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# Organization and management of clinical laboratories

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## **Laboratory definition**

**Is a facility that provides controlled conditions in which scientific research, experiment, and measurement may be performed.**

# Types of labs

- Scientific lab.
- film lab.
- computer lab.
- medical lab.
- public health lab.

**-The main objective of the lab design is to provide a safe, accessible environment for laboratory personnel to conduct their work.**

**- The design and workflow of the Laboratory should be such that there is clear segregation between:-**

- ✓ Laboratory areas**
- ✓ Phlebotomy areas**

**Good design will minimise risk of injury.**

**- Minimise risk of occupational illness.**

# Lab. Design consideration

- **Walls, Doors, Security:**
  - The laboratory should be completely separated from outside area (4 walls).
  - The laboratory shall have means of securing.
  - Walls that are smooth free from cracks impermeable to liquids and easily washable.

## **Lab. Design consideration**

- A door at each end of the laboratory.**
- A door should open out wards and exit routes must never be obstructed.**
- The laboratory doors shall be automatically self-closing.**



- **Windows:**
  - **If the laboratory has windows that open, they must be fitted with insect screens.**
- **Flooring:**
  - **A floor that is non slip, impermeable to liquids and resistant to the chemical used in the lab.**
  - **The floor must be one piece.**

- **Sinks:**
  - Each laboratory must contain a sink for hand washing.
  - Laboratory sinks shall have lips that protect sink drains from spills.
- **Furniture Design, Location & Exit Paths:**
  - All work surfaces (Bench tops and counter) must be resistant to chemicals used in the lab., washable and without cracks.

- Laboratory shelving should NOT be installed at heights and distances.**
- The space between adjacent workstations and laboratory benches should be 5 ft or greater to provide ease of access.**

- **Sectioning of the lab, into separate rooms or working areas with definite place from patients.**
- **Sufficient space or facilities should be provided, so that materials that have unique physical or hazardous properties are stored safely, and that materials that, in combination with other substances, may cause a fire or explosion, or may liberate a flammable or poisonous gas, are kept separate. Separate space or facilities can include storage cabinets with partitions, acid cabinets, flammable cabinets, gas cabinets, etc.**

# Electricity and utility issues

- **A sufficient supply of wall electric point to avoid the use of adaptors.**
- **As good illumination as possible especially in testing areas of the lab.**
- **Circuit breakers should be located outside the lab, but not in rated corridors.**
- **Main valves for gas and vacuum lines should be located outside the lab.**

- **A gas supply stored in an outside locked store.**
- **A room that separate from the working areas, personal food, other belonging stored safely, hand lab coats.**
- **An adequate number of hand basins in the laboratory with running water.**

# Laboratory Ventilation and fume hoods

- **To provide safe , comfortable, breathable environments for all employees and to minimize exposure to hazardous air contaminants.**
- **All laboratories shall have mechanical ventilation.**
- **All laboratory rooms shall use 100% outside air and exhaust to the outside.**

# Fire Safety

- Fire extinguisher sited at accessible point these need to be of the dry chemical type.
- Fire alarm system.

## Biological Safety

- An adequate waste disposal area and safe disposal system.
- Provisions of protective safety cabinets and fume cupboards as required.



# Laboratory Organization

- It is a system with an orderly structure, putting resources together into a working order and establishing a mechanism for undertakings which require cooperation and coordination.

**- The design and workflow of the Laboratory should be such that there is clear segregation between:-**

**✓ Laboratory areas.**

**✓ Clerical areas.**

**✓ Phlebotomy areas.**

**Why? - Minimise risk of injury.**

**- Minimise risk of occupational illness.**

**We must be able to control environmental conditions that may impact on the quality of the test result/ product:-**

- ✓ Sterility cleanliness (dust).**
- ✓ Electromagnetic (equipment performance).**
- ✓ Radiation.**
- ✓ Humidity (dry air in clean rooms ).**

# Segregation of laboratory activities

Where activities are incompatible or may effect the result/ product:-

- ✓ Class 100,000 room for blood component preparation (ISO 15189 Section 5.2 ).
- ✓ Class III room for analysis of faeces e.coli 0157 or myco bacteria.

- ✓ **PCR amplification technology.**
- ✓ **Separate room for cytology screening process – quiet environment, manual test, no interruptions.**
- ✓ **Computer room (dedicated controlled environment temperature).**
- ✓ **Eating, drinking, personal items.**

**Must have sufficient storage space  
for:-**

- ✓ archiving of documentation.**
- ✓ archiving of specimens/ preparations.**

**These storage areas must ensure continuing  
integrity of material.**

**-Storage and disposal of dangerous material shall meet statutory regulations.**

**✓ Must have clean Laboratories and be well maintained.**



# **Administration in Clinical Laboratory**



**Administration of the clinical laboratory is generally viewed as a whole process covering the managerial skills necessary for personnel from the laboratory director to the bench supervisor.**

# Definitions of Management

- **Management involves the coordination and integration of resources to accomplish specific results.**
- **Management: is the guiding of human and physical resources into dynamic organization units that attain their objectives .**
- **The definition contains four basic elements:**
- **Toward objectives.**
- **Through people: these professional laboratorians feel a sense of responsibility.**

- **Using techniques.**
- **In an Organization: Into dynamic organizational units implying division of labor, specialization, protocols and procedures, and functional processing units.**

- **Administer Managerial duties and responsibilities.**
- **Director.**
- **Administrator.**
- **Manager.**
- **Supervisor.**

- **Director**: His role is: broad policy-making.
- He directs the affairs of an organization by establishing goals and priorities that determine the direction the organization will take. Not directly supervise or manage in a technical sense.
- **Administrator**: administers or runs and organization within the framework of the various directives and policies given to him. He is not the person who establishes the larger goals, but he knows how to make the organization move efficiently to achieve its purpose.

- **A manager**: checks whether functioning of an activity to achieve a set goal or purpose. His strength is in his ability to use all of these resources to get things done properly.
- **A Supervisor**: over sees the activities of others to help them to accomplish specific task or to perform scheduled activities most efficiently.

# The Administrative Process

- **Planning.**
- **Identifying goals and objectives.**
- **Establishing policies for operation.**
- **Analyzing data and making decisions.**
- **Estimating space, personnel, and equipment needs.**
- **Preparing budgets.**

# Organizing

- **Grouping related work activities.**
- **Developing an organization chart.**
- **Establishing lines of communication and authority.**
- **Staffing and scheduling.**
- **Establishing procedures and rules.**
- **Organizing equipment and workflow.**



# Directing

- **Creating an effective communication system.**
- **Supervising daily work.**
- **Creating a challenging work environment.**
- **Integrating organizational and personnel goals.**
- **Training and staff development .**

# Controlling

- **Establishing standards.**
- **Developing feedback mechanism.**
- **Measuring performance against goals.**
- **Counseling personnel.**
- **Analyzing and acting on financial and productivity data.**
- **Preparing reports .**

# Decision-Making

- **Problem analysis.**
- **Development and analysis of alternative courses of action.**
- **Decision implementation and control.**