Case 1

A 24-year old female automotive technician presents herself at the doctor’s office. She complains of fever and of pain in her left hand.

On physical examination, the patient had a deep wound on her left palm that was oozing pus. She had purplish, red streaks running up her left arm. She had enlarged lymph nodes at the elbow and under her arm. The patient’s skin was warm and dry.

In her history, the patient had punctured her left palm with sharp metal from the undercarriage of a "real cherry" 1977 Malibu about a week earlier. She said the wound had bled for a few minutes and she thought that she had washed it "real good" with soap and water. She had covered the wound with a large "band-aid" and gone back to work. She developed a fever about three days later. For the past couple of days, she "did not feel so good" and had vomiting and diarrhea.

1. What type of infection do you believe she has in this hand?
   a. *Streptococcus pyogenes*
   b. *Staphylococcus aureus*
   c. *Clostridium*
   d. *Pseudomonas*
   e. *Pasteurella multocida*

2. From complaint and physical examination, which of the symptoms lead you to your choice of agent?
   a. the fever and pain in the hand
   b. the fever, wound with oozing pus and enlarged lymph nodes
   c. the lymph nodes and red streaks
   d. the warm dry skin
   e. the pain, red streaks and enlarged lymph nodes

3. From the history, which of the information confirmed your choice?
   a. The wound had bled for a while.
   b. The wound was cleaned with soap and water.
   c. The wound had been covered and had perhaps become anaerobic.
   d. She had diarrhea and vomiting.
   e. The cut was from a rusting car frame.

4. Which of the following is most likely to follow this infection?
   a. gangrene and amputation
   b. toxic shock syndrome
   c. muscle spasms
   d. neurological disfunction of the hand
   e. arthritis
Case 2

A 27-year old white female presented at the walking clinic of her local physician on August 15. On physical exam, the patient had a fever of 38.5C. She appeared fatigued, had tender joints, and complained of a headache, a stiff neck and a backache. The physician noticed a circular "rash" about 5 inches in diameter, with a bright red leading edge and a dim center in the form of a "bull's eye". The physician noted an irregular heart beat. The patient complained of lack of ability to concentrate.

The patient gave the following history: She is a graduate student in the wildlife program at the university in town. She was in the field for three weeks in Wisconsin during the months of May and June. She tracks small mammals in the field and studies their behavior. It had been a warm, wet spring and she complained of a large number of biting flies, mosquitoes and ticks in the area. She felt well until about 2 weeks after returning to her home. Since that time, many of her symptoms had progressed. She finally found that she could take it no more.

1. What is your best diagnosis of this case?
2. What features are critical to your diagnosis?
3. What further steps should be taken to clear up the problem?
Case 3

At the Mount Union hospital, a 5-year old white male child in good general health and physical condition was presented at the Saturday walk-in clinic by his mother. He was brought in because he had a fever, was cranky and had complained of a sore throat for about 24 hours. On physical examination by the attending resident, the patient had a fever of 39.3°C, and he had considerable swelling and drainage of the pharynx and in the conjunctivae. His tonsils were enlarged and coated with a white patchy exudate. He had a red throat and swollen anterior cervical lymph nodes. His ears were clear. His chest sounded clear and he had no additional remarkable findings on routine examination.

1. What would be your presumptive diagnosis for this child? Why?
2. What diagnostic testing would be indicated to follow this exam?
3. What is the most likely treatment for this illness? Why is it important?
4. What factors of this case allowed you to make a presumptive diagnosis?
Case 4

A lethargic 22-month old black female was presented by her mother to the emergency room at 2:15am on a Sunday. The child had a history of a runny nose, hoarse cough and low-grade fever (~99°F) for the past 48 hours. The mother was concerned about the forced and noisy breathing of the child. The pediatrician examined the child and found cloudy eyes and mild inflammation of the ears, but no overt signs of bacterial infection (no significant changes in the eardrums). The throat of the child was red and coated with mucus. The larynx was swollen and raw.

The physician performed a rapid Strep test and found it was negative. Throat swabs were taken for culture. The physician placed the child in a room with a warm vaporizer for about 30 minutes. This dramatically improved the breathing of the child.

1. What is the presumptive diagnosis for this case?
2. Will the throat cultures likely show evidence of *Streptococcus pyogenes*? How about *Staphylococcus aureus*?
3. Do you believe that this is a bacterial or viral disease? Why?
4. What further treatment is indicated for this case?
Case 5

A 22-year old male college student was presented at the ESU health clinic. He looked tired and pale. He presented because of high fever and chest pain. He was afraid he was having a heart attack (bad week of exams). He was examined immediately by the PA and an EKG strip was run. He had no evidence of acute heart problems. The attending physician visited the patient. He obtained the following history from the past 36 hours. The patient had a tight cough. He had significant muscle aches and pains. He had a bad headache and had had fevers of 101-103F.

The physician ordered a chest x-ray. It did not show any significant consolidated inflammation suggestive of pneumonia. The patient showed significant nasal drainage and a moderately tight, but productive cough on physical exam. He had a fever of 101F and generally inflamed mucous membranes. A rapid Strep test showed no evidence of Streptococcal infection and his tonsils and adenoids had been removed.

1. What is the most likely diagnosis for this patient? On what do you base this diagnosis?
2. What secondary infection problems should be monitored?
3. What is the preferred treatment for this disease?
Case 6

A 68-year old patient with Alzheimer disease was brought to the emergency room by the staff of a local nursing home. He presented as lethargic with a sallow complexion. He had an admission temperature of 102.4°F and a respiratory rate of 33/minute. During respiration, the right side of his chest moved better than the left. He showed dense consolidation of the lower lobe of the left lung on physical exam. A sputum sample revealed blood and a greenish color.

A chest x-ray showed tight consolidation of the left lung with evidence of formation of cavities in the lung tissue from cytotoxic damage. The patient complained of chills in the exam room, combined with his fever. A smear of his sputum demonstrated no acid-fast bacteria.

1. What is your presumptive diagnosis for this case?
2. What evidence could the sputum give for this case?
3. Is the reduced respiration rate and unequal chest movement indicative of the pathology?
4. Is this a bacterial or viral disease?
Case 7

A 35-year old accountant presented to his physician with a steady burning pain just right of the mid-line of the of the abdominal region in an area from 1 to 4 inches above the "belly button." The pain usually followed meals by about 1-3 hours. He had several episodes of vomiting, which included frank blood.

On physical examination, the patient had no fever. He appeared generally well. He had no evidence of weight loss. He showed slight rebound tenderness in the upper abdomen. An occult blood test revealed the presence of blood.

1. What would your diagnosis in this case be?
2. What organism is most likely to be responsible for these symptoms and findings?
3. What further testing and treatment are called for?
Case 8

A 4-year old girl presents at the emergency room with bloody diarrhea, fever and vomiting. The child’s mother reports that the child has had these symptoms for about 24 hours and she has not passed any urine for about 12 hours.

The child is enrolled in a day care center and the group had recently made a field trip to a fast food place to learn about different jobs. The children had a lunch of ground beef, fries and cola after meeting with different workers. This field trip was 4 days earlier on Friday. The child had a temperature of 39°C and showed physical signs of dehydration. Blood samples drawn showed evidence of greatly reduced kidney function and lysed red blood cells.

1. What is your diagnosis here? What is organism is responsible?
2. What pathogenic feature of this organism caused the severity of this problem?
3. What were the critical features to your diagnosis?
Case 9

A 26-year old white female presents in her physician’s office with genital itching and sharp, severe pain on the labia. She complains of three previous episodes of pain over the past 6 months, each of which were followed by the appearance of red sores which crusted and healed without a scar.

On examination the physician observes a cluster of small red blisters localized in the area of the worst pain. No significant discharge was observed from the vagina. The patient’s urine was clear and yellow. Urinalysis revealed normal specific gravity, no sugar, no protein, no white blood cells or red blood cells and no bacteria. The patient’s temperature was 36.5C.

The patient history reveals that she is unmarried. She is moderately sexually active and currently using an oral contraceptive which she has been taking for about 4 years. The woman stated that she has had 5 sexual partners over the past year. She reported that her episodes have become progressively more severe.

1. What is the cause of this woman’s complaint?
2. As her physician, would you recommend that this woman modify her sexual activity?
3. Is there an effective treatment for this condition?
4. What serious long-term risk does this woman have?
Case 10

A 22-year old woman presents at the walk-in health clinic with slight fever (38.5°C), a complaint of frequent urination, burning on urination, vaginal discharge and a small lesion on the labia.

The woman reported that she was moderately sexually active and had three sexual partners in the past six months. Her last sexual contacts were about 7 days earlier. She had developed mild symptoms about 5 days earlier, beginning with a discharge from the vagina. She began having pain on urination about 3 days earlier.

Urine analysis revealed a pH of 8.2, some white cells and a few red blood cells. There was protein in the urine. A smear of the vaginal secretion showed a number of Gram-negative cocci.

1. What is your diagnosis here?
2. What clinical features are critical to your diagnosis?
3. What further actions must be taken?
Case 11

A white male, 17 years of age presented at the emergency room with a severe headache, vomiting, and a stiff neck with pain running up his back. On admission, his temperature was 101F. The young man appeared to have trouble hearing during the nurse’s interview and also seemed to have trouble concentrating.

The history revealed that the young man is a wrestler for the local high school team. He had felt as though he were getting a cold the past few days, since his last meet in Hicksville. He did not smoke or drink, but he had attended a party two days earlier thrown by his girlfriend and the other cheerleaders to celebrate his victory in the sectionals. He had been holding his weight at 162 for the season, so he ate little and did not drink on the day of meets (today is a day of the meet).

On physical exam, the physician noticed several areas of small purplish spots on the skin of the back, thigh and arm. The boy thought those were from wrestling.

1. Which of the following is the most likely diagnosis?
   a. Neisseria gonorrhoeae induced meningitis
   b. E. coli induced meningitis
   c. Neisseria meningitidis induced meningitis
   d. Streptococcus pneumoniae induced meningitis
   e. LaCrosse encephalitis

2. Which of the following was a critical factor in your choice of diagnosis?
   a. The fact the he is a wrestler and he does not eat or drink much.
   b. The headache, vomiting, stiff neck, fever and purplish spots.
   c. The party he went to with the cheerleaders.
   d. His trouble hearing.
   e. The cold symptoms.

3. Which of the following will likely happen if he is not treated?
   a. He will continue to have a fever and stiff neck for a few days and recover.
   b. His symptoms will progressively worsen until he develops shock and dies.
   c. He may get better in a few days, but will likely have permanent hearing loss.
   d. It is impossible to tell, because not enough data is available for an assessment of his condition.
   e. He will likely recover from the acute illness, but develop chronic arthritis later.
Case 12

A missionary couple, living in West Africa, bring their 4-year old son to the office of their physician on the second day of a visit home to Minnesota. The boy had a mild episode of diarrhea about seven days earlier and would not eat. He seemed to recover, but the mother noticed that the boy was having trouble walking the previous night and had seemed to have trouble dressing himself and walking that day.

On examination, the patient had no significant fever (98.9) and normal bowel sounds. His chest, ears and eyes were clear. He had no rebound tenderness in the abdomen. The physician noted that the child had poor muscular reflexes in his arms and legs. The child also was a bit lethargic and seemed confused.

The family lives in an isolated village in Africa. The mother opposes vaccinations on personal grounds, so the child has only had the initial series of DPT shots and no other typical vaccines. The village where they live has many problems with parasites and insect borne fevers (including Dengue).

Urine, stool and blood samples were collected for analysis.

1. This disease is most likely:
   a. an intestinal infection or parasite.
   b. a respiratory infection or parasite.
   c. a neurological infection or parasite.
   d. a urinary tract infection or parasite.
   e. Not enough information is given to determine this.

2. My best guess at a diagnosis is:
   a. Hib meningitis
   b. sleeping sickness
   c. polio
   d. a parasitic worm
   e. malaria

3. Which of the following samples could easily provide confirmation of your diagnosis?
   a. The stool would show the presence of the worms.
   b. The serum would have antibody against polio.
   c. The urine would contain H. influenzae organisms.
   d. The blood would contain red blood cells with malarial parasites.
   e. Only CSF will show the answer.

4. Would receiving the childhood vaccine series have prevented this problem?
   a. yes, without doubt
   b. yes, most likely
   c. possibly, but living in Africa the pathogen load might be too high
   d. no, no vaccine is normally given
   e. no way, no vaccine exists
Case 13

A 62-year old diabetic black man presents in the emergency room with a swollen left leg with areas of blanching and blue mottling. A "foul odor" is coming from a dressed wound. The physicians remove the dressing and a brownish fluid is seeping from a wounded area. The fluid contains what appear to be small bits of the tissue. No pus appears to be present. The wound has a strong "rotten" odor.

Five days earlier, while at his work as a farmer, he caught the leg in his manure spreader, sustaining a deep, crushing, grossly dirty injury. His wife cleaned the wound as well as she could with soap and water, dressed it with clean gauze, and wrapped it tightly with an elastic bandage to stop the bleeding. The second day they redressed the wound and applied triple antibiotic ointment. The patient treated his pain with ibuprofen (Advil). He reported the pain was not very bad for the first 72 hours. In the past 24 hours, the leg swelled and the mottling began to appear. A foul odor and severe pain accompanied the swelling. His wife convinced him to come to the emergency room even though they did not have medical insurance.

1. What is your diagnosis in this case?
2. How should this wound be treated?
3. Is this a life-threatening condition?
4. Is it likely that the patient's diabetes contributed to the problem as presented?
Case 14

A 58-year old lawyer presents in the emergency room with headache, irritability, generalized muscle pain and uncontrollable back spasms. He has become very restless and worried because he has had the back spasms all through his court case that afternoon and they became extremely painful.

In his history, the lawyer states that he has a very busy practice. He is on medication for high blood pressure (beta blocker) and has mild asthma. He injured himself about 10 days earlier, puncturing his left arm with a nail from an old barn he is tearing. The wound has produced moderate quantities of pus, but he has been keeping it clean. When asked, he did not remember having a tetanus shot since he was a kid.

The wound was sampled for microscopic examination and culture. The back appears to have very tight contractions and spasms. The patient is in obvious agonizing pain.

1. What is your diagnosis here?
2. What is the proper treatment of this problem?
3. How could this have been prevented?
Case 15

A 35-year old Native-American male presents in the clinic with a complaint of recurrent low-grade fevers, sweating, weakness, muscle pains and a loss of about 10% of his body weight over a 4 month period. The worsening weakness and muscle pain prompted the visit.

The patient reports that he has been working on a bison slaughter line owned by his tribe, and blood and tissue juices often splash in his face or contaminate minor hand and arm injuries. He likes to hunt and fish. He is married and has two children. He eats fairly well, but he has not been as hungry lately. He had rheumatic fever as a child and was in a fairly serious car accident three years earlier, resulting in a leg broken in three places. He feels he was physically fit prior to the past 4 months. He likes to play basketball and softball. He has had all the usual childhood immunizations, but does not see the doctor often.

On physical examination, the patient has a temperature of 101°F. He has mildly swollen lymph nodes in the neck and under the arms. He has blood pressure of 136/86, and a normal heart rate without a heart murmur. There is no evidence of acute respiratory or gastrointestinal infection.

1. What would be your diagnosis for this patient? Why?
2. How should this case be treated?
3. What could have been done to prevent this condition?
Case 16

A 24-year old, female graduate student in biology presented with exhaustion, weakness and a low grade fever. She was pale and showed poor ability to concentrate.

Her history revealed that she had gradually become increasingly tired and weakened over the past two months. She had experienced low-grade fevers over the past month and felt she would need to drop out of her graduate program if she did not get this under control. She had had a severe strep throat about a year earlier and showed some signs of rheumatic fever at the time. She had had minor dental surgery about two months earlier.

On examination, she had a temperature of 100F. She had slightly enlarged cervical lymph nodes. She had a heart murmur, with abnormal valve sounds. Her ears, eyes and throat were clear. She had clear lungs and there were no significant findings in other systems.

1. What would be your primary diagnosis of this patient?
   a. autoimmune heart failure due to rheumatic fever
   b. subacute bacterial endocarditis
   c. acute bacterial endocarditis
   d. generalized viral infection
   e. protozoal endocarditis

2. What agent do you think is causing this problem?
   a. *Streptococcus pyogenes* caused the problem
   b. *Staphylococcus epidermidis*
   c. *Streptococcus pneumoniae*
   d. *Herpes simplex*
   e. *H. fowleri*

3. How would you make a definite diagnosis?
   a. I would look for rheumatoid factor in the serum.
   b. I would get a blood culture and culture for *Staphylococcus epidermidis* or viridans Strep.
   c. I would do a blood culture and look for beta hemolytic colonies.
   d. I would do a serum assay for the presence of herpesvirus.
   e. I would do a chest x-ray and look for the inflammatory signature of the protozoa.

4. Which of the following is a common outcome when this disease is untreated?
   a. The patient may have a stroke.
   b. The patient may develop aneurysm.
   c. The patient may develop glomerulonephritis.
   d. Any of the above could occur.
   e. None of the above could occur.