About Antibiograms

(ANTIMICROBIAL SUSCEPTIBILITIES OF SELECTED PATHOGENS)

What is an antibiogram?

An antibiogram is an overall profile of antimicrobial susceptibility testing results of a specific microorganism to a battery of antimicrobial drugs. This profile is generated by the laboratory using aggregate data from a hospital or healthcare system; data are summarized periodically and presented showing percentages of organisms tested that are susceptible to a particular antimicrobial drug. Only results for antimicrobial drugs that are routinely tested and clinically useful should be presented to clinicians.

The Clinical and Laboratory Standards Institute (CLSI; formerly NCCLS) published guidelines entitled "Analysis and Presentation of Cumulative Antimicrobial Susceptibility Test Data" for use when creating an antibiogram. CLSI guidelines recommend compiling the antibiogram at least annually, including only the first isolate per patient in the period analyzed, and including only organisms for which ≥30 isolates were tested in the period analyzed. Antibiograms are compiled mainly by microbiology laboratory technologists, but may be a collaborative effort involving the lab, pharmacy, infection preventionists, and clinicians.

Antibiogram Uses

Antibiograms help guide the clinician and pharmacist in selecting the best empiric antimicrobial treatment in the event of pending microbiology culture and susceptibility results.

They are also useful tools for detecting and monitoring trends in antimicrobial resistance. When antimicrobial susceptibility testing data are summarized cumulatively for a hospital, healthcare system, or other healthcare facility periodically (such as yearly or quarterly), trends in resistance can be identified and investigated.

Antibiogram Limitations

While the antibiogram is useful it should not be relied upon as the sole tool for guiding therapy. Limitations of the antibiogram are as follows:

• Minimum inhibitory concentrations (MICs) are not included; as a result subtle trends below the resistance threshold (known as "MIC creep") are not reflected
• Data do not take into account patient factors such as history of infection or past antimicrobial use. Resistance patterns for certain drugs vary significantly by age, and a patient's underlying medical condition may affect how well an antimicrobial works
• Data are the result of single organism-antimicrobial combinations, therefore do not show trends in cross-resistance of an organism to other drugs, nor do they reveal synergistic properties of antimicrobials used in combination
• Data may not be generalizable to specific patient populations or locations of a healthcare facility if the antibiogram is compiled using hospital- or healthcare system-wide data

Example: 2013 Antibiogram (% susceptible) Gram-negative

Organism	# tested	Cefepime	Ciprofloxacin	Gentamicin	Meropenem
E. coli	1272	99	85	93	99
Klebsiella pneumoniae	254	98	96	98	98
Enterobacter cloacae	167	94	87	93	95
Proteus mirabilis	173	99	79	92	100

Example: 2013 Antibiogram (% susceptible) Gram-positive

Organism	# tested	Cefepime	Ciprofloxacin	Gentamicin	Meropenem
S. aureus (MSSA)	2415	85	63	96	100
S. aureus (MRSA)	1551	22	11	96	100
Coagulase neg. Staph	1860	53	34	84	100
Enterococcus spp.	1737	61	--	--	95

Minnesota Department of Health
Infectious Disease Epidemiology, Prevention, and Control Division
651-201-5414 | 1-877-676-5414 | www.health.state.mn.us

1/2015