellular carcinoma. Which of the following laboratory test findings is most likely present in this patient?
A. Low ceruloplasmin
B. Increased serum ferritin
C. Anti-mitochondrial antibodies
D. Normal hemoglobin and hematocrit
E. Low serum cortisol with increased ACTH
52. Which of the following sets of hepatitis B serologic test data best represents a patient who is infective and may have either acute or chronic hepatitis?

<table>
<thead>
<tr>
<th>HBsAg</th>
<th>HBcAg</th>
<th>Anti-HBc-IgM</th>
<th>Anti-HBc-IgG</th>
<th>Anti-HBs</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>negative</td>
<td>negative</td>
<td>negative</td>
<td>positive</td>
</tr>
<tr>
<td>B.</td>
<td>negative</td>
<td>negative</td>
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</tr>
<tr>
<td>C.</td>
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<td>negative</td>
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</tr>
<tr>
<td>D.</td>
<td>positive</td>
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<tr>
<td>E.</td>
<td>positive</td>
<td>positive</td>
<td>negative</td>
<td>negative</td>
</tr>
</tbody>
</table>

53. An afebrile 62 year old man with a long history of smoking cigarettes presents with weight loss, a slow onset of jaundice, and a normocytic anemia. PE reveals a palpable gallbladder, a light-colored stool, and dark yellow urine. The patient MOST LIKELY has...
A. hepatocellular carcinoma
B. carcinoma of the gallbladder
C. primary sclerosing cholangitis
D. a stone in the common bile duct
E. carcinoma of the head of pancreas

54. A 42 year old Asian man has postnecrotic necrosis with ascites secondary to chronic hepatitis B. He develops a low grade fever, weight loss, abdominal pain, and a rapid increase in abdominal girth. A non-traumatic peritoneal tap reveals bloody ascitic fluid. The fluid WBC count is normal. Which of the following blood tests is most indicated in this patient?
A. Carcinoembryonic antigen (CEA)
B. Antimitochondrial antibody
C. Hepatitis D serology
D. Alpha fetoprotein
E. Blood culture

55. In diabetic ketoacidosis, which of the following biochemical reactions is most responsible for maintaining hyperglycemia?
A. Alanine → Pyruvate
B. Pyruvate → Acetyl CoA
C. Pyruvate → Oxaloacetate
D. Oxaloacetate → Aspartate
E. Methylmalonyl CoA → Succinyl CoA
56. An obese, mildly mentally retarded 13-year-old boy has bilateral gynecomastia, decreased testicular volume for age, and sparse axillary and pubic hair. He has had the usual childhood infections except for mumps. A CT scan of the sella turcica is normal. A chromosome study is pending. Based on the physical findings and CT scan results, which of the following serum follicle stimulating hormone (FSH), serum luteinizing hormone (LH), and serum testosterone levels is expected in this patient?

<table>
<thead>
<tr>
<th>Serum FSH</th>
<th>Serum LH</th>
<th>Serum testosterone</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. High</td>
<td>Normal</td>
<td>Normal</td>
</tr>
<tr>
<td>B. Normal</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>C. High</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>D. Normal</td>
<td>Normal</td>
<td>Normal</td>
</tr>
<tr>
<td>E. Low</td>
<td>Low</td>
<td>Low</td>
</tr>
</tbody>
</table>

57. A 22-year-old woman presents with a complaint of a bilateral milky nipple discharge. She has been amenorrheic for the past 5 months. Physical exam is unremarkable except for her initial complaint. The serum β-hCG is negative, serum TSH is normal, and serum prolactin is elevated. A CT scan of the sella turcica is normal. You would anticipate which of the following gonadotropin, estradiol, and progesterone challenge test results in this patient?

<table>
<thead>
<tr>
<th>Serum FSH</th>
<th>Serum LH</th>
<th>Serum estradiol</th>
<th>Bleeding post-progesterone</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. High</td>
<td>High</td>
<td>Low</td>
<td>None</td>
</tr>
<tr>
<td>B. Low</td>
<td>Low</td>
<td>Low</td>
<td>None</td>
</tr>
<tr>
<td>C. Normal</td>
<td>Normal</td>
<td>Normal</td>
<td>Yes</td>
</tr>
<tr>
<td>D. Normal</td>
<td>Normal</td>
<td>Normal</td>
<td>None</td>
</tr>
<tr>
<td>E. Low</td>
<td>High</td>
<td>High</td>
<td>Yes</td>
</tr>
</tbody>
</table>

58. A pregnant woman presents with a complaint of chest palpitations and heat intolerance. The heart rate, blood pressure, thyroid gland, and deep tendon reflexes are all normal. Which of the following sets of thyroid function tests best represents the patient’s clinical condition?

<table>
<thead>
<tr>
<th>T₄</th>
<th>RT₃/T₄BR</th>
<th>FT₄-index</th>
<th>TSH</th>
<th>I₁₃₁</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. High</td>
<td>High</td>
<td>High</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>B. High</td>
<td>High</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>C. High</td>
<td>Low</td>
<td>Normal</td>
<td>Normal</td>
<td>Not performed</td>
</tr>
<tr>
<td>D. Low</td>
<td>Low</td>
<td>Low</td>
<td>High</td>
<td>Not performed</td>
</tr>
<tr>
<td>E. Low</td>
<td>High</td>
<td>Normal</td>
<td>Normal</td>
<td>Not performed</td>
</tr>
</tbody>
</table>

RT₃ = resin T₃ uptake, T₄BR = T₄ binding ratio
59. A 62-year-old woman has a history of recurrent urinary tract stones, peptic ulcer disease, and diastolic hypertension. Which of the letters in the schematic depicted below best represents the serum parathormone (PTH) and serum calcium levels in this patient? (Note: the square represents normal values for PTH and serum calcium)

![PTH and Serum Calcium Diagram]

50. A 56-year-old woman presents with hypertension, muscle weakness, and polyuria. While taking her blood pressure, the thumb adducts into the palm, the interphalangeal joints extend, and the metacarpophalangeal joints and wrist flex. A prominent U wave is noted on an ECG. Serum electrolytes are as follows:

<table>
<thead>
<tr>
<th>Serum Sodium</th>
<th>150 mEq/L (135–147 mEq/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serum Chloride</td>
<td>107 mEq/L (95–105 mEq/L)</td>
</tr>
<tr>
<td>Serum Potassium</td>
<td>2.2 mEq/L (3.5–5.0 mEq/L)</td>
</tr>
<tr>
<td>Serum Bicarbonate</td>
<td>35 mEq/L (22–28 mEq/L)</td>
</tr>
</tbody>
</table>

You would anticipate which of the following additional laboratory test results in this patient?

A. Increased 24-h urine for metanephrines  
B. Normal 24-h urine for potassium  
C. Decreased 24-h urine for sodium  
D. Decreased plasma renin activity  
E. Hypocalcemia

61. A 49 year old man presents with fatigue and postural hypotension. Physical exam reveals dry mucous membranes, an increase in heart rate and drop in blood pressure when moved from the supine to sitting position, and increased pigmentation in the buccal mucosa. Laboratory studies reveal a low serum cortisol, which does not increase with ACTH stimulation. A metyrapone test reveals an increase in ACTH and no increase in 11-deoxycorticisol. Which of the following sets of electrolytes is most likely present in this patient?

<table>
<thead>
<tr>
<th>Serum Na⁺ (135–147 mEq/L)</th>
<th>Serum K⁺ (3.5–5.0 mEq/L)</th>
<th>Serum Cl⁻ (95–105 mEq/L)</th>
<th>Serum HCO₃⁻ (22–28 mEq/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. 118</td>
<td>3.0</td>
<td>88</td>
<td>21</td>
</tr>
<tr>
<td>B. 125</td>
<td>2.9</td>
<td>80</td>
<td>36</td>
</tr>
<tr>
<td>C. 126</td>
<td>5.8</td>
<td>86</td>
<td>18</td>
</tr>
<tr>
<td>D. 140</td>
<td>4.0</td>
<td>100</td>
<td>24</td>
</tr>
<tr>
<td>E. 152</td>
<td>2.8</td>
<td>110</td>
<td>33</td>
</tr>
</tbody>
</table>
62. Which of the following differentiates pituitary Cushing's syndrome from adrenal and ectopic Cushing's syndrome?
A. High plasma ACTH levels
B. Increased 24 hr urine for free cortisol
C. Increased 24 hr urine for 17-ketosteroids
D. Decreased urine for 17-hydroxycorticoids
E. Decreased serum cortisol post high dose dexamethasone

63. One week after an upper respiratory infection, a 25-year-old man develops weakness in the lower legs that is progressing into his upper torso. A laboratory report on cerebrospinal fluid indicates increased protein, a normal glucose, a negative gram stain, and 20–30 lymphocytes/mononuclear cells/μL. Which of the following categories of disease best explains the clinical and laboratory findings in this patient?
A. Inborn error of metabolism
B. Atherosclerotic disease
C. Demyelinating disease
D. Neoplastic disease
E. Infectious disease

64. A 38 year old woman complains of recurrent episodes of blurry vision, paresthesias in her arms and legs, muscle weakness in the extremities, and problems with balance. Which of the following categories of disease best explains this recurrent symptom complex?
A. Inborn error of metabolism
B. Atherosclerotic disease
C. Autoimmune disease
D. Neoplastic disease
E. Infectious disease

65. A 72 year old man presents with a sudden onset of expressive aphasia, and contralateral hemiparesis and sensory loss. CT scans of the brain on admission and after 24 hours reveal no evidence of hemorrhage. Which of the following pathologic processes best explains the pathogenesis of this patient's clinical findings?
A. Embolism
B. Atherosclerosis
C. Lacunar infarction
D. Intracerebral bleed
E. Subarachnoid hemorrhage

66. A 48-year-old man presents with frontal headaches when he wakes up in the morning, severe anxiety, and drenching sweats. His mean blood pressure on 3 separate readings is 156/100 mm Hg. Physical exam also reveals oblong, fawn-colored lesions on his trunk and axillary freckling. Based on these findings, which of the following laboratory tests is indicated in this patient?
A. 24 hr. urine for potassium
B. 24 hr. urine for aldosterone
C. 24 hr. urine for free cortisol
D. 24 hr. urine for metanephrines
E. 24 hr. urine for 17-ketosteroids
67. A 42-year-old man with a previous splenectomy for congenital spherocytosis develops a sudden onset of fever and nuchal rigidity. Examination of the spinal fluid reveals increased protein, decreased glucose, increased neutrophils, and a positive gram stain. Which of the following most likely represents the morphology of the organisms noted in the gram stain of spinal fluid?
A. Gram negative coccobacilli
B. Gram negative diplococci
C. Gram positive diplococci
D. Gram positive cocci
E. Gram positive rods

68. An afebrile 62-year-old man with an 80-pack year history of smoking cigarettes and a 10 year history of hypertension presents with a history of weight loss, cough, and a persistent headache. Positive physical findings include papilledema, lid lag on the right, deviation of the right eye to a down and out position, and mydriasis of the right pupil. A MRI of the brain reveals multiple mass lesions with asymmetric swelling of the right cerebral hemisphere. Which of the following pathologic processes best correlates with the neurologic findings in this patient?
A. Primary CNS tumor derived from astrocytes
B. Uncal herniation through tentorium cerebelli
C. Cerebellar herniation into the foramen magnum
D. Cingulate gyrus herniation beneath the falx cerebri
E. Intracerebral hematoma due to malignant hypertension

69. An autopsy on a 38-year-old woman reveals severe atrophy of the frontal and temporoparietal lobes. Microscopic examination of the brain reveals neurofibrillary tangles and senile plaques in the same locations as the atrophy. Which of the following best represents the pathogenesis of the CNS disease in this patient?
A. Decreased dopamine levels
B. Triplet repeat disorder
C. Chromosome disorder
D. Metabolic disorder
E. Slow virus disease

70. A 68-year-old man complains of weakness in his right arm. He has a facial stare, excessive eye blinking, and a shuffling gait when entering the examining room. The deep tendon reflexes and muscle strength are normal. Which of the following best explains the pathogenesis of this patient’s clinical findings?
A. Stroke with residual upper and lower motor neuron disease
B. Degeneration of neurons in the substantia nigra
C. Amyloid-β protein destruction of neurons
D. Low ceruloplasmin levels
E. Slow virus disease
71. A 38-year-old man, who works in a machine shop, states that he is unable to sense pain when he injures his hands with hot metal. He also states he has lost strength in both hands. Physical exam reveals absent pain and temperature sensation in both hands, atrophy of the intrinsic muscles of the hands, and absent deep tendon reflexes in both arms. Which of the following pathologic processes best explains the pathogenesis of the patient's neurological findings?
A. Primary degenerative disease of upper and lower motor neurons
B. Subacute combined degeneration of the spinal cord
C. Cystic degeneration of the cervical spinal cord
D. Benign tumor of the spinal cord
E. Herniated cervical disc

72. A 28-year-old man, who lives in Connecticut, presents with a sudden onset of drooping and drooling out of both sides of his mouth, inability to close both eyes, and slurred speech. His wife states that a few weeks ago he removed a tick from his right thigh. In a few days following removal of the tick, a concentric, erythematous rash developed in that same area. Based on this information, which of the following infectious agents is most likely responsible for the patient's previous skin disorder and current neurological findings?
A. Tick
B. Fungus
C. Rickettsia
D. Protozoan
E. Spirochete

73. Which of the following clinicopathologic findings is present in both osteoarthritis and rheumatoid arthritis?
A. Synovial tissue hyperplasia with destruction of articular cartilage
B. Narrow joint space in proximal interphalangeal joint
C. Reactive bone formation at the margins of the joints
D. Negatively birefringent crystals in neutrophils
E. Linear calcification in the articular cartilage

74. A 4-year-old child with recurrent *Staphylococcus aureus* infections and an absent respiratory burst MOST LIKELY has a/an...
A. defect in spectrin in the cell membrane
B. defect in microtubule polymerization
C. defect in microbicidal activity
D. deficiency of myeloperoxidase
E. defect in phagocytosis

75. Which of the following characterizes early endotoxic (septic) shock rather than hypovolemic or cardiogenic shock?
A. Cool skin
B. Decreased cardiac output
C. Low mixed venous oxygen content
D. Decreased total peripheral resistance
E. Decreased venous return to the heart
76. A 72-year-old man presents with a sudden onset of left flank pain. In the ER, the patient is hypotensive. A pulsatile mass is palpated in the abdomen. Which of the following is MOST responsible for the pathogenesis of this patient's condition?
A. Atherosclerosis
B. A defect in fibrillin
C. A defect in collagen
D. Long-standing hypertension
E. Immune destruction of elastic tissue

77. A 42 year old man with a history of cardiac death in his family presents with a sudden onset of severe, retrosternal chest pain with radiation of the pain into his back. His left pulse is absent. A high pitched diastolic blowing murmur that increases with expiration is heard immediately after S2. There is widening of the aortic knob on a chest x-ray. The mechanism for this patient's condition is MOST CLOSELY related to...
A. atherosclerosis
B. a defect in fibrillin
C. a defect in collagen
D. an infectious process
E. an acute myocardial infarction

78. A 26-year-old woman presents with a history of chest palpitations particularly when anxious. Physical exam reveals a mid-systolic ejection click followed by a murmur. The click and murmur move closer to S1 when the patient is standing and closer to S2 when lying down. The mechanism for this patient's valvular disorder is MOST CLOSELY related to...
A. a defect in fibrillin
B. an infectious process
C. immunologic damage
D. myxomatous degeneration
E. a defect in collagen synthesis

79. A 28-year-old patient has a family history of sudden cardiac death at a young age. The patient has a systolic ejection murmur that decreases in intensity when the patient is lying down and increases in intensity when standing up. An echocardiogram reveals abnormal movement of the anterior MV leaflet against an asymmetrically thickened interventricular septum. The patient MOST LIKELY has...
A. mitral valve prolapse
B. hypertrophic cardiomyopathy
C. a congenital bicuspid aortic valve
D. a cardiac myxoma of the left atrium
E. infective endocarditis involving the mitral valve
80. A 65-year-old man on the 5th day of hospitalization for an acute anterior AMI has recurrence of chest pain and an increase in both CK-MB and troponin-I. The patient MOST LIKELY has...
   A. papillary muscle dysfunction
   B. a right ventricular infarct
   C. a ventricular aneurysm
   D. a myocardial rupture
   E. reinfarction

81. Which of the following is present in BOTH left and right heart failure?
   A. S₃ heart sound
   B. Pillow orthopnea
   C. Pulmonary edema
   D. Neck vein distention
   E. Dependent pitting edema

82. You would expect a patient with an atrial septal defect to have which of the following oxygen saturation (SaO₂) findings obtained by cardiac catheterization?

<table>
<thead>
<tr>
<th></th>
<th>SaO₂ %</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right atrium</td>
<td>75</td>
<td>75</td>
<td>80</td>
<td>75</td>
<td>75</td>
<td>80</td>
</tr>
<tr>
<td>RV ventricle</td>
<td>75</td>
<td>80</td>
<td>80</td>
<td>75</td>
<td>75</td>
<td>80</td>
</tr>
<tr>
<td>Pulmonary artery</td>
<td>75</td>
<td>80</td>
<td>80</td>
<td>80</td>
<td>75</td>
<td>80</td>
</tr>
<tr>
<td>Pulmonary vein</td>
<td>95</td>
<td>95</td>
<td>95</td>
<td>95</td>
<td>95</td>
<td>95</td>
</tr>
<tr>
<td>Left ventricle</td>
<td>95</td>
<td>95</td>
<td>95</td>
<td>95</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>Aorta</td>
<td>95</td>
<td>95</td>
<td>95</td>
<td>95</td>
<td>80</td>
<td>80</td>
</tr>
</tbody>
</table>

83. A 45-year-old woman 24 hours post-cholecyst-ectomy develops fever and dyspnea. Physical exam reveals decreased percussion, increased tactile fremitus, and decreased breath sounds in the right lower lobe. The diaphragm is elevated and there is inspiratory lag on the right side. The patient MOST LIKELY has...
   A. atelectasis
   B. a lung abscess
   C. bronchopneumonia
   D. a pulmonary infarction
   E. a spontaneous pneumothorax

84. A dyspneic 23-year-old man present with a stab wound in the left anterior chest. Physical exam of the left chest reveals hyperresonance to percussion, deviation of the trachea to the right, depression of the diaphragm, decreased tactile fremitus, and decreased breath sounds. The MOST LIKELY diagnosis is...
   A. pleural effusion
   B. bronchopneumonia
   C. tension pneumothorax
   D. a pulmonary infarction
   E. spontaneous pneumothorax
85. A newborn child develops dyspnea, tachypnea, intercostal muscle retractions, and cyanosis 4 hours after birth. The mother developed gestational diabetes mellitus and was in poor glycemic control throughout the pregnancy. A chest x-ray reveals a "ground glass" appearance in both lungs. The primary mechanism for this patient's respiratory problem is...
   A. aspiration of amniotic fluid  
   B. group B streptococcus pneumonia  
   C. decreased production of surfactant  
   D. Chlamydia trachomatis pneumonia  
   E. heart failure from congenital heart disease

86. Which of the following describes a pneumonia due to *Mycoplasma pneumoniae* rather than *Streptococcus pneumoniae*?
   A. High fever  
   B. Insidious onset  
   C. Productive cough  
   D. Increased tactile fremitus  
   E. Neutrophilic leukocytosis

87. A 58-year-old smoker presents with weight loss and cough. Physical exam reveals a mild lid lag on the left and a miotic pupil, scattered sibilant rhonchi throughout all lung fields that clear with coughing, and an increased anteroposterior diameter. Based on these findings, you suspect the patient has...
   A. a Pancoast tumor  
   B. a thoracic outlet syndrome  
   C. the superior vena caval syndrome  
   D. obstructive lung disease without primary cancer  
   E. obstructive lung disease with metastatic cancer from another primary site

88. An afebrile 25-year-old medical student presents with intermittent complaints of left and right lower quadrant abdominal pain and distention associated with alternating periods of mucoid diarrhea and constipation. He states that stooling relieves the pain. A flexible sigmoidoscopy and stool guaiac exam are both normal. The patient MOST LIKELY has...
   A. an intrinsic bowel motility disorder  
   B. inflammatory bowel disease  
   C. chronic appendicitis  
   D. melanosis coli  
   E. celiac disease

89. Which of the following correctly describes a gastric rather than a duodenal ulcer?
   A. Association with Zollinger-Ellison syndrome  
   B. Association with *Helicobacter pylori*  
   C. Pain awakens the patient at night  
   D. Highest incidence of perforation  
   E. Small risk for adenocarcinoma
90. The MOST COMMON location for diverticula, polyps, and cancer in the GI tract is the...
   A. ascending colon
   B. sigmoid colon
   C. esophagus
   D. stomach
   E. rectum

91. Which of the following is more commonly associated with ulcerative colitis rather than Crohn's disease?
   A. Discontinuous spread
   B. Fistula formation
   C. Toxic megacolon
   D. Perianal disease
   E. Obstruction

92. A 38-year-old Asian woman has a long history of explosive diarrhea and abdominal distention after eating dairy products. The pathogenesis of this patient's diarrhea is MOST CLOSELY related to...
   A. antigliadin antibodies
   B. activation of cyclic AMP
   C. intraluminal osmotically active solutes
   D. mucosal injury with increased permeability
   E. loss of the absorptive surface of the small bowel

93. A 62-year-old man smoker presents with weight loss, a dragging sensation in his right upper quadrant, and crampy left lower quadrant abdominal pain. He has alternating bouts of constipation/diarrhea. In addition, he states that blood coats and is mixed in with his stools. There is mild hepatomegaly. The rectal exam reveals non-thrombosed external hemorrhoids. The stool is guaiac positive. A CBC reveals a mild microcytic anemia. The MOST LIKELY cause for this patient's condition is...
   A. angiodysplasia
   B. an anal fissure
   C. diverticulitis
   D. hemorrhoids
   E. colon cancer
94. Which of the following sets of data best represents a patient with hepatitis B who is non-infective and in the serologic gap?

<table>
<thead>
<tr>
<th></th>
<th>HBsAg</th>
<th>HBeAg</th>
<th>Anti HBe-IgM</th>
<th>Anti-HBe-IgG</th>
<th>Anti-HBs</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td></td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>E</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td>-</td>
</tr>
</tbody>
</table>

95. In which of the following diseases would you expect a conjugated bilirubin >50% of the total bilirubin?
A. Gilbert's syndrome
B. Chronic viral hepatitis
C. Stone in the common bile duct
D. Extravascular hemolytic anemia
E. Rh hemolytic disease of newborn

96. A 65-year-old man with an elevated WBC, RBC, and platelet count has a history of gout, frequent headaches, and pruritus after bathing. He presents with a sudden onset of abdominal pain and bloody diarrhea. Which of the following sets of laboratory data best represent this patient's hematologic disease?

<table>
<thead>
<tr>
<th>RBC Mass</th>
<th>Plasma volume</th>
<th>SaO2</th>
<th>Erythropoietin</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Increased</td>
<td>Normal</td>
<td>Increased</td>
</tr>
<tr>
<td>B.</td>
<td>Increased</td>
<td>Normal</td>
<td>Increased</td>
</tr>
<tr>
<td>C.</td>
<td>Increased</td>
<td>Increased</td>
<td>Low</td>
</tr>
<tr>
<td>D.</td>
<td>Normal</td>
<td>Decreased</td>
<td>Normal</td>
</tr>
<tr>
<td>E.</td>
<td>Normal</td>
<td>Normal</td>
<td>Normal</td>
</tr>
</tbody>
</table>

SaO2 = oxygen saturation

97. A 19-yr-old African American woman presents with fatigue. She has a history of menorrhagia. A CBC reveals a mild microcytic anemia, a low normal WBC count, and a normal platelet count. A corrected reticulocyte count is <2%. Which of the following sets of laboratory data best represents the hematologic findings in this patient?

<table>
<thead>
<tr>
<th>Serum iron</th>
<th>TIBC</th>
<th>% Saturation</th>
<th>RBC count</th>
<th>Ferritin</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>normal</td>
<td>normal</td>
<td>high</td>
<td>normal</td>
</tr>
<tr>
<td>B.</td>
<td>low</td>
<td>low</td>
<td>low</td>
<td>high</td>
</tr>
<tr>
<td>C.</td>
<td>low</td>
<td>high</td>
<td>low</td>
<td>low</td>
</tr>
<tr>
<td>D.</td>
<td>high</td>
<td>high</td>
<td>normal</td>
<td>high</td>
</tr>
<tr>
<td>E.</td>
<td>normal</td>
<td>normal</td>
<td>low</td>
<td>normal</td>
</tr>
</tbody>
</table>

TIBC = total iron binding capacity
98. Vitamin K deficiency is MOST LIKELY present in a patient...
   A. with liver disease who is being treated with a broad spectrum antibiotic
   B. who has taken warfarin 3 hours ago
   C. with traveler's diarrhea
   D. with lactase deficiency
   E. on heparin therapy

99. A blood group O, Rh-negative woman is pregnant with her first child. She has a negative antibody screen and no previous administration of Rh immune globulin. She delivers a blood group A, Rh-positive baby. The baby develops unconjugated hyperbilirubinemia 8 hs after birth. Which of the following statements correctly describes this case?
   A. She is Rh compatible with her baby
   B. She is ABO compatible with her baby
   C. She is a candidate for Rh immune globulin
   D. Negative direct Coombs' of baby's cord blood
   E. Jaundice is secondary to Rh hemolytic disease of the newborn

100. A 28-year-old man has a motorcycle accident outside the emergency room. Physical exam in the emergency room reveals a weak, thready pulse, cold, clammy skin, and a blood pressure of 60/40 mm Hg. An open right femoral fracture is present as well as tenderness over the left lower ribs. Which of the following would you expect in this patient?
   A. Normal hemoglobin and hematocrit
   B. Decreased systemic vascular resistance
   C. Normal effective arterial blood volume
   D. Increased central venous hydrostatic pressure
   E. Increased pulmonary capillary wedge pressure

101. An 82 year old man presents with lower back pain and complaints of problems with voiding urine. There is point tenderness over the lower lumbar vertebra. His bladder is percussed at the level of the umbilicus. Which of the following tests or procedures is indicated as the first step in the management of this patient?
   A. Radionuclide bone scan
   B. Prostate specific antigen
   C. Digital rectal examination
   D. Serum alkaline phosphatase
   E. Transrectal ultrasound with biopsy

102. A 28-year-old man with a history of removal of a right cryptorchid testis as a child is noted to have a painless enlargement of the remaining testicle in the left scrotal sac. The testicle is enlarged and does not transilluminate. The patient most likely has a...
   A. hydrocele
   B. seminoma
   C. varicocele
   D. yolk sac tumor
   E. choriocarcinoma
103. A 7 year old boy presents with a low-grade fever, arthralgias, colicky abdominal pain, and a palpable purpuric rash limited to the lower extremities. Lab studies reveal a guaiac positive stool, a urinalysis with red blood cell (RBC) casts, hematuria, and mild proteinuria, and a normal hemoglobin, hematocrit, and platelet count. Which of the following is the most likely diagnosis?
A. Idiopathic thrombocytopenia purpura
B. Poststreptococcal glomerulonephritis
C. Systemic lupus erythematosus
D. Rocky mountain spotted fever
E. Henoch-Schonlein vasculitis

104. A 66 year old man with a 45 pack year history of smoking presents with weight loss, hematuria, fever, and a palpable mass in the left lower quadrant. A chest x-ray reveals multiple nodular masses in the lungs. These findings most strongly suggest which of the following diagnoses?
A. Miliary TB involving the kidneys
B. Renal cell carcinoma with lung metastasis
C. Primary lung cancer with metastasis to the kidney
D. Choriocarcinoma with metastasis to lungs and kidneys
E. Acute pyelonephritis with metastatic abscesses in the lung

105. A febrile 23 year old woman presents with an acute onset of right flank pain, suprapubic discomfort, dysuria, and increased frequency of urination. The urinary sediment shows clumps of leukocytes, WBC casts, occasional RBCs, and numerous motile bacteria. The mechanism of this patient's urinary condition is most closely related to...
A. a renal stone
B. ascending infection
C. immunocomplex disease
D. drug-induced interstitial nephritis
E. hematogenous spread of infection to the kidneys

106. A 25 year old male presents with a history of hemoptysis and malaise. His blood pressure is 140/90 mm Hg. He has periorbital edema and smoky colored urine. Pertinent lab data include a serum blood urea nitrogen of 40 mg/dL (7-18 mg/dL) and a creatinine of 4.0 mg/dL (0.6-1.2 mg/dL). Urinalysis shows 2+ protein, 3+ blood, RBCs too numerous to count, and RBC casts. A chest radiograph demonstrates opacities in both lung fields. The mechanism of this patient's lung and renal disease is most closely related to which of the following types of hypersensitivity reaction?
A. Type I
B. Type II
C. Type III
D. Type IV
E. Type II and III
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Items 107–108
A. IgA glomerulonephritis
B. Membranous glomerulonephritis
C. Focal segmental glomerulosclerosis
D. Rapidly progressive crescentic glomerulonephritis
E. Type I membranoproliferative glomerulonephritis

107. A 74 year old man with a history of colorectal cancer presents with generalized anasarca. A urinalysis reveals 4+ proteinuria, hypercholesterolemia, and fatty casts.

108. A 34 year old male who is a known heroin addict presents to the emergency room in an agitated state. He is restrained and you note multiple needle tracks on both arms. He also has severe pitting edema of the lower extremities. The urinalysis is positive for protein and shows fatty casts.

Items 109–111
A. Infiltrating ductal carcinoma
B. Intraductal carcinoma
C. Intraductal papilloma
D. Lobular carcinoma
E. Fibrocystic change

109. A 28-year-old woman during her breast exam is noted to have a bloody nipple discharge. No masses are palpable.

110. A 65 year old woman with a history of breast cancer in her mother is noted to have retraction of skin in the right upper outer quadrant when abducting her right arm. A non-tender, indurated 3-cm mass is present in this area. Non-tender, firm right axillary lymph nodes are present in the lower axillary chain.

111. A 26 year old woman without any family history of breast cancer complains of pain and "lumpiness" in her breasts that progressively increases throughout her menstrual cycle. The pain is relieved after menses is completed. PE reveals a painful, ill-defined mass in the left upper quadrant. No palpable axillary lymph nodes are present.

112. A 58-year-old woman with a 20-year history of smoking has a history of breast cancer in her mother. Her diet is poor in fiber and rich in saturated fats. Menarche occurred at 13 years of age and menopause began at 52 years of age. She has had 3 children. She had a cervical conization at 28 years of age for severe cervical dysplasia and has since had normal cervical Pap smears. Which of the following is her greatest risk factor for breast cancer?
A. Age
B. Family history
C. Smoking history
D. Severe cervical dysplasia
E. Low fiber, high saturated fat diet
113. During her monthly self-breast exam, a 19-year-old woman notes a moveable, firm, slightly tender mass in the left upper outer quadrant. There is no skin retraction or nipple discharge. She is currently taking birth control pills. Her older sister was recently given a diagnosis of breast cancer for which she opted for breast conserving therapy. You would expect a fine needle aspiration of the mass to reveal...
A. an infiltrating ductal cancer  
B. an intraductal papilloma  
C. benign cyst fluid  
D. a fibroadenoma  
E. lobular cancer

114. Which of the following patients is potentially MOST at risk for developing endometrial carcinoma?

<table>
<thead>
<tr>
<th></th>
<th>Age</th>
<th>Menarche</th>
<th>Menopause</th>
<th>Children</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>65</td>
<td>11</td>
<td>55</td>
<td>none</td>
<td>Radical mastectomy</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 yrs ago, smoker</td>
</tr>
<tr>
<td>B.</td>
<td>65</td>
<td>14</td>
<td>52</td>
<td>1</td>
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<tr>
<td>C.</td>
<td>65</td>
<td>12</td>
<td>52</td>
<td>2</td>
<td>Obese</td>
</tr>
<tr>
<td>D.</td>
<td>65</td>
<td>13</td>
<td>53</td>
<td>none</td>
<td>High fiber/low fat diet</td>
</tr>
<tr>
<td>E.</td>
<td>65</td>
<td>13</td>
<td>55</td>
<td>3</td>
<td>Type II DM</td>
</tr>
</tbody>
</table>

DM = diabetes mellitus

115. A 22 year old woman, gravida 1, para 0, presents to the outpatient office for a routine prenatal visit at 34 weeks' gestation. Her blood pressure is 150/95 mm Hg. On urine dipstick, she has 1+ glucose and 2+ albumin. Her blood pressure on the initial prenatal visit at 14 weeks' gestation was 120/75 mm Hg. Her maternal grandfather has adult-onset diabetes. Her mother and maternal grandmother both have chronic hypertension. Which of the following is the most likely explanation for the findings in this patient?
A. Preeclampsia  
B. Molar pregnancy  
C. Abruptio placenta  
D. Gestational diabetes  
E. Primary renal disease

116. A 17 year old girl presents with a sudden onset of abdominal pain. Physical exam reveals a tender mass in the left adnexa. A pregnancy test is negative. An x-ray exhibits a mass lesion of the left ovary with focal areas of calcification. Which of the following best characterizes the ovarian mass?
A. Malignant surface-derived tumor  
B. Benign surface-derived tumor  
C. Malignant germ cell tumor  
D. Follicular cyst of the ovary  
E. Benign germ cell tumor
117. A 66 year old nulliparous woman presents with abdominal distention. She underwent menopause 17 years ago. A rectal exam reveals induration in the rectal pouch of Douglas. She has a fluid wave in the abdomen and a left-sided pleural effusion. A thoracentesis shows clumps of malignant cells that stain positive for CA 125. Which of the following is the most likely diagnosis?
A. Metastatic uterine leiomyosarcoma
B. Metastatic endometrial cancer
C. Metastatic stomach cancer
D. Metastatic ovarian cancer
E. Metastatic cervical cancer

118. A 28 year old woman, gravida 1, para 0, at 12 wks gestation presents with painless vaginal bleeding. Her blood pressure is 160/95 mm Hg, there is 3+ proteinuria, and the uterus is too large for gestational age. Which of the following is the most likely diagnosis?
A. Gestational diabetes
B. Abruptio placenta
C. Molar pregnancy
D. Placenta previa
E. Twin placenta

119. Place the following neoplasms of the female genital tract in decreasing incidence and in decreasing mortality.

<table>
<thead>
<tr>
<th>Incidence</th>
<th>Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Cervix</td>
<td>3, 2, 1</td>
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<tr>
<td>2. Ovary</td>
<td>2, 3, 1</td>
</tr>
<tr>
<td>3. Endometrium</td>
<td>2, 1, 3</td>
</tr>
</tbody>
</table>

120. A 51 year old woman with a long smoking history is hospitalized for Rx of right pyelonephritis. An intravenous pyelogram shows right-sided hydrenephrosis and a dilated ureter. During pelvic examination, you detect a malodorous vaginal discharge. A firm, irregular right adnexal mass extends to the pelvic side wall. The patient experiences vaginal bleeding after examination. What is the most likely diagnosis?
A. Perinephric abscess due to acute pyelonephritis
B. Endometriosis involving the right ovary
C. Invasive endometrial adenocarcinoma
D. Invasive ovarian adenocarcinoma
E. Invasive cervical carcinoma
121. Which of the following alterations in lipid metabolism is expected in a patient with diabetic ketoacidosis?
   A. Activation of capillary lipoprotein lipase
   B. Inhibition of hormone sensitive lipase
   C. Decreased production of acetyl-CoA
   D. Increased β-oxidation of fatty acids
   E. Increased fatty acid synthesis

122. A 35-year-old pharmacist presents to your office with recurrent episodes of forgetfulness and tiredness. A serum glucose is reported to be 20 mg/dL (70-110 mg/dL). Additional studies on the same sample reveal a high serum insulin and low C-peptide level. Based on these findings, you suspect the patient has...
   A. a benign tumor involving β-islet cells
   B. a benign tumor involving α-islet cells
   C. surreptitiously injected human insulin
   D. ectopic secretion of an insulin-like factor
   E. an early phase of type 1 diabetes mellitus

123. An obese 22-year-old woman presents with infertility problems. She has a long history of oligomenorrhea. PE reveals hirsutism on the face and anterior chest. Pelvic exam reveals bilaterally enlarged ovaries. The following lab test results are available: serum LH increased, serum FSH low, LH/FSH ratio >3/1, serum free testosterone increased, serum DHEA-sulfate normal, serum prolactin normal, and the serum TSH is normal. Based on these findings, you strongly suspect that the patient has...
   A. a gonadotropin-secreting pituitary tumor
   B. androgen-secreting ovarian tumors
   C. polycystic ovarian syndrome
   D. adrenal Cushing's syndrome
   E. deficiency of GnRH

124. A 10 year-old-adolescent boy presents with a unilateral, tender subareolar mass in the left breast. PE is otherwise unremarkable. Which of the following would you recommend for this patient?
   A. Serum gonadotropins
   B. Chromosome analysis
   C. Surgical consult
   D. Serum β-hCG
   E. No treatment

125. If an African American woman with sickle cell disease has children with a man lacking the genetic defect, you would expect...
   A. all of their children to have sickle cell trait
   B. 25% of their children to have sickle cell trait
   C. 50% of their children to have sickle cell trait
   D. 25% of their children to have sickle cell disease
   E. 50% of their children to have sickle cell disease
126. A 17 year old adolescent presents with primary amenorrhea. Physical exam reveals normal secondary female sex characteristics. Discrete masses are noted in both inguinal canals. A speculum exam of the vagina indicates a blind pouch. You would expect this patient to also have...
A. testicles
B. an epididymis
C. one Barr body
D. seminal vesicles
E. a prostate gland

127. While examining a mildly mentally retarded 13 year old boy during a routine physical exam, you note bilaterally enlarged, non-tender testes. Which of the following studies would you recommend on this boy?
A. Buccal smear
B. Serum testosterone
C. Serum gonadotropins
D. Chromosome study on his father
E. Chromosome study to identify for triplet repeats

128. A 25-year-old woman has not had her period for the last 8 mths. She is 5' 2" and weighs 80 pounds. A pregnancy test is negative. She states that she has been trying to lose weight for her upcoming wedding. You give the patient an intramuscular injection of progesterone. Ten days later she reports that there was no withdrawal bleeding. Additional lab tests reveal the following: normal serum prolactin and TSH, low serum FSH/LH and estradiol, and an increased serum cortisol. Which of the following is the most likely diagnosis in this patient?
A. Secondary hypothyroidism
B. Primary ovarian disease
C. Weight loss syndrome
D. Cushing's syndrome
E. Hypopituitarism

129. Carpopedal spasm, nyctalopia, and a hemorrhagic diathesis are expected findings in which one of the following disorders?
A. Hypothyroidism
B. Cystic fibrosis
C. Marasmus
D. Bulimia
E. Scurvy

130. Which of the signs or symptoms is more often associated with a fat soluble rather than a water soluble vitamin deficiency?
A. Perifollicular hemorrhage
B. Skin hyperpigmentation
C. Peripheral neuropathy
D. Bone pain and tetany
E. Ophthalmoplegia
131. Which of the signs or symptoms are more often associated with marasmus rather than kwashiorkor?
   A. Pitting edema
   B. Hepatomegaly
   C. Flaky paint dermatitis
   D. Broomstick extremities
   E. Reduced total lymphocyte count

132. Pellagra will MOST LIKELY develop in which of the following patient scenarios?
   A. Pure vegan
   B. Corn-based diet
   C. Treatment of TB
   D. Malabsorption due to chronic pancreatitis
   E. Treatment of hyperlipidemia with nicotinic acid

133. Which of the following clinicopathologic findings is more often associated with anorexia nervosa rather than bulimia nervosa?
   A. Osteoporosis
   B. Hypokalemia
   C. Metabolic alkalosis
   D. Normal body image
   E. Normal serum gonadotropins

134. Which of the following cancers is most often associated with morbid obesity?
   A. Endometrial
   B. Pancreatic
   C. Stomach
   D. Cervical
   E. Ovarian

135. A 65-year-old woman complains of bleeding gums after brushing her teeth, easy bruising, and pain in her legs when walking. Her platelet count is normal. The pathogenesis of her disease is MOST CLOSELY related to...
   A. lack of hydroxylation of lysine and proline
   B. a cofactor deficiency in lysyl oxidase
   C. a cofactor deficiency in collagenase
   D. platelet dysfunction
   E. ATP depletion

136. A 39 year old type I insulin dependent diabetic has a burning sensation around his ankles and on the bottoms of both feet. Physical exam reveals depressed Achilles and knee jerk deep tendon reflexes bilaterally and decreased light touch sensation in both lower extremities. The mechanism for this disorder is most closely associated with...
   A. thiamine deficiency
   B. lumbar disk disease
   C. pernicious anemia
   D. osmotic damage
   E. syringomyelia
137. A family history of chronic liver disease beginning at an early age and a movement disorder developing later in life characterizes a disease associated with...
   A. a chromosome exhibiting triplet repeats
   B. low serum ceruloplasmin
   C. low dopamine levels
   D. thiamine deficiency
   E. pernicious anemia

138. A 40-year-old neuropathologist developed a rapidly progressive dementia and died. The pathogenesis of his condition is most closely related to...
   A. neuronal damage by β-amyloid protein
   B. a slow virus disease involving prions
   C. autoimmune destruction of myelin
   D. a decrease in CNS acetylcholine
   E. a deficiency of dopamine

139. A 15-year-old boy develops fever, nuchal rigidity, and petechial lesions which progressed into hypovolemic shock. The CSF shows increased protein, decreased glucose, and numerous neutrophils. You would expect the CSF gram stain to reveal...
   A. gram negative cocccobacilli
   B. gram negative diplococci
   C. gram positive diplococci
   D. gram positive cocci
   E. gram positive rods

140. Which of the following represents a primary malignant brain tumor that would more likely develop in an adult rather than a child?
   A. Ependymoma of fourth ventricle
   B. Malignant lymphoma
   C. Acoustic neuroma
   D. Medulloblastoma
   E. Meningioma

141. A 32-year-old man presents with right-sided sensorineural hearing loss and facial numbness in the distribution of the trigeminal nerve. At surgery, an encapsulated mass is removed from the right cerebellopontine angle. Which of the following best describes the clinicopathologic findings in this case?
   A. Malignant tumor derived from astrocytes
   B. Benign tumor derived from Schwann cells
   C. Malignant tumor derived from lymphocytes
   D. Benign tumor derived from oligodendrocytes
   E. Benign tumor derived from arachnoid granulations
142. A 45-year-old woman with a history of mitral stenosis and a chronic arrhythmia died suddenly at home. At autopsy, a hemorrhagic lesion was noted at the periphery of the temporal lobe. Which of the following best explains the mechanism for this patient's CNS disease?
A. Hemorrhagic infarction
B. Intracerebral hematoma
C. Arteriovenous malformation
D. Malignant tumor of astrocytes
E. Thrombosis of internal carotid artery

143. A febrile 28-year-old man with AIDS and a CD4 T helper count of 50 cells/μL develops new onset focal epileptic seizures. A CT scan reveals multiple ring enhancing lesions in the brain. The pathogenesis of this patient's CNS disorder is most closely related to...
A. virus
B. fungus
C. bacteria
D. protozoa
E. neoplasm

144. A sexually active 30 year old man presents with fever and pain in his right big toe that woke him up at night. He has been taking aspirin to relieve the pain without relief. His mother has severe osteoarthritis. The right toe is swollen, hot, and tender. Lab studies reveal a neutrophilic leukocytosis and left shift. A synovial tap is performed. Which of the following is an expected finding in the synovial fluid?
A. Neutrophils with negatively birefringent crystals
B. Neutrophils with positively birefringent crystals
C. Neutrophils with gram negative diplococci
D. Neutrophils with phagocytosed immunocomplexes
E. Normal mucin clot

145. A febrile, sexually active 23 year old woman presents with a hot, swollen right knee and pustular lesions on the palm of her left hand. She recently returned from a camping trip in Colorado. A gram stain of the synovial fluid in the knee and from an aspirate of one of the pustules revealed a...
A. gram negative diplococcus
B. gram positive diplococcus
C. gram negative rod
D. gram positive rod
E. spirochete

146. A 52-year-old man with congestive heart failure develops cough and swelling in the deep subcutaneous tissue. He is most likely taking...
A. a calcium channel blocker
B. a thiazide diuretic
C. an ACE inhibitor
D. a phenothiazine
E. digitalis
147. A 43-year-old woman presents with joint pains and a butterfly-like rash on the face. She is most likely taking...
A. oral contraceptives
B. procainamide
C. doxycycline
D. barbiturates
E. thiazides

148. A 30-year-old female with a long history of alcohol and barbiturate abuse presents with diffuse colicky abdominal pain. Examination reveals numerous surgical scars on the abdomen. There is no history of photosensitivity. You suspect that her urine would...
A. be positive for blood
B. contain an increase in uroporphyrin
C. contain an increase in coproporphyrin
D. have an excess amount of urobinogen
E. turn a port wine color after exposure to light

Items 149–150
A. *Yersinia enterocolitica*
B. *Staphylococcus aureus*
C. Enterotoxigenic *E. coli*
D. *Cryptosporidium parvum*
E. *Mycobacterium avium-intracellulare*

149. A 28 year old man with AIDS presents with chronic, recurrent, profuse, nonbloody, watery diarrhea. An Entero-Test (string test) reveals oocysts that are partially acid-fast positive.

150. A 25 year old medical student during Spring break in Tijuana, Mexico develops fever, vomiting, abdominal cramps, and watery diarrhea ~14 hours after eating a few tacos purchased from a street vendor. He recovers uneventfully in 48–72 hours.

151. Odynophagia in a HIV-positive 28 year old man with white plaque-like material on his tongue and buccal mucosa MOST LIKELY has an AIDS-defining lesion caused by...
A. Epstein-Barr virus
B. *Candida albicans*
C. Kaposi’s sarcoma
D. cytomegalovirus
E. *Herpes simplex*

152. In a child with nasal polyps and frequent respiratory infections, you should order...
A. nasal smear for eosinophils
B. blood salicylate level
C. chromosome study
D. sweat chloride test
E. serum IgE level
153. A febrile 12 year old boy with a viral infection lapses into coma. Physical exam reveals papilledema and hepatomegaly. The serum ammonia and transaminases are elevated and the prothrombin time is prolonged. The patient MOST LIKELY has...
   A. viral hepatitis
   B. Reye’s syndrome
   C. salicylate intoxication
   D. acetaminophen toxicity
   E. α-1 antitrypsin deficiency

154. Which of the following types of hepatitis is associated with a vasculitis characterized by p-antineutrophil cytoplasmic antibodies?
   A. Hepatitis A
   B. Hepatitis B
   C. Hepatitis C
   D. Hepatitis D
   E. Hepatitis E

155. An afebrile 42 year old migrant worker from Mexico presents with bloody diarrhea and right upper quadrant pain. The patient MOST LIKELY has...
   A. amebiasis
   B. echinococcosis
   C. acute cholecystitis
   D. ascending cholangitis
   E. metastatic colon cancer

156. A febrile 23 year old college coed presents with fatigue and difficulty with swallowing. Physical exam reveals exudative tonsillitis, palatal petechia, cervical lymphadenopathy, and tender hepatosplenomegaly. A CBC reveals a mild microcytic anemia, lymphocytic leukocytosis with ~ 20% of the lymphocytes exhibiting atypical features, and a mild thrombocytopenia. You would expect this patient to have...
   A. a low total iron binding capacity
   B. normal serum transaminases
   C. an elevated total bilirubin
   D. a normal serum ferritin
   E. heterophile antibodies

157. Inspiratory stridor is commonly associated with...
   A. a respiratory syncytial virus infection
   B. a parainfluenza virus infection
   C. aspirin-induced asthma
   D. rhinovirus infections
   E. choanal atresia

158. Chlamydia trachomatis and the respiratory syncytial virus are BOTH commonly associated with...
   A. an interstitial type of pneumonia
   B. laryngotracheobronchitis (croup)
   C. the respiratory distress syndrome
   D. typical community-acquired pneumonia
   E. hospital-acquired (nosocomial) pneumonia
159. Which of the following is more often associated with *Klebsiella pneumoniae* than *Pseudomonas aeruginosa*?
   A. Upper lobe cavitation
   B. Green-colored sputum
   C. Association with cystic fibrosis
   D. Association with respirators
   E. Association with skin and wound infections

160. In a 30 year old man who lives in Tennessee, you would expect a calcified solitary coin lesion in the lung to represent...
   A. a foreign body
   B. an old granuloma
   C. metastatic cancer
   D. a primary lung cancer
   E. a bronchial hamartoma

Items 161–166
   A. *Vibrio cholera*
   B. *Bacillus cereus*
   C. *Shigella sonnei*
   D. *Salmonella typhi*
   E. *Campylobacter jejuni*
   F. *Yersinia enterocolitica*
   G. *Staphylococcus aureus*
   H. *Enterotoxigenic E. coli*

161. An afebrile 22 year old man and several other members of his family developed severe vomiting without diarrhea ~1–6 hours after eating potato salad at a picnic. They all recovered uneventfully 12–24 hours later.

162. A 23 year old man developed explosive, watery diarrhea with blood, leukocytes, and mucus ~3 days after eating chicken that was improperly cooked. Comma-shaped organisms are noted in the fecal smear of stool along with RBCs and leukocytes.

163. A febrile 10 year old child presents with severe right lower quadrant pain that is interpreted by the attending physician as acute appendicitis. At laparotomy, the surgeon notes that the appendix is normal. However, the mesenteric lymph nodes are markedly enlarged and have focal areas of microabscess formation on cut section.

164. A 29 year old man develops watery diarrhea and volume depletion shortly after visiting the Gulf Coast states

165. On a trip to India, a man develops a high fever associated with bradycardia, absolute neutropenia, and splenomegaly. A blood culture is positive for a gram negative non-lactose fermenting motile organism.

166. Eight hours after eating in a Mexican restaurant a man develops severe gastroenteritis. Gram positive rods are present in his stool.
167. A veterinarian develops tenosynovitis within 24-hs of an animal bite. You suspect the offending organism is...
   A. *Yersinia pestis*
   B. *Eikenella corrodens*
   C. *Fusobacterium*
   D. *Pasteurella multocida*
   E. *Staphylococcus aureus*

168. Which of the following is more often associated with *Escherichia coli* than *Pseudomonas aeruginosa*?
   A. Osteomyelitis from puncture wounds through rubber footwear
   B. Malignant otitis externa in a diabetic patient
   C. Pneumonia in an intensive care unit
   D. Death in a patient in a burn unit
   E. Meningitis in a newborn

169. An afebrile newborn child presents with a staccato type cough, wheezing, and bilateral conjunctivitis. Which of the following pathogens is most likely responsible for this patient's clinical condition?
   A. Respiratory syncytial virus
   B. *Mycoplasma pneumoniae*
   C. *Chlamydia pneumoniae*
   D. *Chlamydia trachomatis*
   E. Parainfluenza virus

170. Study the following test results in a control and a disease population for disease X.

<table>
<thead>
<tr>
<th></th>
<th>Positive test</th>
<th>Negative test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disease</td>
<td>140</td>
<td>60</td>
</tr>
<tr>
<td>Control</td>
<td>20</td>
<td>180</td>
</tr>
</tbody>
</table>

Regarding the above data for disease X...
A. prevalence is 35%
B. PV$^+$ is 90%
C. PV$^-$ is 70%
D. sensitivity is 70%
E. specificity is 75%

171. If the prostate specific antigen (PSA) test for prostate cancer is lowered from a reference interval of 0–10 ng/mL to 0–4 ng/mL, this will...
A. increase the number of false negatives
B. decrease the number of false positives
C. increase the test’s specificity
D. increase the PV$^+$
E. increase the PV$^-$
172. Study the following schematic involving a control group and disease X.

![Schematic diagram]

Reference interval

Which of the following correctly describes test results in the space occupied by each of the lettered groups?

A. Group A: true negatives + false negatives
B. Group B: true negatives + false positives
C. Group C: true positives + false positives
D. Group D: true positives + false negatives

173. If you have ordered two tests on a patient, what is the chance of one of those two tests having a false positive test result?

A. 0
B. 2
C. 5
D. 10
E. 20

174. Test X is performed on four normal controls. One standard deviation for the test is 3 mg/dL. Calculate the reference interval for the test.

<table>
<thead>
<tr>
<th>Control</th>
<th>Test result</th>
</tr>
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<tbody>
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<td>Control #1</td>
<td>110 mg/dL</td>
</tr>
<tr>
<td>Control #2</td>
<td>90  mg/dL</td>
</tr>
<tr>
<td>Control #3</td>
<td>105 mg/dL</td>
</tr>
<tr>
<td>Control #4</td>
<td>95  mg/dL</td>
</tr>
</tbody>
</table>

A. 92–108 mg/dL
B. 94–106 mg/dL
C. 97–103 mg/dL
D. 100–113 mg/dL
E. 103–116 mg/dL
Items 175–178

A. Acute lymphoblastic leukemia
B. Chronic lymphocytic leukemia
C. Hairy cell leukemia
D. Acute myelogenous leukemia
E. Chronic myelogenous leukemia
F. Adult T cell leukemia
G. Acute progranulocytic leukemia

175. A 28 year old man presents with fever, generalized lymphadenopathy, and hepatosplenomegaly. His CBC reveals a moderately severe normocytic anemia, thrombocytopenia, and an elevated WBC count with 20% of the cells having immature nuclear features and red splinter-like inclusions in the cytoplasm. His coagulation studies are normal.

176. A 24 year old man presents with ecchymoses, generalized lymphadenopathy, and hepatosplenomegaly. A CBC reveals a normocytic anemia, a total WBC count of 50,000 cells/μL, and thrombocytopenia. Hypergranular “blasts” with numerous Auer rods are present. The prothrombin and partial thromboplastin times are prolonged, serum fibrinogen is reduced, and the D-dimer test is positive.

177. A 45 year old man presents with fever, weight loss, sweating, epistaxis, generalized lymphadenopathy, and massive hepatosplenomegaly. A CBC exhibits a slightly macrocytic anemia, thrombocytosis, and a WBC count of 125,000 cells/μL with 1% myeloblasts, 8% basophils and hypogranular cells representing all stages of the neutrophilic series. Occasional hypersegmented neutrophils are present. A biochemical profile reveals hyperuricemia and marked elevation of LDH. A bone marrow aspirate exhibits cells that are similar in percent distribution to those present in the peripheral blood.

178. A 68 year old man presents with fever, fatigue, generalized, nontender lymphadenopathy, and hepatosplenomegaly. A CBC reveals a normocytic anemia, thrombocytopenia, and a WBC count of 65,000 cells/μL with normal to slightly atypical lymphocytes accounting for ~98% of the cells.

179. A 3 year old child presents with abdominal colic and a severe microcytic anemia. A peripheral smear reveals coarse basophilic stippling. Which of the following laboratory or x-ray findings would you expect in this patient?

A. Low serum ferritin
B. Normal abdominal x-ray
C. Densities in the epiphyses
D. Decreased free zinc RBC protoporphyrin
E. Low serum iron, high TIBC, and low percent saturation
180. A 49 year old alcoholic with a hemoglobin of 6 gm/dl receives 3 units of packed RBCs. The following day his hemoglobin is 6.5 g/dL. Which of the following best explains the patient's hematologic response to the RBC transfusions?

A. Normal hemoglobin response to the transfusions
B. Autoimmune destruction of transfused RBCs
C. Hemolysis of the transfused cells
D. Active gastrointestinal bleeding
E. Marrow destruction of RBCs
1. B: Conversion of pyruvate to lactate: anaerobic glycolysis
2. E: Low partial pressure of arterial oxygen (PaO₂)
3. E: Prostate gland in an elderly man with urinary retention: example of hyperplasia
4. E: Cerebral abscess: liquefactive necrosis
5. A: Unrestricted passage of the cell from the G₁ into the S phase: no inhibition of cyclin dependent kinase
6. A: *Clostridium difficile*-induced colitis: pseudomembranous inflammation due to a toxin
7. C: Leukocyte synthesis of β₁-integrins: adhesion molecule defect
8. A: Mast cells: histamine release
9. B: Macrophages and helper T cells: type IV hypersensitivity
10. B: Decreased synthesis of prostaglandins: corticosteroids and NSAIDs
11. E: Defect in the development of the 3rd and 4th pharyngeal pouches: DiGeorge syndrome
12. D: Warm autoimmune hemolytic anemia: type II hypersensitivity
13. C: Positive PPD skin reaction: type IV hypersensitivity
14. C: Increased POsm and ADH

![POsm vs Serum ADH Diagram]

A = normal dilution, B = diabetes insipidus, C = normal concentration or patient infused with hypertonic saline, D = inappropriate ADH

15. A: Cirrhosis with ascites: increased hydrostatic pressure from portal hypertension and decreased oncotic pressure from decreased albumin synthesis
16. B: In central diabetes insipidus after water deprivation you would expect a high POsm and low UOsm

![POsm vs UOsm Diagram]

17. D: DKA produces high POsm which causes water movement out of the ICF into the ECF and from the ECF it is lost in the urine due to osmotic diuresis

<table>
<thead>
<tr>
<th>POsm</th>
<th>ECF</th>
<th>ICF</th>
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<tbody>
<tr>
<td>High</td>
<td>Contracted</td>
<td>Contracted</td>
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18. A: SiADH from small cell cancer
19. C: hypovolemic shock from ruptured abdominal aortic aneurysm

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<tr>
<th>POsM</th>
<th>ECF</th>
<th>ICF</th>
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<table>
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<tr>
<th>MVO₂</th>
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<th>SVR</th>
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<tr>
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<tr>
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<td>7.00</td>
<td>52</td>
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<td>mixed disorder: respiratory acidosis + metabolic acidosis</td>
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<td>B.</td>
<td>7.27</td>
<td>60</td>
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<td>uncompensated acute respiratory acidosis</td>
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<td>C.</td>
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<td>F.</td>
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<td>G.</td>
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<td>21</td>
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<tr>
<td>H.</td>
<td>7.58</td>
<td>49</td>
<td>39</td>
<td>partially compensated metabolic alkalosis</td>
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</table>

20. G: pulmonary embolus with respiratory alkalosis

21. D: diabetic ketoacidosis, and example of increased anion gap metabolic acidosis

22. F: salicylate intoxication—mixed disorder with metabolic acidosis and respiratory alkalosis

23. H: metabolic alkalosis from loop diuretic

24. B: thiamine deficiency affects pyruvate dehydrogenase reaction—Pyruvate → Acetyl CoA

25. E: B₁₂ deficiency with neurologic disease—Methylmalonyl CoA → Succinyl CoA

26. E: pyridoxine deficiency from INH producing sideroblastic anemia  
Succinyl CoA + glycine → δ-Aminolevulinic acid

27. A: Schilling's test corrected with intrinsic factor: unique to pernicious anemia

28. D: Secondary hyperparathyroidism: malabsorption of fat soluble vitamins, in this case vitamin D produces hypocalcemia and secondary HPTH

29. C: Familial polyposis: autosomal dominant pedigree

30. D: Robertsonian translocation: child has 3 functional chromosome 21s

31. E: Mitochondrial DNA disorder: mother gives to all her children, father with disease does not give it to any of the children

32. D: Fragile X syndrome: concept of anticipation in triplet repeat disorders

33. C: Genomic imprinting: microdeletion on chromosome 15

34. A: Distal esophagus: adenocarcinoma from Barrett's esophagus

35. D: brain: no relationship of primary cancer to smoking
36. D: Liver involvement: remember the TNM system—metastasis outside of nodes is always worse

37. D

<table>
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<th>Men</th>
<th>Incidence</th>
<th>Mortality</th>
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<td>3-2-1</td>
<td>2-3-1</td>
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<table>
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<th>Women</th>
<th>Incidence</th>
<th>Mortality</th>
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<td></td>
<td>1-3-2</td>
<td>3-1-2</td>
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</tbody>
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38. B: kidney: ectopic secretion of erythropoietin or PTH-like peptide

39. B: testicle: choriocarcinoma secreting β-hCG, which is an LH analogue producing gynecomastia

40. C: Barbiturate overdose: calculated A-a gradient is normal, so lung disease is excluded- PAO2 = 0.21 (713) - 80/0.8 = 50, :: A-a = 50 - 40 = 10. Respiratory acidosis must be due to CNS depression.

41. A: sarcoidosis: restrictive pattern described

42. E: Thrombocytopenia in systemic lupus erythematosus: patient has ITP, which is a type II hypersensitivity reaction similar to autoimmune thrombocytopenia in SLE

43. E: coagulation factor consumption disorder: DIC is a coagulation consumption disorder

44. E: Prolonged partial thromboplastin time: all of them will also have a prolonged PTT

45. D: Child can only receive O blood; mother is blood group A, father is blood group B, and child is blood group O. Mother and father must be heterozygote for D antigen to have a D negative child

46. E: extravascular hemolysis in the newborn of RBCs previously coated by maternally-derived anti-A,B IgG antibodies: first pregnancy ABO hemolytic disease of newborn

47. C: Improves the chances of donor RBC survival in the patient: compatible major crossmatch indicates that there are no patient antibodies that are reacting against donor RBC antigens

48. C: patient IgG antibodies reacting against a donor RBC antigen: example of a delayed hemolytic transfusion reaction. Titer was not present at original crossmatch, but increased with exposure to the antigen

49. E: Dihydroxyacetone phosphate ➔ Glycerol 3-phosphate: NADH increases in alcohol metabolism which pushes this reaction in the direction of glycerol 3-P, the carbohydrate backbone for VLDL synthesis

50. D: Decreased synthesis of coagulation factors: if the PT did correct, then vitamin K deficiency is present, which could be due to A, B, C

51. B: Increased serum ferritin: classic findings of hemochromatosis

52. D: could be acute or chronic: A is someone who was vaccinated, B is the serologic gap, C is someone who recovered from HBV, and E is someone in the earliest stages of HBV

53. E: carcinoma of the head of pancreas: classic obstructive jaundice and Courvoisier’s sign

54. D: Alpha fetoprotein: classic history for hepatocellular carcinoma developing in cirrhosis from HBV

55. A: Alanine ➔ Pyruvate: gluconeogenesis is the key reaction for maintaining hyperglycemia. Alanine is transaminated into pyruvate.
56. C: Klinefelter's syndrome
   Serum FSH  Serum LH  Serum testosterone
   C. High  High  Low

57. B: classic prolactinoma with inhibition of GnRH
   Serum FSH  Serum LH  Serum estradiol  Bleeding post-progesterone
   B. Low  Low  Low  None

58. C: normal pregnancy with the effect of estrogen on thyroxine
   T4  RT3/T4BR  FT4-index  TSH  I131
   C. High  Low  Normal  Normal  Not performed

59. D: primary hyperparathyroidism: increased PTH and increased calcium

60. D: Decreased plasma renin activity: classic primary aldosteronism (Conn syndrome, metabolic alkalosis lowers ionized calcium without affecting total calcium)

61. C: classic description of Addison's: A is SiADH, B is vomiting or diuretics, D is normal, E is primary aldosteronism

<table>
<thead>
<tr>
<th>Serum Na⁺ (135–147 mEq/L)</th>
<th>Serum K⁺ (3.5–5.0 mEq/L)</th>
<th>Serum Cl⁻ (95–105 mEq/L)</th>
<th>Serum HCO₃⁻ (22–28 mEq/L)</th>
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<tbody>
<tr>
<td>A. 118</td>
<td>3.0</td>
<td>88</td>
<td>21</td>
</tr>
<tr>
<td>B. 125</td>
<td>2.9</td>
<td>80</td>
<td>36</td>
</tr>
<tr>
<td>C. 126</td>
<td>5.8</td>
<td>86</td>
<td>18</td>
</tr>
<tr>
<td>D. 140</td>
<td>4.0</td>
<td>100</td>
<td>24</td>
</tr>
<tr>
<td>E. 152</td>
<td>2.8</td>
<td>110</td>
<td>33</td>
</tr>
</tbody>
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62. E: Decreased serum cortisol post high dose dexamethasone: only pituitary Cushing's can be suppressed

63. C: Demyelinating disease: Guillain-Barré

64. C: Autoimmune disease: multiple sclerosis, autoimmune destruction of myelin

65. B: Atherosclerosis: classic atherosclerotic stroke due to thrombosis over atherosclerotic plaque in carotid producing a pale infarct

66. D: 24 hr. urine for metanephrines: pheochromocytoma in a man with neurofibromatosis

67. C: Gram positive diplococci: *Streptococcus pneumoniae* sepsis/meningitis in a patient without a spleen

68. B: Uncal herniation through tentorium cerebelli: uncal herniation with IIIrd nerve compression from metastasis

69. C: Chromosome disorder: woman has Down syndrome and Alzheimer's disease

70. B: Degeneration of neurons in the substantia nigra: idiopathic Parkinson's syndrome

71. C: Cystic degeneration of the cervical spinal cord: syringomyelia, a combination of motor and sensory disease

72. E: Spirochete: Lyme's disease with bilateral Bell's palsy, vector is the tick, but pathogen is *Borrelia burgdorferi*

73. B: Narrow joint space in proximal interphalangeal joint: PIP joint is affected in both OA and RA, both narrow the joint space for different reasons
74. C: defect in microbicidal activity: chronic granulomatous disease of childhood with deficient NADPH oxidase, can phagocytose but cannot kill bacteria
75. D: Decreased total peripheral resistance: arteriolar vasodilatation in endotoxic shock
76. A: Atherosclerosis: ruptured abdominal aortic aneurysm, weakening due to atherosclerosis
77. B: a defect in fibrillin: Marfan's syndrome with dissecting aortic aneurysm
78. D: myxomatous degeneration: classic mitral valve prolapse, excess GAGs deposited in valves
79. B: hypertrophic cardiomyopathy: MCC of sudden cardiac death, decreasing venous return makes obstruction worse and increases murmur intensity
80. E: reinfarction: classic reinfarction with reappearance of CK-MB
81. A: S3 heart sound: both have volume overload of ventricles, which produces an S3
82. B: ASD has left to right shunt into RA first, then RV, then PA, A is a VSD, C is a PDA, D is a tetralogy, and E is a complete transposition
83. A: atelectasis: classic physical findings of atelectasis
84. C: tension pneumothorax: classic physical findings for a tension pneumothorax with shift of structures to opposite side
85. C: decreased production of surfactant: classic history of RDS (hyaline membrane disease)
86. B: Insidious onset: question compares atypical with typical pneumonia
88. A: an intrinsic bowel motility disorder: irritable bowel syndrome
89. E: Small risk for adenocarcinoma: duodenal ulcers are never malignant, only reason to Bx a gastric ulcer is to R/O malignancy
90. B: sigmoid colon: MC location for diverticula, polyps, and cancer
91. C: Toxic megacolon: feature of UC more so than CD
92. C: intraluminal osmotically active solutes: classic history for lactase deficiency
93. E: colon cancer: classic history for colon cancer with metastasis to the liver
94. A: non-infective and in serologic gap

<table>
<thead>
<tr>
<th></th>
<th>HBsAg</th>
<th>HBeAg</th>
<th>Anti HBc-IgM</th>
<th>Anti-HBc-IgG</th>
<th>Anti-HBs</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td></td>
<td></td>
<td>+</td>
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</table>

95. C: Stone in the common bile duct: CB% >50% indicates obstruction
96. C: patient has polycythemia rubra vera, A is an appropriate secondary polycythemia due to tissue hypoxia (COPD, high altitude, tetralogy of Fallot), B is ectopic production of EPO, D is volume depletion, E is normal
97. C: iron deficiency from menorrhagia, A is α or β-thalassemia, B is anemia of chronic inflammation, D is iron overload, E is blood loss
98. A: with liver disease who is being treated with a broad spectrum antibiotic: MCC of vitamin K deficiency in the hospital, bowel gets sterilized and colonic bacteria cannot synthesize vitamin K
99. C: She is a candidate for Rh immune globulin: she is ABO and Rh incompatible with her baby and is a candidate. ABO hemolytic disease of the newborn is causing the jaundice. ABO HDN does protect against Rh HDN, but the patient is still given Rh immune globulin.
100. A: Normal hemoglobin and hematocrit: loss of whole blood does not alter the Hb and Hct. If normal saline was infused, the Hb and Hct would have dropped, since normal saline acts like plasma and uncovers the RBC deficit
101. C: Digital rectal examination: metastasis of prostate cancer to the vertebra is likely, the cheapest initial test is DRE
102. B: seminoma: cryptorchid and normal testis are at risk for a seminoma
103. E: Henoch-Schonlein vasculitis: classical picture with small vessel vasculitis and nephritic syndrome
104. B: Renal cell carcinoma with lung metastasis: emphasizes the relationship of smoking to renal adenocarcinoma
105. B: ascending infection: mechanism for all UTIs. Vesicoureteral reflux (ureter junction into bladder is defective) allows infected urine to ascend into the kidneys
106. B: Type II: classic Goodpasture's syndrome beginning in the lung and then moving to the kidneys
107. B: Membranous glomerulonephritis: relationship with cancer
108. C: Focal segmental glomerulosclerosis: relationship with heroin addiction (also AIDS)
109. C: Intraductal papilloma: MCC of bloody nipple discharge under 50
110. A: Infiltrating ductal carcinoma: classic history
111. E: Fibrocystic change: MCC of a mass in breast under 50
112. B: Family history: mother with cancer overrides patients age as the major risk factor
113. D: a fibroadenoma: cancer Hx is a distractor, fibroadenoma best fits the description
114. A: patient has early menarche and late menopause, is nulliparous, and had a radical mastectomy, all of which are increased risks for unopposed estrogen
115. A: Preeclampsia
116. E: Benign germ cell tumor: torsion of a cystic teratoma
117. D: Metastatic ovarian cancer: CA125 is the marker for ovarian cancer
118. C: Molar pregnancy: preeclampsia in first trimester is a hydatidiform mole
119. C: incidence: 3, 2, 1: mortality: 2, 1, 3
120. E: Invasive cervical carcinoma: most common cause of death is renal failure from obstruction of ureters
121. D: Increased β-oxidation of fatty acids: this generates acetyl CoA, which is used to synthesize ketone bodies
122. C: surreptitiously injected human insulin: low C-peptide means that he is injecting insulin and suppressing his β-islet cells
123. C: polycystic ovarian syndrome: classic history
124. E: No treatment: gynecomastia is normal at birth, puberty, and old age
125. A: all of their children have to have sickle cell trait
126. A: testicles: patient has testicular feminization where there are no androgen receptors
127. E: Chromosome study to identify for triplet repeats: patient has fragile X syndrome, a triplet repeat disorder
128. C: Weight loss syndrome: patient's GnRH is shut off from excessive weight loss
129. B: Cystic fibrosis: carpopedal spasm: vitamin D deficiency, nystagmus: vitamin A deficiency, hemorrhagic diathesis: vitamin K deficiency; all are fat soluble vitamin deficiencies, hence malabsorption is necessary for their deficiency
130. D: Bone pain and tetany: vitamin D deficiency, bone pain and fractures due to soft bone (osteomalacia)
131. D: Broomstick extremities: marasmus
132. B: Corn-based diet: lacks tryptophan to synthesize niacin
133. A: Osteoporosis: from lack of estrogen
134. A: Endometrial: obese individuals have more estrogen due to increased aromatization of androgens
135. A: lack of hydroxylation of lysine and proline: scurvy
136. D: osmotic damage: peripheral neuropathy in diabetes
137. B: low serum ceruloplasmin: Wilson's disease
138. B: a slow virus disease involving prions: Jakob-Creutzfeldt disease
139. B: gram negative diplococci: Neisseria meningitidis
140. B: Malignant lymphoma: however, remember that glioblastoma multiforme is the MC malignant primary tumor of the brain in adults and primary malignant lymphoma is increasing owing to the increase in AIDS. Medulloblastoma is the MC malignant primary CNS tumor in children but cystic cerebellar astrocytoma is the MC primary CNS tumor, however it is benign
141. B: Benign tumor derived from Schwann cells: acoustic neuroma
142. A: Hemorrhagic infarction: secondary to embolism from left atrium
143. D: protozoa: Toxoplasma gondii is a protozoan
144. A: Neutrophils with negatively birefringent crystals: patient has gout
145. A: gram negative diplococcus: patient has disseminated gonococccemia
146. C: an ACE inhibitor: mechanism is bradykinin
147. B: procainamide: drug-induced lupus
148. E: turn a port wine color after exposure to light: patient has acute intermittent porphyria (see Skin notes for discussion)
149. D: Cryptosporidium parvum
150. C: Enterotoxigenic E. coli
151. B: Candida albicans: MC fungal infection in AIDS
152. D: sweat chloride test: child has cystic fibrosis
153. B: Reye's syndrome
154. B: Hepatitis B: relationship of HBsAg with polyarteritis nodosa
155. A: amebiasis
156. E: heterophile antibodies: patient has infectious mononucleosis. Heterophile antibodies are against sheep, bovine, and horse RBCs
157. B: a parainfluenza virus infection: laryngotracheobronchitis
158. A: an interstitial type of pneumonia: Chlamydia trachomatis and respiratory syncytial virus
159. A: Upper lobe cavitation: Klebsiella pneumoniae
160. B: an old granuloma: probably Histoplasmosis since patient lives in the Ohio-Tennessee valley
161. G: Staphylococcus aureus
162. E: Campylobacter jejuni
163. F: Yersinia enterocolitica
164. A: Vibrio cholera
165. D: Salmonella typhi
166. B: Bacillus cereus
167. D: Pasteurella multocida
168. E: Meningitis in a newborn: Escherichia coli
169. D: Chlamydia trachomatis
170. D: sensitivity is 70%: sensitivity = 140/200 = 70%, specificity = 180/200 = 90%, PV+ = 140/160 = ~88%, PV- = 180/240 = 75%, prevalence = 200/400 = 50%
171. D: increase the PV: moving into normal country, hence increasing sensitivity and PV- test result
172. C: Group C: true positives + false positives
173. D: 10: there is a 5% chance of a FP test result per test, hence there is a 10% chance for 1 of 2 tests to be a FP
174. B: 94–106 mg/dL: The mean of the test is the sum of the 4 control test results divided by 4; mean = 100 mg/dL. The reference interval should be 2 standard deviations from the mean of the test. Since 1 SD = 3 mg/dL, 2 SD = 6 mg/dL, therefore, the reference interval is 100 - 6 mg/dL = 94 for the lower limit, and 100 + 6 mg/dL = 106 mg/dL for the upper limit.
175. D: Acute myelogenous leukemia
176. G: Acute progranulocytic leukemia: note the relationship with DIC
177. E: Chronic myelogenous leukemia
178. B: Chronic lymphocytic leukemia
179. C: Densities in the epiphyses: the child has Pb poisoning
180. D: Active gastrointestinal bleeding: GI blood loss is the most likely cause