**Academic Half Day 11/30: Antibiotics**
**Learner’s Guide**

**Recommended Pre-Reading**
Johnson, JR, Russo, TA. Acute pyelonephritis in adults. N Engl J Med 2018; 378:48–59.

Leekha S, Terrell CL, Edson RS. General principles of antimicrobial therapy. Paper presented at: Mayo Clinic Proceedings 2011. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3031442/>

Stevens, D. L., Bisno, A. L., Chambers, H. F., Dellinger, E. P., Goldstein, E. J., Gorbach, S. L., Hirschmann, J. V., Kaplan, S. L., Montoya, J. G., & Wade, J. C. (2014). Practice guidelines for the diagnosis and management of skin and soft tissue infections: 2014 update by the Infectious Diseases Society of America. *Clinical Infectious Diseases*, *59*(2). <https://doi.org/10.1093/cid/ciu296>

**Agenda**
1:15 – 1:30: Theory Burst
1:30 – 2:15: Cases 1 and 2
2:15 – 2:30: Questions for the Expert / Break
2:30 – 3:20: Cases 3 and 4
3:20 – 3:30: Questions for the Expert

For each of the cases, you may refer to the following resources:
 

Antibiotic Spectrum

**Case 1**

Mr. Sal Ulitis is a 56-year-old with congestive heart failure and chronic lower extremity edema, atrial fibrillation on warfarin, and diabetes mellitus presents to the emergency room with abrupt onset of right lower extremity pain associated with redness and swelling that evolved over a period of several hours.

He has a low-grade temperature (99.9°F) at presentation but is otherwise hemodynamically stable. His white blood cell count (WBC) is slightly elevated (10.6 cells/μL). His right lower extremity is more swollen than the left lower extremity. It is erythematous, warm, and painful to touch. There is no drainage.

1. **What is on your differential diagnosis for this patient?**
2. **What are the most common pathogens?**
3. **What additional history would you like to obtain?**
4. **Are you admitting this patient?**
5. **Which antibiotics will you prescribe?**

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| **Antibiotic** | **-Static or -Cidal** | **Mechanism of Action** |
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1. **How long will you treat with antibiotics?**

**Case 2**

Ms. Ethel Coli, a 33-year-old who identifies as a woman and has type 2 diabetes mellitus, presents to the hospital for frequent urination and burning with urination. She is not experiencing fevers, chills, nausea, vomiting, back or flank pain, or vaginal discharge or pruritis. She does have some lower abdominal pain. Symptoms have been present for 2 days. She drank some cranberry juice without resolution. Vital signs are all normal.

1. **What are the most common organisms responsible for her symptoms? What additional workup do you want to obtain?**
2. **How would you treat Ms. Coli’s infection?**

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| **Antibiotic** | **-Static vs. -Cidal** | **Mechanism of Action** |
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1. **What additional history would make Ms. Coli’s cystitis complicated?**
2. **What additional organisms would you need to consider covering for with complicated cystitis?**
3. **How would your management change if the patient presented with dysuria, fever, right-sided flank pain, nausea and vomiting?**
4. **Ms. Coli is admitted to the hospital for pyelonephritis. She is unable to eat anything given her extreme nausea and is vomiting up all medications. She appears very dehydrated. Her blood cultures grew pan-sensitive E. coli. How would you treat her infection?**

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| Antibiotic | -Static vs. -Cidal | Mechanism of Action |
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**Case 3**

Mr. Franco Mycin is a 61-year-old male with past medical history of COPD on 2 L O2 at home, CKD (baseline creatinine 1.4), type 2 diabetes mellitus, hypertension, aortic aneurysm (stable, monitoring at this time), who presents with fever, chills, dry cough, and extreme pain and swelling in his left lower extremity. He was seen in his primary care physician’s office 2 days ago for his lower extremity pain and swelling and is worried he caught a respiratory virus at the office. His doctor diagnosed him with cellulitis at the time and sent him home on amoxicillin and doxycycline. He noted some gross drainage from the leg as well. He was supposed to follow up in a few days, but his swelling worsened and his pain has become unbearable.

His vital signs on arrival are:
T 102.4. HR 110. BP 104/56. RR 18. SpO2 100% on 2 L

Labs:
WBC 15k (90% PMNs), Hgb 13, Plt 350k
Na 140, K 3.9, Cl 95, CO2 18, BUN 25, Cr 1.9

1. **What are you concerned about in this patient?**
2. **If you are admitting this patient, what orders would you enter?**

You decide to start Vancomycin. Mr. Mycin reports that the last time he had Vancomycin, he developed a red hot rash. He is concerned and is wondering if he should get that medication again given his allergy. He denies anaphylaxis or desquamating rash.

1. **What are the potential side effects? Can he get vancomycin? How do you dose and manage the vancomycin?**
2. **If he did have an anaphylactic reaction to Vancomycin, what additional medications can you use to treat this patient for MRSA soft tissue infection?**
3. **His blood cultures grow MRSA. What additional workup do you want?**

He is started on Vancomycin, infused slowly, and administered with Benadryl. Three days later, Mr. Mycin reports his lower extremity swelling has improved, but he now is reporting a new cough and some associated shortness of breath. He is now requiring 4 L of oxygen. See the QR code for the chest xray.



1. **How will you change management with this new information?**

Mr. Mycin improves and is discharged to a facility to complete his antibiotic course and rehabilitation.

**Case 4**

Ms. Flora Quinolone is a 42-year-old with past medical history of migraines and anxiety, who presented to the hospital with abdominal pain. The pain started last night and has been constant and progressively worsening over the last 12 hours. She describes it as sharp. No diarrhea but has been nauseous since the pain began and vomited a few times at home. She was taking tylenol for the pain but hasn’t been able to keep it down. She can’t recall any fevers but has not checked her temperature. She is sexually active with 2 male partners and uses condoms inconsistently.

Vitals: T 99.1 HR 100 BP 110/78 RR 21 SpO2 98% on RA

Exam:
General: Appears uncomfortable, but not in acute distress
HEENT: Normocephalic, atraumatic. Pupils equal and round. Oropharynx normal without evidence of erythema or exudate.
Neck: Supple, thyroid normal.
Cardiac: Normal S1 and S2, slightly tachycardic. No murmurs appreciated. No edema appreciated.
Lungs: Normal breath sounds bilaterally. Normal work of breathing, slightly tachypneic.
Abdomen: Slightly decreased bowel sounds. Tenderness to palpation in lower abdomen (LLQ, suprapubic). No rebound or signs of peritonitis.
Skin: No rashes or bruises noted.
Neurology: Moving all 4 extremities spontaneously with normal strength. Cranial nerves intact.
Psych: Normal affect, normal speech.

1. **What is on your differential and what additional information/work up do you want?**
2. **What are the most common organisms responsible for this diagnosis?**
3. **Would you admit this patient?**
4. **What orders would you enter for Ms. Quinolone?**

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1. **When would you order repeat imaging for this patient?**
2. **What if the patient had a positive Trepia test?**