1

A 35-year-old man presents to the emergency department with intense back pain. He is hydrated and given pain medication. After several hours, he passes a kidney stone. Laboratory analysis of the stone reveals that it is composed of struvite (magnesium ammonium phosphate), and the organism was recovered on standard media in <24 hours in the microbiology lab. Infection with which of the following organisms is the most likely etiological agent in this case?
A. Escherichia coli
B. Proteus mirabilis
C. Pseudomonas aeruginosa
D. Staphylococcus saprophyticus
E. Ureaplasma urealyticum

2

A 12-year-old girl has a temperature of 102.5°F and a sore throat. Two days later, she develops a diffuse erythematous rash and is taken to her pediatrician. On physical examination, there is circumoral pallor, and an erythematous rash with areas of desquamation is noted. What additional findings might you expect to find on physical exam?
A. Pain as a sign of deep infection in the subcutaneous tissue
B. Bright red tongue with a strawberry appearance
C. Spreading erythema with well demarcated edge on the face
D. Pustule with yellow crust appearing on face or extremities
### Question 3

A 7-year-old boy presents to the pediatrician because his mother noticed a “smoky” color to his urine. On questioning the mother, it is revealed that the child had a sore throat several weeks ago that was left untreated. Physical examination reveals hypertension and mild generalized edema. Urinalysis is significant for red blood cell casts. Which of the following accurately describes the microorganism responsible for this child’s illness?

A. It causes alpha-hemolysis on blood agar  
B. It is catalase-positive  
C. It is coagulase-positive  
D. It is sensitive to bacitracin  
E. It is sensitive to optochin

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### Question 4

A 69-year-old alcoholic man comes to the emergency department because of high fever, chills, and a cough. He says that he has been producing “lots of thick, bloody, gelatinous mucus” over the past 2 days. Gram staining of the sputum reveals pinkish-red bacilli. Chest x-ray shows consolidation of the upper lobes. Which of the following is found only in microorganisms with this color Gram staining?

A. Cell envelope  
B. Exotoxin  
C. Peptidoglycan  
D. Periplasmic space  
E. Teichoic acids

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### Question 5

After eating a dinner of leftovers that included rewarmed vegetable fried rice, a 17-year-old boy develops diarrhea and stomach pain. Which of the following is the most likely pathogen?

A. Bacillus cereus  
B. Campylobacter jejuni  
C. Clostridium botulinum  
D. Escherichia coli  
E. Yersinia pestis
6

A 23-year-old woman with a history of sickle cell disease presents with fever and severe bone pain localized to her left tibia. An x-ray film reveals a lytic lesion, and blood cultures reveal infection. A bone culture grows gram-negative rods. Which of the following best describes the infecting organism?

A. It is comma-shaped and sensitive to acidic pH
B. It is an obligate intracellular parasite
C. It is motile and does not ferment lactose
D. It is motile and oxidase positive
E. It is a non motile facultative anaerobe

7

A 3-year-old boy presents with a 1-day history of loose stools, fever, abdominal cramping, headache, and myalgia. He has no blood in the stool. A careful history reveals that he has several pet turtles. Which of the following is the most likely pathogen?

A. Chlamydia psittaci
B. Entamoeba histolytica
C. Salmonella enterica spp.
D. Staphylococcus aureus
E. Yersinia enterocolitica

8

A 16-year-old boy with sickle cell disease is hospitalized for a severe infection. His spleen has autosplenectomized, and he has had other minor infections in the past. His symptoms include fever, chills, cough, and chest pain. Bacteria from the patient’s sputum are optochin-sensitive organisms with a positive quellung reaction. Which of the following is the most likely pathogen?

A. Escherichia coli
B. Haemophilus influenzae
C. Klebsiella pneumoniae
D. Neisseria gonorrhoeae
E. Streptococcus pneumoniae
9

A 24-year-old woman has fever, malaise, and a dry, nonproductive cough. She also complains of headache, muscle aches, and leg pain. Laboratory values are significant for elevated cold agglutinins. Which of the following microorganisms is responsible for her symptoms?
A. Haemophilus influenzae
B. Klebsiella pneumoniae
C. Legionella pneumophila
D. Mycoplasma pneumoniae
E. Streptococcus pneumoniae

10

An 18-year-old, previously healthy woman presents to the student health service with fever, vomiting, and diarrhea. On physical examination, she is hypotensive and has an erythematous, red, sunburn-like skin rash. She is currently menstruating and has been using super-absorbent tampons. Which of the following findings from a positive culture would confirm the suspected diagnosis?
A. Organisms are acid-fast
B. Organisms are coagulase-positive
C. Organisms grow on EMB (eosin-methylene blue) agar
D. Organisms grow on Thayer-Martin medium
E. Organisms have positive quellung reaction

11

A 47-year-old man presents with a nonproductive cough and rales on his chest examination. A chest x-ray film suggests atypical pneumonia. The pneumonia resolves after treatment with azithromycin. A diagnosis of psittacosis is established by the presence of complement fixing antibodies against Chlamydia psittaci in the convalescent serum. Which of the following is the most likely occupation of this patient?
A. Cat breeder
B. Florist
C. Homeless shelter worker
D. Poultry farmer
E. Slaughterhouse worker
12
A 53-year-old woman with diarrhea and lower abdominal pain of 3 days' duration comes to her physician after various home remedies fail to relieve her symptoms. She denies any recent travel. There is blood and pus in her stool. Fecal cultures yield several flagellated, curved, oxidase-positive, gram-negative rods. Which of the following is the most likely pathogen?
A. Campylobacter jejuni
B. Escherichia coli
C. Salmonella enterica typhimurium
D. Shigella sonnei
E. Vibrio cholerae

13
A previously healthy 11-year-old girl develops a gastrointestinal infection with cramping and watery stools. After several days, she begins to pass blood per rectum and is hospitalized for dehydration. In the hospital, she has decreasing urine output with rising blood urea nitrogen (BUN). Total blood count reveals anemia and thrombocytopenia, and the peripheral smear is remarkable for fragmented red cells (schistocytes). Infection with which of the following bacterial genera is most likely responsible for this syndrome?
A. Campylobacter
B. Clostridium
C. Salmonella
D. Shigella
E. Vibrio

14
The best specimen to collect to detect Group B Streptococcal maternal colonization during the perinatal period is
A. Vaginal swab
B. Rectal swab
C. Vaginal/rectal swab
D. Throat swab
### Name That Bug

- PYR positive
- Optochin Sensitive
- H$_2$S producer
- Beta hemolysis
- Urease producer/urea splitter
- Oxidase positive
- Catalase positive
- Fastidious
- Lactose fermenter
- Novobiocin resistant
- Gram negative cocci

### Name That Bug

- Bacterial pharyngitis
- Typhoid fever
- Toxic Shock Syndrome
- Scarlet Fever
- Neonatal meningitis
- Abscess former
- Urinary tract infection
- Pseudo appendicitis
- Cystic fibrosis
- Sickle cell disease
- Pneumonia
- Normal flora
- Bloody diarrhea
- Cat bite
- Hiking near prairie dogs
- Traveled to India
- Rabbit hutch
- Hospital acquired pneumonia
- Rheumatic fever