#1
This 34 year old female with AIDS (CD4 = 20 cells) was brought to a Washington DC emergency room by her husband because of fever and somnolence. There is no history of travel outside the locality. Her only medications had been naturopathic.

The figure shows her contrast-enhanced CT.

Which of the following would most likely be effective?

A. Azithromycin  
B. Metronidazole  
C. Quinine+clindamycin  
D. Pyrimethamine+clindamycin  
E. Primaquine + clindamycin

Correct answer: D

Rationale:
- The lesions in this HIV-infected patient would be consistent with toxoplasmosis or lymphoma.
- Only one of the drug choices would treat toxoplasmosis and, of course, none would treat lymphoma.
- The usual treatment of cerebral toxoplasmosis would be sulfadiazine plus pyrimethamine but pyrimethamine plus clindamycin gave comparable therapeutic results in one randomized trial.
- Trimethoprim-sulfamethoxazole has been reported useful in a few case reports.is also acceptable and has the advantage of being the only regimen in which both drugs can be given IV.

#2
This ski lesion is typical of which entity:

A. Purpura fulminans  
B. Impetigo  
C. Pyoderma gangrenosum  
D. Ecthyma gangrenosum

Correct answer: D

Rationale:
The sharply deliminted border, central necrosis and pale outer border is typical of ecthyma gangrenosum.
A 42-year-old Basque sheep herder was seen in a Salt Lake City Clinic for cough. He had been employed herding sheep in the mountains of Utah. He had been living and cooking his meals outdoors, drinking spring water and eating an occasional fish he caught from streams.

- The left photo is his chest x-ray.
- The right photo shows specimens from a fine needle aspirate of a lung lesion.

The infection was likely acquired from:

A. Spring water
B. Dog stool
C. Undercooked pork
D. Undercooked fish

Correct answer: B

Rationale:

- The first photo shows a hydatid lung cyst in chest xray. The second photo shows the hooklets that appear in the sputum when a cyst ruptures into a bronchus. The hooklets may also be seen in fine needle aspirates of a hydatid cyst.
- This patient acquired echinococcosis from incidental ingestion of stool from dogs who have eaten uncooked meat from sheep infected with Echinococcus granulosus. Cysts are often single, in the lung or liver, and asymptomatic as they enlarge over several years.
- Echinococcus species are widely distributed worldwide as a tapeworm (taenia) of carnivores. Humans are infected by eating food contaminated with stool from a carnivore excreting Echinococcus eggs.
- Echinococcus multilocularis (alveolar echinococcosis) is seen in Alaskan natives with dogs fed infected bear or other animal meat.
Patients with this condition are most prone to which of these serious complications:

A. Hemoptysis
B. Brain abscess
C. Spread to contiguous bone
D. Spread within the lung

Correct answer: A

Rationale:

Massive hemoptysis is an infrequent but potentially lethal complication of fungus ball of the lung. Spread of the fungus, usually Aspergillus, beyond the cavity is extremely rare.

This is the modified acid fast smear of sputum from a 34-year-old woman with pneumonia.

She had systemic lupus erythematous and was receiving prednisone 60 mg daily.

When she had been given sulfamethoxale trimethoprim last year, she had developed severe Stevens Johnson syndrome.

Which of the following would you recommend?

A. Imipenem plus amikacin
B. Intravenous azithromycin
C. Clarithromycin and ethambutol
D. Ceftriaxone
E. Isoniazid plus rifampin plus pyrizinamide

Correct answer: A

Rationale:

- Presence of branching modified acid fast bacilli indicates nocardiosis, one of the causes of pneumonia in immunosuppressed patients.
- Trimethoprim-sulfamethoxazole is the preferred drug but reports of imipenem, with or without amikacin, have indicated efficacy.
- Azithromycin does not appear to be effective. There are a few reports of success with ceftriaxone but this may depend on the Nocardia species.
- Susceptibility testing is not clearly reliable and speciation is often not available at time of diagnosis, making ceftriaxone not recommended.
#6
A 38-year-old Mexican migrant worker in California reported this painless lesion had been present for almost a year.

The drug most likely to be useful, among the following, would be which of the following:

- A. Thalidomide
- B. Clarithromycin
- C. Amikacin
- D. Rifampin
- E. Liposomal amphotericin B

**Correct answer: D**

**Rationale:**

This is a typical lesion of lepromatous leprosy. Rifampin has proven to be very effective, though expensive, for treatment of leprosy.

Amikacin and clarithromycin are not used.

Thalidomide is recommended for management of erythema nodosum leprosum, except in pregnant women but this is not specific therapy for the causative organism.

#7
This 26-year-old patient with keratitis originating underneath a contact lens would be most likely due to which species of amoeba, among the following choices:

- A. Naegleria fowleri
- B. Acanthamoeba castellani
- C. Entamoeba dispar
- D. Balamuthia mandrillaris

**Correct answer: B**

**Rationale:**

Acanthamoeba species have caused corneal ulcers but none of the other amoebae listed here have done so. Acanthamoeba also can cause subacute/chronic granulomatous meningoencephalitis most often but not always in immunosuppressed patients.

You should know the syndromes caused by each of the answer choices.
- **Naegleria** causes acute amebic meningitis/encephalitis typically in children with exposures to fresh water ponds such as diving. This syndrome is usually fatal.
- **Entameba dispar** is an enteric organism that is considered a non pathogen: the following are usually considered non pathogens. If they are on the exam, they are distracters most likely: entamoeba coli or hartmanni, endolimax nana, Iodameoiba butschlii, trichomonas hominis, Chilomastix mesnili.
- **Balamuthia mandrillaris** is a rare cause of subacute encephalitis in both immunocompetent and immunosuppressed patients. The mode of acquisition is unclear but this is a soil organism that is probably airborne. Look for cases from California, Texas, or Florida.

**#8**

This lesion in the ocular fundus is most consistent with which of the following:

A. Miliary tuberculosis  
B. Candidemia  
C. Endocarditis  
D. Systemic lupus erythematosus

**Correct answer: C**

**Rationale:**

A retinal hemorrhage with a pale center is called a Roth spot, as occurs in endocarditis.

Retinal lesions due to candidemia, miliary tbc and SLE (cytoid bodies) are pale with no surrounding hemorrhage.

**#9**

Which of the following organisms is seen in the cytoplasm of this enterocyte of an AIDS patient with diarrhea?

A. Cyclospora cayetanensis  
B. Microsporidium africanus  
C. Enterocytozoon bieneusi  
D. Cryptosporidium parvum  
E. Cytoisospora belli

**Correct answer: D**

**Rationale:**

Size of this organism an location in the cytoplasm is only consistent with a microsporidium. Enterocytozoon bieneusi is the microsporidium causing diarrhea in AIDS patients.
#10
This soft tissue gas in a patient with neutropenia and adenocarcinoma of the colon is most likely due to which organism:

A. Clostridium septicum  
B. Fusobacterium necrophorum  
C. Bacteroides fragilis  
D. Eikenella corrodens

Correct answer: A

Rationale:
Ratio Gas formation is a common development in clostridial myonecrosis and is not seen with the other bacilli listed. C. septicum is notable for causing bacillemia and metastatic lesions in immunosuppressed patients.

#11
This lung biopsy shows cells that stain pinkish-red with Mayer's mucicarmine stain.

The most likely organisms is:

A. Blastomyces dermatitidis  
B. Histoplasma capsulatum  
C. Paracoccidioides brasiliensis  
D. Cryptococcus neoformans

Correct answer: D

Rationale:
Mucicarmine stain is helpful in confirming that a yeast in tissue is a Cryptococcus, though not all cryptococcal cells on a pathology slide will stain clearly positive.
This otherwise healthy patient with a chronic leg ulcer is most likely to have:

A. Common variable immunoglobulin deficiency  
B. Lupus erythematosus  
C. Hepatitis C  
D. Ulcerative colitis  

**Correct answer: C**

**Rationale:**  
This is a typical lesion of pyoderma gangrenosa. The most common underlying disease is ulcerative colitis and may precede the onset of bowel disease.

A 56-year-old car salesman from Birmingham, AL, returned two weeks ago from a photo safari in an East African game park, and presented with fever, intermittent mildly pruritic rash, malaise, and easy fatigue of one week's duration.

This person was bitten by a:

A. Fly  
B. Flea  
C. Mosquito  
D. Kissing bug  
E. Tick  

**Correct answer: A**

**Rationale:**  
The structure shows the bloodstream phase of African trypanosomiasis, most likely Trypanosoma brucei rhodesiense, the agent of East African trypanosomiasis, also called sleeping sickness because of the encephalitis the infection produces. The vector is the tsetse fly. The flagellated structure in the photomicrograph is similar to West African trypanosomiasis, also acquired from a tsetse fly bite, but the blood smear is less often positive in that infection. Chagas disease is also caused by a trypanosome but occurs in the Americas, particularly South America, and is rarely seen in the blood smear.
#14
Blood cultures of this patient are likely to grow which of the following:

A. Gram negative cocci
B. Gram positive cocci
C. Gram negative bacilli
D. Gram positive bacilli

Correct answer: A

Rationale:
This patient has purpura fulminans, usually due to Neisseria meningitidis; less often other organisms.

#15
A previously healthy young female had the onset of pain in her calf and a red, tender rash on her calf.

She was unaware of preceding trauma. In the photo, the bleeding was from an unsuccessful needle aspirate.

She was given cephalaxin but the progressively excruciating pain increased and came to the emergency room about 48 hours after onset.

Her vital signs were normal except for a temperature of 102°F. There was no rash outside the calf, which was red, tensely swollen and tender.

A soft tissue film showed no gas. WBC was 15,000 with 80% PMN and 5% bands.

The clinical picture is most consistent with infection by which of the following organisms:

A. Streptococcus pyogenes
B. Clostridum perfrigens
C. Staphylococcus aureus
D. Mixed infection with anaerobes and aerobes

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Correct answer: A

Rationale:

- This patient should be considered to have streptococcal necrotizing fasciitis and emergency surgical consultation obtained. The location, normal host, severe pain and rapid progression make Meleney’s gangrene with mixed anaerobes and aerobes less likely. Clostridium perfringens, gas gangrene, usually follows major trauma or occurs in poorly vascularized tissue and has gas in the tissue. Staphylococcal pyomyositis is a rare cause of this clinical picture in the calf and is most often mistaken for deep venous thrombosis. But patients in the United States with Staphylococcal pyomyositis often have comorbid conditions, pain is less intense or progression slower. Imaging is often helpful in distinguishing causes in patients like this.

#16
This is a stool smear of a young child from rural Georgia who was seen by a pediatrician for listless behavior.

This smear could explain which of the following findings in this child?

A. Diarrhea
B. Appendicitis
C. Hepatomegaly
D. Anemia

Correct answer: D

Rationale:

- Hookworm infection is often asymptomatic except for development of anemia from the blood consumed by the worm attached to the intestinal wall.
- Appendicitis can be seen in ascariasis but not hookworm.
- Hepatomegaly is not seen with any of the intestinal worms.
- Diarrhea is not common in hookworm infection.
#17

This 9-month-old infant had the sudden onset of irritability and fever ranging up to 104°F.

On the second day of illness, the child was examined by a physician and found to still be febrile to 103°F but not to appear critically ill. There were a few palpable anterior cervical nodes. The oropharynx appeared clear.

Three days later, the mother returned with the child because, while the child no longer had a fever, an erythematous rash developed on his trunk, face and extremities. The child appeared much less ill. The infant did not attempt to scratch the lesions. The oropharynx was clear.

A WBC showed a modest leukopenia and a few atypical lymphocytes.

Of the following entities, which would best explain this illness?

A. Human herpes virus 6  
B. Epstein barr virus  
C. Cytomegalovirus  
D. Toxoplasmosis  
E. Human herpes virus 8

Correct answer: A

Rationale:

While the ID boards do not test on pediatrics, you should probably know at least how HHV 6 presents in normal humans, since there are more cases being recognized in abnormal adults, ie immunocompromised adults, who presumably reactivate latent HHV 6 which they acquired during childhood.

Herpes virus 6 causes roseola infantum, also called sixth disease or exanthema subitum. This is an acute viral disease of very young children, characterized by the acute onset of fever, followed in about three days by defervescense and appearance of rash.

Although herpesvirus 6 has been divided into 6A and 6B, most cases of roseola are due to 6B. EBV, CMV and toxoplasmosis can cause an infectious mononucleosis syndrome, with acute onset of fever and atypical lymphocytes, usually accompanied by lymphadenopathy but typically without rash.

Onset of rash with drop in fever should suggest roseola.

Acquired CMV or EBV would present with a mono like syndrome. Rash could be part of the syndrome but would be unusual.

Similarly, HHV 8, the etiologic agent of Kaposi sarcoma, can be acquired in childhood and can be associated with fever and rash, but this biphasic illness would be atypical.
#18

This fundoscopic picture was obtained from a 45-year-old patient who had been receiving parenteral alimentation following complicated abdominal surgery for complications of lymphoma. He had been receiving high dose prednisone for hemolytic anemia but not currently receiving cytotoxic drugs.

The most likely cause is related to:

A. An oocyst found in cat stool
B. An acid fast organism found in sputum from a patient with fever and cough
C. A yeast often found in normal oral flora
D. A fan egg found in human feces
E. A virus found in normal oral secretions

Correct answer: C

Rationale:

This is Candida endophthalmitis that has extended from the retina into the vitreous humor as vitreous abscesses (white balls) surrounded by intense vitritis (cloudiness). Infection follows candidemia, usually from an intravenous catheter, in hosts that are usually not neutropenic.

Patients note clouding or floaters in one eye initially, if they are not intubated or too ill to notice. Candida is part of the normal flora of humans. Toxoplasma acquired from cat stool, or Staphylococcus aureus endophthalmitis, can cause vitritis but not vitreous abscesses.

Herpes viruses include herpes simplex, herpes zoster and cytomegalovirus, all of which can cause retinal diseases, but none with vitreous abscesses.

#19

This patient with profound, prolonged neutropenia had the rapid onset of fever and these painful skin lesions. The most likely test to reveal the etiology is:

A. Blood culture
B. Punch biopsy
C. Serum galactomannan
D. Blood PCR

Correct answer: B
Rationale:

This is eczema gangrenosa, usually due to a mould, Pseudomonas aeruginosa or occasionally another Gram negative bacillus. Blood cultures are rarely positive with aspergillosis or mucormycosis but may be positive with fusariosis or bacteria. Immediate punch biopsy with culture, Gram stain and impression smear using Calcofluor stain for hyphae can be done in hours while waiting for blood culture results.

#20

This 25-year-old female Peace Corps worker returned from a year of service in Nigeria. She felt well but had developed a pruritic, maculopapular rash while in Nigeria that was diagnosed on return home as eczema but did not resolve with topical steroids and interfered with sleep. On exam, she had an asymptomatic subcutaneous nodule near her left elbow that had been present for several weeks. Biopsy of the nodule is shown.

If not appropriately treated, she may return later with:

A. Eosinophlic pneumonia  
B. Lymphedema  
C. Keratitis  
D. Encephalitis  
E. Esophagitis

Correct answer: C

Rationale

The patient has Onchocerca volvulus infection, acquired from a fly bite. Unlike this temporary resident with a single nodule, multiple subcutaneous nodules are usual in long-term African residents. Onchocerciasis nodules, containing the adult filaria, are accompanied by microfilaria migrating through the skin, causing intense itching. A serious complication of prolonged and intense microfilaria migration throughout the body is sclerosing keratitis, giving onchocerciasis its other name, river blindness.

Onchocerciasis is a rare cause of encephalitis.

These firm subcutaneous nodules of onchocerciasis should not be confused with the evanescent subcutaneous swellings (Calabar swellings) of loiasis. Filaria are difficult to demonstrate in Calabar swellings. Loiasis can be accompanied by filaria migrating through the conjunctiva but keratitis does not result from loa loa infection. Thus this is quite different from Ochocerciasis.

Lymphatic (Bancroftian and Malayan) filariasis leads to lymphedema but does not cause subcutaneous nodules.
#21
This 55-year-old microscope repairman has an aquarium at home with tropical fish. This very slightly tender nodule appeared on the dorsum of his hand a week ago and has grown slightly larger.

He otherwise feels well.

Among the following techniques to culture the organism, which is the most important?

A. Addition of ferric citrate to mycobacterial agar
B. Use of fresh chocolate agar
C. Sabouraud’s agar without antibiotics
D. Incubation of mycobacterial agar at 30°C.
E. NNN medium

Correct answer: D

Rationale:

- A chronic erythematous nodule on a skin surface exposed to brackish water or tropical fish tanks should suggest Mycobacterium marinum infection.
- M. marinum is difficult to see in biopsy so that diagnosis depends on culture. M. marinum grows poorly at the usual clinical laboratory incubator temperature of 35-37°C so should be cultured on any standard mycobacterial agar at 30°C.
- Iron is important for Mycobacterium haemophilum but not M. marinum.
- Fresh chocolate agar is recommended for Bartonella henselae culture.
- Sabouraud’s agar is useful for sporotrichosis but not Mycobacteria. Sporotrichosis is acquired from thorny plants and not water.
- NNN medium is used for culturing Leishmania and there is no exposure history for that diagnosis.
This 29-year-old Hassidic Jew from New York presented with seizures. He had no prior history of fever, overseas travel or pets.

He has probably eaten which of the following:

A. Poorly cooked pork
B. Raw hamburger
C. Gefilte fish
D. Human stool
E. Unpasteurized soft cheese

Correct answer: D

Rationale:

The cystic lesion shown is consistent with either neurocysticercosis or echinococcosis. Cysticercosis lesions are usually smaller than this, may be in muscle or brain, and may be multiple or shrunken to form a calcific nodule. Cysticercosis is acquired from eating the eggs of the pig tapeworm, Taenia solium. Ingesting poorly poked pork causes tapeworm infection. When a human with tapeworm infection contaminates food with their own stool, ingesting the food leads to cysticercosis.

In this question, the food preparer may have had tapeworm infection and contaminated the food by not washing hands after defecating. The diagnosis of echinococcosis, called hydatid disease, could be suspected radiologically, but there is no exposure history, usually an occupation in the endemic area that involves close exposure to dogs fed raw meat from sheep or some other infected animal.

In regard to the other sources of infection listed above:

- Diphyllobothrium latum is a tapeworm from eating inadequately cooked fish, such as gefilte fish.
- Raw hamburger can lead to beef tapeworm.
- Unpasteurized cheese is linked to brucellosis, listeriosis and Mycobacterium bovis infection, none of which cause cystic brain lesions.
This man with AIDS presented with low grade fever and tender skin lesions.

The microorganism causing these lesions has also been found in which of the following:

A. Dog’s blood  
B. Ticks  
C. Lice  
D. Cat’s blood

**Correct answer: D**

**Rationale:**

This is bacillary angiomatosis or BA, caused by Bartonella henselae, the agent of cat scratch disease.

The fleshy red, well-circumscribed lesions can be mistaken for Kaposi’s sarcoma but are entirely different on biopsy. Vascular proliferation with bacilli evident on immunoperoxidase or Warthin Starry stain are characteristic of BA.

Low grade fever accompanies onset of skin lesions. Most patients have had AIDS.

In many regions of the United States, B. henselae has been isolated from the blood of apparently healthy feral cats. Transmission between cats is by fleas. The exact route of transmission from cats to humans is less clear, but perhaps by nips or scratches by the cat or cat fleas.

#24

For the EKG shown, what would be the most common vector to transmit this infection to a patient in Maryland?

A. Mosquito  
B. Fly  
C. Tick  
D. Flea  
E. Reduvid bug

**Correct answer: C**
Rationale:
This EKG shows complete heart block. In Maryland, the infectious cause would be lyme disease, transmitted by an Ixodes scapularis tick. In Brazil, Chagas’ disease, transmitted by a reduviid bug, would be the most common vector-borne infection.

#25

This 32-year-old male from a rural area on the Eastern shore of Maryland had a low grade fever and expanding rash on his abdomen, shown here.

Which of the following would be the most likely later complication of this infection?

A. Transverse myelitis  
B. Meningitis  
C. Uveitis  
D. Arthritis  
E. Hepatitis

Correct answer: D

Rationale:
The lesion is typical of erythema migrans due to Lyme disease, Borrelia burgdorferi infection acquired from a deer tick bite in an endemic area. Days to weeks after the skin lesion appears, cardiac or neurologic complications may occur. Arthritis may begin in weeks or months, with intermittent attacks of acute arthritis, usually large joints, with each episode lasting from days to months. A few patients with acute arthritis develop chronic arthritis, usually in the knee.

Uveitis and transverse myelitis are not associated with Lyme, though neuroretinitis and encephalitis can occur.
This organism was found in the sputum of a 62-year-old Vietnamese government official who had sought medical treatment for hemoptysis and cough of a year’s duration.

The probable origin of infection was:
A. Human stool
B. Fish
C. Crabs
D. Walking barefoot on soil
E. Pork

Correct answer: C

Rationale:
The egg is from the lung fluke, Paragonimus westermani, acquired from ingesting Paragonimus eggs contaminating pickled or inadequately cooked crab or crayfish in the Far East. In the chronic phase, multiple pulmonary lesions appear and may cavitate, causing hemoptysis. Radiologically, the lesions must be distinguished from tuberculosis.

This 40-year-old dentist presented with pain and swelling in his elbow of three days duration. He had full range of motion in the elbow despite discomfort on motion. He was afebrile.

Which of the following is most likely:
A. Olecranon bursitis
B. Cellulitis
C. Septic arthritis
D. Tophaceous gout

Correct answer: D

Rationale:
Olecranon bursitis, usually due to Staphylococcus aureus, is distinguished from septic arthritis by not restricting range of motion. Localization to the olecranon bursa area is unlikely for cellulitis or gout.
#28
This 39-year-old male returned 10 days ago from one of his monthly visits to Indonesian Borneo. He has never used prophylaxis or protective measures against malaria but now has a fever and headache.

The most likely cause of his malaria is which of the following:

A. Plasmodium cynomolgi
B. Plasmodium knowlesi
C. Plasmodium falciparum
D. Plasmodium vivax

Correct answer: B

Rationale:
This is the characteristic band trophozoite found in both Plasmodium malariae and the more recently described species, Plasmodium knowlesi, now reported from several locations in the Southeast Asia. Although the treatment is the same as P. malariae, the disease is very different, with P. knowlesi being more severe and potentially fatal. Note the pigment hemazoin. The small or normal size erythrocytes and absence of Schuffner’s dots is unlike P. vivax or P. ovale.

#29
This 25-year-old woman from Guatemala had been given antithymocyte globulin and cyclosporine for her aplastic anemia but had as yet not responded and remained profoundly aplastic when she was observed to have over 24 hours to develop this swelling underneath her chin. There no lesions visible in the front of her mouth but she couldn't open very wide because that caused pain. She took sips of fluid without discomfort but was very nauseated and drinking very little.

The swelling was firm and not apparently red or painful. She could speak softly without obvious hoarseness. The most likely source of this infection is which of the following:

A. Herpetic stomatitis
B. Dental abscess
C. Oropharyngeal candidiasis
D. Vincent's angina
E. Lemierre's syndrome

Correct answer: B

Rationale:
This is Ludwig's angina in a patient with poor dental hygiene. Ludwig's is an infection of the submandibular and sublingual space from streptococci or other oral bacteria and originates from a dental abscess in the first molar or adjacent tooth. Infection spreads below the mylohyoid line into the soft tissue below the mandible. The tongue protrudes upward and posteriorly, potentially obstructing the airway. Tracheostomy may be necessary.
The patient is febrile, toxic and has difficulty opening the mouth if infection has spread into the pterygoid space. Therapy with piperacillin-tazobactam, ampicillin-sulbactam or any regimen that is active against both aerobic and anaerobic flora is indicated. Surgical drainage of the dental abscess can wait until the patient has responded to antibiotic therapy.

Septic thrombosis of the internal jugular vein to cause **Lemierre’s syndrome** does not cause symmetrical submandibular swelling and there is no indication of septic emboli to the lung or positive blood culture in this patient.

**Vincent’s angina** is severe gingivitis, and like herpetic stomatitis and oropharyngeal candidiasis, does not extend into the neck.

### #30

A 23-year-old Chilean male returned to the United States after a week’s vacation back home, during which he went to the Western part of Chile, which is dense jungle, for white water rafting.

He was not ill during the week, though he had numerous insect bites during the rafting trip.

About two weeks after his return, he noted a pruritic red papule on this arm, which enlarged slowly and ulcerated. There were no systemic symptoms, no pus and no lesions anywhere else on his body.

He had been given cephalexin for one week with no response.

A punch biopsy showed chronic inflammation with abundant histiocytes, plasma cells and lymphocytes but no giant cells. Special stains for bacteria and fungi were negative. Culture grew no fungus over four weeks and only skin flora on bacterial culture. Mycobacterial cultures at 30°C were negative at four weeks.

Which of the following would be the most likely source?

A. Dirt  
B. Contaminated water  
C. Thorny bush  
D. Sandfly bite  
E. Mosquito bite

**Correct Answer: D**
Rationale:

This is the typical history of cutaneous leishmaniasis, acquired from a sandfly bite. Different leishmania species cause this infection in many parts of Central and South America.

Lesions can persist for months and can be mistaken for sporotrichosis, Nocardia brasiliensis infection, tropical pyoderma, Buruli ulcer, Mycobacterium chelonae or Mycobacterium fortuitum infection or pyoderma gangrenosa.

Diagnosis is by culture, PCR or direct fluorescent antibody staining of a skin biopsy.

Normal histopathology stains rarely demonstrate the organism.

If this patient had sporotrichosis from a “thorny bush”, the diagnosis should have been made by fungal culture and fungal stains of the biopsy.

Buruli ulcer, caused by Mycobacterium ulcerans, is acquired from water or dirt would likely have been seen on acid fast stain or culture or detected by PCR. Most cases have been reported from rural West Africa although it could occur in South America. The organism can be diagnosed by stain or culture, although cultures most be held 6 weeks and are only positive 60% of cases.

#31

This 31-year-old woman with prolonged neutropenia developed the sudden onset of fever, shock, and severe pain and rash in her leg, extending over 24 hours. Soft tissue film showed no gas.

The most likely organism is:

A. Staphylococcus aureus  
B. Clostridium perfringens  
C. Streptococcus pyogenes  
D. Aspergillus fumigatus

Correct answer: A

Rationale:

Streptococcus pyogenes. Necrotizing fasciitis should be suspected and urgent surgical consultation obtained. Clostridial myonecrosis may not show gas early in the course but is less likely in the absence of a portal of entry. Neither S. aureus or Aspergillus would progress this rapidly.
#32
This blood agar plate inoculated with stool from a patient being treated with high dose steroids who developed pulmonary infiltrates and diarrhea.

The most likely drug to benefit this patient is which of the following:

A. Ivermectin
B. Ciprofloxacin
C. Praziquantel
D. Nitazoxanide

Correct answer: A

Rationale:
Filariform larvae of Strongyloides stercoralis can be seen to migrate on agar plates, dragging the stool flora along with them. Ivermectin is appropriate treatment.

#33
This 35-year-old female was stationed at Lemore Naval Station in central California prior to transfer to Bethesda Naval Medical Center. Sudden sharp chest pain and dyspnea led to discovery of a pneumothorax. She was afebrile and had just passed her physical fitness examination. After the chest tube was removed she had the following chest x-ray.

The agent is most likely which of the following:

A. Normal oral flora
B. Dimorphic fungus
C. Aerobic soil bacillus
D. Amoeba
E. Acid fast bacillus

Correct answer: B

Rationale:
The cavity which caused pneumothorax was caused by Coccidioides posadasii or Coccidioides immitis, two species that can be separated by genomic sequencing but seem to differ in geography, with C.posadasii being more broadly distributed. Both are dimorphic fungi, meaning they have a different form in the tissue (spherules) than in culture (mold).

Healing of coccidioidomycosis may leave a single, thin walled cavity. The cavity is often asymptomatic but found on routine chest x-ray or causes hemoptysis or pneumothorax. Half of the lesions clear spontaneously during the first
year but others either close more slowly or not at all, being found years after leaving the endemic area of the Southwestern United States.

A cavity from normal flora would include actinomycosis, which causes chronic pneumonia in addition to any cavity that might be present.

An aerobic soil bacillus would include bacillus species, which do not cause lung cavities. Amoebic abscess can extend from the liver across the diaphragm but amoebiasis causes an abscess often with empyema and not a solitary cavity. Mycobacteria or Nocardia would be rare causes of an isolated thin walled cavity.

This 9-year-old girl from a dairy farm near Frederick, Maryland had the sudden onset in July of fever, severe headache, nausea, vomiting and muscle aches. On the fourth day she developed the rash shown here on her palms and soles.

The drug of choice would be:

A. Cefotaxime
B. Penicillin G
C. Levofloxacin
D. Doxycycline
E. Meropenem

Correct answer: D

Rationale:

Development of a petechial rash on the fourth day is very consistent with Rocky Mountain Spotted fever, as is a severe headache, fever and myalgias.

Treatment of this rickettsiosis is doxycycline despite her age. Meningococcal sepsis can cause a similar rash and severe headache but rash would have appeared earlier after the onset of severe headache.
A 38-year-old marine sergeant reports to sick bay a week after shore leave with fever, malaise and five pustular skin lesions including the one shown here. He had pain on flexion and slight swelling in the right wrist. On shore leave in San Diego, he had gone to Tijuana, had sex with a prostitute and drank until he passed out. His buddies found him lying in an alley with rats and flies all around him. If a blood culture is positive, the most likely organism would be which of the following:

A. Spirochete  
B. Gram positive cocci  
C. Gram negative coccus  
D. Gram positive bacillus  
E. Gram positive cocci

Correct answer: C

Rationale: This is the typical pustular skin lesion of disseminated gonococcal infection, a Gram negative coccus. Lesions are usually few, located on hands and feet, and associated with arthralgia, tenosynovitis or monoarticular arthritis. Urethritis often not symptomatic but urine NAAT may be positive. Staphylococcal sepsis can give similar lesions but simultaneous occurrence of wrist arthritis and skin lesions would more likely[ gonococcal.