

Changes to Cephalosporin Susceptibility Reporting

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In the Literature

Papich MG, Lindeman C. Cephalexin susceptibility breakpoint for veterinary isolates: Clinical Laboratory Standards Institute revision. *J Vet Diagn Invest.* 2018;30(1):113-120.

FROM THE PAGE ...

Microbial culture and susceptibility testing is an integral part of the diagnosis and treatment of bacterial infections. The Clinical Laboratory Standards Institute (CLSI) evaluates the antibiotic concentration (ie, breakpoint) required to prevent growth of cultured bacteria, the drug's pharmacokinetic properties, and the likelihood of clinical success for typical doses of the antibiotic to determine whether an isolate will be susceptible (S), intermediate (I), or resistant (R) to that particular drug. Cephalothin, a first-generation cephalosporin, has historically been evaluated to predict the susceptibility to all other oral drugs within that class (eg, cephalexin, cefadroxil, cephapirin). However, research has shown that cephalothin is poor at predicting cephalexin susceptibility. This limitation, combined with cephalexin's position as the most commonly prescribed first-generation cephalosporin, highlights the need for cephalexin-specific CLSI guidelines.

This study evaluated bacterial isolates from a 4-year time span to determine minimum inhibitory concentration (MIC) breakpoints for 4 cephalosporins used in veterinary medicine (ie, cephalexin, cephalothin, cefovecin, cefpodoxime) and simulated the likelihood of successful eradication of the infection. The study results showed discrepancies in susceptibility between cephalothin and cephalexin. Most notable were

the susceptibility results for the *Staphylococcus pseudintermedius* isolates that were positive for penicillin-binding protein 2A. Only 4.3% of these isolates had MIC values ≤ 2 $\mu\text{g/mL}$ for cephalexin as compared with 66.3% for cephalothin. These results further confirm the poor agreement of cephalothin to predict cephalexin susceptibility, which has led the CLSI to replace cephalothin with cephalexin for testing canine isolates.

... TO YOUR PATIENTS

Key pearls to put into practice:

- 1** Microbiology laboratories should replace cephalothin with cephalexin on culture and susceptibility reports.
- 2** Cephalexin at 25 mg/kg PO q12h has a 90% likelihood of clinical success in dogs when treating isolates with a MIC ≤ 2 $\mu\text{g/mL}$. The likelihood of success for isolates with MICs of 4 $\mu\text{g/mL}$ and 8 $\mu\text{g/mL}$ is only 73% and 47%, respectively. Alternative drugs should be considered at these higher MICs based on culture and susceptibility report results.
- 3** If a bacterial isolate is resistant to oxacillin, it should also be considered resistant to all other β -lactam drugs, including cephalexin and cephalothin. Alternative drug classes should be used to treat such infections.