

HOW TO ESTABLISH A LABORATORY
FOR RURAL HEALTH CENTERES
IN THE COUNTRY SIDE OF EGYPT

ESSAY

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By

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TO MY PARENTS AND MY HUSPAND, Dr. AHMED
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INTRODUCTION

INTRODUCTION AND AIM OF WORK

In the past, the laboratory was playing a very small role in the diagnosis of limited diseases but now with this enormous scientific progress the hospital laboratory has been cast into a dominant role in the diagnosis, assessment and treatment of a large number of disease processes (Mosby, 1979).

We find that many and many laboratories were built without any scientific basis and still the building of laboratories is done haphazardly. From this point our study begins, to know how can we design and prepare a laboratory under the modern technological basis.

The planning of such a laboratory for a developing country should be undertaken by an expert (or experts) with a high level of technical and administrative experience in the organization and functioning of a laboratory (WHO, 1962).

Clearly, design of total space will vary with the size and density of the population, the number of hospital beds to be served and the complexity of the work that will be required from the laboratory (WHO, 1972).

At the same time we try to know how many of the scientific and the technical personnel and their certificates we are in need for a hospital laboratory.

We have also an important point in our study which is the safety programme. The laboratory safety programmes are plane for preventing sickness and injury to personnel and damage or destruction of physical assets (Mosby, 1979).

In recent years the demand has grown for greater validity of test results to the extent that approval or certification of a laboratory can be dependant on satisfactory performance in quality assessment exercises. Quality control procedures together with statistical analysis are used to ensure that all procedures in the laboratory are carried out with the highest level of accuracy and reliability (Roger and Robert, 1984).

Aim of work

The aim of our work is to establish a laboratory for a rural health unite in the countryside of Egypt, thus we are in need to establish a laboratory in a hospital serving health centers as well as these rural health unites.

DESIGNING THE LABORATORY

DESIGNING THE LABORATORY

The function of the laboratory designer is to assess the requirements of all the staff concerned and to present the information to the architect and builder in such a way that the completed laboratories satisfy all concerned. Before beginning any planning the designer must be in possession of the following information:

- 1- The amount of money available.
- 2- The kind of work to be done in the laboratories.
- 3- The number of persons who will use them at one time (Guyk, 1961).

It is essential to have constant liaison between all those concerned with various aspects of planning. This may involve individuals or committees according to the size and complexity of the operation (Purvis, 1972).

BUILDING DESIGN

For ease of coordination the planning of the services should be the responsibility of one man. The suppliers of the various services and furniture should also be brought into the planning at an early stage and the frame work of the building should not be designed before details of the

service installations are known (Scharmns, 1965).

These includes:

I- Building Shape:

The general shape of the building is extremely important in relation to working areas, ease of access and natural lighting (Purvis, 1972).

There are two types of buildings:

* A single storey building and a multi-storey building. The single storey building requires a large area and results in long roads and long power cables, but it enables the concentration of departments into one compact building and separation of the different branches more easily than in the case with a tall building (Kay, 1963).

* A multi-storey design allows more intense use of land, though access to departments on higher floors is not so convenient and passenger and goods lifts will be required. Direct entry to any buildings must be by ramps; steps must never be in the direct path of entry (Purvis, 1972).

II- Room Size and Shape:

The shape of a room is even more important than its size for dictating the greatest usable area. For example, a preparation area which operates a trolley system can be run

more efficiently when it is rectangular rather than square. Conversely, a room for seminars or informal gathering has advantages in being square, it is difficult to gather round for group discussion in a narrow rectangular area (Kay, 1963).

III- Internal Access:

The type of plan which is chosen must take two factors into account, the amount of space which is available and the type of work which is to be carried out in the area. Corridors take valuable space but if they are necessary they must be wide enough to allow the passage of large pieces of equipment or a large number of people at any one time. The latter is particularly true in case one has to evacuate the building in emergency (Coleman, 1957).

IV- Floor:

1) Floor Surfaces:

The materials used for laboratory floor surfaces should be selected in accordance with the type of work to be done in the laboratories throughout the building may not, therefore, necessarily be the same. When selecting the flooring consider the following points:

- a- Safety.**
- b- Resistance to substances likely to be spilled on it.**

- c- Resistance to wear.
- d- Comfort.
- e- Ease of cleaning.
- f- Appearance.
- g- Noise. (Koenis, 1979).

Plastics varnish floors such as polyurethane or acrylic types are applied over an epoxy base coat. They have good wear resistance and are impereable to many chemicals. They are attractive in appearance, available in a number of colours and not present a cleaning problem (Reichmann, 1961).

2) Floor Loading:

Occasionally it is necessary to install a piece of heavy equipment before the building programme has been completed.

If this situation occurs all parties must be notified well in advance so that the appropriate arrangements can be made for handling the equipment and seeking insurance cover for damage. It is always advisable to consider whether it will be possible to remove the equipment again without demolishing the building (Munce, 1962).

V- Benches

1- Materials

Materials which are used for benches will vary considerably with the proposed type of laboratory. (Purvis, 1972).

The laboratory furniture is generally made of wood. Steel furniture is not commonly available, it has the advantage, however, in medical and bacteriological laboratories, and places where sterile conditions are required (Reeves, 1955).

2- The Surface

The surface of furniture is usually left in its natural state and protected with an acid proof varnish (Werner Scharmn, 1965).

In most chemical and biochemical laboratories the surface should be resistant to acids, alkalies, solvents, water and heat. In microbiology laboratories the surfaces are often required to be washed down or sterilized and resistance to heat is again necessary. Solid Arborite appears excellent for bench tops, but it is expensive. It is resistant to particularly every chemical and solvent and it is heat resistance. Formica & Melamine surfaces can be excellent in certain biology & bacteriology and physics laboratories. Asbestos

cement or Sindanyo is expensive but has excellent heat resistant qualities. It can be stained easily and is not resistant to strong acids (Dobson, 1963).

A new development is the use of plastics (Resopal etc.) for covering of furniture, providing a good resistance to chemical action and requiring no painting. The question of cost will influence the choice of material to be used as a surface covering of laboratory furniture (Werner Scharmn, 1965).

3- Shape

There are two types of the shape of benches double sided benches and a single side benches

a- Double sided benches:

The bench with its services and fittings is the most important feature in the laboratory. Benches will either be erected against a wall or be free standing island benches. Both having a working surface at 0.90-0.92 m. above the floor level.

b- Single side benches:

These are benches built against a wall. In this case, the shelves will be attached to the wall in order to keep the surface of the bench free.

(Green, 1957).