Case for Question 1
A 16-year-old girl comes in to your office complaining of a severe sore throat. Her mother requests that you prescribe an antibiotic because she has missed a week of school. She looks tired and has a fever of 101°F. On physical examination you notice she has multiple 1 to 2 cm lymph nodes palpable in the anterior and posterior cervical region bilaterally, as well as the axillae. She has markedly enlarged tonsils with a small amount of exudate present. Her spleen is palpable, about 8 cm below the left costal margin. A rapid strep test is negative. Her peripheral blood smear has many atypical lymphocytes.

1. You advise her…
   A. Because the rapid strep tests can be falsely negative, she should take 500 mg of ampicillin 4 times a day for 10 days to prevent rheumatic fever.
   B. She has a common viral infection and she will feel better in 24 hours.
   C. She should take acyclovir to prevent the development of lymphoma.
   D. She should avoid contact sports or abdominal trauma.

Case for Question 2
A 19-year-old male comes to your office complaining of pain on urination and a urethral discharge. About 10 days ago, he had unprotected sex with a new female acquaintance. On examination he has a purulent discharge. You do a full STD work-up. After a few hours, the lab calls you with a report of finding gram negative intracellular diplococci in the gram stain of the urethral discharge.

2. What is the diagnosis:
   A. Chlamydia infection
   B. Syphilis
   C. Gonorrhea
   D. HIV infection
   E. Trichomoniasis

Case for Question 3
A 62-year-old male was diagnosed with diabetes 20 years ago. Over the past 2 to 3 weeks he has noted some redness of his great toe. It did not concern him since it was not painful. He denies having fever. On examination his great toe is red, warm and swollen. Neurological examination reveals that he has marked reduced sensation in his feet. An x-ray of the foot shows bony destruction of the great toe and first metatarsal head. The third year medical student diagnoses osteomyelitis.
3. Which of the following is correct:
   A. The patient had an occult bacteremia that infected the bone(s).
   B. The neuropathy was a risk factor for the development of infection.
   C. The foot is an unlikely place for osteomyelitis to occur in a diabetic.
   D. The patient probably had an unrecognized cat bite.
   E. Medical (antibiotic) treatment always cures this infection.

Case for Question 4
A 52-year-old mother of five children is a frequent blood donor. She sees you because she was told that her blood was rejected by the Rhode Island Blood Center due to a positive HIV test. You review the lab work and find that the ELISA is positive and the Western blot is negative. Her concern is that she has HIV infection. She denies risks for HIV infection. One month after the blood donation you send repeat blood work and the following results are obtained: ELISA positive and Western blot negative. The Western blot is repeated 6 months later and is negative.

4. Which statement is correct:
   A) She is infected with HIV-1
   B) She is infected with HIV-2
   C) She does not have HIV infection
   D) She is infected with HTLV-1
   E) She has a congenital immunodeficiency

Case for Questions 5 and 6
A 70-year-old woman one year ago was found to have a systolic murmur. An echocardiogram showed moderate aortic stenosis. She now presents with fever, rigors, loss of appetite, and weight loss that started several weeks ago. Her physical examination reveals a temperature of 38.5°C, two petechiae in her right palpebral conjunctiva, and a systolic murmur. Three blood cultures are drawn and the patient is started on intravenous antibiotics. The next day, all six bottles from the blood cultures are growing gram positive cocci.

5. Which statement is correct:
   A. Her heart murmur has nothing to do with her current symptoms and positive blood cultures.
   B. She must be an intravenous drug user and injected the bacteria into her blood.
   C. This infection could have been prevented by immunization.
   D. This infection is treated with an oral antibiotic.
   E. The gram positive cocci in her blood is most likely viridans group streptococci.

6. Her blood cultures most likely grew:
   A. Neisseria gonorrhoeae
   B. viridans group streptococci
   C. HACEK
   D. Staphylococcus aureus ✓
   E. Pseudomonas aeruginosa
Case for Question 7
Rhonda is a 6-month-old who is at the Health Center today for a routine visit. She lives with her mother and a 20-year-old uncle who has hemophilia and an HIV infection from a transfusion.

7. Which of the following vaccines is contraindicated for this infant?
   A. Oral poliovirus vaccine (OPV)
   B. *Haemophilus influenzae*, type b vaccine
   C. Hepatitis B vaccine
   D. Diphtheria-tetanus-pertussis (DTP/DTaP)
   E. Pneumococcal vaccine

Case for Question 8
A 4-month-old infant is admitted to the hospital in October with respiratory distress. Two days prior to admission she had developed a brassy cough and rhinitis. The evening prior to admission she was noted to have stridor which worsened the evening of admission prompting her parents to bring her to the hospital.

8. The most important factor in causing the stridor heard in this infant is:
   A. Small size of the infant airway.
   B. Floppiness of the infant airway.
   C. Production of IgE in nasopharyngeal secretions.
   D. Edema of the tracheal mucus membranes.
   E. Viral infection of the larynx and trachea.

Case for Question 9
A newly diagnosed woman wants some information concerning the transmission of HIV.

9. You tell her:
   A. A concomitant STD, such as a genital ulcer due to herpes, can increase sexual transmission of HIV.
   B. It can be spread via the airborne route.
   C. It can be spread by handshake.
   D. It can be spread via urine.
   E. All of the above.

10. The most common problem caused by HIV treatment with protease inhibitors:
    A. Hepatotoxicity
    B. Interactions with other drugs
    C. Renal toxicity
    D. Blurred vision
    E. Cardiotoxicity
Case for Question 11
A 10 day-old baby is brought to the emergency room by his mother. The child is listless, has had fever for the past 2 days, and has been feeding poorly. The child is “floppy” and has a temperature of 105.1°. A lumbar puncture reveals cloudy CSF containing 1200 white blood cells with 91% neutrophils. A Gram stain is pending.

11. You immediately order:
A. Intravenous antibiotics
B. A stat CT scan of the brain
C. Lyme serology
D. PCR for HSV on the cerebrospinal fluid
E. Acyclovir

Case for Question 12
A 30-year-old woman in her fifth month of pregnancy develops symptoms of influenza in December. After a few days she starts to feel better and she no longer has fevers. Then she goes on to develop a productive cough, fevers and right sided chest pains. She is found to have extensive lobar pneumonia.

12. Which of the following is correct?
A. She has tuberculosis and should be started immediately on medications.
B. The lobar pneumonia was caused by influenza virus.
C. The risk factors associated with this type of pneumonia are inhibition of the epiglottal reflex.
D. *Klebsiella pneumoniae* is the most common cause of bacterial pneumonia.
E. Influenza vaccine would have prevented this type of pneumonia and should be given to pregnant women.

13. Inhibition of neuraminidase is effective against influenza because this enzyme is required for:

A. Virus binding to the host cell
B. Assembly of viral coat proteins
C. Uptake of virus into the host cell
D. Release of virus from the host cell
E. Uncoating of viral RNA

Case for Question 14
A 42-year-old female is undergoing evaluation for kidney transplantation. Her Mantoux skin test (PPD) is 20 mm in size. Her dermatologist tells her that her reaction to the skin test is due to allergy and no further evaluation is required. While awaiting her transplant, she continues her usual activities which include attending the transplant support group (patients both awaiting transplantation as well as those who have received transplantation attend) as well as singing in two church choirs. She and her husband go for vacation to the Mediterranean where they travel by cruise ship for 7 days. On return to the US she tells her physician that she has coughed intermittently for 4 months but has no other symptoms. A chest radiograph reveals a right upper lobe infiltrate. Her sputum smears reveal 1+ acid-fast bacillus per high power field.
14. Which of the following is correct:
A. Screening by Mantoux skin testing should be initiated immediately amongst the transplant support group.
B. The dermatologist is correct. Her Mantoux skin test is an allergy. The sputum result is of no concern at this point.
C. On interviewing the patient, it is clear that she just joined the choir groups 2 months ago. Practice occurs two times per week for 1 hour. Members of the choir do not need to be tested as they had very little contact with the source patient.
D. Tuberculosis is more common outside of the United States than inside the United States. The patient must have become infected with TB on the trip to the Mediterranean.

Case for Question 15
A 5 year old boy is brought in to the emergency room with a fever of 102 and a diffuse, pruritic, vesicular rash. Each vesicle has an erythematous base, and they appear in crops with differing stages of development – some are flat red macules, some are fully developed vesicles, and some are crusts. They cover his body including the arms, legs, chest, face, and he even has one inside his mouth. He is in day care. The family moves frequently and he is behind on his vaccinations. On physical exam, other than the rash, the child appears well. The itching irritates him. His mother wants to know if the rash is contagious and what is the likelihood that his 12-month-old sister will get the same rash.

15. You tell her…
A. No risk to the sister since the rash is not contagious.
B. The risk to the sibling is only 5%.
C. The sibling has a 90% chance of developing the rash if she is not vaccinated.
D. The sibling has a 30% chance of developing the rash.

Case for Question 16
A 28-year-old medical student went to the Dominican Republic for vacation. While there she ate and drank whatever was available. She awoke one morning with diarrhea and abdominal cramps. She then noticed that she had some nausea.

16. Which of the following is correct?
A. Enterotoxigenic E. coli (ETEC) is the most likely cause of her diarrhea.
B. She has intestinal tuberculosis.
C. Salmonella typhi is the most likely cause of her diarrhea.
D. Vibrio cholerae is the most likely cause of her diarrhea.
E. Giardia lamblia is the most likely cause of her diarrhea.
Case for Question 17
The 18-year-old first baseman on the American Legion travel team presents to your office with a rash. He claims that he has had severe “acne problems” for the last year, ever since he started working out with a new trainer who had given him some “vitamin and nutrition injections” every few weeks. He said that the skin problems had been manageable because his slugging percentage had gone from .300 to .690 during that time. However, now he is unable to get a date. On exam he has a very muscular body habitus with diffuse pustules on erythematous bases over his anterior and posterior trunk, proximal extremities and face. The lesions range in size from 2 to 16 mm. There are no lesions on his palms, soles, genitalia or mucous membranes. His testes are small bilaterally.

17. Which of the following are true?
   A. The infection involves his hair follicles and sebaceous glands.
   B. It is likely that he frequents hot tubs.
   C. The pathophysiology involves a protein exotoxin.
   D. He has cutaneous anthrax.
   E. He has impetigo.

Case for Question 18
Rose is a 1-year-old who is in the pediatrician’s office today for a well child visit.
18. Her routinely recommended childhood vaccines should not be given at this visit if:
   A. Her mother is in the first trimester of pregnancy.
   B. She had a mild skin rash after her last set of immunizations.
   C. She has a minor upper respiratory tract infection.
   D. She has a history of a possible seizure.
   E. She has a high fever with vomiting and diarrhea.

Case for Question 19
An 18 year old Rhode Island high school football player notes his right knee is swollen and warm but with little pain. He attributes this to a football game injury in the Homecoming game in late October, but does not recall any scratch or open wound on the knee. As it persists for days the team doctor sends him to an orthopedic surgeon who removes the fluid from the knee. The cell count is 10,000 white blood cells/mm³ with a predominance of polymorphonuclear cells. The Gram stain is negative for bacteria. He is placed on cephalaxin (Keflex). Culture of the fluid has no growth. He does not improve.

19. What organism should be considered as the likely cause of this infection?
   A. Streptococcus pneumoniae
   B. Borrelia burgdorferi
   C. Staphylococcus aureus
   D. Ehrlichia chaffeensis
   E. Group A Streptococcus
Case for Question 20
A 32-year-old male born in Guatemala presents with a 6 month history of cough and 15 pound weight loss. He denies fevers. Because of hemoptysis, he spontaneously coughed producing ½ cup of bright red blood, he decided to seek medical care. A chest x-ray showed an infiltrate in the right upper lobe surrounding a 4 centimeter cavity. A sputum examination revealed 4+ acid-fast bacilli. The patient works as a roofer. He lives in an apartment with his wife, 4 children (age 3 months to 12 years), his mother (who is diabetic), brother (who has HIV), sister-in-law, and two nieces.

20. Which of the following is correct:
   A. Grading of the smear result (the scale of how many organisms are seen on the smear) assists in determining how contagious he is to others.
   B. The lack of fever predicts that the patient has not been contagious over time.
   C. Because the patient works 14 hour days with the construction crew, his co-workers are at higher risk of infection than his family.
   D. All family members are equally at risk for infection and subsequent disease from exposure to the source case.
   E. Treatment given to those infected by this source case will not influence their risk of developing disease later in life.

Case for Question 21
A 70-year-old female develops severe abdominal pain and fever. An investigation reveals a perforated diverticular abscess that necessitates a hemicolectomy. Post-operatively she becomes hypotensive with evidence of lactic acidemia, disseminated intravascular coagulation, acute renal failure and has positive blood cultures for Escherichia coli and Bacteroides fragilis. She is treated in the intensive care unit with intravenous fluids, broad spectrum antimicrobial agents and full supportive care. However, she remains hypotensive despite intravenous fluids.

21. The hypotension (low blood pressure) is due to:
   A. Excess blood loss.
   B. Nitric oxide.
   C. Excess lactic acid levels.
   D. Acute renal failure.
   E. Fever.

22. Which one of the following patients is least likely to require antibiotic treatment tailored to the individual's condition?
   A. Patient undergoing cancer chemotherapy
   B. Patient with hypertension
   C. Patient with kidney disease
   D. Elderly patient
   E. Patient with liver disease
23. Which of the following statements about bacterial pneumonia is correct?
   A. All pleural effusions secondary to pneumonia are infected.
   B. The majority of patients have positive blood cultures.
   C. The 23-valent pneumococcal polysaccharide vaccine is not effective in adults.
   D. Aspiration pneumonia only occurs in alcoholics, because alcohol depresses the epiglottal reflex.
   E. The normal flora of patients who are hospitalized are replaced with gram positive bacteria which can then be aspirated and cause "nosocomial pneumonia"

Case for Question 24
A 30-year-old married woman was recently told by her primary physician that she has herpes and she calls you to ask for advice. She recently had a painful oral ulcer that her doctor swabbed the ulcer and the test showed herpes. She is worried that she got this from her husband and that he may have been unfaithful to her. On further questioning, she tells you that she occasionally gets cold sores, but she has never had any genital ulcers or other sexually transmitted infections. Her husband is her only lifetime sex partner and her age at first intercourse was 20.

24. You advise her that:
   A. From now on she and her husband should reliably use condoms during intercourse to prevent the spread of this infection.
   B. Future pregnancies should be delivered by cesarean section to prevent mother to child transmission.
   C. Oral herpes is not sexually acquired.
   D. Oral herpes is commonly acquired in childhood and was likely responsible for her cold sores.

Case for Question 25
It is February and a 2-year-old child developed the abrupt onset of vomiting at the day care center and is sent home. Several other toddlers at the center had been ill and the parents have questioned whether the water supply is safe. There was no blood in the stool and fever was minimal (99-100 F).

25. The most likely cause of this child’s illness is:
   A. Giardia lamblia
   B. Enterotoxigenic E. coli (ETEC)
   C. Bacillus cereus
   D. Cryptosporidium parvum
   E. Rotavirus

Case for Question 26
A sexually active 24-year-old female with presents to the Emergency Room with a painful swollen ankle. On examination her temperature is 102.8° F, her right ankle is red, swollen, and tender. Fluid is removed from the joint. The synovial fluid has an elevated white blood cell (WBC) count.

26. The most likely organism to cause this infection in this patient is:
   A. Haemophilus influenzae
   B. Salmonella
   C. Mycobacterium tuberculosis
   D. Neisseria gonorrhoeae
   E. Staphylococcus aureus
Case for Question 27
A 42-year-old woman undergoes a gastric stapling procedure for morbid obesity. She does well post-operatively until the 6th post-op day when serosanguinous material begins to drain from the abdominal incision. Over the next 24 hours, the wound develops a rapidly enlarging zone of erythema, her temperature spikes to 40.2°C and she becomes confused and agitated. At that point, her pulse is rapid (115/minute), respiratory rate of 26, blood pressure is low (90/50), and she is noted to have a diffuse erythematous eruption of her trunk and extremities (sunburn-like rash), including her palms. Laboratories reveal new-onset renal failure, thrombocytopenia and mild elevations of transaminases.

27. Which of the following is true about this illness:
   A. It is caused by a gram-negative bacteria.
   B. Tampons are the only cause of this illness.
   C. She is having a delayed reaction to the anesthetic agent used for surgery.
   D. The illness was first recognized more than 100 years ago.
   E. A protein product of bacteria is important in the pathogenesis.

Case for Question 28
A 35-year-old man, who lives Maryland, presents to the hospital in August with the acute onset of fever to 103°F, headaches and myalgias. You suspect meningitis and immediately perform a lumbar puncture and promptly start intravenous ceftriaxone and vancomycin. After a few days in the hospital, culture of the cerebral spinal fluid (CSF) shows no growth. However, he has developed a rash that started on the palms and soles that is now spreading to the trunk. Clinically he is getting worse. The patient’s best friend informs you that several days prior to admission they both went hiking in a wooded area and were bitten by ticks.

28. What organism should you consider as the most likely cause of his illness?
   A. Rickettsia rickettsii
   B. Enterovirus
   C. Neisseria meningitidis
   D. Streptococcus pneumoniae
   E. Haemophilus influenzae

Case for Question 29
A 45-year-old smoker develops the sudden onset of fever and chills. It is January and because of the blizzard he decides to stay home. However, one hour later he coughs and produces thick purulent sputum that is rusty in color. Additionally, he develops right sided chest pain and he feels short of breath. He calls his brother-in-law, who lives next door and owns a snowmobile, to ask him to take him to the local emergency room. Upon arrival to the emergency room his temperature is 104°F and his respiratory rate is 28 per minute. There are rales at the right base. A chest x-ray shows a lobar infiltrate involving the right lower lobe.

29. The most likely cause of pneumonia is:
   A. Chlamydia pneumoniae
   B. Legionella pneumophila
   C. Bacillus anthracis
   D. Mycoplasma pneumoniae
   E. Streptococcus pneumoniae
Case for Question 30
Your longstanding HIV patient recently relapsed after 12 months of abstinence from intravenous drug use. Recently, he started injecting heroin after his brother's unexpected death. He calls you because he has been febrile and short of breath for the past two days. You meet him in the emergency room where he has a temperature of 103°F, tachycardia, and a chest x-ray suggestive of pulmonary emboli. You immediately send two sets of blood cultures after you hear a loud systolic murmur at the left sternal border.

30. Which of the following is correct?
   A. He should immediately be treated with ampicillin for enterococcal bacteremia.
   B. You should immediately order a TEE (transesophageal echocardiogram) to confirm the diagnosis.
   C. Right-sided endocarditis is likely and empiric treatment to cover Staphylococcus aureus should be started.
   D. He is likely to have splenomegaly as a physical finding.
   E. He has cavitary tuberculosis.

Case for Question 31
A 22-year-old previously healthy male presents to the ER in August with a 3-day history of fever to 101.3°F and headache. On examination, he is febrile and his neck is supple, it is painful when he moves his neck, neurological exam is normal. A lumbar puncture is performed and reveals CSF with 120 white blood cells, 91% of which are lymphocytes, glucose of 75 mg/dL and protein of 52 mg/dL. Serum glucose is 100 mg/dL. CSF Gram stain reveals no organisms.

31. Which statement is most correct:
   A. He has bacterial meningitis
   B. He has viral meningitis
   C. He has viral encephalitis
   D. He has a brain abscess

Case for Question 32
An 88-year-old female is brought to the ER with fever and confusion. Physical exam confirms the fever (temperature 102.4°F) and confusion. A lumbar puncture is performed and the cerebral spinal fluid is cloudy. Analysis of the CSF shows a high white blood cell count, an elevated protein and low glucose. You suspect the patient has bacterial meningitis.

32. Which of the following BEST describes the pathophysiology of bacterial meningitis?
   A. Bacteria colonize nasopharyngeal epithelial cells, invading the bloodstream via the basement membrane, enter the CSF (cerebral spinal fluid).
   B. Bacteria colonize the GI tract, then enter the bloodstream via translocation, invading the CNS via the blood-brain barrier.
   C. Bacteria colonize non-intact skin, resulting in bacteremia with spread to the CNS via the blood-brain barrier.
   D. Bacteria colonize the nasopharynx, invading the CNS directly via invasion of sinus mucosa and retrograde axonal transport along cranial nerves.
   E. Bacteria gain access to the central nervous system via the prostatic venous plexus.
Case for Question 33
A 60-year old man with acute stem cell myelogenous leukemia is admitted to hospital and becomes neutropenic following chemotherapy-induced myelosuppression. His leukemia proves to be refractory and he has prolonged periods of severe neutropenia with an absolute neutrophil count (ANC) less than 50 neutrophils/mL. He has prolonged high fevers of unclear etiology that persists despite a variety of antibacterial agents and high-dose fluconazole as empiric antifungal treatment. After two weeks of persistent fever, he develops bilateral pulmonary infiltrates. A bronchoscopy is performed. Silver stain of the bronchial washings show acute angle branching septated hyphae.

33. The most likely causative organism in this patient’s illness is which of the following?
A. Candida albicans
B. Cryptococcus neoformans
C. Sporotrichosis schenckii
D. Aspergillus fumigatus
E. Nocardia asteroides

Case for Question 34
A 35-year-old physician was in his usual state of good health, having never missed a day of work, when he developed the abrupt onset of headache, fever, and body aches during the month of February. He subsequently noted a sore throat and a nonproductive cough. Physical examination was notable for a temperature of 38.9°C, but was otherwise unremarkable.

34. The myalgias, headache and fever seen in this patient are the result of:
A. Cilial cell death.
B. Damage to muscle cells produced by viral infection.
C. Viremia.
D. Toxins produced by the virus.
E. Release of chemical mediators of inflammation.

Case for Question 35
A 35-year-old man is brought to the emergency room for severe shortness of breath. He has been using injection drugs for years, had sex with prostitutes and has never been tested for HIV. His respiratory rate is 36 per minutes and on lung exam there are fine rales. A CXR shows bilateral interstitial pattern. A bronchoscopy is performed and staining shows numerous Pneumocystis carinii (PCP). Several days later his HIV tests (ELISA and Western blot) are positive.

35. Which statement is correct?
A. He has recently become infected with HIV.
B. His CD4 count is probably normal.
C. He is not at risk for having other infections such as hepatitis C, hepatitis B, or syphilis.
D. Taking TMP/SMX (trimethoprim/sulfamethoxazole) prophylactically can prevent PCP.
E. He has a false positive Western blot.
Case for Question 36
A 4-year-old boy is admitted to Hasbro Children’s Hospital with *Burkholderia* bacteremia and sepsis. He was treated six months ago for a liver abscess that grew *Staphylococcus aureus*. He is short for his age and you notice that on oral examination he has severe gingivitis.

36. You suspect that he has:
   A. Inherited complement deficiency
   B. DiGeorge’s Syndrome
   C. Chronic Granulomatous Disease (CGD)
   D. Ataxia Telangiectasia

Case Question 37
A 23-year-old male presents to your office with a chief complaint of severe pain in his genital and perirectal area. He also has a fever, headache, myalgia, and dysuria. He admits to having unprotected sex with an anonymous male partner a few days earlier. On examination, you find multiple vesicular extremely tender lesions in the penile area and perirectal area. No abnormal discharge is elicited. You are able to palpate some inguinal lymph nodes that are slightly tender.

37. What is the most likely diagnosis:
   A. Candida infection
   B. Syphilis
   C. Gonorrhea
   D. Genital warts
   E. Genital herpes

Case for Question 38
An 80-year-old nursing home resident is brought to the emergency room with a one-week history of worsening confusion and lethargy. While having his vital signs taken this morning, he complained to a staff member of “smelling dead fish.” She became concerned and had him transferred to the ER. There, he has a temperature of 96.4°F and is somnolent and disoriented when aroused. He has a nonfocal neurologic examination. A CT scan of the brain without intravenous contrast (ordered to rule out an intracerebral hemorrhage) reveals generalized atrophy. A lumbar puncture reveals CSF with a white blood cell count of 65 (75% lymphocytes, 23% monocytes, 2% neutrophils), glucose of 68 mg/dL (serum = 102 mg/dL) and protein of 45 mg/dL.

38. Which of the following tests is most likely to diagnose his condition?
   A. Cerebrospinal fluid culture for acid fast bacilli.
   B. MRI with gadolinium to look for a brain abscess.
   C. Blood cultures for *Streptococcus pneumoniae*.
   D. CSF polymerase chain reaction for HSV.
   E. MRA of the brain to look for an aneurysm.
Case for Question 39
A six-year-old previously healthy boy presents with abrupt onset fever, chills, malaise, weakness, rapidly progressing purpuric skin lesions and has positive blood cultures for gram-negative diplococci (*Neisseria meningitidis*). He develops diffuse intravascular thrombosis and evidence of a consumptive coagulopathy necessitating the amputation of several fingers of his right hand.

39. Disseminated intravascular coagulation as observed in the septic patient is:
   A. Best treated with blood pressure support.
   B. Primarily induced by increased tissue factor expression of endothelial cells and monocytes.
   C. Treated with stress dose corticosteroids.
   D. Caused by excess platelet activating factor.

40. Which pathogen does not cause toxin-mediated gastrointestinal illness?
   A. *Staphylococcus aureus*
   B. *Clostridium difficile*
   C. *Salmonella typhi*
   D. *E. coli* O157:H7
   E. *Vibrio cholerae*

Case for Question 41
A 22-year-old female comes to your office with 2 days of fevers. She has had urinary tract infections in the past. On exam, she is tender over the left flank area and is dehydrated. Her urine is positive for leukocyte esterase and nitrites. You send her to the emergency room for hydration and admission to the hospital. She is given intravenous antibiotics, improves and is discharged after two days. A urine culture grew *E. coli*.

41. Which of the following is correct?
   A. All she needs is a total of three days of antibiotic therapy.
   B. She probably has an anatomic abnormality of her urinary tract.
   C. It is more likely for a 22-year-old male than a 22-year-old female to have a urinary tract infection.
   D. She had a bacteremia that then infected her kidneys.
   E. The *E. coli* causing her urinary tract infection has a “P” pili that binds to the uroepithelial cell membrane.

Case for Question 42
A 40-year-old female comes in for routine annual Pap smear. Her previous Pap smears have been normal. Since, her visit last year she has been sexually active with a new partner. She is asymptomatic and feels well. On gynecologic examination, you find 3 large warty lesions in the external genital area which are non-tender. The rest of the gynecologic exam is unremarkable.

42. What is the causative organism for these lesions:
   A. Chlamydia trachomatis serovars L1, L2, L3
   B. Primary HIV infection
   C. *Haemophilus ducreyi*
   D. Human Papilloma Virus
   E. Herpes Simplex Virus (HSV-2)
Case for Question 43
A 38-year old HIV-infected patient from Arizona presents with progressive headache, fever and neck stiffness. His chest x-ray reveals some pleural thickening and a lung infiltrate. His CD4 count is 50 cells/mm³. His lumbar puncture reveals a leukocyte predominant CSF pleocytosis with elevated protein and reduced CSF sugar. India ink prep is negative and a cryptococcal antigen test is negative in the spinal fluid and in the blood. Blood and CSF cultures are not growing any pathogen after 72 hours.

43. The most likely etiologic agent responsible for this patient’s illness is which of the following?
   A. Candidiasis
   B. Histoplasmosis
   C. Cryptococcosis
   D. Coccidioidomycosis
   E. Blastomycosis

Case for Question 44
A 70-year-old man is hospitalized for a stroke and a foley catheter (urinary catheter) is placed on admission. He is recovering from the stroke but develops a fever. A urine specimen from the catheter reveals numerous polymorphonuclear white blood cells and culture grows a gram-negative bacterium. He is treated with an appropriate antibiotic and improves.

44. Which of the following is correct?
   A. He should have a CT scan or ultrasound done to exclude an anatomic abnormality.
   B. A condom catheter is more likely to cause infection.
   C. The urine most likely grew *Neisseria gonorrhoeae*.
   D. The catheter predisposes to infection and should be removed.
   E. Everyone with a foley catheter should receive prophylactic TMP/SMX (trimethoprim/sulfamethoxazole) to prevent the development of a urinary tract infection.

Case for Question 45
Your 21-year old cousin calls you for advice because she heard you were studying infectious diseases in medical school. She is scheduled to have periodontal surgery two weeks from now. She had a Tetralogy of Fallot repaired at 6 months of age. Recently she was found to have a new murmur consistent with mitral valve regurgitation.

45. You tell her:
   A. Prophylactic antibiotics are only indicated for extraction and that the periodontal work is considered low risk
   B. No need for antibiotics because the Tetralogy of Fallot was repaired.
   C. She should not receive prophylactic antibiotics. However, if she develops a fever within one month after the periodontal surgery she should take acetaminophen (anti-pyretic).
   D. She should receive prophylactic amoxicillin for the dental procedure.
   E. You advise her to never brush her teeth again because it causes bacteremia with viridans group streptococci that in turn may infected her mitral valve.
Case for Question 46
A 28-year-old nurse in an AIDS clinic is found on routine employee testing to have a newly positive PPD. She has no cough or weight loss. She is healthy and totally asymptomatic. Her chest x-ray is normal.

46. Which of the following statements is correct?
   A. She has active disease and should be started on a combination of four anti-TB medications.
   B. She has a 10% lifetime chance of developing TB disease.
   C. She should be excused from work since she is highly infectious and may infect the patients in the HIV clinic.
   D. It is a false positive. She should be reassured she is not infected and has nothing to be concerned about.

Case for Question 47
A 28-year-old female is diagnosed with acute leukemia (AML) and admitted to the hospital. Chemotherapy is started. She does well until hospital day #7, when she develops nausea and fever to 38.5°C. She has severe mucositis and her white blood cell count is 140 cells (normal 4,000-10,000) with an absolute neutrophil count (ANC) of 40 cells.

47. What statement regarding this patient is correct?
   A. Antifungals are immediately needed as she has absolute neutropenia.
   B. Her central venous line is the most likely source of infection.
   C. An antimicrobial agent that is active against gram negative bacteria including Pseudomonas aeruginosa should be started.
   D. Her humoral immunity is most severely affected and she is most at risk for sinopulmonary infections from Streptococcus pneumoniae.
   E. She most likely has a CMV infection due to loss of T-cell mediated immunity.

Case for Question 48
In January a 6-week-old full-term infant without underlying illness developed nasal congestion, low-grade temperature, and cough. The next day, the baby's breathing was more labored, and he was brought to the emergency room. There, the infant's temperature was 37.8°C and the respiratory rate was 70 per minute. Nasal flaring and intercostal retractions were present. Auscultation revealed diffuse wheezing. A chest x-ray found hyperexpanded lungs.

48. Which of the following organisms is the most likely cause of this infant's infection?
   A. Adenovirus
   B. Influenza virus
   C. Parainfluenza virus
   D. Respiratory syncytial virus
   E. Rhinovirus
49. Which of the following statements are true and represent a major clinical distinction between the deep mycoses (histoplasmosis, coccidioidomycosis, blastomycosis) and tuberculosis?

A. The deep mycoses induce a granulomatous tissue response while tuberculosis does not.
B. They produce a subacute to chronic disease while tuberculosis does not.
C. Pulmonary forms of the deep mycoses are not transmissible person-to-person while tuberculosis is transmissible.
D. The organisms grow on routine bacteriologic media within 48 hours (blood agar plates) while tuberculosis does not.
E. Environmental contamination is important in the transmission of tuberculosis, but this is not true for deep mycosis.

Case for Question 50
James is a 4-month-old who is in the pediatrician’s office today for a well child visit.

50. Which of the following vaccines would not be given at this well child visit because of the potential presence of maternal transplacental antibody?

A. Diphtheria-tetanus-pertussis (DTP/DTaP)
B. Haemophilus influenzae, type b vaccine
C. Live measles virus vaccine
D. Hepatitis B vaccine
E. Pneumococcal conjugate vaccine

Case for Question 51
A 45-year-old male received a cadaveric renal transplant. Both the donor and he had evidence of previous infection with CMV, HSV, VZV, and EBV by antibody testing. He is receiving immunosuppressive therapy to prevent rejection of the transplanted kidney. Two months after discharge he presents to the clinic with fever, anorexia, and watery diarrhea. Physical examination: temperature 38°C, general ill appearing and pale; and lower abdominal tenderness. Laboratory: pancytopenia (low white blood cell count, low red blood cell count, low platelet count) and a slight increase in his liver function tests.

51. Concerning this patient, which statement is most correct:

A. He most likely has a post-operative wound infection.
B. He most likely has an infection at the site of anastomosis.
C. It is highly likely that he has a bacteremia with Pseudomonas aeruginosa.
D. It is impossible for him to have a urinary tract infection since he was transplanted with a normal kidney.
E. The fevers, diarrhea and pancytopenia may be due to CMV.

Case for Question 52
A 26-year-old woman sees you in an urgent care clinic because of pain in her left posterior thigh. She claims that symptoms began last night, after a car door hit that area while she was removing her baby from a car seat. The pain has worsened significantly over the last 12 hours; she also has nausea. Exam discloses a moderately ill-appearing young woman with a temperature of 39°C and a pulse of 120/minute. Her left posterior thigh is remarkable for an absence of open lesions and a 3cm × 6 cm exquisitely tender, bluish area of ecchymosis. She walks with a limp.
52. Which of the following statements is true regarding this illness?
   A. Surgery is likely to be required.
   B. She acquired the illness from her child.
   C. Strict bedrest, extremity elevation and antipyretics are the mainstays of treatment.
   D. The most likely etiology is a Gram negative organism.
   E. None of the above.

Case for Question 53
A 36-year old previously healthy fisherman from Wisconsin develops fever, cough, gradual shortness of breath and chest pain of approximately six weeks duration. He is seen by his physician who prescribes a course of levofloxacin for suspected community-acquired pneumonia with no improvement in his symptoms. Repeat chest x-rays reveal an increasingly expanding parenchymal process involving his left lung field. He now develops several large, nodular, mildly painful skin lesions located his left lower extremity. A saline touch prep from one of these skin lesions reveals the organism, which is approximately 12-15 microns in diameter with broad-based budding yeast forms.

53. You diagnose:
   A. Histoplasmosis
   B. Coccidioidomycosis
   C. Tuberculosis
   D. Sporotrichosis
   E. Blastomycosis (North American)

Case for Question 54
You are the physician for a nursing home. You are reviewing immunizations needed for the patients under your care.

54. Yearly vaccination would be routinely recommended for those patients over age 65 against which of the following diseases?
   A. Hepatitis A
   B. Hepatitis B
   C. Influenza
   D. Pneumococcal pneumonia
   E. Tetanus

Case for Question 55
Your best friend from high school calls and states that he was recently diagnosed with North American Blastomycosis. He asks you how he caught this fungus.

55. You tell him:
   A. Inhalation of the organism from sites with pigeon droppings
   B. Transmission by a tick bite from North Central USA
   C. Ingestion of inadequately cooked freshwater fish
   D. Spread by droplet nuclei from a household member with the same disease
   E. Inhalation of the organism from moist, rich, soil from North Central USA
Question 56
A 25-year-old female presents with a one week history of a vaginal discharge. On examination there is a cottage-cheese discharge.

56. The most likely cause of the discharge is:
   A. *Trichomonas vaginalis*
   B. *Haemophilus ducreyi*
   C. *Candida albicans*
   D. *Chlamydia trachomatis granulomatisos*
   E. *Treponema pallidum*

57. Indicate the enzymatic modification of acyclovir that must occur for it to become a therapeutically active antiviral agent:
   A. Hydrolysis
   B. Phosphorylation
   C. Dehydration
   D. Deamination
   E. Hydroxylation

58. An antiviral agent will be the most selective for the virus compared to the host cell if it targets which type of enzyme?
   A. Protease
   B. DNA polymerase
   C. DNA ligase
   D. Reverse transcriptase
   E. Nucleoside kinase

59. Indicate which of the following antiviral agents is the most appropriate for treating cytomegalic retinitis:
   A. Zidovudine (AZT)
   B. Ganciclovir
   C. Indinavir
   D. Amantadine
   E. Acyclovir

60. The concept of “boosting” with ritonavir is based on its ability to:
   A. Inhibit cytochrome P-450 activity
   B. Inhibit renal excretion
   C. Stimulate T-cells
   D. Enhance drug absorption
   E. Decrease drug binding to serum proteins
61. Indicate which of the following is used in combination with interferon in the treatment of hepatitis C:

A. Amantidine
B. Ganciclovir
C. Ribavirin
D. Foscarnet
E. Indinavir

62. Indicate which drug is considered to be a broad-spectrum trematocide:

A. Albendazole
B. Praziquantel
C. Bithionol
D. Oxamniquine
E. Mebendazole

63. The drug of choice for pinworm infections (Enterobiasis):

A. Ivermectin
B. Piperazine
C. Praziquantel
D. Diethylcarbamazine ✗
E. Pyrantel pamoate

64. Following treatment of river blindness (Onchocerciasis) with ivermectin, a Mazotti-like reaction (fever, headache, dizziness, hypotension) can develop. This reaction is caused by:

A. Ivermectin-induced hepatotoxicity
B. Ivermectin-induced renal toxicity
C. The killing of the microfilaria
D. Opportunistic infection by other helminthes
E. Ivermectin-induced release of mast cell contents

65. Indicate for which class of nematode infection diethylcarbamazine treatment is most effective:

A. Filariasis
B. Strongyloidiasis
C. Capillariasis
D. Taeniasis
E. Ascariasis
66. Mefloquine, an antimalarial agent, is contraindicated in patients who have a history of:

A. Elevated plasma lipoproteins  
B. Retinal deposits  
C. Seizures  
D. Gastrointestinal ulcers  
E. Thalassemia

67. Patients with a deficiency in glucose-6-phosphate dehydrogenase activity are at risk for red blood cell lysis if they are treated for malaria with:

A. Quinine  
B. Atovaquone-proguanil  
C. Chloroquine  
D. Mefloquine  
E. Primaquine

68. Indicate which of the following is a characteristic of the action of atovaquone-proguanil in the treatment of malaria:

A. It is a potent schizonticide, acting only on the late blood stages of malaria  
B. It has causal activity, acting on the early stages of the malarial parasites as they develop in the liver  
C. It inhibits protozoan glucose uptake  
D. It inhibits protozoan heme polymerization  
E. It inhibits protozoan glucose phosphorylation

69-73. Match the numbered antibiotics below with the single most appropriate lettered mechanism of antibiotic action. Each lettered choice may be used once, more than once, or not at all.

69. Ciprofloxacin  
70. Trimethoprim  
71. Vancomycin  
72. Erythromycin  
73. Cefazolin

A. Inhibition of bacterial cell wall synthesis  
B. Inhibition of dihydropteroate synthetase  
C. Inhibition of protein synthesis  
D. Inhibition of DNA gyrase (topoisomerase II)  
E. Inhibition of dihydrofolate reductase
74. Clavulanic acid is used in combined antibiotic therapy with Drug X. Indicate the most likely identity of Drug X.

A. Clindamycin  
B. Tetracycline  
C. Chloramphenicol  
D. Amoxicillin  
E. Neomycin

75. The loop diuretic, furosemide, can produce ototoxicity (damage to hearing). Indicate which of the antibiotics below presents the greatest increase in this danger when combined with furosemide treatment.

A. Vancomycin  
B. Sulfamethoxazole  
C. Gentamicin  
D. Penicillin V  
E. Ciprofloxacin

76. The most common side effect due to penicillin treatment:

A. Blurred vision  
B. Cardiac arrhythmia  
C. Constipation  
D. Hypersensitivity reaction  
E. Venous thrombosis

77. Decreased excretion in neonates of which antibiotic can lead to a “gray baby” syndrome (depressed breathing, cyanosis and death)?

A. Clarithromycin  
B. Chloramphenicol  
C. Cefazolin  
D. Ampicillin  
E. Sulfamethoxazole
78. Indicate which antibiotic best fits the following profile: (1) inhibits the cytochrome P-450 mediated metabolism of warfarin, (2) destroyed by gastric acid and (3) binds to the 50S subunit of the bacterial ribosome to inhibit protein synthesis.

A. Trimethoprim  
B. Cefepime  
C. Tetracycline  
D. Oxacillin  
E. Erythromycin

79. Sulfonamides increase the risk of neonatal kernicterus (jaundice and CNS lesions) because they:

A. Compete for bilirubin binding sites on plasma albumin  
B. Diminish the production of plasma albumin  
C. Inhibit the metabolism of bilirubin  
D. Depress the bone marrow  
E. Increase the turnover of red blood cells

80. Which of the following statements is true regarding the pharmacology of fluconazole?

A. The drug causes frequent systemic reactions with fever and chills with a rapid intravenous administration  
B. The apparent volume of distribution of fluconazole is large but it does not achieve therapeutic levels in the cerebral spinal fluid.  
C. Its use is restricted primarily to the treatment of lymphocutaneous sporotrichosis  
D. The drug is extensively hepatically metabolized and less than 5% of the administrated dose is excreted in the urine.  
E. The drug is well absorbed orally and attains CSF levels of almost 75% of blood levels and it is excreted primarily in the urine.

81. The primary advantage of liposomal forms of amphotericin B versus standard amphotericin B formulations is which of the following?

A. Liposomal amphotericin is less expensive  
B. Liposomal amphotericin attains higher antifungal urinary levels  
C. Liposomal amphotericin has a longer plasma half-life.  
D. Liposomal amphotericin is less nephotoxic  
E. Liposomal amphotericin is less likely to cause bone marrow suppression.
82. A 65-year-old male with severe lung disease and atrial fibrillation is taking glucocorticoids, warfarin and verapamil. He presented with blood streaked sputum and was found to have pulmonary aspergillosis. He is treated with itraconazole. After several days of treatment he is better but has increasing amounts of hemoptysis and now is developing bleeding from his urinary bladder. The most likely explanation for this excess bleeding is which of the following?

A. The fungal infection has spread to his urinary bladder.
B. Itraconazole causes thrombocytopenia.
C. Itraconazole delays hepatic metabolism of warfarin and increases its anti-coagulant effect.
D. The patient has endocarditis with septic emboli to the urinary bladder.
E. Hepatic failure has occurred with decreased production of clotting factors.

83. A 75-year-old male with North American blastomycosis was initially treated with Caspofungin but failed to respond.

Why did he fail to get better on caspofungin?

A. Caspofungin is a beta 1-3 glucan inhibitor and the organism responsible for his illness lacks beta 1-3 glucans in its cell wall.
B. Caspofungin is a 14 de-methylase inhibitor of sterol synthesis and this organism does not possess a 14 de-methylase enzyme system.
C. Caspofungin is myelosuppressive.
D. Caspofungin is intrinsically not active against the causative organism in this patient.
E. Caspofungin is highly nephrotoxic.

84. A 50-year-old female with invasive pulmonary aspergillosis did not tolerate liposomal amphotericin B because it caused intolerable side effects (nausea and vomiting). She was switched to high dose voriconazole and develops an acute psychotic episode felt to be related to the voriconazole. Indicate the most appropriate treatment strategy for this patient at this time:

A. Fluconazole
B. Saturated solution of potassium iodide
C. Caspofungin
D. 5-Fluorocytosine
E. Alternating doses of voriconazole and liposomal amphotericin B

85. Which statement is correct?

A. Caspofungin has the broadest spectrum of activity
B. Amphotericin B is well tolerated by everyone
C. Voriconazole has no visual side effects
D. Fluconazole is active against Candida krusei
E. SSKI (saturated solution of potassium iodide) is used to treat sporotrichosis
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**SECTION 1 (85 items)**

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