Limitations of Antimicrobial Susceptibility Testing

It is important to understand the limitations of antimicrobial susceptibility testing. It should be recognized that resistance patterns will change and guidelines will be subject to periodic revision. The interpretation of an antimicrobial susceptibility test result on a laboratory report must never be taken in isolation. It is important that all factors are taken into account and that it should be remembered that there is no substitute for sound clinical judgment.

There are cases where susceptibility testing is not indicated. This may include, organisms with predictable susceptibility patterns, the mode of delivery of the antibiotic to the target site, or in some cases the fact that there are no interpretative guidelines for the susceptibility of an individual organism and therefore appropriate clinical judgment will be more beneficial than an in vitro susceptibility test.

The laboratory testing of organisms with predictable susceptibility testing is not recommended by international guidelines. In these organisms the overwhelming majority (and in some cases all) isolates are susceptible to the recommended antibiotics. Susceptibility testing of these isolates is therefore not indicated. All that is achieved is that there is a time delay in reporting of the results, and therefore in the possibility of proper therapy being initiated. Organisms in this category include beta-hemolytic streptococci and Pasteurella species.

The laboratory routinely tests for the susceptibility of organisms up to a concentration of around 256 µg/ml. However, because concentrations of antibiotics achieved after topical application are much higher than those which can be safely achieved in systemic therapy, standardized susceptibility tests are not appropriate to predict its effectiveness.

CLSI guidelines state that both disc diffusion and MIC dilution methods have been standardized for specific organisms. However for some fastidious organisms, studies are not yet adequate to develop reproducible definitive standards. It is suggested that susceptibility testing not be carried out due to marked differences in atmosphere, growth rate and strain to strain variation among isolates.

References
1. Performance standards for antimicrobial disc and dilution susceptibility tests for bacteria isolated from animals. Approved Standard. CLSI. M31-A. June 1999