Laboratory Management

Lec: 1

- قسم تقنيات المختبرات الطبية
- المرحلة الرابعة

laboratory

Laboratory is a place that is equipped with different instruments, equipment ~and chemicals (reagents) etc., for performing experimental works, research activities and investigative procedures. Medical laboratory is one part of the laboratory that is equipped with various biomedical instruments, equipment, material and reagents (chemicals) for performing different laboratory investigative activities by using biological specimens (whole blood, serum, plasma, urine, stool, etc.).

Medical laboratory science

is a complex field embracing a number of different disciplines such as Microbiology, Haematology, Clinical Chemistry, Urinalysis, Immunology, Serology, Histopathology, immunohematology and Molecular ‘biology and others

Classification of medical laboratories

The world Health Organization (WHO) lists four kinds of levels of laboratories based on their biosafety

1- Basic laboratory level I

Basic laboratory level I is the simplest kind and adequate for work with organisms which have low risk to the individual laboratory personnel as well as to the members of the community. These organisms are unlikely to cause human diseases. Example, food spoilage bacteria, common molds and yeasts.

2- Basic laboratory level II

Basic laboratory level II is suitable for work with organisms that predispose to moderate risk to the laboratory worker and a limited risk to the members of the community. They can cause serious human diseases but not serious hazards due to the availability of effective preventive measures and treatment. Example, staphylococci, streptococci, entero bacteria except Salmonella typhi and others. Such laboratory should be clean, provide enough space, have adequate sanitary facilities and equipped with autoclave.

3- Containment laboratory (Level III)

Containment laboratory is more advanced and it is used for work with infectious organisms that present a high risk to the laboratory personnel but a lower risk to the community. Example, Tubercle bacilli, Salmonella typhi, HIV, Yersinia and others. The principle is to remove from the basic laboratory those organisms and Activities which are particularly hazardous. They are easily transmitted through airborne, ingestion of contaminated food or water and parenterally- Such laboratory should be a separate room with controlled access by authorized staff. It should also be fitted with microbial safety cabinet

4- Maximum containment laboratory

Maximum containment laboratory is intended for work with viruses, with predispose to a high risk for both laboratory personnel and the community. Example, Small pox, Ebola, Lassa fever and others. Most of these organisms cause serious disease and readily transmitted from on person to another. These laboratories are usually a separate building with strictly controlled access.

Laboratory Design Considerations

1. The laboratory shall be bound by four walls and a roof or ceiling.

2. Design for adjacent spaces for storage and consumption of food and drink as needed.

3. Design laboratory workstations to accommodate the range of body dimensions that may be using the workstations. For workstations may require height-adjustable Work surfaces and chairs. Example, computer and microscopes

4. Each laboratory using hazardous materials, whether chemical, biological, or radioactive, should contain a sink for hand washing.

5. All work surfaces (e.g., bench tops, counters, etc.) should be impervious to the chemicals and materials used in the laboratory.

6. The laboratory shall be designed so that it can be easily cleaned. Bench tops should be of a seamless one-piece design to prevent contamination. Penetrations for electrical, plumbing, and other considerations should be completely and ipermanently sealed. Lf the bench top abuts a wall, it should be covered or have a backsplash against the wall.

7. The walls shall be non-porous and painted with a durable, impervious finish to facilitate decontamination and cleaning. High gloss paint is recommended

Hospital lab types

. **Chemistry:** Chemistry performs a wide variety of tests using the most current technology‘

. **Haematology:** Haematology is the study of blood, blood morphology and blood diseases.

- **Microbiology:**
- **Transfusion Services/Immunology:**
- **Immunology:**
- **Surgical Pathology:**
- **Cytology**

THANK YOU