Lecture- 3, 4 and 5: Selection, collection, and transport of specimens for microbiological examination

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. (Figure- 1).

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

1. Patient details.

2. Clinical diagnosis.

3. Onset of symptoms

4. Sample type.

5. Time of collection.

6. Treatment history and concurrent antimicrobial therapy.

7. Other health and safety issues.

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

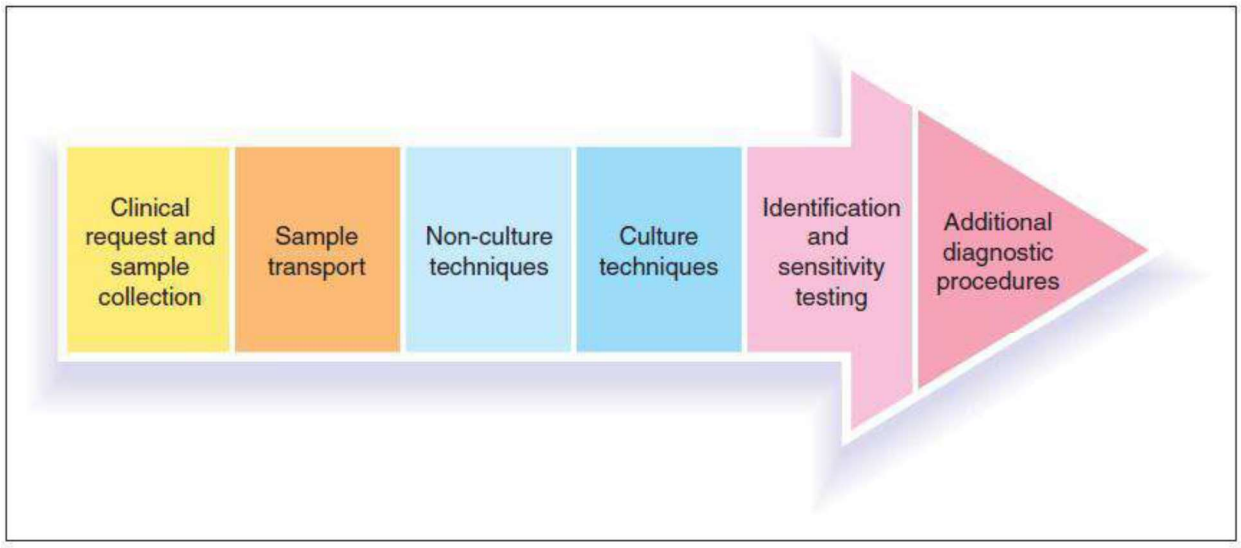

Figure (1): Laboratory diagnostic pattern.

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: 1-** use sterile, leak-proof containers; **2-** label the specimen correctly; **3-** 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. **4-** should be taken prior to antibiotic therapy, to avoid false-negative results.

Transport of microbiological specimens

Rapid transport of samples to the microbiology laboratory is essential, **as many fastidious microorganisms, such as *Neisseria gonorrhoeae* and *Haemophilus influenzae*, 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 ºC can help to preserve cells and reduce the multiplication of commensals in unpreserved specimens.
3. Freezing at -70 ºC 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 prefect a specimen.
7. If the specimen is fluid, use sufficient absorbent material to absorb it.
8. Mark all specimen that may contain highly infectious organism "HIGH RISK".

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. There are several situations where non- culture techniques are of importance:

. Microorganism cannot be readily cultured in vitro;

. Microorganism is slow-growing;

. Rapid laboratory diagnosis significantly influences clinical management of the patient. Non-culture techniques include direct microscopy, immunological methods, serology, and nucleic acid amplification techniques (NAAT).

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