

**University of Salahaddin  
College of engineering  
Department of architecture**



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**[Outpatient, X-ray, Laboratory, and  
Pharmacy, Physical Therapy] Departments  
Lecture 4-5**

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# Out-patients department

## Location:

- Close to the diagnostic services (labs and x-ray).
- Close the pharmacy.

The OPD provides **consultation**, **investigation** and **diagnoses** for patients who require little or no recovery services afterwards; they generally **attend by appointment**.

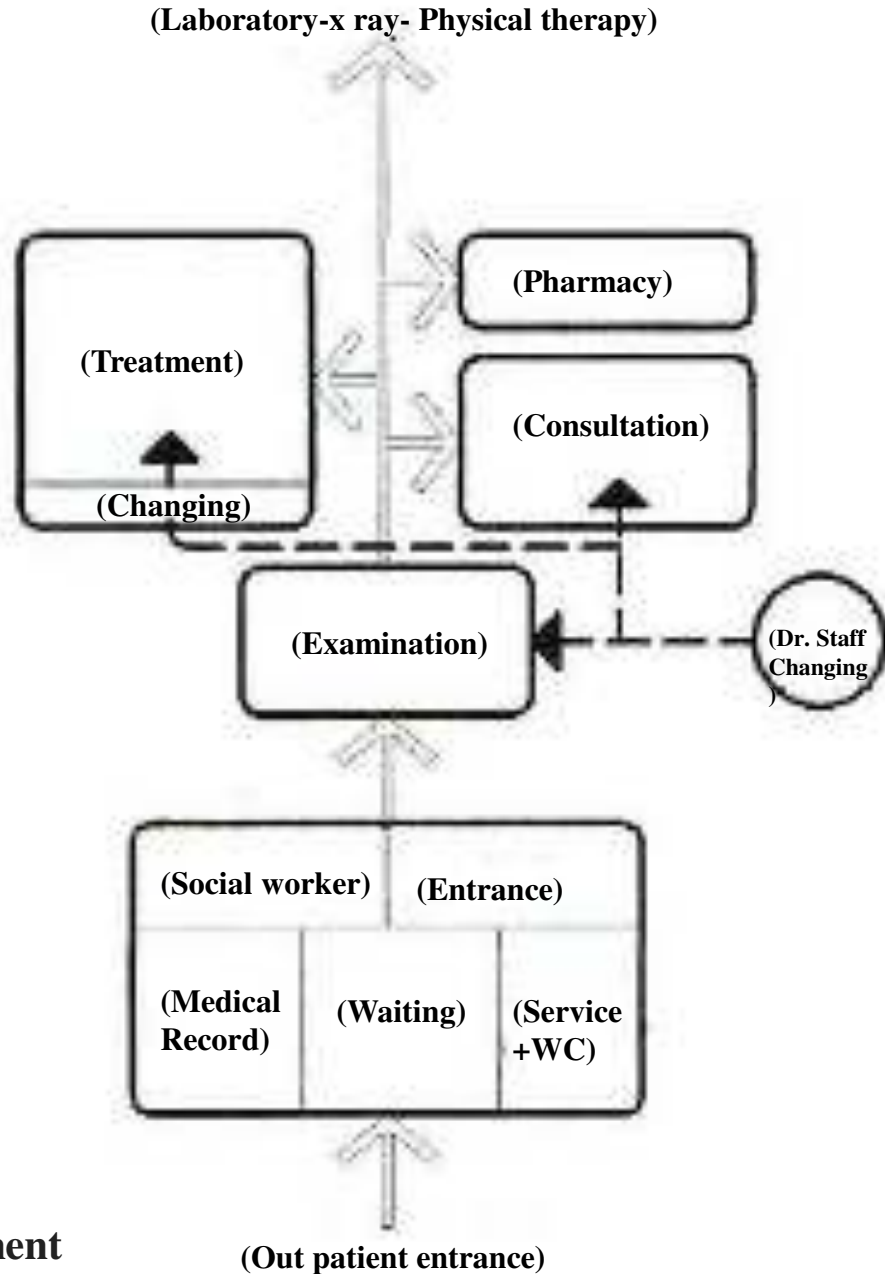


- Outpatients
- Diagnosis and Treatment
- Main hospital ward
- Operating Theatres

## Out-patients department

There is usually a **main waiting** area, with **registration** and enquiry point but preferably it should be relatively small, with patients sent onwards to **sub-waiting areas** near the clinic they are to attend.

Those clinics with little specialized equipment .



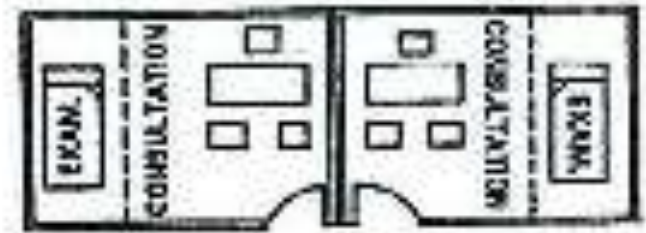
Functional Relations of Outpatient Department

## Out-patients department

General **medicine**, general **surgery**, **gynaecology**, **urology**) can use multipurpose consulting and examining facilities.

Although **traditionally** many doctors **preferred a purpose-designed clinic**, with **designated consulting rooms**, each with one or more examining rooms, a more flexible and economical arrangement is a long row or string of combined **consulting and examining (CE) rooms**, in which the **patient remains in one room**, but the **doctor may move between two or three adjoining rooms**.

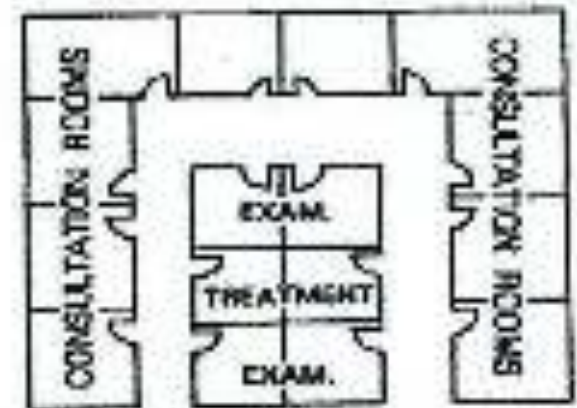
Each should be 14-15 m<sup>2</sup>, with sound resisting intercommunicating doors. **Each clinic will use as many CE rooms as its staff and patients need.**



a. COMBINED CONSULTATION-EXAMINATION ROOMS



b. SHARED EXAMINATION ROOM



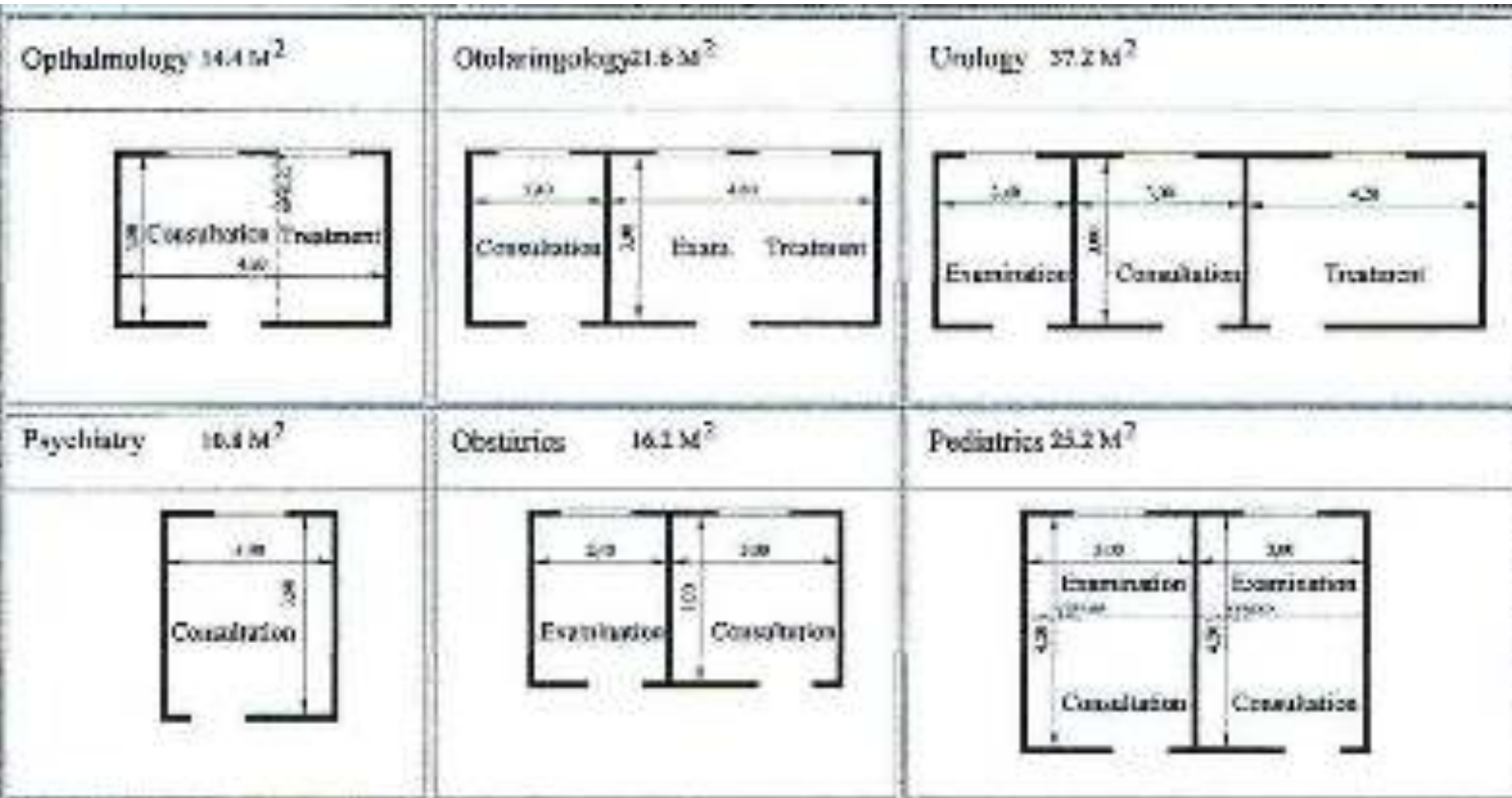
c. COMMON POOL OF SHARED ROOMS

Different design configurations for outpatient clinics

# Out-patients department

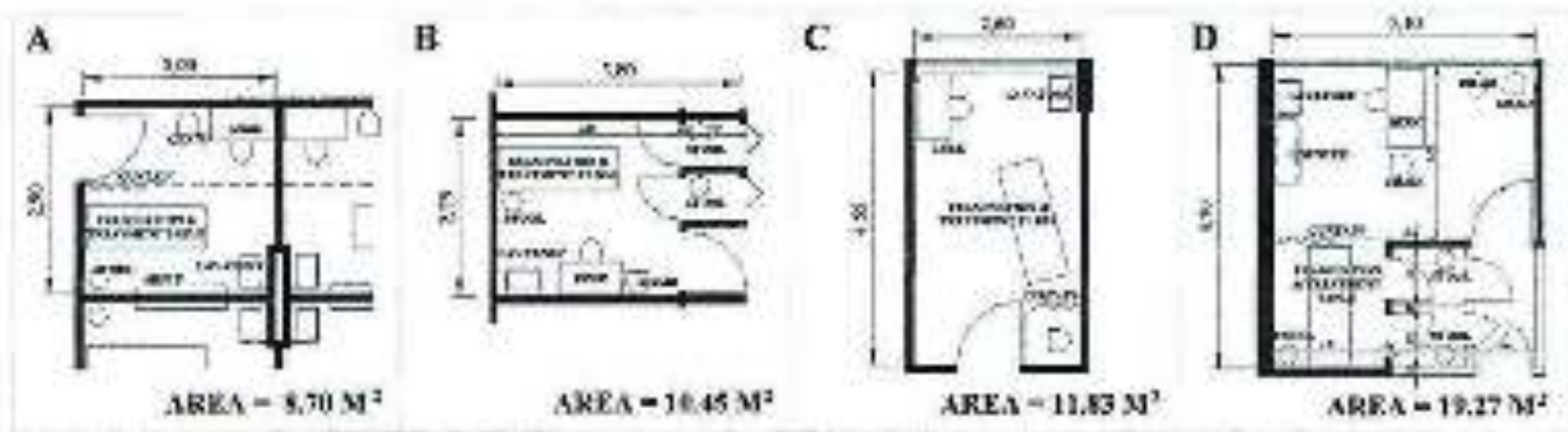
<p>Internal Medicine</p> <p>12.6 M<sup>2</sup></p> <p>16.2 M<sup>2</sup></p> <p>28.1 M<sup>2</sup></p>	<p>Diagram 1: A single room divided into an Examination room (top) and a Consultation room (bottom). The width is 3.00.</p>	<p>Diagram 2: Two rooms side-by-side. The left room is Examination (width 2.45) and the right room is Consultation (width 2.20). The total width is 4.65.</p>	<p>Diagram 3: Three rooms side-by-side. The left room is Examination (width 2.45), the middle room is Consultation (width 2.20), and the right room is Examination (width 2.45). The total width is 7.10.</p>
<p>Surgery</p> <p>14.4 M<sup>2</sup></p> <p>21.5 M<sup>2</sup></p> <p>34.6 M<sup>2</sup></p>	<p>Diagram 4: A single room divided into a Consultation room (left) and a Treatment room (right). The width is 4.00.</p>	<p>Diagram 5: Two rooms side-by-side. The left room is Consultation (width 3.00) and the right room is Treatment (width 4.20). The total width is 7.20.</p>	<p>Diagram 6: Three rooms side-by-side. The left room is Examination (width 2.20), the middle room is Consultation (width 2.20), and the right room is Treatment (width 2.20). The total width is 6.60.</p>

Models for outpatient clinics according to their specialization - the American architect and health plan E. . Todd on the integration of examination and consulting rooms



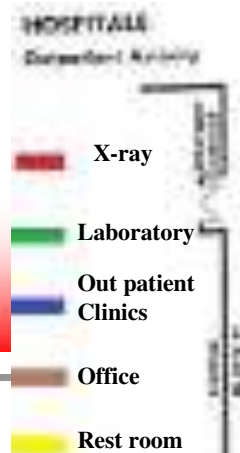
Models for outpatient clinics according to their specialization - the American architect and health plan E. . Todd On the integration of examination and consulting rooms

## Out-patients department



Models and dimensions of outpatient clinics as well as by the American architect(Isadore Rosienfield)

## Outpatient Department



The key to **economy** in construction and **efficiency** in use is to achieve **multipurpose OP suites** than for **clinics** like **ophthalmology**, which require much **specialized equipment**, and which are not easy (and not usually appropriate) to use for other purposes.

**Associated** with each **group of CE** rooms should be a **sub-waiting space**, **nurse's treatment room**, with **clean and dirty utility rooms**, **toilets** and other facilities.

A **toilet adjoining a dirty utility room** can have a pass-through hatch for **specimen testing**.





## Out-patients depart

Some clinics can use CE rooms for most purposes, but also need some **special accommodation** to serve **cardiac clinics** electrocardiography (ECG), audiology (a sound proof room - often a prefabricated booth) for **ear nose and throat (ENT)**, and treatment **baths and ultra-violet light** equipment for dermatology.





## Diagnostic imaging

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The essential feature about planning ‘imaging departments’ is that, apart from ultrasound, imaging modalities require **specialized protective arrangements**, either from **radiation** or from **magnetic fields**.

**Protection** in X-ray rooms may be provided by **lead** or by **barium plaster** which prevent the emission of radiation beyond the room. Where **control positions** are within the room, operators may be protected by **lead screens**.

During investigations staff who must work in close proximity to the patient, may **additionally wear lead aprons**, and **patients themselves** may require **specific shielding** from radiation to **sensitive zones** such as gonads.

# X-ray Department [Diagnostic Imaging]

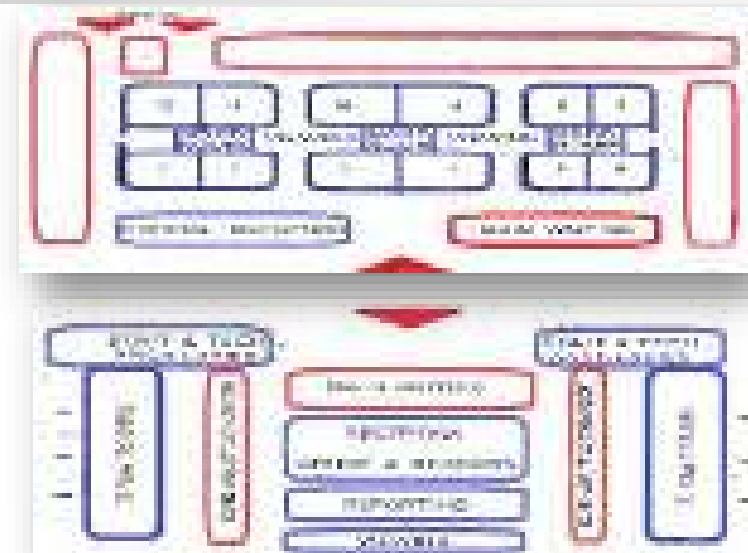
## □ Location:

- Very close to the emergency department and external clinics.
- Easily accessible from internal division.
- Ground floor is preferred.



# X-ray Department [Diagnostic Imaging]

This term includes **diagnostic investigations** using **X rays** (plain films) and the **non-X-ray** modalities using **ultrasound** and **magnetic resonance** to produce image [MRI].



## X- ray Department[Diagnostic Imaging]

Patients on entry to the imaging department need quiet reception and waiting areas before moving to the diagnostic rooms.

The layout of the department should ensure that frequently used rooms and those whose investigations are brief (e.g. plain X-ray, chest rooms) are sited closest to the waiting areas.

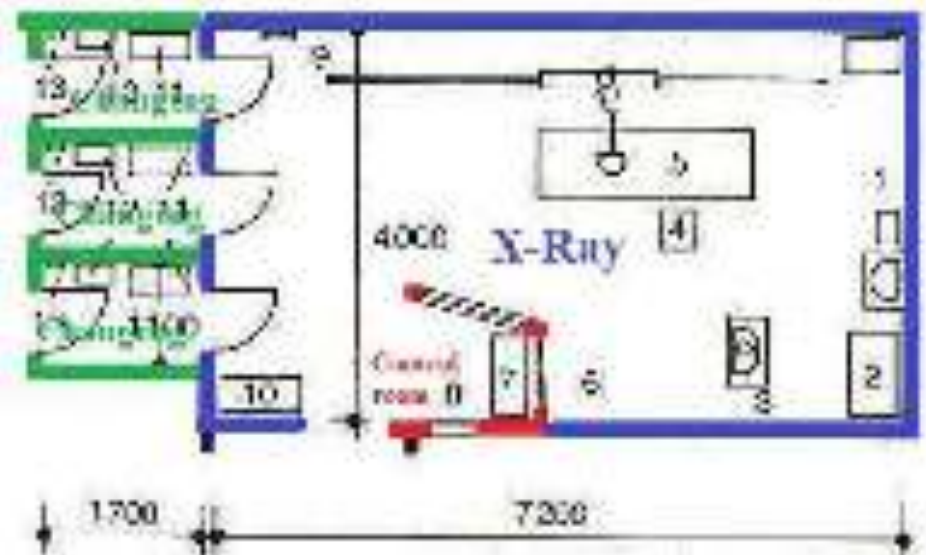
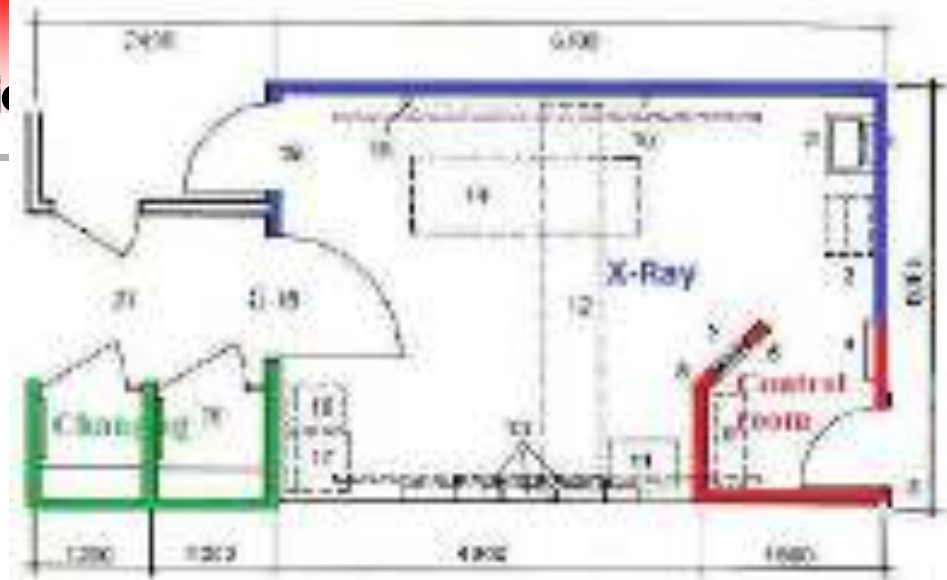


## X- ray Department[Diagnostic

**All rooms** will require patient **changing** facilities.

Changing rooms may be either **'stand-alone'** or **'pass-through'**.

In this latter category, the **patient** **accesses** the room from **the sub** **waiting** space, and **enters** the **diagnostic** room directly from the **changing room**.



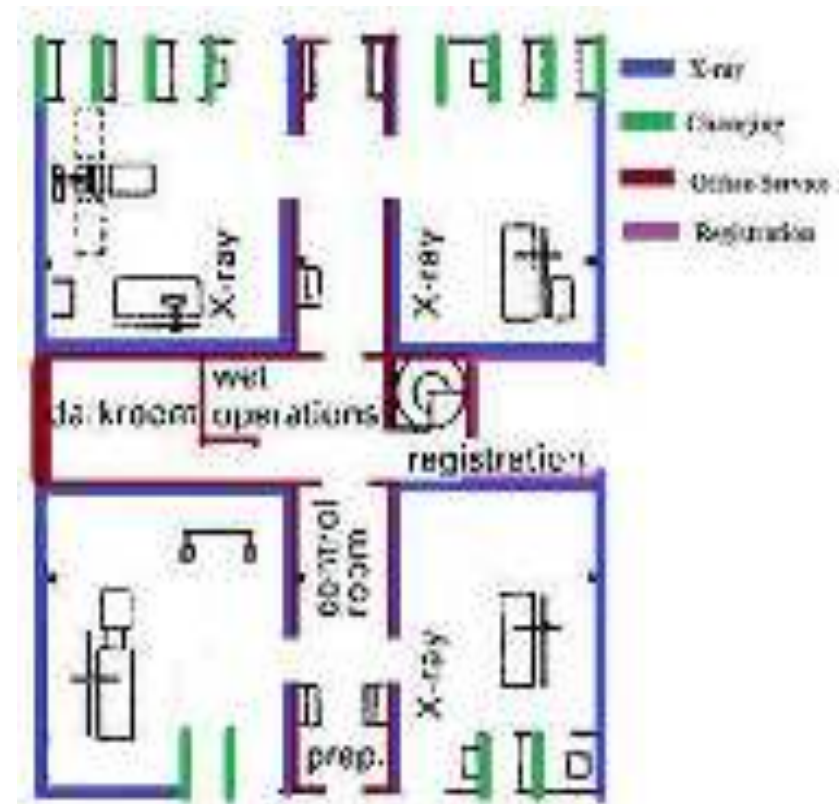
# X-ray Department [Diagnostic Imaging]

These rooms have the **advantage** that, once undressed, the patient does not have to **traverse any general circulation** and so benefits from **greater privacy**.

However this pattern is often found to be very **claustrophobic** for patients, and can generate **anxieties** that one has been placed in this **isolated space** and **forgotten**.

It is also a pattern which, because of the more **numerous doorways** into the X-ray rooms, creates additional problems in achieving **radiation protection**.

The greater **flexibility** of the **stand-alone pattern** usually makes it the **preferred** option.



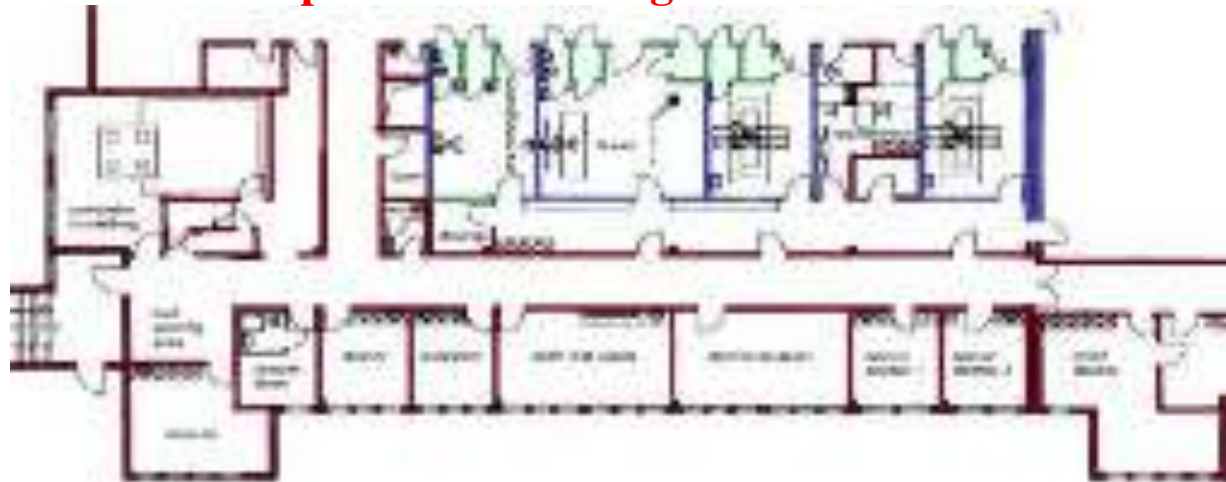
X-ray diagnosis with layout known as an X-ray cross

# X-ray Department[Diagnostic Imaging]

In **radiology departments**, considerations of radiation protection demand that the **diagnostic rooms are internal**. In those circumstances it becomes particularly important that the more **general spaces, offices, sorting and reporting rooms** and **staff rest** rooms have **natural light**.

Most X-ray processing now makes use of **daylight processing**, and processors can be sited within the **staff areas** or within **general circulation** space, which can help to **simplify circulation** and to create a more **compact staff working** area.

However, some specialist investigations may make use of **cine film**, and for these a small **dark room** needs to be provided.



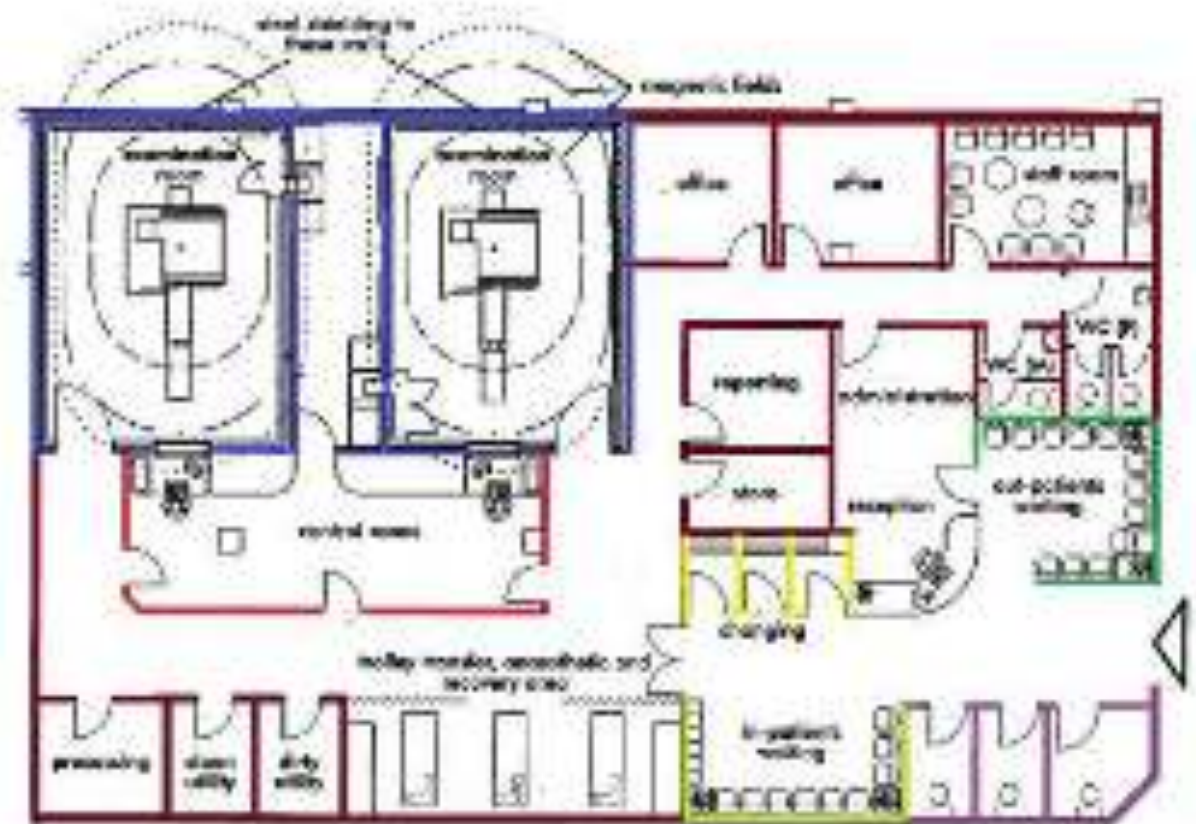


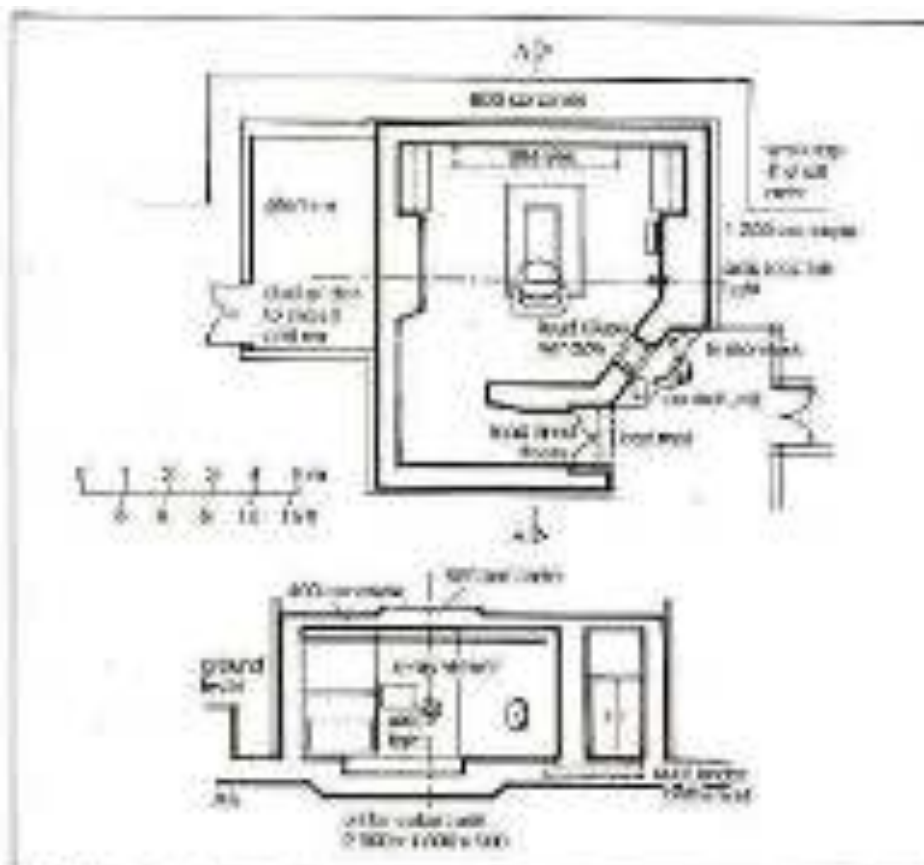
## Magnetic Resonance Imaging [MRI]



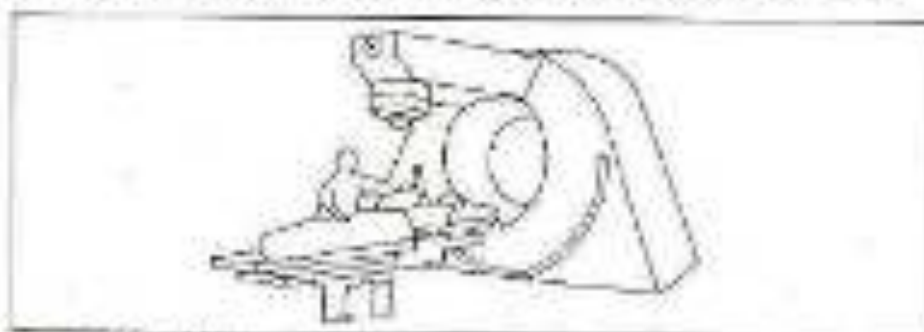
**Protection** from magnetic fields in magnetic resonance imaging [MRI] studies initially depended on the **provision of sufficient area around the magnet** for the strength of the field to fall off.

However, current trends are for the use of **lower tesla magnets** and for protection from the magnetic field to be built into the machine .

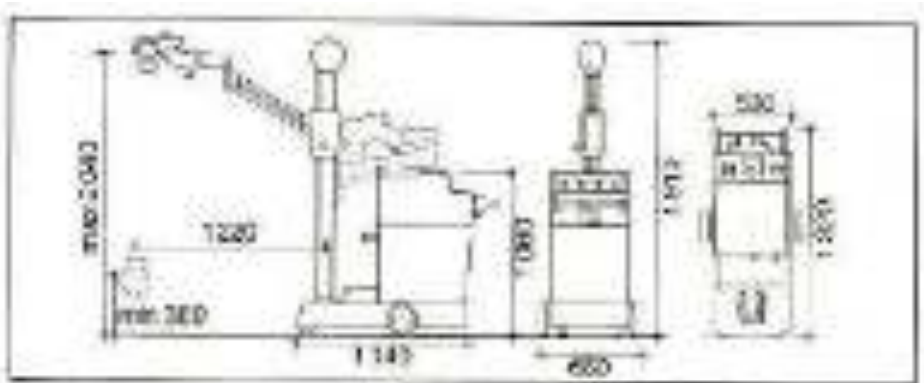




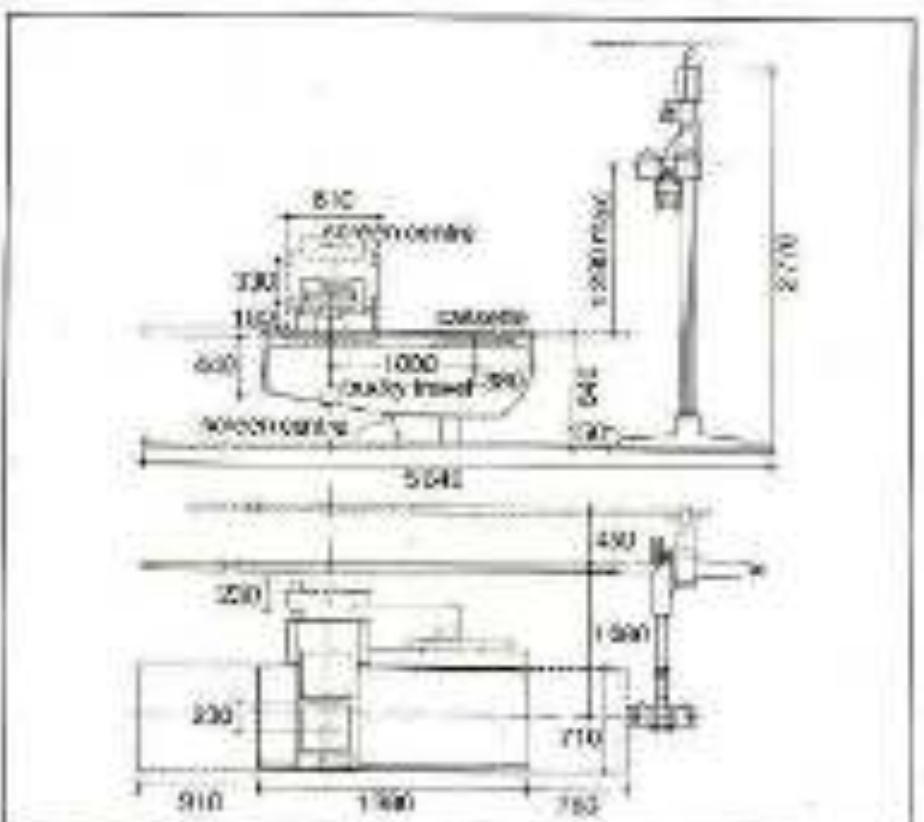
1 Cobalt unit for rad. therapy Humberly England Arch G.E. Thomas R.A.R.



2 Typical cyclotron



1 Mobile x-ray unit; can be power or hand driven; weight 900 kg



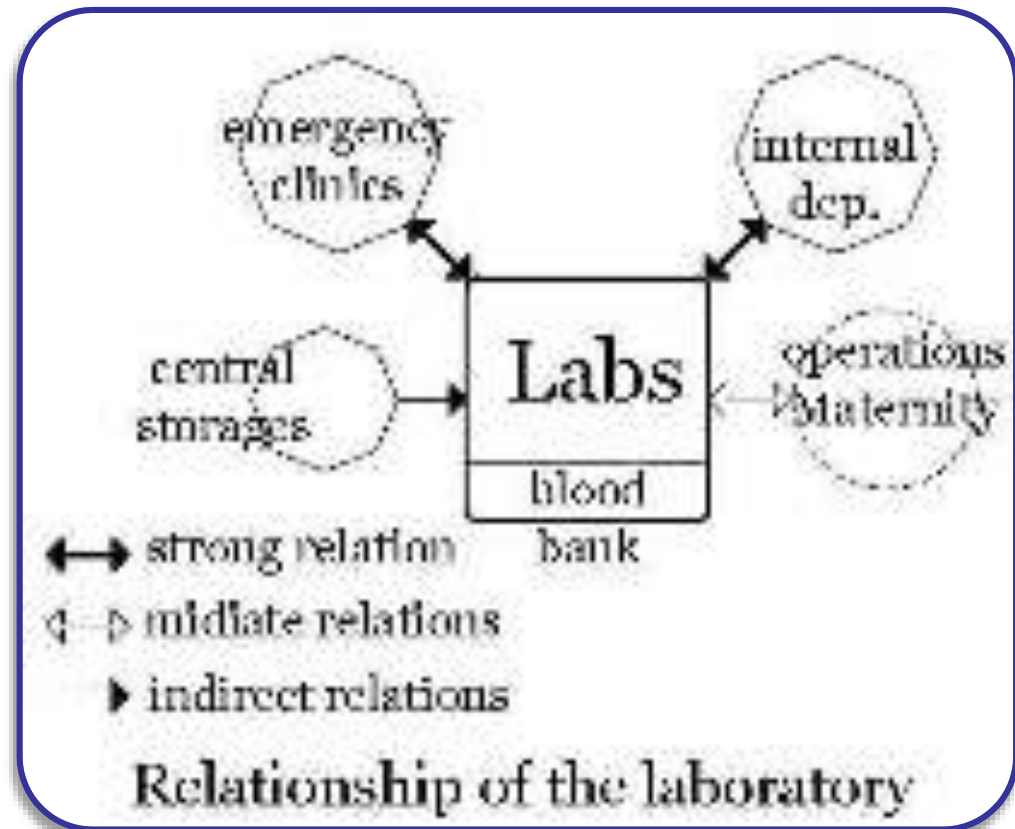
2 Heavy table; min required with floor/ceiling tubestand min 1000 max 4000

# Laboratory Department



## □ Location:

- Very close to the emergency department and external clinics.
- Easily accessible from internal department.
- Easily accessible from maternity and surgery departments.
- Accessibility from central storages.



Relationship of the laboratory

# Laboratory Department



The four main laboratory disciplines in hospitals are:-

**Histology**

**Microbiology**

**Hematology**

**Biochemistry**

The **last two** may be **grouped together** as they can **share** much **automated** equipment.

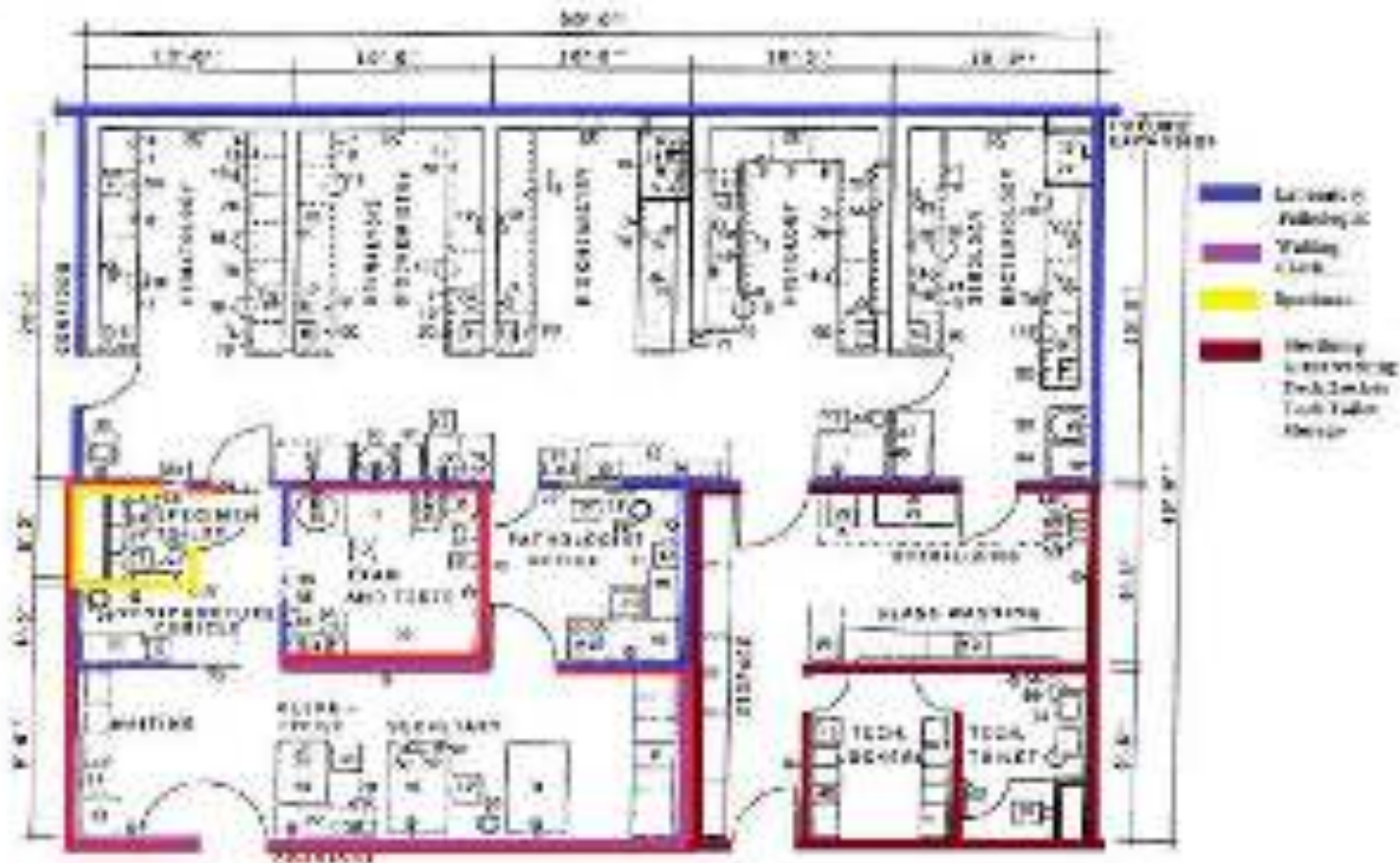


# Laboratory Department

The **whole** department will generally have a **shared receiving area for specimens and records.**

**Ventilation** and other **safety standards** must meet current **legislation.**

Laboratory



## Laboratory Department

The **laboratory** must be **located very close** to the **outpatient department** and **emergency**.

**Easy access** from [ward, surgical, and **maternity**] department.

It **can be accessed** from the **central storage** of the hospital



1 WAITING	9 MICROBIOLOGY	16 STAFF LOCKERS/TOILETS
2 SPECIMEN COLLECTION	10 VIROLOGY	17 SUPPLY STORAGE
3 SPECIMEN RECEPTION	11 GROSS TISSUE	18 PHOTOGRAPHY STUDIO
4 CHEMISTRY/URINALYSIS	12 HISTOLOGY	19 PATHOLOGIST OFFICES
5 HEMATOLOGY/COAGULATION	13 CYTOLOGY	20 RECEPTION OFFICES
6 BLOOD BANK	14 PARAFFIN BLOCK/SLIDE STORAGE	21 LAB OFFICES
7 MICROBIOLOGY	15 STUDENT LAB	22 RECEPTION CENTRE

# Pharmacy

A dispensary is needed, **close** to the **out-patient department** and with a comfortable waiting area.

If the **main hospital pharmacy** cannot be so located, **pneumatic tubes** from it to the **dispensary** and some other user areas may be **justified**.

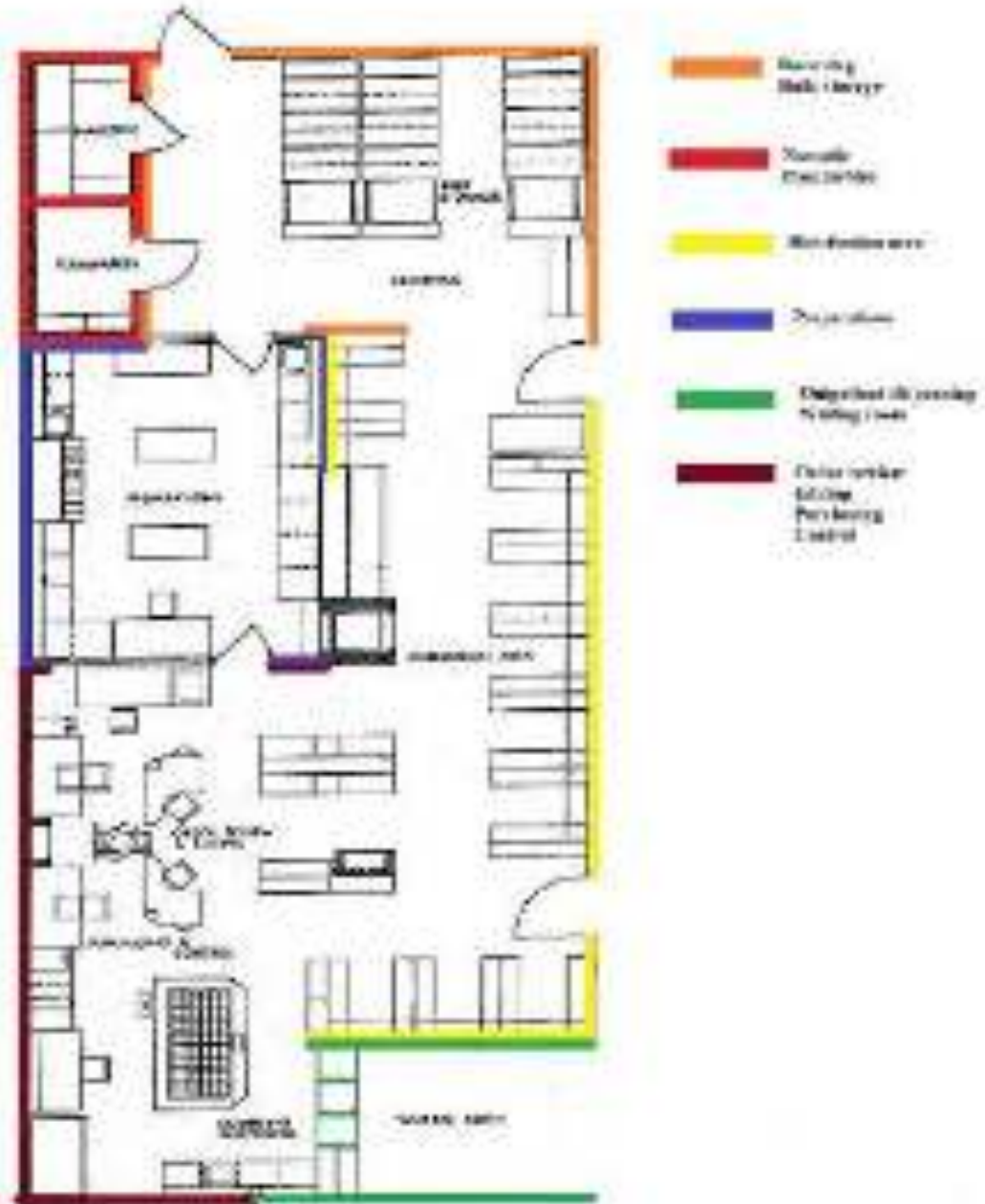
More and more pharmaceutical items are **commercially produced**; where **manufacturing** is undertaken at the hospital.

**Security** is of the highest importance, **especially** associated with the **entrance used for deliveries**.

Pharmacy



# Pharmacy





# Physical Therapy

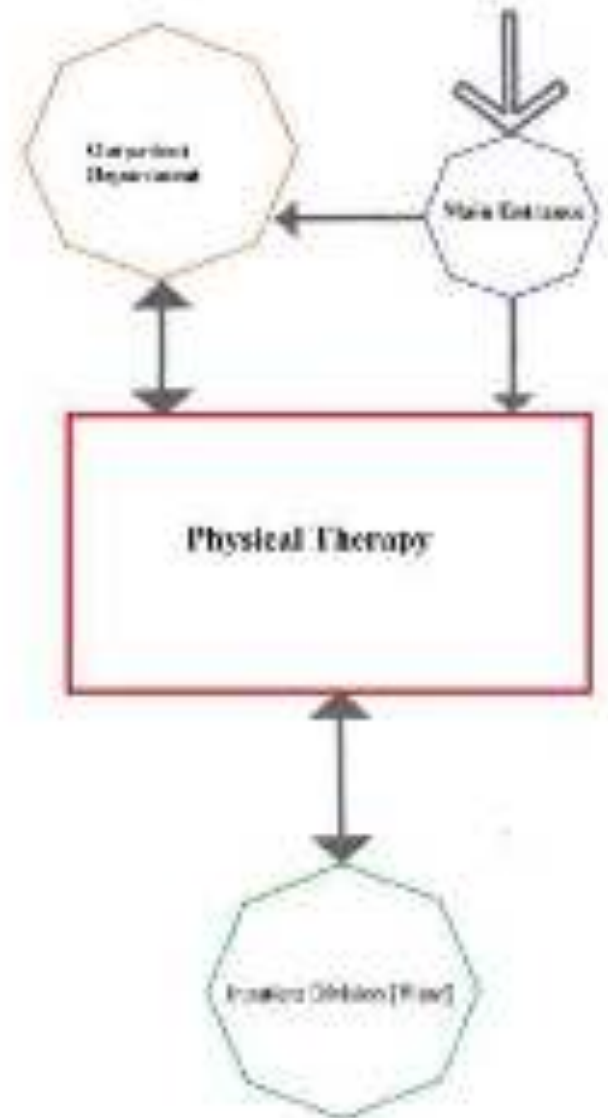
## □ Location:

The **Physical therapy** must be **located very close** to the **main entrance** and **emergency**.

**Easy access** from **out patient** department, and inpatient department [**ward**].

It is preferable to located in the **ground floor**.

The physiotherapy department doesn't exist in **small hospital** where the **technology** used is very **expensive** so it is usually found in hospital with a size of **200 beds** or **more**.



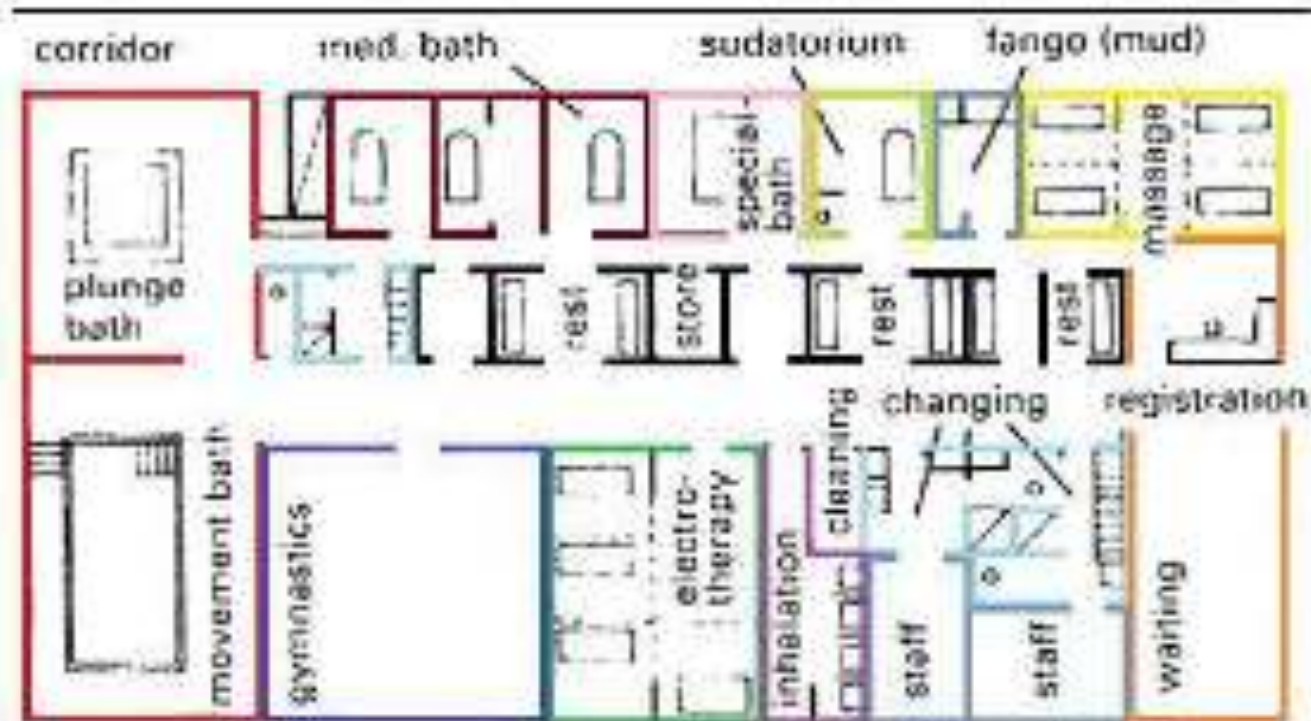
# Physical Therapy Department

## Dry Division

- 1-Thermal therapy
- 2-Electrotherapy
- 3-Exercise[gymnastics]
- 4-Massage
- 5-Inhalation

## Wet Division

- 1-Hydrotherapy
- 2-Mud treatment



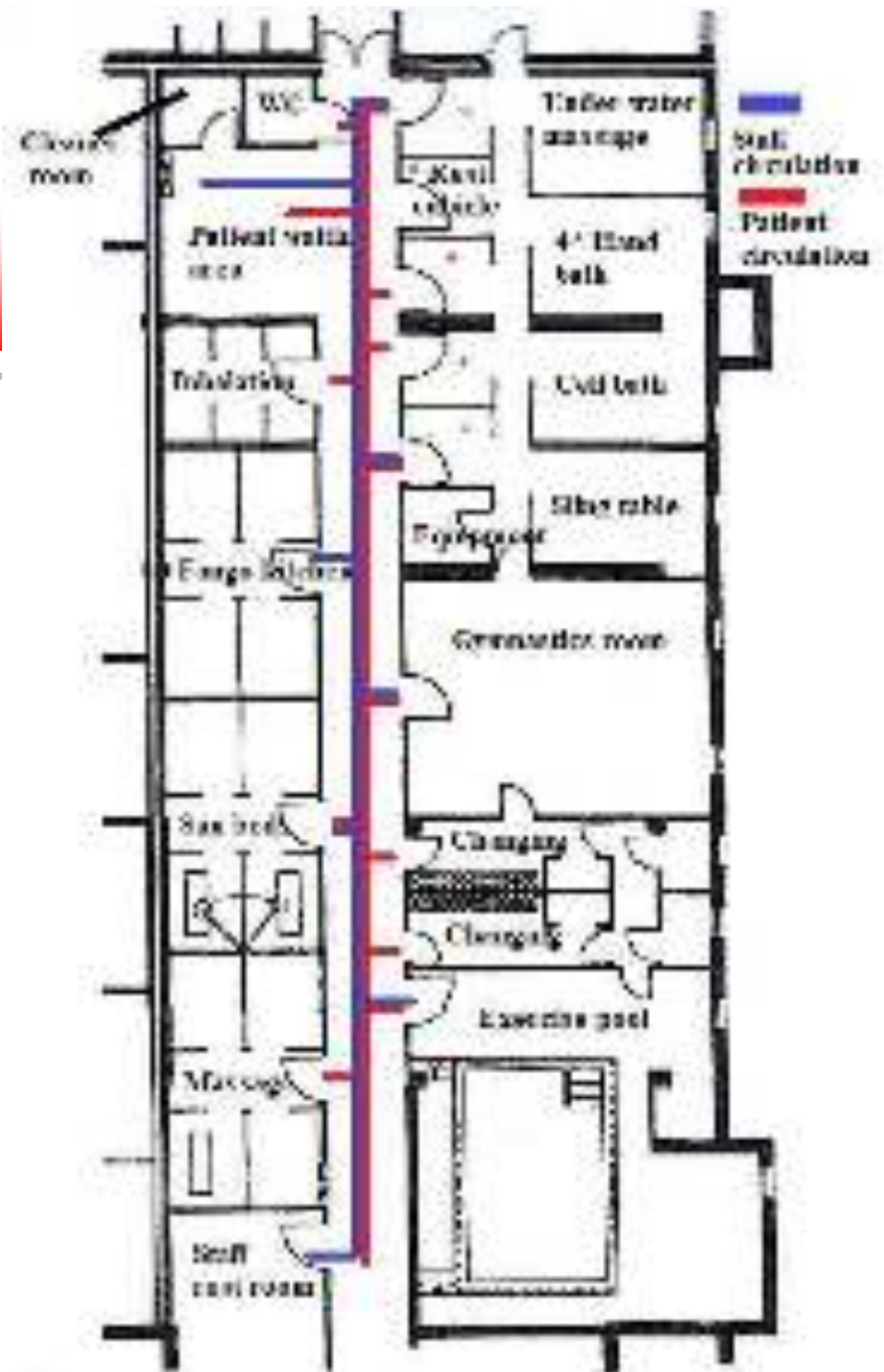
Architect: Wichtendahl

4

Munich-Perlach Municipal Hospital: 687 beds

# Physical Therapy

In physiotherapy department the **patient corridor** is **mixed** with the **staff corridor**.



② Physical therapy department with gymnasium