Intrinsic Antibiotic Resistance

Appropriate antibiotic selection is important in the treatment of bacterial infections. Knowledge regarding antibiotic resistance in certain organisms can be helpful in making the right therapeutic choice.

There are two types of bacterial resistance to antibiotics, acquired and intrinsic resistance. **Acquired resistance** arises through mutation or exchange of genetic material between bacteria. **Intrinsic resistance** is a natural insensitivity in bacteria that have never been susceptible to a particular antibiotic. All (or almost all) members of a particular bacterial genus or species will exhibit the same intrinsic (innate) resistance, which can be predicted from an organism's identity. For example, *Pseudomonas aeruginosa* is intrinsically resistant to many classes of antibiotics due to a low number of porins in its outer membrane, which means that many antibiotics cannot penetrate to the interior of the bacterial cell.

Some common examples of intrinsic resistance are shown in the following table (based on *Antimicrobial Therapy in Veterinary Medicine* 4th edition, 2006. Giguere S, Prescott JF et al):

Knowledge of the intrinsic resistance of a bacterial isolate can be important in practice to choose the best first line antibiotic as well as avoid inappropriate therapy. QML Vetnostics does not test bacterial isolates against antibiotics to which they are intrinsically resistant, but indicates these resistances in the reports.

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	Gram positive		Gram negative				
	Streptococcus sp	Enterococcus sp	Klebsiella sp	Enterobacter sp, Citrobacter sp, Morganella sp	Serratia marcescens	Proteus vulgaris, Proteus penneri	Pseudomonas aeruginosa
Ampicillin/amoxycillin			●	●	●	●	●
Amoxycillin-clavulanic acid				●	●		●
Cephalosporins (1st generation)		●		●	●	●	●
Cephalosporins (2nd, 3rd generation)		●					●[a]
Tetracycline/Doxycycline						●	●
Trimethoprim-sulfamethoxazole		●					●
Macrolides (e.g. erythromycin)			●	●	●	●	●
Lincosamides (e.g. clindamycin)		●	●	●	●	●	●
Aminoglycosides[b]	●[c]	●[c]					
Chloramphenicol (and florfenicol)							●
Polymyxin B	●	●			●	●	

a includes resistance to cefovecin (Convenia®). Exceptions include ceftazidime.
b e.g. gentamicin, neomycin, framycetin.
c resistant to low dose aminoglycoside therapy.

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