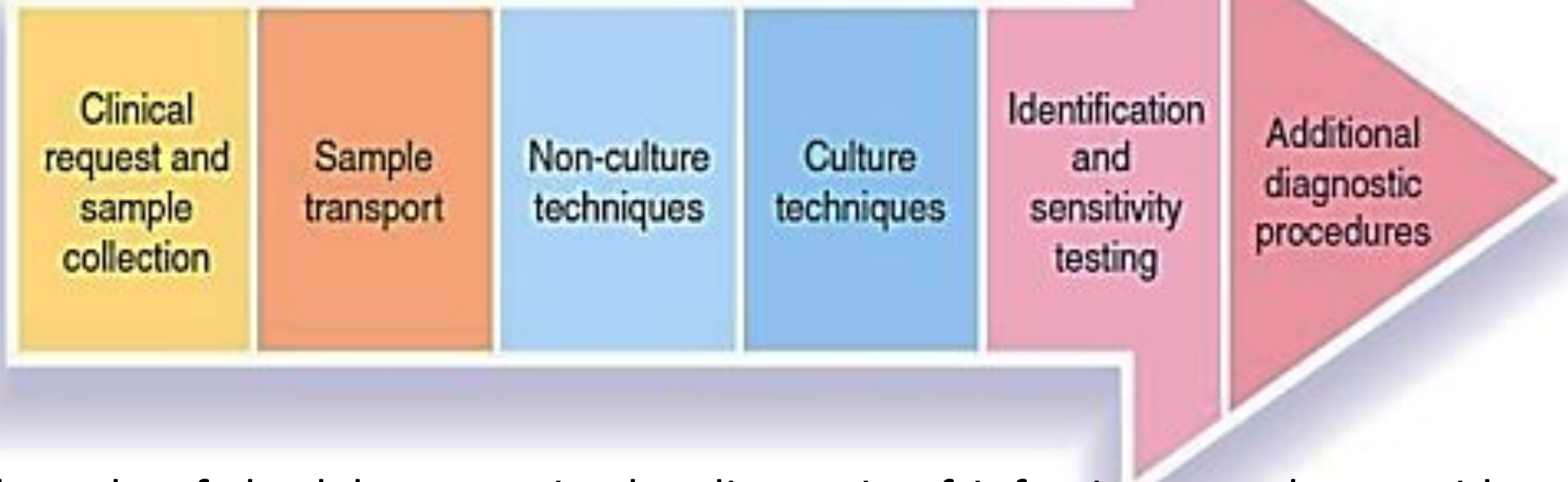




Grade: 4
Lecture : 3

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The role of the laboratory in the diagnosis of infections can be considered a major steps of diagnostic microbiology. If pathogens are to be isolated successfully, **the type of specimen, its collection, time and method of its dispatch to the laboratory** must be correct.

01

Patient details.

02

Clinical diagnosis..

03

**Onset of
symptoms**

04

Sample type

05

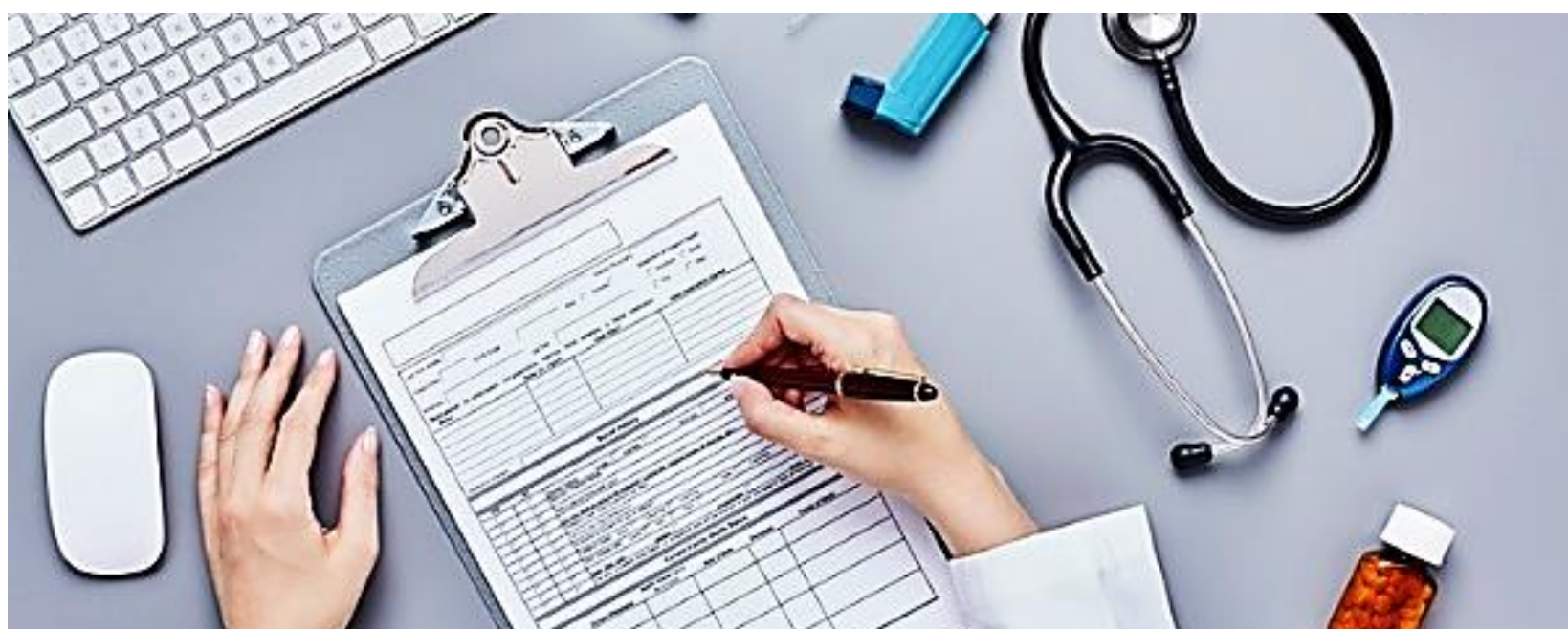
**Time of
collection**

06

**Treatment history and concurrent
antimicrobial therapy**

07

Other health and safety issues. Supporting clinical information, including travel history and contact with infected individuals, is also important.



Essential reported information



A detailed request form that accompanies a clinical sample is pivotal in ensuring the appropriate diagnostic procedures are undertaken; information should include:

Sample collection

Samples for microbiological investigation require careful collection, without contamination from external sources **or the patient's own flora**. When taking clinical samples, it is important to: **use sterile, leak-proof containers; label the specimen correctly;** take care whilst obtaining samples through an area containing a normal flora like vein puncture through skin to obtain blood culture in this instance the skin should be decontaminated with an appropriate antiseptic prior to collecting blood. If possible, specimens for microbiological culture should **be taken prior to commencement** of antibiotic therapy, to avoid false-negative



2-Transport of microbiological specimens

Rapid transport of samples to the microbiology laboratory is essential, as many fastidious microorganisms, such as *Neisseria gonorrhoeae* and *Haemophilus influenza*, die during transit. Furthermore, overgrowth by contaminating normal flora confusing the pathogen may also occur. To minimize these complications,

The microbiology department may adopt several strategies such as:

1. Specimen should reach to the laboratory as soon as possible or a suitable preservative or transport medium must be used.
2. Refrigeration of sample at 4 °C can help to preserve cells and reduce the multiplication of commensals in unpreserved specimens.
3. Freezing at -70 °C or below in the presence of a stabilizing fluid, like glycerol or serum.
4. Ensure that the specimen container is free from cracks, and the cap is leak proof.

5. Seal round the container cap with adhesive tape to prevent loosening and leakage during transit.
6. If the container is glass tube or bottle, use sufficient packaging material to protect a specimen.
7. If the specimen is fluid, use sufficient absorbent material to absorb it.
8. Mark all specimens that may contain highly infectious organism "HIGH RISK".

3- Non-culture techniques

Following receipt of the sample, the microbiology laboratory may utilize non-culture techniques to provide rapid clinical information, which may benefit patient management.

01

Microorganism cannot be readily cultured in vitro

02

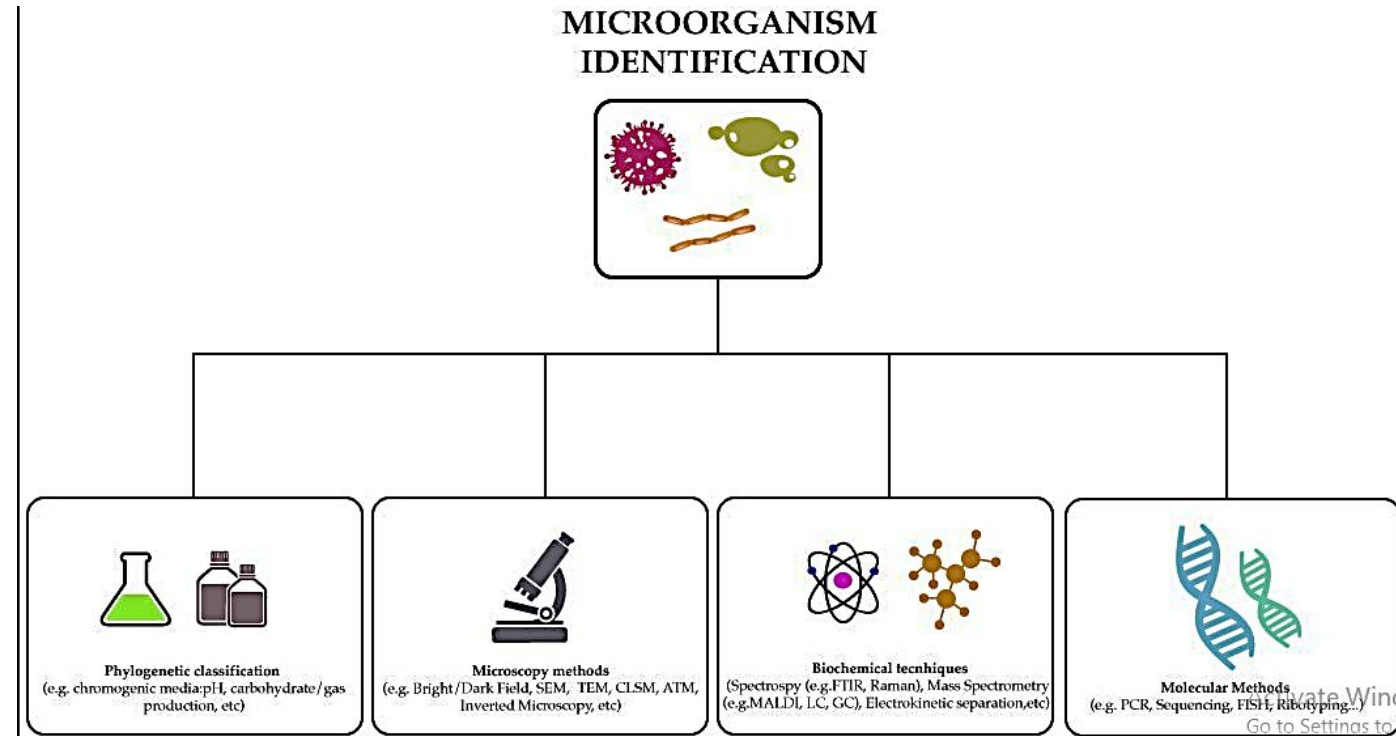
Microorganism is slow-growing

03

Rapid laboratory diagnosis significantly influences clinical management of the patient

04

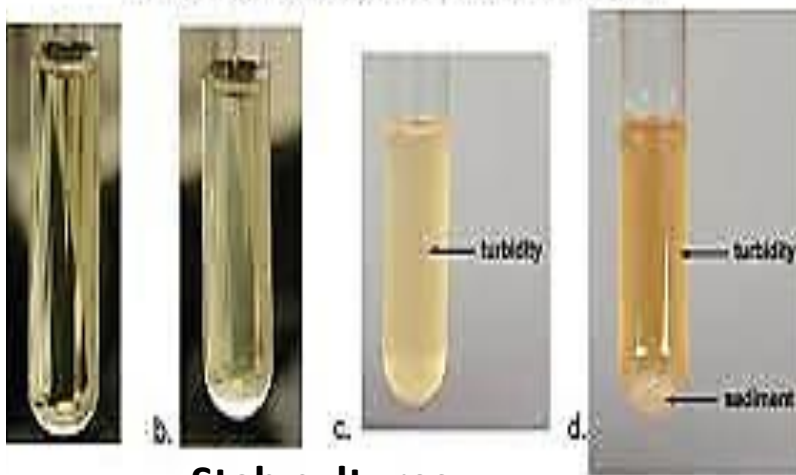
Non-culture techniques include direct microscopy, immunological methods, serology, and nucleic acid amplification techniques (NAAT)



Culture techniques

There are several types of bacterial culture methods that are selected based on the agent being cultured and the downstream use

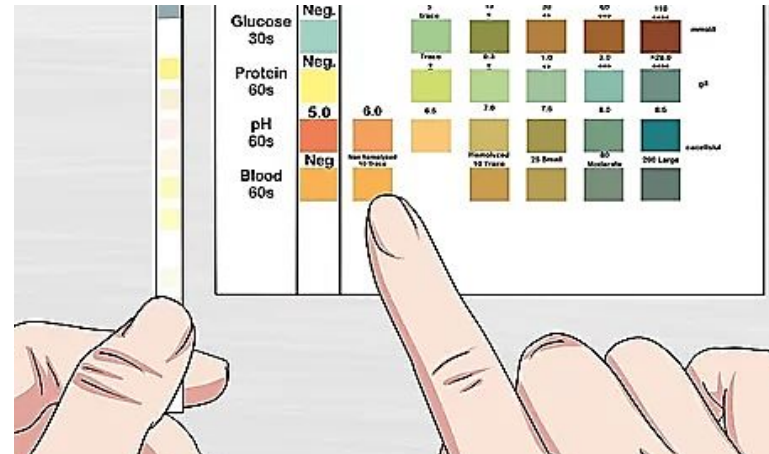
Broth cultures



- Stab cultures.



- Agar based dipsticks.



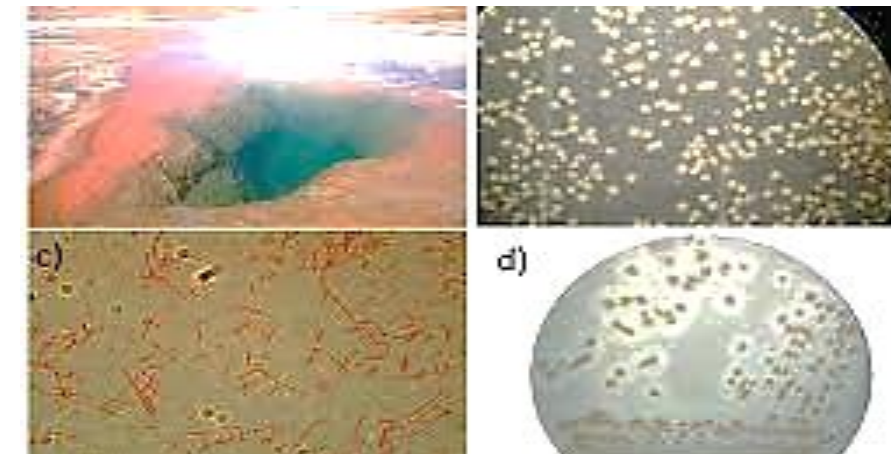
- Culture collections.



- Agar plates.

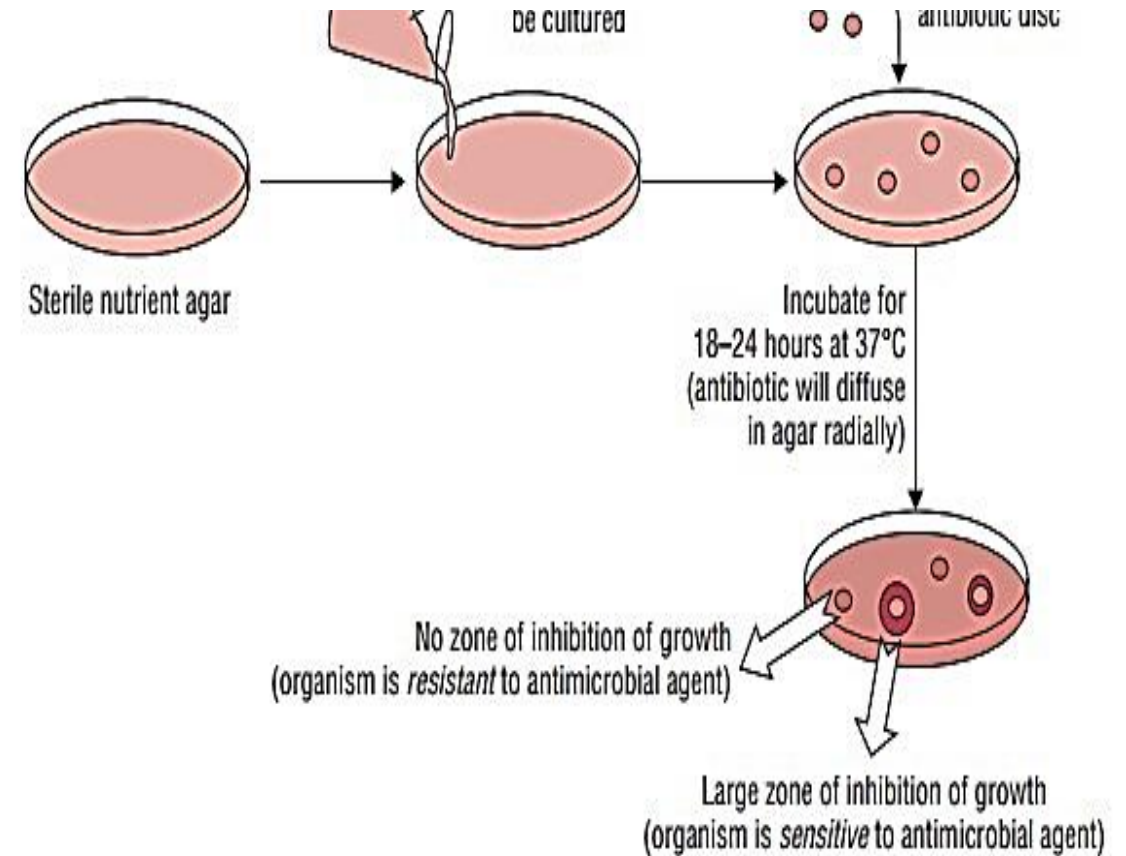


culture of thermophilic microorganisms



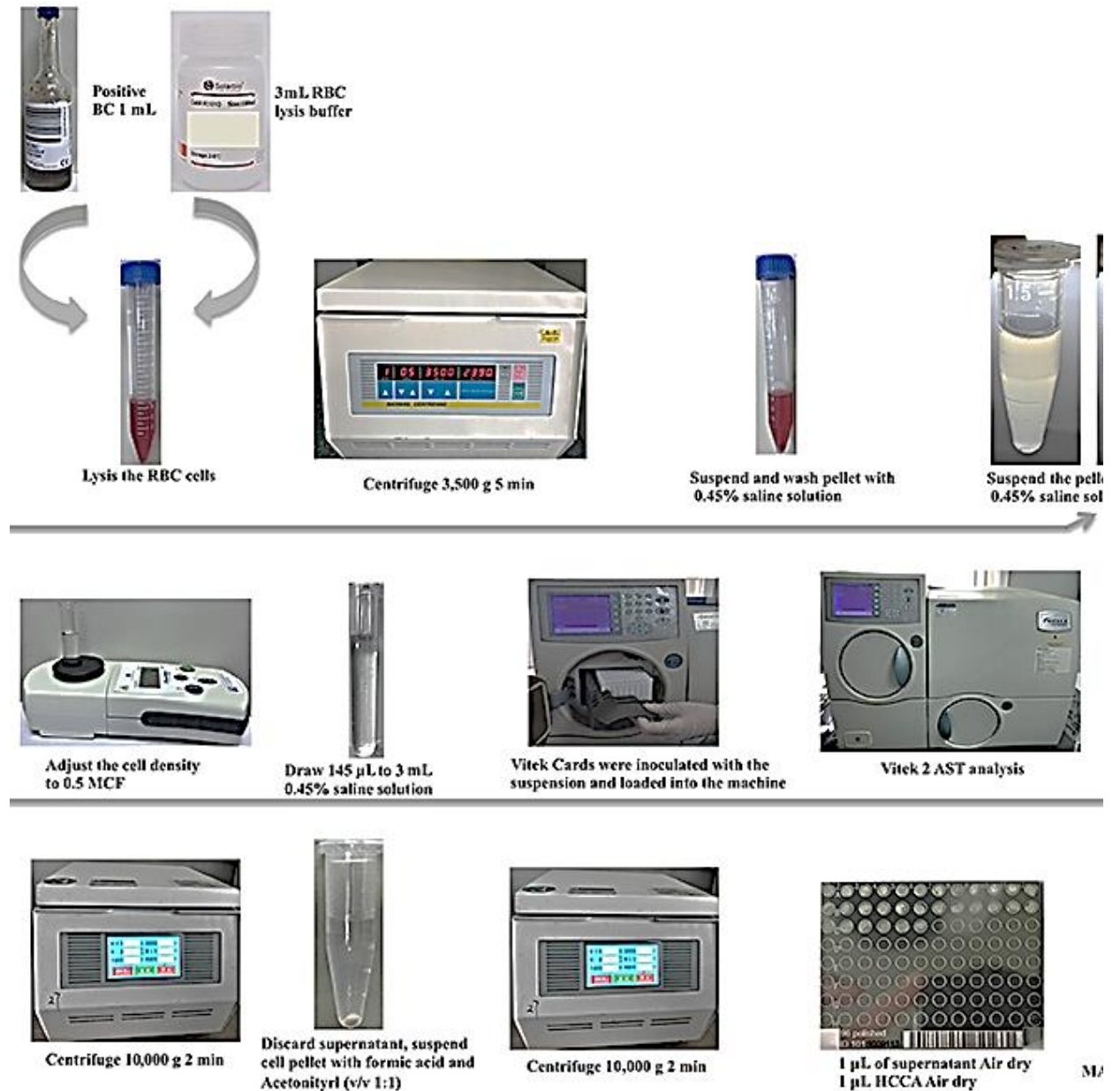
5- Identification and sensitivity testing

Susceptibility testing is used to determine which antimicrobials will inhibit the growth of the bacteria or fungi causing a specific infection. The results from this test will help a health care practitioner determine which drugs are likely to be most effective in treating a person's infection.



6- Further diagnostic procedures for microbiology laboratory

The purpose of diagnostic microbiology is to confirm the suspicion of infectious disease and to identify the etiologic agent, often by bacterial or fungal culture or virus isolation using advanced diagnostic techniques such as Vitek2, Eliesa, Electrophoresis, and PCR...





THANK YOU