



## Selecting an Antibiotic from a Susceptibility Report

A susceptibility report, sometimes referred to as a sensitivity report, provides information on the activity of antimicrobials against pathogens identified in culture. A susceptibility report will include interpretations (e.g. susceptible, susceptible dose dependent, intermediate, resistant) of some or all of the drugs tested<sup>1</sup>. For more information on bacterial susceptibility testing, check out the KASIC pearl "[What is a Minimum Inhibitory Concentration?](#)"

### So Many Options - Which Antibiotic Do I Choose?

Consider the following when selecting an antibiotic<sup>2</sup>:

**Efficacy:** Some antibiotics may be reported as susceptible, but are clinically less effective than comparators. For example, vancomycin is less effective than beta-lactams for the treatment of severe methicillin-susceptible *Staphylococcus aureus* (MSSA) infections. Guideline recommendations will take into consideration efficacy and can be a good resource to use in tandem with susceptibility reports.

**Safety:** Consider patient specific characteristics with drug interactions, side effect profile, black box warnings, and allergies. For example, quinolones are high risk for *Clostridioides difficile* infection, therefore lower risk alternatives may be preferred in patients with a recent history of *C. difficile* infection.

**Site of Infection:** The drug must distribute to the infected site. Some drugs may be reported as susceptible by the microbiology lab, but may not reach the site of infection at sufficient concentration or are inactive at the specific site of infection. For example, daptomycin may be report as susceptible from a blood culture growing MRSA, but should not be used if the source of the bacteremia is from pneumonia.

**Patient Characteristics:** The patient must be right for the drug. Patient's renal function, liver function, weight, and comorbid disease states must be accounted for to ensure safety and efficacy. For example, nitrofurantoin is an excellent option for the treatment of cystitis, but is not be appropriate for patients with an eCrCl < 30 mL/min.

**Administration burden:** An antibiotic will only work if the patient can take it. Consider patient capabilities for multiple daily administrations and/or IV administration.

**Spectrum:** The antibiotic should be the most narrow spectrum agent that satisfies the above criteria. Using an overly broad agent can increase antimicrobial resistance and often also increases risk for *C. difficile* infection. **Even in critically ill patients**, narrow spectrum agents can be effective.

**Access:** A great antibiotic won't work if the patient can't afford it. Many antibiotics are inexpensive, but some require prior authorization from insurance companies.

**Key Takeaway:** There are multiple considerations in addition to a susceptibility report when selecting an antibiotic. Safety and efficacy are the priority, but using the most narrow spectrum agent helps control the emergence of antimicrobial resistance and keeps antibiotics working for future patients.

### Reference:

1. L. Barth Reller, Melvin Weinstein, James H. Jorgensen, Mary Jane Ferraro, Antimicrobial Susceptibility Testing: A Review of General Principles and Contemporary Practices, Clinical Infectious Diseases, Volume 49, Issue 11, 1 December 2009
2. Bennett, Raphael Dolin, Martin J. Blaser. Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases. Philadelphia, PA :Elsevier/Saunders, 2015.

