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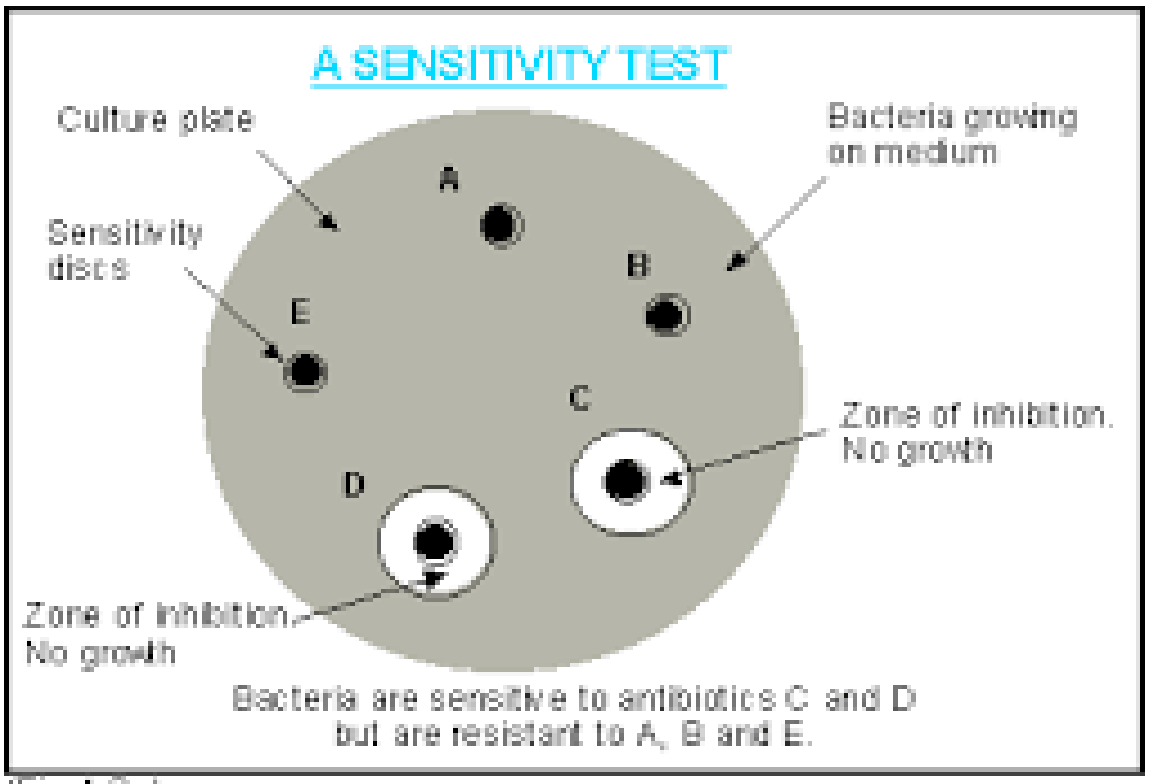
Antibiotic sensitivity is the susceptibility of bacteria to antibiotics. Antibiotic susceptibility testing (AST) is usually carried out to determine which antibiotic will be most successful in treating a bacterial infection *in vivo*. Testing for antibiotic sensitivity is often done by the Kirby-Bauer method. Small disc containing antibiotics are placed onto Müeller-Hinton agar plate used to grow different bacterial species. If the bacteria are sensitive to the antibiotic, a clear ring, or zone of inhibition, is seen around the wafer indicating poor growth. Müeller-Hinton agar is most frequently used in this antibiotic susceptibility test.

Antibiotic sensitivity Thin disc containing antibiotic have been placed on an Müeller-Hinton agar plate growing bacteria. Bacteria are not able to grow around antibiotics to which they are sensitive.



(Fig.4-3a)

Ideal antibiotic therapy is based on determination of the etiological agent and its relevant antibiotic sensitivity. Treatment is often started before laboratory microbiological reports are available when treatment should not be delayed due to the seriousness of the disease. The effectiveness of individual antibiotics varies with the location of the infection, the ability of the antibiotic to reach the site of infection, and the ability of the bacteria to resist or inactivate the antibiotic. Some antibiotics actually kill the bacteria (bactericidal), whereas others merely prevent the bacteria from multiplying (bacteriostatic) so that the host's immune system can overcome them.

Minimum inhibitory concentration (MIC)

In microbiology, **minimum inhibitory concentration** (MIC) is the lowest concentration of an antimicrobial that will inhibit the visible growth of a microorganism after overnight incubation. Minimum inhibitory concentrations are important in diagnostic laboratories to confirm resistance of microorganisms to an antimicrobial agent and also to monitor the activity of new antimicrobial agents. A MIC is generally regarded as the most basic laboratory measurement of the activity of an antimicrobial agent against an organism.

Agar and Broth dilution methods for Minimum Inhibitory Concentration determination.

Minimum bactericidal concentration (MBC)

MBC

The **minimum bactericidal concentration** (MBC) is the lowest concentration of an antibacterial agent required to kill 99.9 percent of bacterium. It can be determined from broth dilution minimum inhibitory concentration (MIC) tests by sub culturing to agar plates that do not contain the test agent. The MBC is identified by determining the lowest concentration of antibacterial agent that reduces the viability of the initial bacterial inoculum by ≥99.9%. Antibacterial agents are usually regarded as bactericidal if the MBC is no more than four times the MIC. Because the MBC test uses colony-forming units as a proxy measure of bacterial viability, it can be confounded by antibacterial agents which cause aggregation of bacterial cells. Examples of antibacterial agents which do this include flavonoids and peptides.

The different between MIC and MBC are:

Minimum inhibitory concentrations (MICs) are defined as the lowest concentration of antimicrobial that will inhibit the visible growth of a micro-organism after overnight incubation, and minimum bactericidal concentrations (MBCs) the lowest concentration of antimicrobial that will prevent the growth of an organism after sub-culture on to antibiotic free media.

Determination of MIC (here: broth ditution test)