LexaGene

Antimicrobial Resistance **Glossary**

Antibiotic	A drug that is used for treating bacterial infections. The original definition only included substances naturally produced by certain microorganisms that inhibited the growth of others.
Antimicrobial Drug	A drug with natural or synthetic origin used to kill or stop the growth of microorganisms (i.e., bacteria, viruses, fungi, and parasites). They include antibiotics, antivirals, antifungals, and antiparasitics.
Antimicrobial Resistance (AMR)	The development of a microorganism's ability to survive in the presence of the antimicrobials that are used to treat them. Resistance implies that isolates continue to grow even in the presence of antimicrobial drugs.
Antimicrobial Susceptibility Testing (AST)	Laboratory testing procedure performed on microbes that determines the concentration of an antimicrobial required to inhibit microbial growth. Results identify whether bacteria are susceptible (can be treated with the drug), intermediate (may be treatable with the drug, but may require adjusted dosage), or resistant (cannot be treated with drug).
Antimicrobial Stewardship	Coordinated program that optimizes the selection, dosage, and duration of antimicrobial treatment. Outcomes promote the appropriate use of antimicrobials (including antibiotics), improve patient outcomes, minimize microbial resistance development, and decrease the spread of infections caused by multidrug-resistant organisms.
Beta-Lactamase	Enzyme produced by some bacteria that neutralize the effects of beta-lactam antibiotics. The enzymes hydrolyze the beta-lactam ring of these drugs, rendering them inactive.
Beta-Lactam Antibiotics	Antibiotics that contain a beta-lactam ring in their molecular structure. They act on bacteria by binding to and inactivating enzymes required for cell wall synthesis. Subclasses of these antibiotics include cephalosporins and cephamycins, carabapenems, monobactams, penicillins.
Carbapenems	A subgroup of beta-lactam antibiotics that possess broad spectrum activity, which includes activity against gram-negative, gram-positive, and anaerobic bacteria. Carbapenems are one of the few remaining antibiotics that can treat undesirable ESBL (extended-spectrum beta-lactamase) producing bacteria.
Culture and Sensitivity Test	A laboratory test used to determine the type of infection, bacteria present, and most appropriate antibiotic required to treat the infection.

Extended-Spectrum Beta-Lactamases (EBSL)	Enzymes produced by bacteria that confer resistance to most beta-lactam antibiotics. This evolving group can hydrolyze extended-spectrum cephalosporin (i.e., break down and destroy these commonly used antibiotics) and is active against antibiotics such as ceftazidime, ceftriaxone, cefotaxime and oxyiminomonobactam.
Gram-Negative	Bacteria that contain a cell wall composed of a cytoplasmic inner membrane surrounded by a thin peptidoglycan layer, which is surrounded by an outer membrane consisting of lipopolysaccharide. The cell wall structure affects the cell's ability to retain the crystal violet stain used during a Gram stain, resulting in a pink or red color of the counter stain when viewed by light microscopy.
Gram-Positive	Bacteria that contain a cytoplasmic membrane surrounded by a thick rigid bacteria cell wall composed of peptidoglycan. These bacteria readily take up and retain crystal violet during a Gram stain and appear purple when viewed by light microscopy.
International Society for Companion Animal Infectious Disease (ISCAID) Guidelines	Refers to a set of guidelines that provide recommendations for the diagnosis and management of infectious diseases in dogs and cats.
Methicillin-Resistant *Staphylococcus aureus* (MRSA)	A multi-drug resistant type of *S. aureus* that is genetically distinct from other strains and one of the most important causes of hospital-acquired infections worldwide. These organisms are resistant to almost all beta-lactam antibiotics and often carry resistance markers for other classes of antimicrobials.
Minimum Inhibitory Concentration (MIC)	The lowest concentration of an antibiotic that will inhibit the growth of bacteria. It is used to determine if a drug is susceptible or resistant to a particular organism (i.e., bacteria).
Molecular Diagnostics (MDx)	Refers to a collection of methods used to analyze DNA or RNA to provide clinical information.
Pathogen	A microorganism capable of causing disease.
Polymerase Chain Reaction (PCR)	Molecular detection method used to amplify small segments of DNA or RNA for use in laboratory procedures.
Point-of-Care Testing	Testing used by healthcare professionals performed at the time of patient consultation. It provides results within a short time of the test being administered and allows immediate and informed decision making about patient care.
Real-Time Polymerase Chain Reaction	Also known as quantitative polymerase chain reaction (qPCR), it is a molecular biology laboratory technique that monitors DNA amplification during the PCR in real-time. If the sample of interest contains a target DNA sequence, fluorescent probes or DNA binding dyes will attach, activate, and produce a detectable signal that is then measured and quantified.
Resistance Gene	A region of DNA that encodes for the resistance against antimicrobials.
Susceptibility	Likelihood of a microorganism's growth to be inhibited in the presence of an antimicrobial drug. If a microorganism is susceptible, it will be inhibited by the recommended drug dosage during MIC testing.