

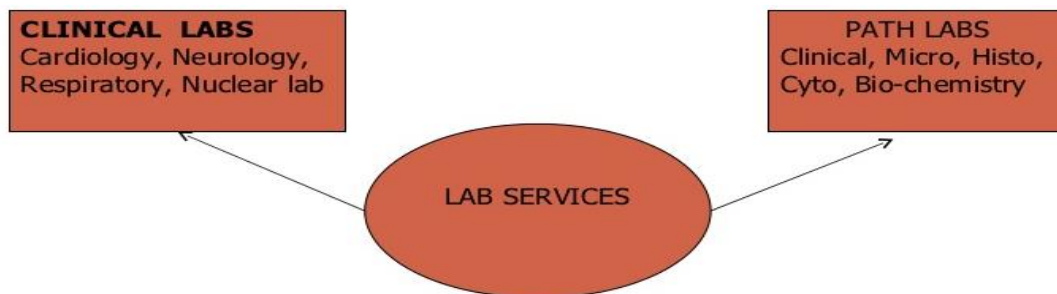


Laboratory services

A **medical laboratory** is a place where tests are done on samples to get information about a patient's health.

Laboratory services include testing materials, tissues, or fluids obtained from a patient or clinical studies to determine the cause and nature of the disease.

Laboratory services play a critical role in detecting, diagnosing, and treating disease. Samples are collected, and examination and analysis of body fluids, tissue, and cells.



The main services are:

- To perform diagnostic tests
- To identify organisms, like *E. coli* bacteria
- To count and classify blood cells to identify infection or disease
- To perform immunological tests to check for antibodies
- To match blood samples for transfusions
- To analyze DNA

Lab equipment and LIS

Planning for equipment

- Basic instruments and equipment should be made available.
- All vital equipment should be in duplicate or have an alternative arrangement.
- Selecting the best instrument for the laboratory is a very important part of equipment management.

Follow elements should be considered during the management program in the lab

- 1) Selection and purchasing
- 2) Installation
- 3) Calibration and performance evaluation
- 4) Maintenance
- 5) Troubleshooting
- 6) Service and repair
- 7) Retiring and disposing of equipment



Lab equipment

Basic equipment for all types of routine investigations are:

A **centrifuge** is a laboratory device used to separate liquids based on their density.

A **water bath** is a device made of a metal bowl, most likely filled with hot water. It is used to incubate samples in water at a constant temperature for a long time. It is also used to heat reagents, dissolve some materials, and incubate environments.

A **microscope** is a device for enlarging small things that cannot be seen with the naked eye or showing the fine details of objects to discover their composition and study.

An **autoclave** is a metal pressure tank designed to heat aqueous solutions above their boiling point at standard atmospheric pressure for sterilization.

A **pH meter** is an instrument used to measure a specific liquid's pH (pH or basic level).

An **incubator** is a device used to grow and maintain microbial colonies or a cell colony.

Balance is used to measure the mass of objects and chemicals with very great accuracy

Other tools and glassware used in the laboratory

Standard flask It has a neck engraved with a sign (___) in the form of a circular line indicating the extent to which the surface of the liquid should reach, and there is a written indication of the size of the vessel.

Burette A graduated glass tube, at the bottom end of which is a plunger glass spout. Various sizes intended to be taken out

The conical flask The solution is transferred to it by the pipette. Easy to move. It is used to prepare, preserve, and measure chemicals and solutions.

Beaker It is a vessel used to stir, mix and mix liquids in chemical laboratories.

A test tube is a glass laboratory instrument with an opening from the top used to pour, transport, or mix solutions, chemicals, and liquids.

LIS

A lab information system (LIS) is a class of software that receives, processes, and stores information generated by medical laboratory processes. These systems often must interface with instruments and other information systems such as hospital information systems (HIS).

A LIS is a highly configurable application customized to facilitate a wide variety of laboratory workflow.

Planning

Planning is the process of drawing the goals to be reached within a certain period of time. From this definition, it can be said that planning answers the following questions:

What is the benefit of pre-planning for the laboratory?

What is the effect of failure to develop planning commensurate with health safety standards?

Who is primarily responsible for giving planning?

In your opinion, what are the specifications of a typical analytical laboratory?

Scientific laboratory design standards

- * The necessity of establishing laboratories in the form of an integrated center.
- * The laboratories, except for the pathology laboratory, must be located on the same site

The following must be observed

- Determining the type and nature of the laboratory and the type of examinations that will be conducted in it.

- The lighting shall be commensurate with the type and size of the work and sufficient to illuminate all sections of the laboratory.
- The design of the walls, floor, and ceiling of a smooth material that is easy to clean. The floor should be designed from a non-slip material, not leaking water, and resistant to interaction with disinfectants, acids, and solvents.
- Provide all laboratory rooms, especially the room designated for microbial farm work, with ultraviolet detectors, with the aim of permanent disinfection and sterilization of them in the event of leakage after completion of the work, in addition to providing them with a safety cabin and filters.
- Biological safety cabins must be appropriately installed (away from doors and windows).

Occupational safety and health conditions

- ✓ Protective means must be available
- ✓ Allocating special places to evacuate people in the event of a fire



- ✓ All emergency exits are lit up automatically
- ✓ Putting stickers on each door of the laboratory rooms to prevent the entry of non-workers.



Laboratory quality system

The basic process of the laboratory is the initial process that consists of three stages:

The pre-analysis phase (taking the sample, receiving it in the laboratory, recording, and processing it)

The analysis phase (the actual laboratory examination and recording of the result).

The post-analysis phase (clearing the result, reporting on it, and saving it) In archives, disposal/preservation of the sample).

Quality standards in medical laboratories

- Get accurate test results.
- The patient is satisfied with the services provided by the laboratory.
- Follow safety and prevention standards, especially in the hematology department, to prevent the transmission of diseases to workers and patients who undergo medical tests.
- Laboratory hygiene, and the use of medical gloves, especially when drawing blood samples from patients
- Putting a sticker on each sample bearing the name of the patient, the type of sample, and the examination required to be performed.
- Using correct and modern scientific methods in conducting analyzes.

Strategic Planning

A mental process that analyzes the internal and external environment of an organization.

Benefits:

1. Clarification of the future and predicting events
2. Predefining job options
3. Promote teamwork and accumulation of experience
4. Properly employing financial capabilities to achieve the best results
5. Improving the organization's perf.

Question:

1. Which laboratories caught your attention, and why?
2. The worst planning for any laboratory? And what's the reason?