Board Review: Day 2

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#16 This is the blood smear from a previously healthy commercial photographer with a fever after visiting Tanzania and Colorado.

He went to Tanzania 42 to 35 days before the presentation. He spent most of the time in the city but did go to a rural orphanage where he took some photographs. He saw many rats near his hotel and in the rural area.

After returning to Chicago, he left for a week-long trip to Colorado in early July, from 14 days previously to 7 days before the presentation. He slept with his friends in his first of the season opening uncle's rustic cabin in the Rocky Mountains, white water rafting and driving an all-terrain vehicle through the woods.

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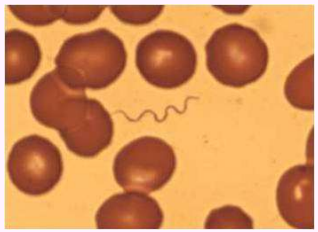
#16 About 3 days after returning to Chicago, he developed a fever, headache and myalgia.

He came to a travel clinic the next day after developing a fever (4 days after returning from Colorado), where a blood film exam to evaluate for malaria was done.



The blood for complete blood cell count and routine chemistries was clotted.

His blood smear is shown. When he was called about his blood smear results, he said he was feeling OK, was busy, and wouldn't return to the clinic.

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#16 What is the most likely identity of this organism?

A. *Borrelia hermsii*
B. *Borrelia recurrentis*
C. *Leptospira interrogans*
D. *Borrelia burgdorferi*
E. *Spirillum minus*

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#17 A 52-year-old man with 35% total body surface area burns has been in the ICU for 3 weeks and recently underwent tracheostomy for prolonged mechanical ventilation. After a period of stability off antibiotics, he develops fever, hypotension, and new bilateral infiltrates on chest radiograph.

Blood cultures and endotracheal aspirate both grow *Acinetobacter baumannii*.

The isolate is preliminarily reported as carbapenem-resistant. The patient is hemodynamically unstable and requires norepinephrine.

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#17 Which of the following is the most appropriate empiric antimicrobial regimen pending susceptibility results?

A. Ceftazidime–avibactam
B. Meropenem–vaborbactam
C. Sulbactam–durlobactam plus meropenem
D. Colistin plus imipenem
E. Colistin monotherapy

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#18 A 23-year-old college student is seen for intermittent fevers, headaches and arthralgias.

He came to the US from the Central African Republic (central Africa) two months ago to attend college.

He says his symptoms have been present for at least the last four months, and it is hard for him to concentrate on his studies.

On exam his temperature is 100.6F; he has a soft, moveable posterior cervical node 3 cm by 3 cm; and his liver and spleen are palpable.

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#18 Which one of the following is the most likely diagnosis?

A. Malaria
B. Rift Valley fever
C. *Rickettsia africae* infection
D. Typhoid fever
E. African trypanosomiasis

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#19 A 56-year-old male from Pittsburgh, PA presents to his primary care physician with fatigue. He reports no fevers, chills, sweats, chest pains, respiratory symptoms, abdominal pain, or diarrhea.

Chest/abdomen/pelvis CT scan with contrast is normal. Blood tests reveal normal thyroid function tests as well as a normal white blood cell count and differential.

His Hgb level is low at 9 g/dL with an MCV of 106 fL.

He reports spending two weeks every summer at Lake Como in Italy where he enjoys fishing and eating freshly caught perch.

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#19 Which of the following is the most likely cause of his fatigue?

A. *Ancylostoma duodenale*
B. *Entamoeba histolytica*
C. *Anisakis simplex*
D. *Wuchereria bancrofti*
E. *Dibothriocephalus latus* (aka *Diphyllobothrium latum)*

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#20 A 45-year-old man previously healthy man presents with two weeks of right upper quadrant pain, fever, and weight loss. He returned from a month-long trip to rural Mexico ten weeks ago. He recalls a self-limited episode of diarrhea while he was there that has fully resolved.

Laboratory tests show a white blood cell count of 12,000/microL with normal eosinophil percentage. Liver enzymes are notable for an elevated alkaline phosphatase.

Ultrasound reveals a solitary 6 cm fluid-filled mass in the right lobe of the liver.

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#20 Which of the following is most likely to be diagnostic?

A. Bacterial blood cultures
B. Percutaneous aspiration of the liver cyst
C. Serology for *Entamoeba histolytica*
D. Stool microscopy for ova and parasites
E. Echinococcal serologies

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#21 A 50-year-old man was admitted for replacement of a non-functioning ventriculoperitoneal shunt that had been placed when he had obstructive hydrocephalus from cryptococcal meningitis.

A low-grade fever began several days after replacing the ventricular end and valve of the shunt.

Cerebrospinal fluid (CSF) from the shunt reservoir revealed a WBC count of 150 cells/mm^3, glucose of 40 mg/dL, and protein of 100 mg/dL. Gram stain was negative, but culture of CSF revealed a light growth of *Staphylococcus epidermidis*, susceptible to vancomycin and linezolid.

The patient's entire shunt was removed, a ventricular drain placed, and intravenous vancomycin started.

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#21 Which of the following is recommended prior to placing a new CSF shunt?

A. Continue vancomycin for ten days
B. Continue vancomycin, add linezolid, and treat for ten days
C. Continue vancomycin until drain cultures have been negative ten days
D. Add intraventricular vancomycin and treat for ten days

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#22 A 68-year-old man with HIV (CD4 = 35 cells/mm^3; viral load 50,000 copies/mL) and emphysema is brought to the emergency department with 3 days of cough productive of purulent sputum, progressive shortness of breath, and fevers.

He recently completed a course of amoxicillin-clavulanate and a steroid dose pack for a COPD exacerbation.

Medications include taking bictegravir/emtricitabine/tenofovir and prophylactic TMP-SMX, although he admits to poor adherence.

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#22 On physical exam his temperature is 39° C, respiratory rate is 30/min, and BP is 96/58. Room air O_2 saturation is 85% and soon required high-flow oxygen.

Initial evaluation is notable for:

- WBC 8700 cells/ mL with 85% neutrophils (prior WBC 3000 cells/mL)
- Sputum Gram stain and sputum and blood cultures: pending from offsite lab
- Chest x-ray: dense, alveolar infiltrates in the left lower and R middle lobes
- MRSA nasal swab: negative

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#22 Empiric coverage for community-acquired pneumonia should include which pathogen in this patient?

A. *Bordetella bronchiseptica*
B. Methicillin-resistant *Staphylococcus aureus*
C. *Rhodococcus equi*
D. *Pseudomonas aeruginosa*
E. *Acinetobacter baumannii*

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#23 A 74-year-old woman with chronic obstructive pulmonary disease and prior stroke with residual dysphagia is admitted from home via the emergency department for acute hypoxemic respiratory failure requiring supplemental oxygen.

On hospital day 2, she has a witnessed aspiration event and develops fever (39.1°C), worsening oxygenation, and hypotension requiring vasopressors. She is intubated and transferred to the ICU. Chest radiograph shows new right lower lobe consolidation.

Bronchoalveolar lavage (BAL) fluid cultures grow *Streptococcus intermedius*.

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#23 She is started on piperacillin–tazobactam. Over the next 72 hours, her oxygenation stabilizes and vasopressor requirements plateau, but she remains intermittently febrile with persistent leukocytosis.

CT scan of the chest reveals multiple cavitary lesions in the right lower lobe, the largest measuring 2.1 cm, with surrounding consolidation. No single collection is amenable to percutaneous drainage.

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#23 Which of the following is the most appropriate next step in management?

A. Escalate antibiotics to meropenem plus vancomycin
B. Add clindamycin
C. Continue piperacillin tazobactam monotherapy
D. Consult thoracic surgery for surgical drainage
E. Perform another bronchoalveolar lavage

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#24 A 27-year-old woman is referred to your office because the blood bank where she recently donated notified her that a test for Chagas disease was positive, as was a confirmatory test they performed.

She is concerned because she is 8 weeks pregnant.

She lived in a rural area of El Salvador until age 12 before moving to the USA and returned twice to visit relatives since then.

She is in good health and takes no medications.

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#24 What is the most appropriate next step in management?

A. Start benznidazole to protect the fetus from becoming infected

B. She needs two confirmatory serologic tests to confirm chronic infection before further action

C. *Trypanosoma cruzi* PCR on her blood now and prior to delivery to detect fetal infection

D. Prescribe benznidazole after delivery to decrease the likelihood of maternal disease later in life

E. Perform serology for *T. cruzi* infection on the infant after delivery

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#25 A 45-year-old man living on Eastern Long Island, New York had been ill for 5 days with fever (T102.7°F) and flu-like symptoms including headache. Two days ago, when he noticed an enlarging oval red rash of about 10 cm on the back of his right thigh, he was started on doxycycline for presumed Lyme disease.

Today, while fevers have not abated though the rash is fading, he became faint on standing at home, and he is brought to the emergency department where his blood pressure is normal, but he is quite anemic.

His past medical history is only remarkable for a motorcycle accident 10 years earlier which he suffered splenic injury requiring splenectomy.

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#25 On examination, he appears ill with pulse 100/minute, blood pressure 98/70 and temperature recorded as 101°F. There is an ovoid homogenous rash over the posterior right thigh and a left upper quadrant abdominal scar.

Laboratories:

- Leukocyte count 3.3 x 10^9/L (50% neutrophils, 35% lymphocytes, 15% monocytes)
- Hemoglobin 4.7 gm/dL
- Platelet count 105,000 x 10^9/L
- Total bilirubin 3.8mg/dL
- ALT 110 U/L
- LDH 650 IU/mL

He develops adult respiratory distress syndrome (ARDS), progressive renal failure and disseminated intravascular coagulation.

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#25 Which of the following is the most likely cause of his progressive problems indicative of severe sepsis?

A. *Borrelia burgdorferi*
B. *Francisella tularensis*
C. *Babesia microti*
D. *Anaplasma phagocytophilum*
E. *Rickettsia rickettsii*

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#26 A group of adults in Detroit, Michigan develops an illness during a banquet in which they are served mahi-mahi, mushrooms, wonton soup, and corn with margarine.

Eight of 16 people eating the meal have symptoms beginning within 20 minutes after eating fish that tastes peppery and unusual.

They experienced a burning mouth, felt flushed, had a headache, and felt dizzy. Two experienced an urticarial reaction.

The illness lasted 10 hours.

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#26 What is the likely cause of the outbreak?

A. Ciguatera
B. Monosodium glutamate toxicity
C. Staphylococcal food poisoning
D. Scombroid
E. Mushroom poisoning

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#27 A previously healthy 60-year-old woman presents to the emergency room with headaches, fevers, nausea, and vomiting for the past 4 days. Two days prior to her ER presentation, she noted difficulty with balance.

Earlier this morning, she noted left facial numbness. She denied any night sweats, photophobia, or neck stiffness. She has not traveled outside of the United States and has lived her entire life in Baltimore, Maryland.

She lives with her husband and two daughters in a row house. They own 2 cats and a dog. She denies smoking, alcohol use, or injection drug use.

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#27 On physical examination, her temperature was 38.3° C, blood pressure 120/60 mmHg, heart rate 109 beats/minute, and respiratory rate 13 breaths/minute. She was alert and oriented but appeared uncomfortable.

Higher cortical functions, extraocular movements and visual fields were intact. Limb tone, motor strength and reflexes were normal. Plantar responses were flexor.

Abnormalities included left facial hypoesthesia, right facial weakness and left gaze-evoked nystagmus. She was noted to have gait ataxia. The remainder of her physical examination was unremarkable.

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#27 Her peripheral white cell count, and differential were normal.

- A comprehensive metabolic panel was normal.
- Lumbar puncture and cerebrospinal fluid (CSF) examination revealed a lymphocytic pleocytosis with 500 white blood cells/mm^3 (64% lymphocytes). CSF glucose was normal, and protein was slightly elevated. No organisms were visualized on Gram stain of the CSF. CT scan without IV contrast was unremarkable.
- Postgadolinium T1-weighted MRI images of the brain showed multiple ring-enhancing abscess-like lesions in the brainstem with mild meningeal enhancement.

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#27 Which of the following is the most likely etiology of her clinical presentation?

A. Behçet disease
B. Cytomegalovirus
C. Herpes simplex virus type 2
D. *Listeria monocytogenes*
E. *Streptococcus pneumoniae*

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#28 A 60-year-old man has been in intensive care unit for the past three weeks with a flare of lupus erythematosus for which he has received a short course of methylprednisolone and cyclophosphamide.

His hospital course was complicated by hospital acquired pneumonia, requiring intubation and mechanical ventilation.

He completed a one-week course of vancomycin and meropenem four days ago.

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#28 After a tracheostomy, he was febrile for several hours but then defervesced with unchanged ventilatory support, PEEP of 10 and an FIO_2 of 0.4.

A tracheal aspirate and blood cultures were obtained, and he was restarted on meropenem and vancomycin.

Blood cultures were negative but tracheal aspirate had a heavy growth of *Stenotrophomonas maltophilia*, susceptible to trimethoprim-sulfamethoxazole, levofloxacin, and minocycline.

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#28 What do you recommend?

A. Stop meropenem and vancomycin and observe
B. Add trimethoprim-sulfamethoxazole
C. Add minocycline
D. Add minocycline and trimethoprim-sulfamethoxazole
E. Add levofloxacin

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#29 A 31-year-old man presents with a chief complaint of enlarged scrotum. He reports having worked as a missionary in rural areas in the northern regions of Nigeria for the past three years.

While in Nigeria he took atovaquone/proguanil daily for malaria prophylaxis during the rainy seasons. He had two episodes of *Giardia* infection and one febrile episode that resolved with empiric treatment for both typhoid fever and malaria.

He did substantial work outdoors and reports having been frequently bitten by mosquitoes.

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#29 He routinely ate fresh produce and meats, and recalls having eaten a few dishes prepared with fresh goat milk.

He had intermittent interactions with livestock but no animal bites or scratches and reports that he was careful to only drink boiled or bottled water.

Ultrasound reveals a collection of anechoic fluid around both testes, consistent with a bilateral hydrocele.

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#29 Which of the following is the most likely cause of this condition?

A. *Wuchereria bancrofti*
B. *Brugia malayi*
C. *Loa loa*
D. *Onchocerca volvulus*
E. *Dirofilaria immitis*

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#30 A 45-year-old man with no significant past medical history is involved in a motor vehicle accident in which he suffers a high-impact blunt force trauma to the head.

On evaluation, he is found to have a basilar skull fracture and is medically managed. Three days later, he is noted to have fluid coming out of his right nostril.

Testing of the fluid is positive for beta-2-transferrin confirming that it is cerebrospinal fluid (CSF). The patient is doing well and is recovering well from his skull fracture.

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#30 On physical examination, he is afebrile and vital signs are normal.

He is alert and oriented to person, place and time, and has no neurological deficits.

His laboratory studies reveal a normal leukocyte count. MRI of the brain does not show a fluid collection or air fluid level.

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#30 Which of the following interventions is appropriate?

A. Immediate surgical intervention to repair the leak
B. Surgical intervention if the leak does not stop after 7 days
C. Administration of prophylactic intravenous vancomycin
D. Administration of prophylactic intravenous vancomycin and cefepime

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