45 – Board Review Session 4

Drs. Auwaerter (Moderator), Alexander, Boucher, Marr, Mitre, and Winthrop

2020 INFECTIOUS DISEASE BOARD REVIEW

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Answer Keys with Rationales

The answer key, including rationales, will be posted tomorrow to the "Board Review Answer Keys" section on the online materials site.

#1

A 55-year-old male is referred to you because of a three day history of spiking fevers, myalgias, dysuria, and vague perineal pain. He has some urinary dribbling which is new.

His prostate is tender on palpation. A urinalysis reveals many white blood cells and gram negative rods. The urine culture grows E. coli (CFU >105/ml) which is sensitive to multiple antibiotics including ciprofloxacin.

CBC reveals a white blood count of 15,000 cells/uL with 90% neutrophils.

He is treated with ciprofloxacin for ten days which he took as prescribed, stopping a week ago. He initially resolved all symptoms, but now has myalgias again as well as more deep pelvic pain and a return of his fever, which is 38-39C.

#1

Assuming that the prostate is the source of the fever and pelvic pain, the best management option would be:

A) Perform prostatic massage in order to obtain a quantitative culture of urine collected in initial post-massage, midstream and remaining urine and treat based on result

B) Repeat a urinalysis and culture and treat based on results; no other evaluation is necessary

C) Retreat with ciprofloxacin

D) Order trans rectal ultrasound

E) Order trans rectal biopsy

#2

A 19 year old college-sophomore develops a sudden fever to 103°F, chills, malaise, hoarseness, painful swallowing, neck soreness and swelling over two days.

She is evaluated at a local emergency department. She had a WBC 15,300 with 88% PMNs, negative rapid Group A strep screen and negative rapid influenza test (RIDT). She is discharged with an amoxicillin prescription for pharyngitis.

Two days later she is evaluated by otolaryngology because of persistent symptoms. She is thought to have a ranula (mucous filled sublingual cyst) as an explanation. Her primary care physician prescribes levofloxacin in addition to the amoxicillin.

The physician arranges for an infectious diseases evaluation, when she is unimproved 6d into her illness.

#2

Her symptoms have continued, but she describes some shortness of breath and chest pain but no cough. On exam, temperature 101.7°F, pulse 113, BP 94/70, respirations 22 and mildly labored. She appears ill and is slightly anxious.

Her oropharynx has no lesions or exudates, but the tongue appears slightly enlarged.
Her neck has bilateral anterior swelling with tenderness with erythema (see photo).

Photo provided by P.G. Auwaerter MD (patient authorized)

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#2

Which of the following answers reflect what should be should be pursued next?

A) Monospot test for Mononucleosis

B) Chest CT with angiography

C) Neck and chest CT

D) Lateral neck film

E) TSH (Thyroid Stimulating Hormone)

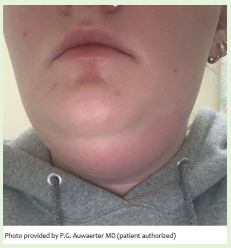


Photo provided by P.G. Auwaerter MD (patient authorized)

#3

A 35-year-old woman is seen for 5 weeks of progressive cough paroxysms, pleuritic pains, chest tightness and dyspnea.
Her primary care provider had tried albuterol as well as a course of amoxicillin/clavulanate with no benefit.

Her past medical history includes early menopause with the institution of estrogen replacement, recurrent urinary tract infections, insomnia and depression.

Her current medications include Premarin, vaginal estrogen, venlafaxine and nitrofurantoin and have been unchanged for 3 months.

Physical examination: largely unremarkable. On the pulmonary exam, she has no percussive dullness but does have fine bibasilar crackles bilaterally

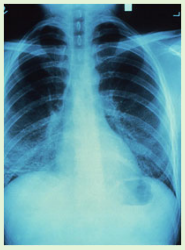
#3

Her laboratories are remarkable for a white blood cell count of 11,800 cells/mL with 63% neutrophils, 36% lymphocytes and 1% eosinophils.

Her chemistry profile is normal.

The urinalysis is acellular.

An erythrocyte sedimentation rate is 48 mm/h.



#3

Which treatment decision will most likely lead to the resolution of her symptoms?

A) Initiate Azithromycin x 5 days

B) Start INH, RIF, PZA, ETB

C) Start Ceftaroline x 7 days

D) Discontinue nitrofurantoin

E) Prednisone 60 mg daily with taper

#4

An 88-year-old man is evaluated in referral for a history of prostate cancer and recurrent urinary tract infections who has severe groin and suprapubic pain, limiting his walking and physical activities.

His history is significant for prostate cancer diagnosed 12 years earlier treated with brachytherapy. He had a transurethral resection of the prostate 6 months earlier for urinary retention with relief. He has had several urinary tract infections, including an ESBL-E. coli and K. pneumoniae over the past years that resolved with treatment. His last antibiotic received was four months ago, ten days of ciprofloxacin.

He otherwise has only hypertension. He is a widower and lives alone with a pet dog in Northern Virginia. He has no known history of TB or potential contacts.

#4

Over the last 3 months, he has had progressive pain with walking or standing. His family has noted that he now walks with a waddle and requires a cane for stability. He has had no recent dysuria or unusual frequency.

A CT scan suggested abnormalities at the symphysis pubis, and a subsequent MRI showed extensive bone marrow edema in this region with some bony erosions symmetrically at the symphysis, along with edema in surrounding abductor muscles.

He was hospitalized at an outpatient facility. 2 fine needle aspirations of the affected area were negative for bacterial or fungal pathogens.

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#4

Urinalysis was without pyuria, and urine culture was negative. Following the second aspiration and based on the imaging, that patient received six weeks of vancomycin and meropenem. The patient states it has had little impact on his pain syndrome.

Repeat MRI imaging is slightly worse, according to the radiologist. Erythrocyte sedimentation rates have continued to range between 45-60 mm/h (normal < 30 mm/h), and a C reactive protein remains elevated 1.5 mg/dL (normal 0.0-0.5 mL).

He now sees you one week after completing his outpatient parental antibiotic therapy (OPAT).

#4

Which course of action will likely lead to durable improvement for this patient?

A) Employing a course of NSAIDs or corticosteroids over six weeks

B) Arrange for an open biopsy of bone and tissue for bacterial, fungal and AFB cultures

C) Resume vancomycin and meropenem to complete a 12-week total course

D) Change to linezolid and ceftazidime/avibactam

E) Obtain a full-body triple-phase bone scan

#5

A 42-year-old male had a heart lung transplant 2 years prior and was doing well when he presented to his transplant team complaining of diffuse body aches, particularly in the extremities. He had no arthritis on examination and full range of motion in joints.

The patient was afebrile, and his routine CBC, chemistry profile, cardiac echo, and pulmonary function tests were unchanged except for a serum alkaline phosphatase which was for the first time twice the upper limit of normal. Other liver function tests were normal.

A bone scan showed numerous scattered areas of uptake. Routine films of the extremities showed patches of periosteal thickening and a few calcified excrescences.

#5

He had been followed for 18 months for pulmonary nodules which had been associated with an elevated serum galactomannan test.

He had been treated ever since the nodules were recognized 18 months previously with voriconazole.

He is receiving tacrolimus (Prograf) and mycophenylate mofetil (CellCept) plus trimethoprim-sulfamethoxazole prophylaxis for PCP, acyclovir for recurrent orolabial Herpes simplex and once daily multivitamins with vitamins A and D.

A repeat chest CT showed no change from the small nodules seen two months prior.

#5

The most likely cause of these joint manifestations is:

A) Drug interaction with Vitamin D

B) Drug interaction with Vitamin A

C) Voriconazole toxicity

D) Tacrolimus toxicity

E) Mycophenylate mofetil toxicity

#6

A 50-year-old woman underwent a successful renal transplant 7 years ago. She has had no complications, and is taking tacrolimus, prednisone and mycophenolate. There have been no changes to her regimen, and she has been doing well.

During the past two weeks, she has had intermittent diarrhea without fever. The biofire screen for stool pathogens was negative (22 target pathogens including Clostridioides difficile toxin a/b and an array of bacteria, viruses, and parasites).

She is referred to you for evaluation, with her primary care physician pointing out that she as two urine cultures that each show >100,000 E coli, with 5-10 wbc. Ultrasound shows no dilatation of renal pelvis or ureter in the transplanted kidney.

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#6

The E. coli is sensitive to cephalosporins and quinolones.
The patient denies any urinary symptoms such as frequency or dysuria.

What would you recommend with regard to the urine findings?

A) No treatment

B) Ciprofloxacin for 3 days

C) Ciprofloxacin for 14 days

D) Ceftriaxone x 1 dose followed by 6 days of cephalexin

E) MR scan of pelvis before a therapeutic decision is made

#7

A 55-year old female has been waitlisted for a deceased donor kidney transplant for treatment of end-stage-renal disease secondary to diabetic nephropathy for the past 5 years.

She received a call stating that an appropriate deceased donor has been identified.

You are notified that the donor's RPR and TP-Ab are positive at the time of procurement.

You reviewed the donor history and it is unclear if the donor has ever been treated.

#7

Which is the most appropriate next step?

A) Turn down the organ offer

B) Accept the kidney and recommend no treatment for the donor and recipient

C) Accept the kidney and treat the recipient only if the recipient seroconverts both RPR and FTA during monitoring monthly for 12 months

D) Accept the kidney and treat the recipient with 2.4 million units of intramuscular benzathine penicillin G weekly for 3 weeks

#8

A 75-year-old male with chronic lymphocytic leukemia was started on ibrutinib monotherapy 20 weeks ago. He has been on trimethoprim-sulfamethoxazole and acyclovir prophylaxis since the initiation of ibrutinib therapy.

For the past week, he has had a cough non-productive of sputum. He was not febrile until today, when he noted a temperature of 38.5 C with slight worsening of his cough, and perhaps some pleuritic pain.

He lives in Annapolis, Maryland, has not traveled outside the East Coast and has no unusual exposures.

His CBC shows that his counts are stable: he is not neutropenic

#8

You are waiting for other lab tests to come back.
A chest CT scan shows a multiple 0.5-1.0 cm nodular lung lesions.
One lesion is probably cavitating.

The most likely cause of these lung lesions is

A) Pneumocystis resistant to TMP-SMX

B) Toxoplasma resistant to TMP-SMX

C) Candida auris

D) Aspergillus fumigatus

E) Nocardia brasiliensis

#9

A 63-year-old male with diffuse large B-cell lymphoma underwent CD-19 CAR-T cell therapy for treatment of underlying lymphoma.

His post-transplant course was complicated by development of grade 4 cytokine release syndrome (CRS) and neurotoxicity, requiring treatment with high dose corticosteroids (methylprednisolone 1 gram IV daily for 3 days), tocilizumab and anakinra.

On day 15 post CAR T-cell infusion, the patient was noted to have anisocoria and an MRI brain showed infarcts in both cerebral frontal lobes. He was noted to have absent brainstem reflexes and family decided to withdraw care and consented to an autopsy.

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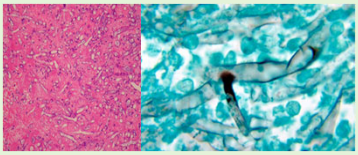
#9

A photomicrograph (H&E stained) of his brain biopsy obtained during autopsy is shown on the left: a methenamine silver stain is shown on the right.



#9

Which of the following would optimally be used to treat this infection?

A) Micafungin

B) Itraconazole

C) Ivermectin

D) Amphotericin B

E) Trimethoprim-sulfamethoxazole

#10

A 67-year-old male with multiple myeloma is status post autologous stem cell transplantation 9 months prior to presenting in the month of December with subacute onset of shortness of breath on exertion, which has progressively been worsening.

His post-transplant course has been uncomplicated, though the patient traveled to Arizona two months prior to admission (7 months post transplant) and he lives on a ranch in West Texas. His medication list is notable for acyclovir 800mg po BID and lenalidomide maintenance treatment.

He was seen in clinic, where he was noted to be febrile to 101F, which prompted a hospital admission for further workup.

#10

His WBC count is 2870 (34% eosinophils).
His oxygen saturation was 90% on room air.

- Respiratory viral panel on nasopharygeal wash and BAL: negative
- Serum 1,3-beta-D-glucan: <31 ng/ml
- Bronchoalveolar lavage galactomannan: negative
- Coccidioides serology (both immunodiffusion IgG and IgM and complement fixation): negative pre stem cell transplant and currently
- Strongyloides IgG: negative pre stem cell transplant and currentlyHis CT chest is shown:

#10

A bronchoscopy with bronchoalveolar lavage and transbronchial biopsy is performed.

Which of the following is the most likely finding on the biopsy?

A) Scattered interstitial eosinophils, organizing diffuse alveolar damage in alveolar parenchyma with negative AFB and GMS stains

B) Spherules 20 – 80 m in diameter on fungal staining (Gomori Methenamine Silver stain-GMS) consistent with coccidioidomycosis

C) Branching, septated hyphae

D) Filariform larvae of a nematode

E) Beaded, branching, gram positive rods, positive on modified acid fast stain

#11

You are consulted by the mother of teenage twins. She is very concerned because both of her 15-year-old daughters have had diarrhea for more than a week.

Their family physician said it was a virus, but the mother is concerned that they are not getting better and are missing school. Additionally, she reports that six of the girls' friends have "the same thing."

A quick investigation discloses that six days before their gastrointestinal illness began the twins had celebrated their 15th birthday along with ten invited friends at a recreational water park. At the park they all swam in a pool and sat in a water spray.

The mother, who has remained well, "didn't go near the water."

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#11

No food was ingested at the park; some of the girls drank chocolate milk, others drank carbonated beverages.

The six of ten girls who became ill all have watery diarrhea; none have fever.

Three also report nausea and abdominal cramps.

All became ill 5-7 days after the birthday celebration.

#11

Which one of the following is most likely responsible for this outbreak of gastroenteritis?

A) Norovirus

B) Listeria

C) Giardia

D) Cryptosporidium

E) Rotavirus

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PREVIEW QUESTION

#12

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 Room 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.

#12

On examination, he appears ill with pulse 100, 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:

- WBC 3300 (50% PMNs, 35% lymphs, 15% monos)
- Hemoglobin 4.7gm/dL
- Platelet count 105,000
- Total bilirubin 3.8mg/dL
- ALT 110 U/L
- LDH 650 IU/mL

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

#12

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

#13

A 48-year-old physician presents with complaints of severe fevers, abdominal pain, diarrhea, and back pain for 5 days. The patient returned from a 6-month medical mission to Sudan 2 weeks ago. The patient took doxycycline daily for malaria prophylaxis while there, but reports she would occasionally forget a dose.

She experienced frequent insect bites, especially when she took hikes along the banks of the White Nile River.

She was usually careful about what she ate, but about once a week would eat home cooked meals prepared by coworkers at the medicine clinic.

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#13

On exam, her heart rate is 110 bpm, BP is 100/70, respiratory rate is 24/min, and temperature is 38.6 °C. Lung sounds are clear to auscultation bilaterally. Abdomen is soft with moderate tenderness in the right upper and right lower quadrants.

Abnormal laboratory values include a white blood cell count of 18,400/mm3 with 45% neutrophils, 24% lymphocytes, 6% monocytes, 24% eosinophils, and 1% basophils. AST is 158 units/L and ALT is 144 units/L.

Ova and parasite examinations on stool and urine samples, sent by the patient's primary physician three days ago, are negative.

#13

Which of the following organisms is most likely causing her illness?

A) Salmonella typhi

B) Plasmodium falciparum

C) Onchocerca volvulus

D) Schistosoma mansoni

E) Ancylostoma duodenale

#14

A 27-year-old male with sickle cell disease presents with a chest syndrome crisis: he has his typical fever, chest pain, and leukocytosis. He is cultured, and started on vancomycin and levofloxacin.

His initial chest radiograph shows bilateral infiltrates: an x-ray one week prior showed only some chronic scarring.

Sputum gram stain, acid fast stain, and culture show only modest amounts of normal flora. His CBC and Chem 12 show a leukocytosis, hemolytic anemia, and mild LFT abnormalities.

#14

Careful physical examination reveals no localizing physical findings: a tunneled double lumen subclavian line, in for 4 months, appears unremarkable.

After 96 hours, the laboratory reports that one blood culture is growing a non-branching beaded Gram positive bacillus that is acid fast stain positive.

Three additional blood cultures are drawn (one through each lumen of the subclavian line) and one peripherally: at 48 hours they are all reported to be positive for an acid fast non branching rod.

#14

Which of the following organisms would be most likely?

A) Nocardia asteroides

B) Mycobacterium mucogenicum

C) Rhodococcus equi

D) Legionella micdadei

E) Mycobacterium tuberculosis

#15

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.

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