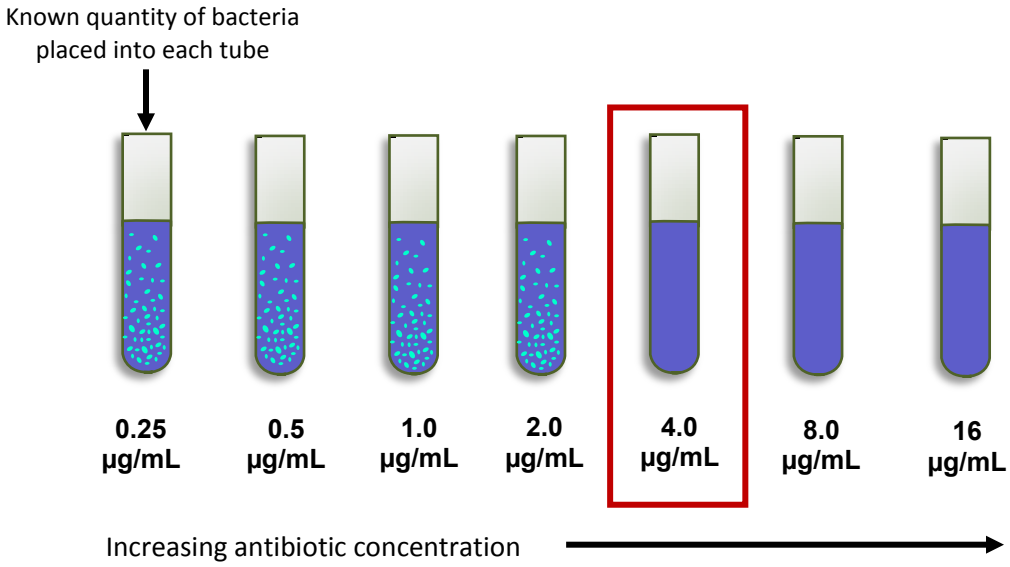
Frequency Asked Questions: Minimum Inhibitory Concentrations

What is a minimum inhibitory concentration (MIC)?

- The lowest concentration of an antimicrobial that results in the inhibition of visible growth of a microorganism.



How is the MIC interpreted?

- **Susceptible** – isolates are inhibited by the usually achievable concentrations of antimicrobial agent when the dosage recommended to treat the site of infection
- **Susceptible-Dose Dependent** – implies that the susceptibility of an isolate is dependent on the dosing regimen that is used in the patient (Carilion Clinic Antibiotic Dosing Guidelines account for these interpretations)
- **Intermediate** – isolates with antimicrobial agent MICs that approach usually attainable blood and tissue levels, and for which response rates may be lower than for susceptible isolates
- **Resistant** – isolates are not inhibited by the usually achievable concentrations of the agent with normal dosages

How to select an antimicrobial? Should the antibiotic with the lowest reported MIC be used?

- Antimicrobials should always be selected keeping in mind the source of infection and patient specific factors.
- Antimicrobials should **NOT be selected based on the lowest reported MIC**. Each breakpoint is specific to an antimicrobial and organism. In general terms, if the isolated is listed as susceptible the most narrow spectrum antimicrobial with good penetration to the site of infection should be used. Consider contacting the Infectious Diseases consult service for help with selecting an appropriate agent if need.

MV is a 69 yo female whom presented with dysuria and increase urinary frequency. Her urine culture revealed >100,000 CFU E. coli with susceptibilities below. She has NKDA. Which agent would be the most appropriate?

Antibiotic	Interpretation	MIC
Cefazolin	Susceptible	4 mcg/mL
Ceftriaxone	Susceptible	≤ 1 mcg/mL
Levofloxacin	Susceptible	0.25 mcg/mL
Nitrofurantoin	Resistant	≥ 128 mcg/mL

Although levofloxacin has to lowest MIC, cefazolin (or the oral equivalent, cephalexin) is the most appropriate agent since it is the most narrow spectrum agent.
Remember: the lowest MIC does NOT mean the most susceptible, since breakpoints are unique to each antimicrobial.

Reference:
1. CLSI. Performance Standards for Antimicrobial Susceptibility Testing. M100S 26th Edition 2016.