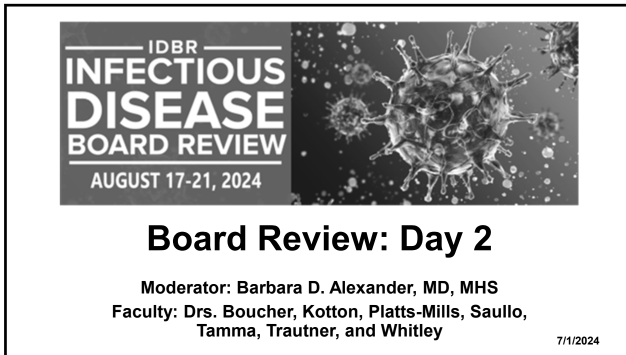

Board Review: Day 2

Moderator: Barbara D. Alexander, MD, MHS
Faculty: Drs. Boucher, Kotton, Platts-Mills, Saullo, Tamma, Trautner, and Whitley

7/1/2024

BOARD REVIEW DAY 2 — 2024

#14 A patient with HIV infection, CD4 = 20 cells/uL, viral load 500,000 copies/mL, and chronic cytopenias (WBC = 800 cells/uL) has never been willing to start antiretroviral therapy.

He is admitted with fever and pulmonary nodules: on lung biopsy, invasive aspergillosis is seen on pathology and grows from biopsy culture (Aspergillus fumigatus).

Voriconazole is started.

1 of 3

BOARD REVIEW DAY 2 — 2024

#14 Which of the following would be the best choice as a backbone of antiretroviral therapy for this patient on voriconazole if a goal is to minimize drug-drug interactions?

A) Efavirenz
B) Darunavir-ritonavir
C) Elvitegravir-cobicistat
D) Dolutegravir

2 of 3

BOARD REVIEW DAY 2 — 2024

#15 A 39-year-old male working in a pork processing plant developed a painful, violaceous lesion on his right hand.

He remembers injuring himself at the site when a bone shard penetrated his glove 3 days prior.

He denies fevers but developed erythema extending from the initial site of injury.

1 of 4

BOARD REVIEW DAY 2 — 2024

#15 He was diagnosed with cellulitis and was started on vancomycin, but the well demarcated board of erythema continued to enlarge, now involving the entire dorsal surface of the hand.

A biopsy of the initial lesion is growing a Gram-positive rod.

2 of 4

BOARD REVIEW DAY 2 — 2024

#15 The most likely pathogen is:

A) *Bacillus cereus*
B) *Cutibacterium acnes*
C) *Listeria monocytogenes*
D) *Erysipelothrix rhusiopathiae*

3 of 4

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#16

A CMV seronegative renal transplant recipient received his allograft from a CMV seropositive donor.

The recommended post-transplant antiviral prophylaxis is:

A) No prophylaxis unless a CMV PCR test on blood returns positive

B) Acyclovir intravenously during the transplant hospitalization, then step down to valacyclovir for 6 months

C) Ganciclovir until tolerating orals then stepdown to valganciclovir for 6 months

D) Ganciclovir until tolerating orals then stepdown to valganciclovir for life

#17

A 23-year-old bartender from Washington, DC came to the emergency department with a three-week history of abdominal pain, fever, and diarrhea.

His symptoms began three weeks ago while he was spending two weeks visiting family in La Paz, Bolivia.

Symptoms resolved after a week without therapy, so he traveled back to the US a week ago but started up again two days ago with lower abdominal pain, non-bloody diarrhea, headache, and low-grade fever.

#17

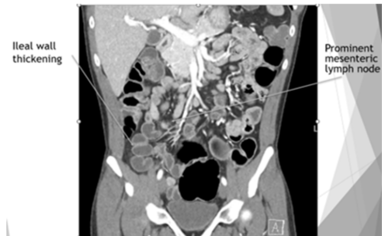
In the ER he was afebrile but tachycardic (pulse 94) and hypotensive (70/50).

His abdomen was tender with some guarding but no rebound. His blood pressure responded to two liters of saline, but he was admitted to the floor and started on cefepime and metronidazole for possible abdominal sepsis.

WBC 8,600 with 24% bands. Liver function showed ALT 114, AST 60, otherwise normal. A rapid HIV test was negative.

#17

An abdominal CT showed the following:



#17

He had never been incarcerated, had no history of substance use disorder, was taking no medications here or in Bolivia, was born and raised in the USA, and had no sick contacts in Bolivia or the USA.

#17

This case is best explained by which diagnosis?

A) Yersinia pseudotuberculosis

B) Tuberculous peritonitis

C) Crohn's disease

D) Amoebiasis

E) Typhoid fever

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#18 A 63-year-old male with end-stage renal disease underwent a deceased-donor kidney transplant with thymoglobulin induction and maintenance immunosuppression inclusive of prednisone, tacrolimus, and mycophenolate.

He received 6 months of valganciclovir prophylaxis due to high risk for cytomegalovirus (CMV) infection (i.e., donor CMV seropositive/recipient CMV seronegative).

1 of 5

BOARD REVIEW DAY 2 INFECTIOUS DISEASE BOARD REVIEW 2024

#18 One and a half months after completing valganciclovir, serial quantitative plasma CMV PCR testing demonstrated progressively rising CMV DNAemia and valganciclovir treatment was initiated.

During this period, he also developed worsening allograft function with the creatinine rising from 1.6 mg/dL to 3 mg/dL. A renal biopsy demonstrated antibody-mediated rejection without evidence of CMV nephritis and high dose steroids, plasmapheresis and intravenous immunoglobulin were initiated.

2 of 5

BOARD REVIEW DAY 2 INFECTIOUS DISEASE BOARD REVIEW 2024

#18 Following institution of antibody-mediated rejection therapy, his quantitative plasma CMV PCR values, which initially had become undetectable on valganciclovir treatment, proceeded to rise by 2-log despite several additional weeks of appropriately dosed valganciclovir treatment.

Genotypic resistance testing demonstrated the UL97 mutation M460V.

The patient was otherwise clinically stable and without evidence of CMV end-organ disease.

3 of 5

BOARD REVIEW DAY 2 INFECTIOUS DISEASE BOARD REVIEW 2024

#18 With this information, a transition to which antiviral therapy below would be most appropriate?

A) Intravenous ganciclovir

B) Oral letermovir

C) Oral maribavir

D) Intravenous letermovir

E) Intravenous acyclovir

4 of 5

BOARD REVIEW DAY 2 INFECTIOUS DISEASE BOARD REVIEW 2024

#19 A 24-year-old healthy G0P1A0 female, 28 weeks pregnant, presents with a 2-day history of fever, dysuria, and supra-pubic pain.

She had a screening urine culture at 18 weeks which was negative.

Physical exam reveals a patient in no acute distress with a temperature of 38° C.

Vital signs are otherwise normal.

1 of 4

BOARD REVIEW DAY 2 INFECTIOUS DISEASE BOARD REVIEW 2024

#19 There is no CVA tenderness.

The uterus is palpable above the umbilicus.

There is mild suprapubic pain.

A dipstick performed in clinic shows 2+ leukocyte esterase and 2+ nitrites.

2 of 4

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#19 What is the most appropriate empiric treatment in this patient?

A) Amoxicillin-clavulanic acid

B) Trimethoprim sulfamethoxazole

C) No antibiotics needed

D) Levofloxacin

E) Amoxicillin

#20 A 55-year-old male undergoes emergency surgery for a ruptured appendix with severe bacterial peritonitis and septic shock.

He has no antibiotic allergies or intolerances.

#20 Which one of the following antibiotics would be appropriate in this clinical setting but would require concomitant administration of IV metronidazole to ensure optimal treatment?

A) Piperacillin-tazobactam

B) Ampicillin-sulbactam

C) Ceftolozane-tazobactam

D) Imipenem-cilastatin-relebactam

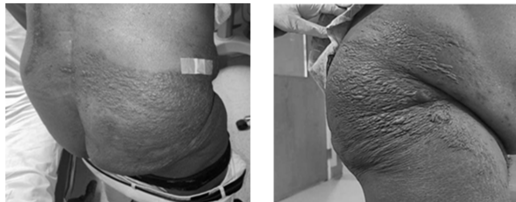
E) Omadacycline

#21 A 66-year-old man with a past medical history of end stage renal disease received a deceased donor kidney transplant 4 years ago.

He presented with vesicular rash on right flank/groin (see pictures).

A skin scraping is positive by PCR for varicella zoster virus.

#21 He had a dose of zoster vaccine live (Zostavax) prior to kidney transplant.



#21 What would have been the optimal approach for preventing this episode of shingles in this patient?

A) He should not have needed any further prophylaxis because he had live zoster vaccine (Zostavax)

B) He should have been taking lifelong acyclovir after kidney transplant

C) He could have gotten recombinant zoster vaccine (Shingrix)

D) He should have had his antibody titer tested to be certain he responded to Zostavax

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#22 A 79-year-old female with history of well-controlled non-insulin dependent diabetes mellitus (NIDDM) and hyperlipidemia is evaluated for abdominal pain and vomiting of 1-day duration.

There is no known history of gallstone disease.

The patient has no exposure to health care facilities, no antibiotic exposure, and has had no acute illnesses in the past two years.

She is an accountant and has not traveled out of the country.

#22 On exam, the patient had temperature of 102°F, blood pressure 94/65, heart rate of 126 beats/min, icteric sclera, and tenderness to palpation in the right upper quadrant.

WBC 18,000 cells/L with 23% bands, amylase = 100 (nl 23-85) U/L, lipase = 160 (nl 0-160) U/L, AST 55 (nl 10-40) U/L, ALT 80 (nl 7-56) U/L, ALK 650 (nl 20-140) U/L. TBili is 5.7 mg/dL, creatinine is 2.7 (baseline 1.0-1.3).

Abdominal ultrasound revealed dilated bile ducts with stones.

#22 What is the most appropriate antimicrobial therapy for this patient?

A) Piperacillin-tazobactam

B) Ampicillin-sulbactam

C) Meropenem plus fluconazole

D) Cefepime plus vancomycin plus metronidazole

E) Cefepime plus clindamycin

#23 A lung transplant recipient developed fatigue, fevers, and diarrhea seven months post-transplant.

She had been receiving valganciclovir prophylaxis since transplant based on her high CMV serologic risk status (donor seropositive, recipient seronegative), but in the context of improving renal function without adjustments in her valganciclovir dosing.

At the time of presentation with fever and fatigue, her CMV viral load on blood was positive at 135,000 IU/ml and her WBC, hemoglobin, platelets, and creatinine clearance were within normal limits.

#23 You recommend:

A) Hold on treatment pending a colonoscopy with colon biopsy to document invasive CMV colitis

B) Increase valganciclovir to prophylactic dosing appropriate for current renal function and recheck CMV viral load in one week

C) Send blood for CMV resistance genotyping and start ganciclovir treatment, double dose

D) Start letermovir

#24 A 72-year-old male with underlying acute myeloid leukemia (AML) underwent allogeneic hematopoietic cell transplantation (HCT) and presented to care on day + 190 with complaints of fever, cough, and new skin lesions.

His pre-transplant serologies for cytomegalovirus and Toxoplasma were positive and negative, respectively and his post-transplant course was complicated by skin / gastrointestinal graft-versus-host disease necessitating high dose steroids and tacrolimus.

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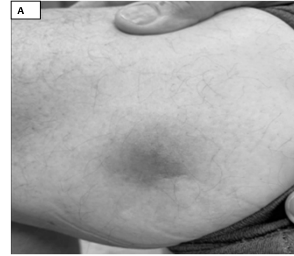
#24 Antimicrobial prophylaxis consisted of posaconazole (recent trough 2.0 mcg/mL), atovaquone (for Pneumocystis jirovecii prevention due to sulfa allergy), letermovir and acyclovir.

On exam, he had a tender medial thigh lesion (Figure A) and similar smaller tender nodular lesions on his right flank and back. He denied direct trauma but admitted to spending significant amounts of time outdoors driving his tractor and working on his farm in the post-transplant period.

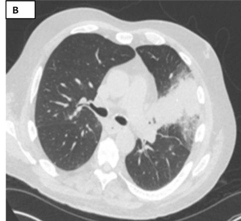
BOARD REVIEW DAY 2 INFECTIOUS DISEASE BOARD REVIEW 2024

#24



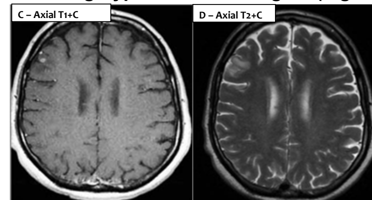
BOARD REVIEW DAY 2 INFECTIOUS DISEASE BOARD REVIEW 2024

#24 Blood cultures and a punch biopsy of the thigh skin lesion ensued. Cross-sectional imaging of the chest is shown in Figure B.



BOARD REVIEW DAY 2 INFECTIOUS DISEASE BOARD REVIEW 2024

#24 Biopsy results prompted brain MRI imaging which showed a 4mm right frontal lobe enhancing lesion with surrounding hyperintense T2 signal (Figures C and D).



BOARD REVIEW DAY 2 INFECTIOUS DISEASE BOARD REVIEW 2024

#24 Blood cultures also turned positive on hospital day 5, further confirming the diagnosis.

What is the most likely diagnosis?

A) Cytomegalovirus

B) Cryptococcosis

C) Aspergillosis

D) Toxoplasmosis

E) Nocardiosis

BOARD REVIEW DAY 2 INFECTIOUS DISEASE BOARD REVIEW 2024

#25 A 72-year-old man with a history of diabetes and obesity presents to his primary care physician with a complaint of foul-smelling, cloudy urine.

He does not have dysuria or voiding difficulties, but he reports recent loss of 10 pounds without dieting.

He has not seen a urologist or had any urinary instrumentation.

No recent fevers noted, and he is afebrile at this visit.

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#25 Urinalysis shows 100 WBC/HPF and many bacteria; culture grows E. coli sensitive to trimethoprim-sulfamethoxazole.

He is treated with a 7-day course of trimethoprim-sulfamethoxazole.

He returns to his primary care physician a week after completing the course of antibiotics and reports his urine is still cloudy and foul-smelling.

#25 Now he notices that his urine has bubbles towards the end of emptying his bladder.

He has no other urinary symptoms.

CBC shows anemia and mild leukocytosis.

Repeat urine culture grows Proteus, sensitive to trimethoprim-sulfamethoxazole, ceftriaxone, fosfomycin and ertapenem.

#25 Stool is positive for occult blood.

His vital signs are normal on physical examination, but he is slightly pale.

He does not have suprapubic tenderness.

#25 Which of the following is the most appropriate management?

A) 14-day course of oral trimethoprim-sulfamethoxazole

B) IV ertapenem

C) Ultrasound of prostate

D) Abdominal/pelvic CT scan with rectal contrast

E) Oral Fosfomycin

#26 A 61-year-old man is admitted to the hospital for fever and abdominal discomfort.

On physical examination, he has a temperature of 39°C, heart rate of 120/min, blood pressure of 100/60, and tenderness to deep palpation with rebound in the left lower quadrant.

#26 After 9 hours of incubation, blood cultures are positive for a Gram-negative bacillus; a rapid multiplex PCR panel performed on the positive blood culture bottle detects Escherichia coli and $bla_{OXA\text{-}48\text{-}like}$.

A β-lactam/β-lactamase inhibitor is considered for therapy.

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#26 **Which of the following β-lactamase inhibitors would be most likely to inhibit the detected β-lactamase?**

A) Avibactam

B) Relebactam

C) Vaborbactam

D) Tazobactam

E) Clavulanic acid

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