

Weekly Pharmacy Pearl #8 – Culture Susceptibility Interpretation

We've all encountered patients who present to the ED with a recurrent infection of the same site or has a warning for previously grown multi-drug resistant organisms (MDROs) on their chart. This would be a great time for providers to review previous microbiology results to guide initial antibiotic choice.

Bottom Line

- **R = resistant = DO NOT USE**
- **I = intermediate = DO NOT USE**
- **S = sensitive = USE**

Drug	Klebsiella pneumoniae ssp. pneumoniae	
	MIC Interp	MIC Dilutn
Ampicillin	R	>16
Ampicillin/Sulbactam	S	8/4
Cefazolin	S	<2
Ciprofloxacin	S	<1
Gentamicin	S	<1
Nitrofurantoin	S	<32
Tobramycin	S	<1
Trimethoprim/Sulfa	R	>2/38

Which antibiotic should I use since there are multiple susceptible antibiotics?

- **The best practice is to start with the narrowest beta-lactam.**
- Unless allergies or patient-specific factors prevent you, always choose the narrowest agent possible.
- In this case, cefazolin or ampicillin/sulbactam would be great IV choices.

What if patient is stable and can go home? I only see IV antibiotics.

Reported Sensitive IV Antibiotics	PO Options
Penicillin G	Penicillin V potassium
Nafcillin or Oxacillin	Dicloxacillin
Ampicillin	Amoxicillin
Ampicillin/Sulbactam	Amoxicillin-clavulanate
Cefazolin	Cephalexin, cefuroxime, cefadroxil, cefaclor, cefprozil
Ceftriaxone	Cefdinir, cefpodoxime, cefixime

- In this case, nitrofurantoin is a great PO option if the patient has uncomplicated cystitis, CrCl > 30 ml/min and not elderly. More on this next week!
- Ciprofloxacin is a fine choice for patients who are generally healthy and have good renal function.

Do I have to do anything with MIC numbers?

- No! Don't worry about it.

If it's sensitive to ciprofloxacin, is it sensitive to levofloxacin and vice versa?

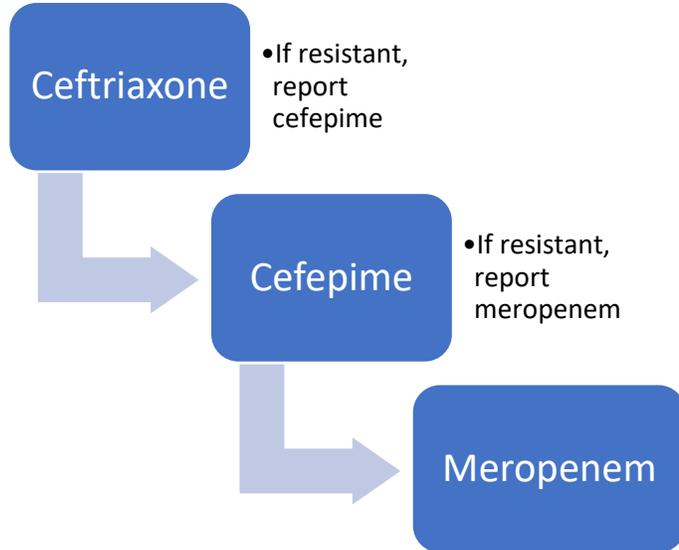
- Be careful if you do not specifically see both drugs' sensitivity results reported.
- There are a few coverage differences between the two antibiotics so you cannot assume they cover the same pathogens. More on this next week!

Why do certain antibiotic sensitivities appear for one patient and not for the other even though they have the same pathogen?

Susceptibility Results Cascade Reporting Algorithm

1. Secondary agents will only be reported if an organism is resistant to primary agents within a particular drug class.
 - Susceptibilities are performed for the narrowest-spectrum antibiotics first

Example:



*If the pathogen was sensitive to ceftriaxone, you would not see cefepime or meropenem susceptibility results

2. Secondary antibiotics are suppressed from resulting (unless primary antibiotics are resistant) for various reasons:
 - Too broad-spectrum
 - High cost agents
 - High toxicity agents
 - Potential for overprescribing
3. Susceptibilities from at least two different antibiotic classes are reported in case of allergies or contraindications
4. For certain pathogens, commonly chosen antibiotics will always be reported even if resistant
 - Examples: Ampicillin, cefazolin, nitrofurantoin, sulfamethoxazole/trimethoprim for Klebsiella
5. If an organism is inherently resistant to an agent, that agent will not be tested nor reported
 - Examples:
 - Cefazolin or ceftriaxone for *Pseudomonas*
 - Aztreonam for gram positive organisms
 - Ertapenem for *Pseudomonas*, *Acinetobacter*, *Enterococcus*
 - Cephalosporins for *Enterococcus species*

Drug	Enterococcus species	
	MIC Interp	MIC Dilutn
Ampicillin	S	<2
Ciprofloxacin	S	<1
Nitrofurantoin	S	<32
Tetracycline	R	>8