

CNS Infections

Asymmetric flaccid paralysis

- A 32-yo man is admitted with a 5-day history of fever, chills, and myalgia. The patient works as a wildlife biologist. Most of his time is spent outdoors in rural areas. He removed an attached tick from his right leg 3 weeks ago but recalls no rash. On exam, temp is 38.8 °C (101.8 °F), and pulse is 115/min. The patient is oriented and conversant. There is no nuchal rigidity. Neuro exam is notable for RLE weakness, with 2/5 strength with foot dorsiflexion and plantar flexion, 2/5 strength with knee flexion and extension, and 3/5 strength with hip flexion. Right knee and ankle deep tendon reflexes are absent but are intact on the left side. Sensation is preserved. Remaining exam findings are unremarkable. Lab studies, including a CBC and CMP are normal. A CT scan of the head w/o contrast is normal. LP is performed. The CSF leukocyte count is 227/ μL ($227 \times 10^6/\text{L}$), with 45% neutrophils. The CSF protein level is 75 mg/dL (750 mg/L). A Gram-stained CSF specimen is negative.

Asymmetric flaccid paralysis

- **Which of the following CSF studies should be performed next?**
 - A. cytomegalovirus PCR
 - B. PCR for *Ehrlichia* species
 - C. PCR for *Borrelia burgdorferi* species
 - D. West Nile virus IgM antibody assay

Encephalitis

- Previously well 60 yo man presents in August with acute onset AMS. Exam reveals temp 38.6°C, rest of vitals normal. Neuro exam reveals B tremors & myoclonus of the extremities & cogwheel rigidity. MRI brain shows hypodense lesions on T1 images in the thalamus & BG, which are hyperintense on T2 images. CSF reveals WBC 120 (90% lymphocytes) with nl glucose and elevated protein.
- **Which of the following is the most likely cause of this patient's findings?**
 - A. *Listeria monocytogenes*
 - B. *Toxoplasma gondii*
 - C. *Tropheryma whippelii*
 - D. Varicella zoster virus
 - E. West Nile virus

Encephalitis

- 74 year old man with tonic-clonic seizure preceded by 3 day h/o fever, HA, myalgias, weakness. + recent return from camping in Colorado
- Confused, oriented to person, febrile to 101.7°F. + nuchal rigidity, mild pain on palpation of thighs/calf muscles, decreased strength BLE> BUE, sensation intact, decreased DTRs.
- CT head neg but MRI with mild meningeal enhancement. CSF TP 105mg/dL, glucose 50mg/dL, gram stain & culture neg.
- **Most likely diagnosis?**
 - A. Progressive multifocal leukoencephalopathy
 - B. West Nile virus meningitis
 - C. Pneumococcal meningitis
 - D. Dengue fever
 - E. Herpes simplex virus encephalitis

Also consider in patients (& transplant donors) who received multiple transfusions

Encephalitis

- 45 yo man evaluated in the ED for low-grade fever, obtundation, & personality changes of 5 days' duration, with progressively declining mental status. One exam temp 37.3°C, & the remaining vital signs are normal. The GSC is 6. There are no focal neurologic findings. MRI brain shows B swelling/enhancement of temporal lobes. CSF reveals lymphocytic meningitis & CSF PCR results are positive for HSV1. IV acyclovir initiated, and pt admitted. 2 weeks into therapy pt remains obtunded, with only minimal improvement since admission. Repeat MRI brain is unchanged, and CSF PCR testing continues to be positive for HSV-1.
- **Which of the following is the most appropriate management?**
 - A. Add dexamethasone
 - B. Brain biopsy
 - C. Change to ganciclovir
 - D. Change to foscarnet
 - E. Continue acyclovir

Recurrent meningitis

- 35-year-old woman is evaluated for a 1-day h/o fever, HA, myalgia, arthralgia, and neck stiffness. The patient is sexually active. She had a similar episode 2 years ago, at which time results of CSF analysis showed lymphocytic meningitis. All culture results were negative, and her symptoms resolved over the next 3 days. On exam, temp is 38.3 °C (101.0 °F), BP is 110/70 mm Hg, pulse is 90/min, and RR is 12/min. There are no oral or genital ulcers. There is mild neck stiffness. Remaining exam findings, including mental status evaluation and complete neurologic examination, are normal. Funduscopic examination is normal. Exam of the CSF shows a leukocyte count of 90/μL ($90 \times 10^6/L$) with 95% lymphocytes, a glucose level of 68 mg/dL (3.8 mmol/L), and a protein level of 70 mg/dL (700 mg/L). A Gram-stained CSF specimen is negative.
- **Which of the following diagnostic studies will most likely establish the cause of this patient's meningitis?**
 - A. CSF cytology
 - B. CSF IgM assay for West Nile virus
 - C. CSF polymerase chain reaction for herpes simplex virus type 2
 - D. MRI of the brain

Fever, HA, nuchal rigidity

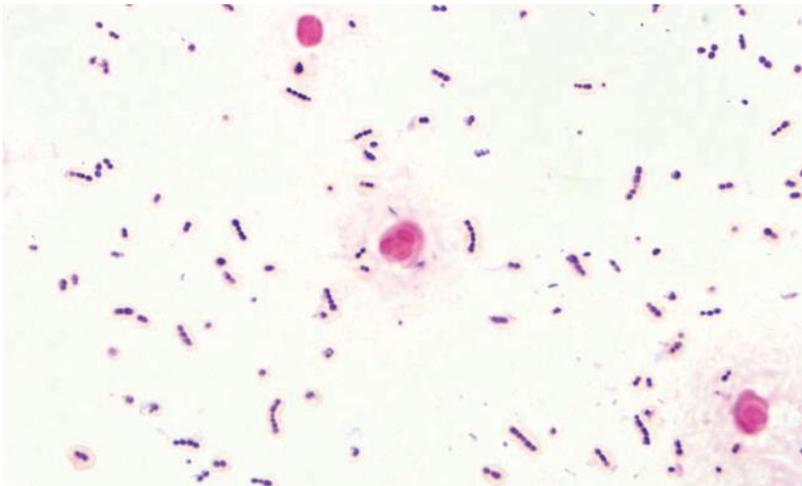
- 35 year old male without PMH brought to the ED with acute onset fever, headache, and confusion, with a seizure witnessed today which prompted his family to call 911. He has no sick contacts and his family reports no recent history of travel or eating processed meats/raw cheeses/melons. Exam reveals temp 103°F, HR 110, BP 115/75, RR 16, + nuchal rigidity, somnolent but arousable, not oriented to person, place, or date, not seizing. You have ordered a CT of the head but it will take 3 hours.
- **What is the most appropriate next step?**
 - A. Give dexamethasone then IV vancomycin and cefotaxime
 - B. Perform lumbar puncture while waiting for CT head
 - C. Get EEG
 - D. Initiate IV vancomycin and cefotaxime
 - E. Wait for CT head results then perform lumbar puncture and wait for CSF results prior to administration of antibiotics

Meningitis

- A 55-yo man is evaluated for a 2-day h/o fever, HA, and confusion. PMH is significant for type 2 DM treated with metformin. The patient has NKDA. On exam, temp is 39.2 °C (102.6 °F), BP is 100/60 mm Hg, pulse is 118/min, and RR is 24/min. He is confused but responds to vigorous stimulation. There are no rashes. Neuro exam findings are nonfocal. Labs show a WBC count of 22,000/ μ L (22×10^9 /L) with 40% band forms. CT head w/o contrast is normal. LP is performed. CSF leukocyte count is 1500/ μ L (1500×10^6 /L) with 95% neutrophils, glucose level is 26 mg/dL (1.4 mmol/L), and protein level is 200 mg/dL (2000 mg/L). A CSF Gram stain is shown:

Meningitis

In addition to adjunctive dexamethasone, which of the following antimicrobial regimens should be initiated at this time?



- A. Ampicillin & ceftriaxone
- B. Ceftriaxone
- C. Levofloxacin
- D. Vancomycin & ceftriaxone
- E. Vancomycin & gentamicin

Meningitis

- A 70-year-old man is evaluated in the ED for a 1-day h/o fever and AMS. PMH is significant for CAD and HTN treated with HCTZ, aspirin, lisinopril, and atenolol. On exam, temp is 38.3 °C (101.0 °F), BP is 98/58 mm Hg, pulse is 100/min, and RR is 20/min. The patient is confused and oriented only to person. He is unable to answer any questions. His neck is supple, and neuro exam is nonfocal. He has no rash. A CT scan of the head w/o contrast reveals evidence of mild cerebral edema. LP is performed. Opening pressure is 300 mm H₂O. Cerebrospinal fluid (CSF) analysis demonstrates a leukocyte count of 1200/μL ($1200 \times 10^6/L$) with 60% neutrophils and 40% lymphocytes, a glucose level of 30 mg/dL (1.7 mmol/L), and a protein level of 350 mg/dL (3500 mg/L). A Gram-stained CSF specimen is negative. Dexamethasone followed by vancomycin, ampicillin, and ceftriaxone are begun in the ED, and the patient is admitted to the hospital. The next day, his clinical condition is unchanged.

Meningitis

- **Which of the following is the most appropriate management at this time?**
 - A. Add rifampin
 - B. Continue current management
 - C. Place an external ventricular drain
 - D. Repeat the CSF analysis

Post-surgical bacterial meningitis

- A 36-yo woman is evaluated for fever and HA 7 days after undergoing a craniotomy for removal of a mass lesion in her right frontal lobe. Path demonstrated a malignant astrocytoma. The patient had been doing well before development of the current symptoms. On exam, temp is 38.9 °C (102.0 °F); other vital signs are normal. Her neck is stiff. The exam findings are normal. Labs show a WBC count of 9600/ μ L (9.6×10^9 /L) with a normal differential. MRI of the brain reveals postoperative changes but only minimal cerebral edema in the area of the surgery. LP is performed. CSF analysis: leukocyte count 450/uL, RBCs 100/uL, glucose 45mg/dL, protein 500mg/dL, gram stain neg.
- **In addition to vancomycin, which of the following empiric antimicrobial agents should be administered now?**
 - A. Ceftriaxone
 - B. Gentamicin
 - C. Meropenem
 - D. Metronidazole
 - E. Trimethoprim-sulfamethoxazole

MENINGITIS

- 25 year old male admitted with fever, stiff neck, HA 10 days after closed head injury from MVA. Immediately after accident he had 15 mins transient LOC. 3 days later he note clear fluid drainage from L nostril. Physical pertinent for 102°F. WBC 17K with 15% bands. Non-contrasted CT head normal. CSF with WBC 700 (85% PMNs), glucose 40, protein 120. Gram stain negative
- **Which of the following empiric regimens should be initiated?**
 - A. Meropenem plus dexamethasone
 - B. Vancomycin
 - C. Vancomycin, ceftriaxone, plus dexamethasone
 - D. Vancomycin plus ceftriaxone

Meningitis

- 40 year old man eval for acute onset fever, HA, nausea, lethargy. H/o obstructive hydrocephalus for which he underwent VP shunt placement 6 months ago, with good function. On exam temp 38°C, BP 110/70, P 90, RR 14. Exam of head reveals shunt catheter w/o skin breakdown or ttp along site. He is oriented to person and place and needs to be aroused to answer questions. Rest of exam (funduscopic/neuro) normal. WBC 11,000 with nl diff. CSF WBC 200 (90% PMNs), glucose 40, protein 100. Gram stain neg.
- **Pending culture results, which of the following antimicrobial regimens should be initiated in this patient?**
 - A. Trimethoprim-sulfamethoxazole
 - B. Trimethoprim-sulfamethoxazole plus rifampin
 - C. Vancomycin
 - D. Vancomycin, ampicillin, plus ceftriaxone
 - E. Vancomycin plus cefepime

Meningitis

- 69 yo man eval for 3 month h/o malaise, intermittent low-grade HA gradually increased intensity and 2-mo h/o intermittent fever and nightsweats. Takes no meds. Exam temp 38.2°C, P 88, RR 16. Oriented to person & place only. Neck stiff/painful on flexion. No skin lesions. TST normal. CT head neg. CSF WBC 440 (22%PMNs, 64% L, 14% Mono), protein 266, glucose 34, OP 320 mm H₂O, RPR neg, VDRL neg, FTA-ABS neg. Gram stain, AFB test, & fungal stains pending. Cx for bacteria, fungi, mycobacteria pending.
- **Which of the following tests should be done next?**
 - A. CSF cryptococcal antigen assay
 - B. CSF PCR *Neisseria meningitidis*
 - C. CSF PCR *Strep pneumo*
 - D. Serum antibody assay for *Histoplasma capsulatum*

Meningitis

- 20 yo female college student eval December due to 12-hour fever, myalgia, HA, & rash. Her only med is OCP. On exam she appears ill. Temp 38.8°C, BP 90/45, P 112, RR 24. Petechial rash prominent on lower extremities. Passive neck flexion causes discomfort. WBC 10,500, platelets 105, BUN 30, Cr 2.5, bicarb 15. LP performed. OP 300. CSF WBC 1250 (95% PMNs), protein 100. Grm stain with numerous PMNs, no orgs seen.
- **Which of the following is the most likely diagnosis?**
 - A. *Listeria monocytogenes* meningitis
 - B. *Neisseria meningitidis* meningitis
 - C. Rocky mountain spotted fever
 - D. Viral meningitis

Encephalitis

- A 57-yo woman is admitted with a 2-day h/o fever and confusion. PMH is significant for HTN treated with metoprolol. On exam, temp is 39.0 °C (102.2 °F); other vital signs are normal. The patient is alert but lethargic and answers questions with one-word responses. She is oriented to person only. Passive flexion of the neck elicits mild nuchal rigidity. Remaining exam findings are unremarkable. LP is performed. Opening pressure is 21 mm H₂O. The CSF leukocyte count is 147/microliter ($147 \times 10^6/L$) with 77% lymphocytes. CSF glucose and protein is normal. An MRI of the brain is normal. Treatment with empiric acyclovir, 10 mg/kg intravenously every 8 hours, is initiated. By hospital day 3, the patient's fever has resolved and her mental status has normalized. Results of a CSF HSV PCR performed at admit are negative.
- **Which of the following is the most appropriate management of this patient's acyclovir therapy?**
 - A. Change IV acyclovir to po acyclovir to complete a 14-day course
 - B. Continue IV acyclovir pending results of repeat HSV PCR
 - C. Continue IV acyclovir to complete a 14 day course
 - D. Discontinue IV acyclovir

Meningoencephalitis

- HSV meningoencephalitis is the most common cause of sporadic encephalitis in the US (treatable)
- HSV PCR 95% sensitivity, 98% specificity
- MRI: > 90% with HSV encephalitis have abnormal MRI (mostly temporal lobe)
- Treatment: Acyclovir 10mg/kg q 8h x 14-21 days
- Note: If have abnormal MRI temporal lobe lesions and HSV PCR initially neg, repeat 2-4 days later and continue acyclovir until then

Epidural abscess

- A 35-yo man is evaluated in the ED following the acute onset of BLE paralysis. The patient has a h/o IVDA. He was well until 5 days ago, when he developed severe pain in the middle of his back that was not relieved by topical heat or ibuprofen. Today, he was unable to walk and was brought to the hospital by ambulance. On exam, temp is 37.8 °C (100.0 °F), BP is 120/74 mm Hg, pulse is 98/min, and RR is 14/min. Neuro exam findings show 0/5 motor strength in both lower extremities and absent sensation below the level of the umbilicus. Emergent MRI of the spine reveals evidence of osteomyelitis involving the lower half of the T10 vertebral body and the upper half of the T11 vertebral body, diskitis at the T10-T11 disk space, and an epidural mass compressing the spinal cord. Blood cultures are obtained.
- **Which of the following is the most appropriate next step in management?**
 - A. Antimicrobial therapy
 - B. CT-guided bone biopsy
 - C. Emergent radiation therapy
 - D. Emergent surgical decompression

Brain abscess

- A 65-yo man is evaluated for a 1-day h/o left arm and left leg weakness. His wife has also noted some asymmetry of his face. PMH is significant for HTN and type 2 DM. Meds are lisinopril and metformin. On exam, temp is 37.2 °C (99.0 °F), BP is 170/100 mm Hg, pulse is 90/min, and RR is 14/min. Neuro exam findings include a central CN VII palsy on the left, 2/5 motor strength of the LUE, and 4/5 motor strength of the LLE/ There are no sensory deficits. Hyperreflexia of the left arm and leg is noted, and the left plantar response is positive. Labs indicate a normal CBC and CMP. MRI of the brain with contrast shows a 3-cm ring-enhancing lesion in the right parietal region with surrounding edema and a midline shift to the left.
- **Which of the following diagnostic studies should be performed next?**
 - A. Stereotactic CT-guided aspiration of the lesion
 - B. CT scan of the chest, abdomen, and pelvis
 - C. Lumbar puncture
 - D. Whole-body PET scan

Brain abscess

- 25 yo man evaluated for 2-week h/o L-sided facial pain. PMH unremarkable. Dx sinusitis is est and pt treated with azithromycin, which partially resolves his pain. One week after initiation of therapy, he is admitted to the ED with HA and tonic-clonic seizure. He is afebrile, drowsy, no focal neuro deficits. Labs normal. MRI with 3.5cm ring-enhancing lesion in the L frontoparietal region. Aspiration of the lesion reveals purulent material. Empiric therapy with vancomycin, metronidazole, and ceftriaxone is initiated. Culture of the aspirate grows only *E. coli*.
- **Which of the following is the most appropriate treatment?**
 - A. Change antimicrobial therapy to imipenem
 - B. Change antimicrobial therapy to levofloxacin
 - C. Continue ceftiaxone only
 - D. Continue metronidazole & ceftriaxone only
 - E. Continue vancomycin, metronidazole, & ceftriaxone

Brain abscess

- 24 year old woman evaluated for new-onset severe HA beginning acutely 3 days ago and is constant & localized to the R temporal area of the had. She has taken ibuprofen & acetaminophen w/o relief. She also repors swelling along the R side of her jaw that began about 2 weeks ago. Exam, temp 38.1 °C, remaining vitals normal. Face swollen & erythematous along R mandible, without drainage. Rest of exam (incl neuro) is normal. WBC normal. CT head/face w/ contrast shows soft-tissue mass surrounding the R mandible with extension thru the mandible & erosion of the base of the skull. There is 3cm- ring-enhancing lesion in the R temporal lobe of the brain. The pt undergoes CT-guided stereotactic aspiration of the lesion.
- **Pending culture results of the lesion, which of the following empiric antimicrobial regimens should be initiated?**
 - A. Clindamycin + ceftriaxone
 - B. Penicillin G
 - C. Penicillin G plus metronidazole
 - D. Trimethoprim-sulfamethoxazole
 - E. Vancomycin plus gentamicin

Skin/soft tissue infections_ Ambulatory ID

Prosthetic joint infection

- An 82 yo woman is evaluated for a 3-week h/o pain in the right knee. She underwent right knee arthroplasty 3 years ago. Ten months following her arthroplasty, she developed a methicillin-resistant *Staphylococcus aureus* (MRSA) infection that required removal of the prosthetic joint and a new TKA as well as 6 weeks of vancomycin and rifampin antimicrobial therapy.
- Exam: VSS. Knee joint and surrounding tissues is unremarkable.
- Leukocyte-tagged nuclear imaging studies demonstrate focal uptake at the proximal tibia, and radiographic findings are consistent with sequestrum formation at the same anatomic location.
- Culture of the joint fluid reveals MRSA sensitive to vancomycin, daptomycin, linezolid, trimethoprim-sulfamethoxazole, tetracycline, and rifampin. The patient refuses to undergo any further surgical procedures.

Prosthetic joint infection (cont'd)

- **Which of the following is the most appropriate management of this patient?**
 - A. Lifelong oral rifampin
 - B. Lifelong oral trimethoprim-sulfamethoxazole
 - C. Six weeks of parenteral vancomycin and oral rifampin
 - D. Symptomatic treatment

Hemorrhagic bullae/sepsis in pt with hemochromatosis

- A 55-yo man in ED after experiencing fever and chills yesterday evening and B arm pain and a rash on the UE upon awakening this morning. The patient ate raw oysters from the Gulf Coast 3 nights ago. He was recently diagnosed with hemochromatosis.
- Exam: ill appearing. Temp is 102.4 °F, BP 85/50, P 130, RR 28. Cardiopulm exam normal. Abd exam + shifting dullness (no guarding/rebound).

Hemorrhagic bullae/sepsis in pt with hemochromatosis

- Skin findings of the upper extremity are shown



- Labs: WBC 28K, ferritin 1000, alb 2.3, AST 145, ALT 100. Peripheral blood smear normal.

- **Which of the following pathogens is most likely causing this patient's current findings?**

- A. *Babesia microti*
- B. *Capnocytophaga canimorsus*
- C. *Rickettsia rickettsii*
- D. *Vibrio vulnificus*

Cellulitis and floods

- 55 year old man with fever and erythema/swelling RLE (ankle→ now knee), after cutting his leg on a piece of concrete while walking through flood waters following a tsunami 2 days ago in Thailand. He has 25 year h/o ETOH use. + tetanus immunization w/i 5 years.
- Exam: temp 102.1°F, P 115, RR 23. RLE erythematous and very ttp, diffuse erythema, hemorrhagic bullae and ecchymoses spreading from R ankle to just above R knee.
- Labs: WBC 17,000, Cr 1.5, AST 100, ALT 60, albumin 2.4. Gram stain of bullous fluid + gram-neg bacilli. Blood cx + gram negative bacilli.
- **Which of the following is the most likely cause of this patient's infection?**
 - A. *Aeromonas hydrophila*
 - B. *Capnocytophaga canimorsus*
 - C. *Pasteurella multocida*
 - D. *Vibrio cholera*

Fist injury

- 28-yo woman in the ED for an injury to the hand sustained after punching another woman in the mouth 5 hours ago. She is allergic to penicillin, which causes hives, facial edema, and wheezing. All immunizations are current, including tetanus toxoid, diphtheria toxoid, and acellular pertussis vaccine administered 4 years ago.
- Exam: temp normal, BP 125/70, P 75, and RR 14. The dorsum of the left hand has several tiny punctures with minimal erythema and tenderness. There is no purulence or other evidence of infection, and no underlying tissue is visible. Results of a urine pregnancy test are negative.
- Radiographs of the left hand show no fracture, foreign body, or gas.

Fist injury (cont'd)

Which of the following is the most appropriate management?

- A. Cephalexin
- B. Clindamycin & moxifloxacin
- C. Tetanus immunization
- D. Trimethoprim-sulfamethoxazole
- E. Observation

Treatment of human bite wound

- 25 year old M with pain and swelling R hand. 3 days ago he was involved in altercation during which he punched another man in mouth with R fist. Exam reveals temp 38.3°C, pain and swelling over R 2nd MCP and decreased ROM. Aspiration of the joint reveals small amount of purulent material; samples submitted for culture.
- **While awaiting culture results, which of the following is most appropriate?**
 - A. Ampicillin-sulbactam
 - B. Cefazolin
 - C. Trimethoprim-sulfamethoxazole
 - D. Metronidazole plus cipro
 - E. Observation only until culture results available

Tetanus prophylaxis

- High school student appropriately immunized with diphtheria-tetanus-acellular pertussis (DTaP) series by kindergarten, but who had received no additional boosters since, stepped on a nail while walking barefoot. The nail was easily removed and the lesion bled freely.
- **What should the student be given?**
 - A. Human tetanus immune globulin and tetanus toxoid
 - B. Human tetanus immune globulin
 - C. Prophylactic antibiotic treatment for *Clostridium tetani*
 - D. No treatment
 - E. Tetanus toxoid

Pseudomonas in burn patient

- A 52yo man is admitted to the ICU with fever and hypotension. He sustained a burn injury 1 year ago with involvement of approximately 20% of his skin surface area. Since his injury, he has been hospitalized frequently for skin grafting procedures, most recently 1 week ago involving the anterior left thigh. At the site of his latest skin graft, he has developed purulent drainage over the past 24 hours. The patient takes no medications, including antibiotics.
- Exam: temp is 101.8 °F, BP 95/50, P 115. Cardiopulmonary examination is unremarkable. He has multiple well-healed skin graft sites except for his recent graft site on the anterior left thigh, which shows an area of devitalized skin with eschar formation and peripheral erythema and drainage of a moderate amount of pus.
- Empiric vancomycin is initiated. Two sets of blood cultures obtained at the onset of fever on admission are positive for *Pseudomonas aeruginosa*. Empiric vancomycin and cefepime are initiated. Antibiotic sensitivity studies show that the organism is pan-resistant to all antimicrobial agents to which it was tested, including all β -lactam antimicrobial agents, carbapenems, fluoroquinolones, and aminoglycosides.

Pseudomonas in burn patient (cont'd)

Which of the following is the most appropriate antibiotic treatment for this patient?

- A. IV colistin
- B. IV minocycline
- C. IV rifampin
- D. IV tigecycline

Outpatient antimicrobial therapy for SSTI

- 48 yo man in ED with painful, swollen R thigh following fall at home. He has MS and is on steroids, DM-2 with neuropathy and recurrent gastroparesis.
- Exam: T 101.2°F. R thigh with fluctuant erythematous, tender mass surrounded by area of skin thickening/erythema extending 7cm beyond.
- He vomits in the ED and is given IVF. He undergoes I&D, initiated on imipenem/vanc.
- Labs: WBC 24,000, Gram stain + WBCs and GNR, Cr 0.4
- On HD #2, stabilized, no longer vomiting. Cx + K. oxytoca R amp, cefazolin, S carbapenems, bactrim, colistin. He asks for D/C home.
- **Which of the following is the most appropriate therapy?**
 - A. Colistin
 - B. Ertapenem
 - C. Imipenem and vancomycin
 - D. Linezolid

Recurrent boils

- A 24-yo man is evaluated for an increasingly painful boil on his back that has been present for 3 days and has increased in size. The patient has had similar lesions on his back and chest previously, but these were smaller and spontaneously drained and resolved without requiring medical attention. The remainder of the medical history is NC.
- Exam: VSS, NAD. Exam of the back → 7-cm fluctuant, tender, oval-shaped lesion, with surrounding erythema extending 3 cm from the edge of the lesion. Rest of exam normal.
- Aspirate of the lesion reveals purulent material, a Gram stain of which demonstrates many leukocytes and many gram-positive cocci in clusters. A culture is sent for processing. Incision and drainage of the lesion produces approximately 5 mL of pus.

Recurrent boils (cont'd)

Which of the following is the most appropriate antibiotic treatment for this patient?

- A. Amoxicillin-clavulanate
- B. Azithromycin
- C. Moxifloxacin
- D. Rifampin
- E. Trimethoprim-sulfamethoxazole

Purulent cellulitis

- A 35-yo man in ED for redness and pus that developed near a scratch on his left forearm.
- Exam: temp 99.4 °F, BP 140/80, P 80, and RR 14. A 3 × 2-cm erythematous, warm patch is present over the left forearm with some associated purulent exudate but no fluctuance, drainable abscess, or lymphadenopathy.
- Labs: WBC 10,000 with 70% PMNs and 30% L.
- **Which of the following is the most appropriate outpatient therapy?**
 - A. Amoxicillin
 - B. Cephalexin
 - C. Dicloxacillin
 - D. Trimethoprim-sulfamethoxazole

Purulent cellulitis

- A 30-yo woman in ED for a RLE skin infection. She works in a nursing facility where she experienced a minor laceration of the right shin 3 days ago. She initially applied a topical sterile dressing but developed purulent drainage from her wound with increasing surrounding tenderness and a fever over the past 24 hours.
- Exam: temp 101.3 °F, BP 125/75, P 90, and RR 18. An area of purulent cellulitis measuring approximately 4 × 5 cm is present over the right lower extremity surrounding a 1.5-cm laceration. There is no fluctuance. Rest of exam nl.
- Labs: WBC 14,000 (90% PMNs and 10% L). U/A nl. A radiograph of the right lower extremity shows only soft tissue swelling.
- **Which of the following β -lactam antibiotics is most appropriate for treatment of this infection?**
 - A. Ceftaroline
 - B. Ceftriaxone
 - C. Meropenem
 - D. Oxacillin

Skin infection

- 25 year old male football player woke up with a “spider bite on his leg” and after several days the skin lesion became much more swollen and intensely painful, so he sought medical help. He has no other PMH. Exam reveals male in NAD, afebrile, with a large fluctuant 2x2cm lesion on his R thigh with overlying erythema. He underwent I&D. Culture of the wound grew gram positive cocci, beta-hemolytic, catalase positive, coagulase positive.
- **What is the best antibiotic choice for this patient?**
 - A. Amoxicillin-clavulanate
 - B. Cephalexin
 - C. Dicloxacillin
 - D. Polymyxin B
 - E. Trimethoprim-sulfamethoxazole (TMP-SMX)

Nonpurulent cellulitis

- A 25-yo woman is evaluated for redness that developed over her right leg at the site of a mosquito bite. She is otherwise healthy and takes no meds.
- Exam: temp 99.0 °F, BP 120/70, P 70, and RR 14. There is an erythematous 3 × 3-cm patch on the right thigh. The area is warm to the touch with no evidence of purulence, fluctuance, crepitus, or LAD.
- **Which of the following is the most appropriate empiric outpatient therapy?**
 - A. Cephalexin
 - B. Doxycycline
 - C. Fluconazole
 - D. Metronidazole
 - E. Trimethoprim-sulfamethoxazole

Nonpurulent cellulitis

- A 60-yo man in ED for swelling and erythema of the right leg with associated fever.
- Exam: temp 100.6 °F, BP 135/85, P 99, and RR 16. BMI 28. An area of cellulitis measuring 4 × 3 cm is present on the distal right lower extremity with associated tenderness, warmth, and edema but without necrosis, purulent exudate, fluctuance, or lymphadenopathy. Tinea pedis infection is found between several toes of both feet. Rest of exam nl.
- Labs: WBC 12,000 (80% PMNs, 18% L, and 2% M). BMP wnl.
- Topical clotrimazole is prescribed for the tinea pedis infection. The patient refuses hospital admission.
- **Which of the following is the most appropriate outpatient therapy?**
 - A. Clindamycin
 - B. Doxycycline
 - C. Rifampin
 - D. Trimethoprim-sulfamethoxazole

Diabetic foot ulcer

- 49 yo man with 5-day h/o pain and redness around small ulcer on heel of R foot. H/o DM. UTD on immunizations
- Exam temp 99.0°F, BP 130/75, P 83, RR 16. Small amount of erythema extending 1cm around 3x3cm ulcer R heel, tender, warm, limited to superficial skin and subcut tissue. No necrosis, purulent discharge, no LAD.
- Labs: CMP, U/A wnl, WBC 12,000
- X-ray foot without bone involvement, minimal edema
- **Antibiotic therapy against which of the following pathogens is most appropriate in this patient?**
 - A. Aerobic-gram neg bacilli
 - B. Aerobic gram-positive cocci
 - C. Aerobic gram positive cocci and anaerobic organisms
 - D. Anaerobic organisms

Diabetic Foot Infection with Sepsis

- 56 yo woman with DM in ED with F/chills/hyperglycemia, UTD on immunizations.
- Exam: T 102.3°F, BP 90/60, P 104, RR 21. + Fissuring in web spaces btw her toes both feet. + 4x3cm necrotic ulcerative lesion extends from 1st & 2nd toe to plantar aspect of foot with significant warmth & extensive surrounding erythema. DPs decreased. Sensation decreased.
- Labs: WBC 25,000, Hg 13, ESR 100, glucose 440, Cr 1.8., MRI foot ordered.
- **Which of the following is the best empiric antibiotic treatment option?**
 - A. Ceftazidime
 - B. Ciprofloxacin
 - C. Vancomycin plus imipenem
 - D. Vancomycin plus metronidazole

Cat scratch

- A 20 yo man is evaluated for a scratch on his right arm from a pet kitten that occurred 3 weeks ago. The patient now has a skin lesion at the inoculation site and painful swelling in the ipsilateral axillary area. He is also experiencing malaise. PMH unremarkable.
- Exam: temp 99.0 °F, BP 120/80, P 80, and RR 14. A red papule is present on the biceps area of the right arm, and tender right axillary LAD with overlying erythema is noted. Rest of exam nl.
- Labs: WBC 11,500 (83% PMNs and 17% L), nl BMP.
- **Which of the following is the most appropriate treatment?**
 - A. Azithromycin
 - B. Dicloxacillin
 - C. Itraconazole
 - D. Linezolid

Cat bite

- 45 year old F bitten R hand by her cat. Pt washed wound and applied antiseptic. One day later with erythema at wound with spread to wrist, now painful. Note hives and pruritus 2/2 amoxicillin 4 years ago. Exam reveals temp 37.2°C, pulse 102, RR 18, BP 162/102. + erythema, swelling and tenderness thenar eminence with spreading to wrist, + 2 puncture wounds.
- **Which of the following is the most appropriate outpatient regimen for her?**
 - A. Doxycycline
 - B. Ciprofloxacin
 - C. Trimethoprim-sulfamethoxazole plus clindamycin
 - D. Cefalexin plus metronidazole
 - E. Amoxicillin-clavulanate

NECROTIZING FASCIITIS

- 18 yo woman in the ED for increasing muscle pain in biceps, nausea, light-headedness, and fever x 3 days. Recently diagnosed with VZV infection. She admits to having vigorously scratched a lesion in that area several days earlier. Vaccinations except VZV are up to date. Only med is prn ibuprofen.
- Exam: T 101.8° F, BP 85/55, pulse 120, and RR 20. Exam reveals healing varicella lesions. L biceps is tender, warm, with “woody” induration to palpation.
- Labs: WBC 20, Hg 11, Platelets 75, Cr 2.0, AST 95, ALT 100. U/A normal. MRI + superficial fascial necrosis between skin and biceps muscle. Pt received single dose vanc and zosyn prior to emergent surgical debridement. Gram stain of tissue and fluid + GPC in short chains.
- **Which of the following treatment regimens should be given now?**
 - A. IVIG
 - B. Metronidazole and cipro
 - C. PCN and clindamycin
 - D. Vancomycin plus cefepime plus metronidazole

Ear pain

- 65 year old diabetic reports fever, exquisite R ear pain and drainage x 4 weeks with resultant pain with chewing on that side. He admits to trying to irrigate that ear 5 weeks ago due to impacted cerumen, and saw his PCP a few weeks later who prescribed amoxicillin without any relief. He denies decreased hearing, tinnitus. Exam reveals R ear with granulation tissue within the external auditory canal, which is erythematous, with some purulence noted. Exam reveals temp 102°F. Labs reveal HIV neg, WBC 7,000. ESR 70. Culture of the purulence is pending.
- **What is the most appropriate initial treatment?**
 - A. Intravenous vancomycin
 - B. Oral azithromycin
 - C. Intravenous ciprofloxacin
 - D. Intravenous amphotericin B deoxycholate
 - E. Topical ciprofloxacin otic drops

Rash in pregnant woman

- 20 year old pregnant woman presents with 2-week history of flu-like symptoms. Physical exam reveals generalized nontender LAD and numerous discrete cutaneous hyperpigmentations of the soles of her feet. She had a PCN allergy as a child – mild rash. RPR is positive as well as treponemal antibody.
- **Which antibiotic is the best choice for treatment?**
 - A. Doxycycline 100mg po bid x 14 days
 - B. Levaquin 500mg po q day x 7 days
 - C. Azithromycin 2gm po x 1
 - D. Benzathine PCN G 2.4 million units IM x 1 after desensitization
 - E. TMP-SMZ DS po bid x 7 days



Osteomyelitis

Osteomyelitis

- A 59-yo woman is evaluated for a 1-week history of increasing pain of the right foot. She recalls stepping on a nail about 1 month before her symptoms began. The patient has a 5-year history of CHF 2/2 to idiopathic dilated cardiomyopathy. She has an implantable cardioverter-defibrillator, and her current medications are carvedilol, lisinopril, furosemide, and spironolactone.
- Exam: VSS. Exam of the foot reveals tenderness and warmth directly below the proximal fifth metatarsal bone. A radiograph of the right foot is normal.
- **Which of the following is the most appropriate next step to establish the diagnosis?**
 - A. CT scan
 - B. Gallium scan
 - C. MRI
 - D. Three-phase bone scan

Osteomyelitis

- A 25yo man is evaluated for a 2-week history of purulent drainage from a small opening in a previously healed right lower extremity wound; this was preceded by about 10 days of tenderness and redness at the wound site. Six months ago, the patient had a motorcycle accident in which he sustained an open comminuted fracture of the proximal tibia. Management consisted of surgical debridement and lavage followed by open reduction and internal fixation with a metal plate and screws as well as empiric antibiotic therapy. Culture results during and after surgery were negative.
- Exam; well-appearing. Temp 98.9 °F, BP 120/75, and RR 12. There is a well-healed surgical incision overlying the right tibia except for a 2-mm opening at the distal margin with minimal surrounding erythema and slight purulent drainage. Rest of exam is normal.
- Swab samples obtained from the wound are sent to the microbiology laboratory for aerobic and anaerobic culture and sensitivity testing. *Proteus mirabilis* and an enterococcal species are isolated from the culture, both susceptible to all antibiotics tested.

Osteomyelitis (cont'd)

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

- A. Bone biopsy cultures
- B. IV ampicillin-sulbactam
- C. Oral cipro & amoxicillin
- D. Technetium 99m-labeled bone scan

DIAGNOSIS OF OSTEOMYELITIS

- 75 year old male with DM-2 with draining chronic ulcer of L foot, erythema, fever. + Plantar ulcer with purulent material over 4th MTP. Metal probe makes contact with bone. WBC normal. ESR 70mm/h. X-ray foot normal. Gram stain + leukocytes, GPCC and GNR.
- **Which of the following is the most appropriate management now?**
 - A. Begin imipenem
 - B. Begin vanc and ceftazidime
 - C. Begin vanc and metronidazole
 - D. Perform bone biopsy

DM- associated osteomyelitis

- A 74-yo man in the ED for a 3-day h/o fever and chills as well as confusion. He has a 5-week history of a nonhealing ulcer on the plantar surface of his left foot. He has DM, HTN, and PVD for which he takes metformin, glyburide, lisinopril, chlorthalidone, and aspirin. NKDA.
- Exam: temp 102.2 °F, BP 92/60, P 108, and RR 18. He appears ill and is slow to respond. Exam of the left foot discloses a 3.5 × 2.5-cm ulcer with surrounding erythema and warmth. A foul odor and edema and tenderness involving the entire foot are noted. Pedal pulses are absent. The underlying bone is detected with a metal probe.
- Labs: WBC 21,500 (18% band forms). CMP wnl.
- X-ray L foot indicates no subcutaneous gas or foreign bodies.
- **Which of the following is the most appropriate empiric antimicrobial regimen?**
 - A. Aztreonam & metronidazole
 - B. Cefazolin & metronidazole
 - C. Clindamycin & gentamicin
 - D. Vancomycin & meropenem

Low back pain

- 75 year old with 2 month h/o gradually increasing, non-trauma related severe low-back pain. + warm and diaphoretic, no urine/stool incontinence. 10 weeks ago dcd from hospital with prolonged ICU stay for CAP with sepsis, during which he required mech ventilation, enteral nutrition, and prolonged central venous access.
- Exam: temp 100.5°F, other VSS. Mild ttp low back, neuro exam wnl.
- Labs: CBC, U/A wnl, ESR 90. Blood cx drawn
- **Which of the following is the optimal diagnostic evaluation?**
 - A. CT lumbar spine
 - B. MRI lumbar spine
 - C. Plain radiograph of lumbar spine
 - D. Three-phase bone scintigraphy

Antibiotic prophylaxis

- 42 year old M with bicuspid aortic valve is asymptomatic on no meds, but has dentist appt for routine care. PCN allergic. Exam: HR 72, BP 140/70. Cardiac auscultation nl S1 & S2, grade 2/6 diastolic crescendo murmur at LSB.
- **What is your recommendation before he undergoes dental cleaning?**
 - (A) No antibiotics
 - (B) Amoxicillin 2gm po, 1 hour before the visit
 - (C) Azithromycin 500mg po 1 hour before and 6 hours after the visit
 - (D) Clindamycin 600mg po 1 hour before the visit
 - (E) Vancomycin 1gm po 1 hour before the visit

MRSA endocarditis

- A 52-yo man is admitted to the hospital with fatigue and fever of 3 days' duration. He is a health care worker and has a bicuspid aortic valve. He takes no meds. Blood cultures are obtained at the time of admission, and he is started on empiric vancomycin for possible endocarditis. On hospital day 2, his initial blood cultures become positive for gram-positive cocci in clusters, and on hospital day 3, his blood cultures grow methicillin-resistant *Staphylococcus aureus*. Susceptibility to vancomycin is intermediate (MIC = 4 µg/mL).
- On hospital day 4, the patient continues to appear ill. T 101.5 °F, BP 105/65, and P 110. On cardiopulmonary examination, the lungs are clear, and a grade 2/6 systolic ejection murmur is heard at the right upper sternal border, but there is no evidence of heart failure or septic emboli.
- **Which of the following is the most appropriate management?**
 - A. Discontinue vancomycin & begin daptomycin
 - B. Discontinue vancomycin & begin linezolid
 - C. Discontinue vancomycin & begin trimethoprim-sulfamethoxazole
 - D. Increase vancomycin dose

MRSA Endocarditis

- 55 yo man with 2-d h/o fever, erythema at site of PICC. Dxd with AML s/p chemo 11 days ago. He has Vanc IgE-mediated hypersensitivity reaction characterized by urticaria, bronchospasm, & hypotension
- Exam temp 102.5°F, BP 100/70, P 110/min, RR 22/min. Erythema/ttp at cath insertion site L AC fossa. New grade 3/6 holosystolic murmur increasing with inspiration at LLSB.
- Labs: Hg 7, WBC 1,000 with 5% PMNs, platelets 20, multiple blood cx with MRSA.
- CXR and ECG unremarkable. TTE reveals mod TR and vegetation on TV
- **In addition to catheter removal, which of the following is the most appropriate treatment?**
 - A. Cefazolin
 - B. Clindamycin
 - C. Daptomycin
 - D. Nafcillin

Endocarditis with septic pulmonary emboli

- 26 yo man in ED with acute onset cough and R-sided pleuritic CP x 2 days. He is IVDA with last use 4 days ago. HIV test neg.
- Exam T 103°F, BP 120/80, P 100, RR 20. Exam + clear lungs, grade 3/6 HSM RSB increases with inspiration
- Labs: hct 39%, WBC 17,000 (17% bands), platelets 160.
- CXR with small infiltrates in LUL, RUL, and RLL. Blood cx obtained.
- **Which of the following empiric antimicrobial regimens should be initiated?**
 - A. Azithromycin plus ceftriaxone
 - B. Levofloxacin plus clindamycin
 - C. Piperacillin/tazobactam plus aztreonam
 - D. Trimethoprim-sulfamethoxazole
 - E. Vancomycin plus cefepime

MSSA endocarditis

- 29 yo woman with 4-d h/o fevers/chills/myalgias and non-productive cough. 10-y h/o heroin use; last use 1 day ago. NKDA.
- Temp 102°F, rest VSS. + needle track marks both arms. Cardiac exam + early grade 2/6 Systolic murmur at base
- Labs: WBC 14,000, hg 10.54, platelets 190, Cr 1.4
- CXR with one round 2cm lesion each lung with cavitation L-lung lesion. ECG wnl. TTE neg (limited study).
- After blood cx obtained, vancomycin initiated. W/I 48 hours, all blood cx + Staph aureus S oxacillin, cephalosporins, tetracycline, FQ. Strain is S to clindamycin and D-test is negative.
- **Which of the following is most appropriate at this time?**
 - A. Continue vancomycin
 - B. Switch to clindamycin
 - C. Switch to linezolid
 - D. Switch to oxacillin

Transplant/Heme Onc ID

Adverse reactions

- A 45-yo woman is evaluated for nausea, anorexia, and fatigue. She had a kidney transplant 7 months ago and has been doing well since then, with normal BP, a normal serum Cr., and an at-goal tacrolimus level on routine follow-up last month. Medications are tacrolimus, mycophenolate mofetil, and prednisone. She reports that 5 days ago, she also began taking some leftover clarithromycin that she had at home because she thought she was getting a sinus infection. On exam, temp is 37.2 °C (99.0 °F), BP is 142/90 mm Hg, pulse is 104/min, and RR is 20/min. Cardiopulmonary examination is normal. The abdomen is soft and nontender. The surgical site of the transplanted kidney is well healed. Labs indicate a BUN of 51 mg/dL (18.2 mmol/L) and a serum Cr. of 3.7 mg/dL (327.1 μmol/L). Dipstick and microscopic U/A are normal.
- **Which of the following is the most likely cause of this patient's acute kidney injury?**
 - A. Clarithromycin-induced interstitial nephritis
 - B. Mycophenolate mofetil toxicity
 - C. Organ rejection
 - D. Tacrolimus toxicity

Fever post-transplant

- A 44-yo woman is evaluated for a 1-week h/o low-grade fever, fatigue, and body aches. She had a kidney transplant 5 months ago; at the time of transplantation, she was seropositive for EBV and seronegative for CMV with a seropositive donor. Her recent course has been uncomplicated with no episodes of rejection. She completed CMV prophylaxis with valganciclovir last month. Medications are tacrolimus, mycophenolate mofetil, prednisone, and trimethoprim-sulfamethoxazole. On exam, temp is 37.8 °C (100.0 °F), BP is 136/88 mm Hg, pulse is 96/min, and RR is 16/min. There is no LAD. The transplant surgical wound site is without erythema or drainage. Cardiopulmonary examination is normal. The abdomen is soft and nontender. Labs: WBC 3200/uL, hct 33%, platelets 112,000/uL, AP 155 U/L, ALT 52 U/L, AST 48 U/L, bili 0.6 mg/dL, BUN 18 mg/dL, Cr 1.1 mg/dL. Microscopic U/A is unremarkable. The CXR is normal.
- **Infection with which of the following is the most likely diagnosis?**
 - A. Cytomegalovirus
 - B. Epstein-Barr virus
 - C. *Listeria monocytogenes*
 - D. Polyoma BK virus

PNA post-transplant

- 50-yo woman is admitted to the ED for a 2-day h/o fever and chills, dyspnea, hemoptysis, and left-sided pleuritic chest pain. She underwent allogeneic HSCT for myelodysplastic syndrome 6 months ago; until 2 days ago she had been doing well. Her medications are trimethoprim-sulfamethoxazole, acyclovir, prednisone, and cyclosporine. On exam, temp is 39.3 °C (102.7 °F), BP is 110/68 mm Hg, pulse is 122/min, and RR is 24/min. Dullness to percussion, crackles, and egophony are heard at the left lung base. The remainder of the exam is normal. Labs reveal leukocyte count of 4400/ μL ($4.4 \times 10^9/\text{L}$), a platelet count of 155,000/ μL ($155 \times 10^9/\text{L}$), and a hct of 30%. CXR shows a dense infiltrate in the left lower lobe.
- **Infection with which of the following is the most likely diagnosis?**
 - A. *Candida krusei*
 - B. Cytomegalovirus
 - C. *Pneumocystis jirovecii*
 - D. *Streptococcus pneumoniae*

Pulmonary nodules

- A 29-yo man is evaluated in the hospital 2 weeks after allogeneic HSCT for acute myeloid leukemia. He has had a dry cough and persistent fever for 3 days despite taking antibiotic agents. The patient and donor were both seropositive for cytomegalovirus. His medications are imipenem, ciprofloxacin, vancomycin, acyclovir, and fluconazole. On exam, temp is 38.5 °C (101.3 °F), BP is 122/74 mm Hg, pulse is 98/min, and RR is 18/min. Skin exam shows some petechiae but no lesions or rash. Cardiopulmonary and abdominal examinations are normal. The intravenous catheter site is without erythema or drainage. Labs reveal a hct of 24%, a leukocyte count of 100/ μL ($0.10 \times 10^9/\text{L}$), and a platelet count of 15,000/ μL ($15 \times 10^9/\text{L}$). CXR discloses scattered opacities. A noncontrast CT scan of the chest demonstrates nodular infiltrates without cavitation.
- **Which of the following is the most likely infectious cause of this patient's fever?**
 - A. Aspergillus
 - B. Cytomegalovirus
 - C. Mucormycosis (zygomycosis)
 - D. Pneumocystis jirovecii

Invasive pulmonary aspergillosis

- A 27-yo woman is evaluated for a 2-day h/o fever, hemoptysis, and chest pain. She was recently diagnosed with acute myeloid leukemia and completed her last course of chemotherapy 2 weeks ago. Her course has been complicated by profound neutropenia, thrombocytopenia, and fever that initially resolved after treatment with cefepime and vancomycin. On exam, temp is 38.9 °C (102.0 °F), BP is 110/70 mm Hg, pulse is 100/min, and RR is 20/min. A friction rub is heard at the left posterior lung base. Labs indicate a leukocyte count of 100/ μ L (0.10×10^9 /L). Serum galactomannan antigen immunoassay results are positive, consistent with a diagnosis of invasive pulmonary aspergillosis. A CXR shows a pleural-based nodular density at the left lung base.
- **Which of the following is the most appropriate treatment?**
 - A. Itraconazole
 - B. Liposomal amphotericin B
 - C. Micafungin
 - D. Voriconazole

Listeria meningitis

- 75 year old woman evaluated for 1-day h/o fever & AMS. Recently dx'd with autoimmune hemolytic anemia for which she has been on high-dose prednisone for 3 weeks. Also has 6 month h/o CLL. Difficult to arouse on exam, temp 38.4°C, BP 110/70, P 100, RR 16. Resistance to neck flexion. Non-contrast CT head normal. CSF WBC 1200 (50% PMNs, 50%L), glucose 30, protein 200. CSF gram stain neg and empiric dexamethasone, vancomycin, ampicillin, & ceftriaxone initiated. Blood & CSF cultures + *Listeria monocytogenes*.
- **Which of the following antimicrobial regimens should now be administered?**
 - A. Ampicillin plus gentamicin
 - B. Ceftriaxone
 - C. Chloramphenicol
 - D. Vancomycin plus gentamicin

Meningitis in immunocompromised

- 35 year old F hospitalized with F, HA, ataxia, confusion, loose stools. S/p cadaveric renal transplant 12 months ago for ESRD, on prednisone, azathioprine. Allergic to PCN → anaphylactic shock. Received cephalexin without reaction. Exam reveals temp 39.4°C, HR 100, RR 30, BP 90/60. She is confused, neck supple. WBC 18K (20% bands). LP: WBC 1500 (50%PMNs, 50%L), glucose 30, TP 300, gram stain neg.
- **In addition to vancomycin, which of the following antimicrobial regimens should be initiated?**
 - (A) Ceftriaxone
 - (B) Ceftriaxone plus trimethoprim-sulfamethoxazole
 - (C) Ceftriaxone plus levofloxacin
 - (D) Ceftriaxone plus azithromycin

Pneumonia in transplant

- 57 yo woman with acute onset dyspnea and dry cough rapidly worsening over past 3 days. She is s/p liver transplant 15 months ago. Meds include sirolimus, azathioprine, prednisone, and inhaled pentamidine. She is allergic to sulfonamides. Exam reveals temp 38.4 °C, BP 140/80, P 110/min, RR 23/min. Arterial O₂ sat 83% RA. Exam reveals scattered fine crackles bilaterally. CBC, BUN, Cr. and UA normal. CXR with slight diffuse, increase opacities bilaterally. CT chest reveals bilateral diffuse, fine alveolar and interstitial infiltrates. Sputum sample cannot be obtained.
- **Which of the following is the most likely cause of this patient's findings?**
 - A. *Aspergillus fumigatus*
 - B. *Candida glabrata*
 - C. *Pneumocystis jirovecii*
 - D. *Staphylococcus aureus*
 - E. *Streptococcus pneumoniae*

Virus and Transplant

- 52 year old woman eval for 6 week h/o generalized malaise & fatigue. She received a kidney transplant 15 years ago for HTN-related CKD. Meds include cyclosporine & azathioprine. Vitals & exam normal. CBC normal. BUN 56, Cr 3.0 (compared to 1.7 2 months ago). U/A significant for 19 WBCs, 2+ protein, many squamous & renal tubular epithelial cells, some of which have intranuclear inclusions.
- **Infection with which of the following is the most likely cause of this patient's worsening kidney function?**
 - A. Cytomegalovirus
 - B. Epstein-Barr virus
 - C. Human herpesvirus-8
 - D. Polyomavirus BK virus
 - E. Polyomavirus JC virus