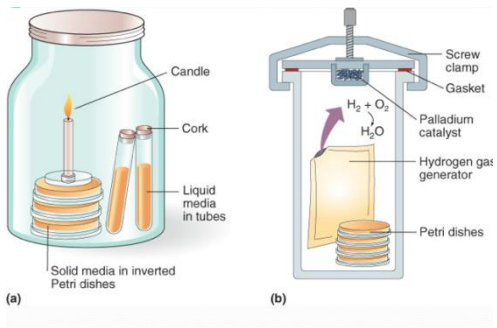
Procedure for antimicrobial susceptibility testing of *Streptococcus pneumoniae* by disc diffusion

Once identification of isolate is confirmed, sub-culture onto **sheep blood agar** and incubate in a **CO_2- enhanced atmosphere** (CO_2 incubator or candle-extinction jar) for 18-24 hours[1].



a) Candle jar
b) Commercial CO_2 generating container

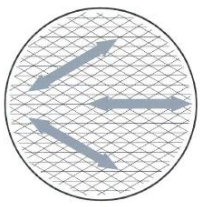
Prepare inoculum

Prepare a **0.5 McFarland** suspension from sheep blood agar[1;2] or **1 McFarland** suspension from chocolate agar[2] of the bacteria to be tested in sterile saline

Compare prepared suspension of the **0.5 McFarland** [1;2] or **1 McFarland**[2] standard (control) and adjust turbidity as needed with sterile saline or pure culture until correct density is achieved. Suspension must be used within 15 minutes [1,3].

Perform **quality control** of medium as appropriate

Inoculate **Mueller Hinton agar (MHA) with 5% sheep blood plate [CLSI] OR MHA + 5% defibrinated horse blood and 20mg/L β-NAD [EUCAST]** by streaking the plate with a sterile swab multiple times in different directions to ensure even confluent growth. Allow to dry (Maximum 10 minutes)



Allow discs and media to reach **ambient temperature** before inoculating plates and placing discs

Perform **quality control** of antimicrobial discs as appropriate.

CLSI[1]	EUCAST[2]
Streptococcus pneumoniae	
Streptococcus pneumoniae ATCC®49619	

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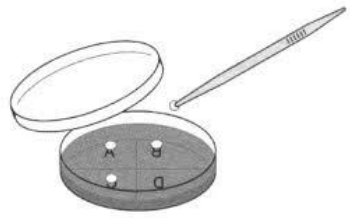
Place discs on plate with sterile forceps/tweezers/disc dispenser. Do not move the discs once they have touched the agar surface.

Incubate

35°C±2°C; 5% CO_2; 20- 24 hours

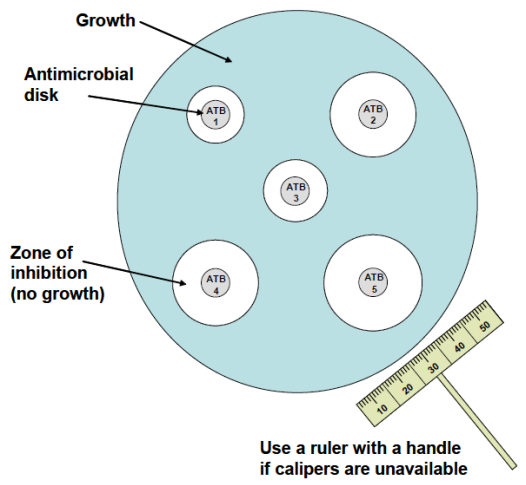


Read **quality control** strain zones of inhibition first. If within limits, read test strain. If quality control fails trouble shoot whole process.

Read zone edges at the point showing no growth against a dark background illuminated with reflected light. Measure zone diameter (mm) using ruler/calipers.

Interpret according to the latest **Clinical and Laboratory Standards Institute (CLSI) / European Committee on Antimicrobial Susceptibility Testing (EUCAST)** guidelines.

Record and report findings.



1. Clinical and Laboratory Standards Institute (2017); Performance Standards for Antimicrobial Susceptibility Testing; Twenty-fifth Information supplement. CLSI document M100-S27
2. European Committee on Antimicrobial Susceptibility Testing; Breakpoint tables for interpretation of MICs and zone diameters. Version 7.1,2017
3. Laboratory methods for the diagnosis of meningitis caused by *Neisseria meningitidis, Streptococcus pneumoniae* and *Haemophilus influenzae*; WHO manual; second edition (2011)