ALMUSTAQBAL UNIVERSITY

College of Health and Medical Techniques
Medical Laboratories Techniques Department

Stage : Fourth year students
Subject : Laboratory Management - Lecture 9

Lecturers:

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Collection and storage of laboratory specimens

General considerations

The interpretation of the microbiological results depends, to a great extent, on the quality of the samples received for study. Therefore, appropriate management of the samples is necessary to achieve an optimal diagnosis in Microbiology.

The clinical syndrome and the possible causing agents involved determine not only the type of sample to be sent, but also the procedure for obtaining, transporting, preserving and processing it. Likewise, clinical information is what allows the laboratory to apply the available diagnostic techniques more efficiently. Therefore, there must be close communication between the microbiologists and the clinicians responsible for the patient, actively participating in the diagnostic process.

Good clinical laboratory practices an international scientific standard for designing and conducting medical tests. The main objectives of the laboratory are:

1) Obtain excellent biological specimens for pathology testing while Ensuring the comfort and safety of the patient and the technician.

2) Preserve the integrity of the specimen to ensure optimum results by:
a. Collecting the specimen into the correct container (size, medium etc.).

b. Storing the specimen at the correct temperature and conditions.

3) Ensure that the specimen is transported to the laboratory in a safe and timely manner

SAMPLE COLLECTION, HANDLING, AND PRESERVATION

The primary objective of sampling is to collect a portion of material small enough in volume to be transported conveniently and handled in the laboratory while still accurately representing the material being sampled.

In general, the shorter the time that elapses between the collection of a sample and its analysis, the more reliable will be the analytical results.

In order for the results provided by the Microbiology Laboratory to be accurate, significant and clinically relevant, it is required that all microbiological samples that arrive at the Lab be correctly selected, collected and transported.

The interpretation and accuracy of the microbiological results still depend to a great extent on :

1. The sample quality and processing within the Microbiology laboratory.

2. The type of specimen,

3. The appropriate time to obtain the sample,

4. The way of sampling,

5. Storage and transportation are critical points in the diagnostic process.

Regardless of the nature of the sample, complete stability for every constituent can never be achieved. At best, preservation methods only serve to retard the chemical and biological changes that inevitably continue after sample collection.

Sample preservation is difficult because almost all preservatives interfere with some of the analyses.

Some determinations are more likely than others to be affected by sample storage before analysis.

Preservation Methods

In general, it is most appropriate for a laboratory to develop a standard procedure for sample preservation in conjunction with the requirements and needs of each test.

The inhibition of biological activity in a sample is often particularly important but Strict rules for the preservation of samples do not exist

Biological activity is usually prevented or reduced by storing samples at low temperatures and keeping them in the dark as much as possible from the time of collection until analysis. Frozen samples should be thawed slowly and well-mixed before analysis. Care is still required to ensure that the sample is analyzed quickly to prevent any subsequent instability

Biological and clinical specimens and materials
Temperature-controlled storage facilities, including cold rooms, freezers or refrigerators, are necessary for the storage of biological and clinical materials to prevent deterioration and the growth of unwanted organisms. Domestic freezers and refrigerators are suitable for the storage of biological specimens.
but those used for particularly delicate organisms or important specimens should be connected to a socket outlet provided with an emergency backup supply(electric power generator) or be fitted with power failure alarms. Unless spark-proofed, domestic equipment should not be used to store specimens preserved in low flashpoint solvents.

The laboratory's responsibilities

The collection of appropriate and optimum samples is the responsibility of the laboratory, even though the actual collection process is often carried out by persons who are not part of the laboratory staff. The sample may be collected at the bedside by a nurse if the patient is being managed in a hospital. The health care provider may collect a sample in a clinic setting. The laboratory can help to ensure good samples by providing collection information to health care personnel at the collection site, making sure that appropriate containers and collection supplies are

available, defining a good labelling system and checking all samples carefully when they arrive in the laboratory.

Test requisition

The first step in the process of obtaining the sample is the request for testing. The laboratory must make available a test request form that specifies all the information that will be needed for proper handling and reporting.

Essential information for the test request form includes:

1. Patient identification (Name, gender and Age)
2. Tests requested
3. Time and date of the sample collection
4. The source of the sample, when appropriate
5. Clinical data, when indicated
6. Contact information for the health care provider requesting the test.