

HOSPITAL AND ITS ORGANIZATION

Points to be covered in this topic

- DEFINITION
- CLASSIFICATION OF HOSPITAL
- ORGANIZATION STRUCTURE OF HOSPITAL
- MEDICAL STAFF AND THEIR FUNCTIONS

DEFINITION

- The hospital is a **complex organisation** and an institute which **provides health** to people through complicated but **specialized scientific equipments** and team of **trained staff educated** in the problems of **modern medical science**.
- They are all co-ordinated together for the **common goal** of restoring and **maintain good health**.



FUNCTIONS OF A HOSPITAL

- A **modern hospital** is much more than a **health care institution** since it exercises **greater influence** on the surroundings.

1. It raises the **quality of care** and **general standards of medical practice**.
2. It is a **centre of community health** and contributes a great deal to **preventive and social medicine**.
3. It **lowers the incidence of disease** through **early detection** and **immediate treatment**.
4. It is a **link between the general public and policy makers**.
5. It stimulates the **growth of medical science**. Doctors and nurses receive their **training in large teaching hospitals**.
6. **Bigger hospitals** co-operate with **smaller hospitals**. **Speciality hospitals** co-operate with **general hospitals**.

CLASSIFICATION OF HOSPITAL

PRIMARY HOSPITALS

- **Primary care hospitals** provide the services of the **day-to-day healthcare facilities** by **health care practitioners**.
- In such hospitals, the **health care provider** act as the **principal and main point of contactors** for continuing care of the patient and may **co-ordinate other specialists** for the **care of the patient** if need.
- This type of hospital provides mostly **basic health care facilities** and consider as a **gateway** to receive **more speciality care facilities** for example: **Upazilla Health Complex**.

SECONDARY HOSPITALS

- This type of hospital provides the **first level of recommendation services** which are **more complicated** and beyond the **scope and capacity of the primary level**.
- This level is allocated to provide **some specialist care services** mostly in **Internal Medicine, General Surgery, Obstetrics and Gynaecology, and Paediatrics**.
- Such level of a hospital usually provides **50–200 bedded capacity**.

TERTIARY LEVEL

- Such a level of hospitals deals to provide **highly specialized care services** at **regional or central-level hospitals**.
- Like **teaching hospitals**, **super-specialized hospitals** like; **Cancer hospitals, Chest hospitals, Infectious Disease hospitals, and Mental Disease hospitals** are also included in this level of care.
- These institutions provide **recommendation support** to **primary and secondary level health care**.
- This also includes **Divisional and National Level Hospitals**.

❖ BASED ON CLINICAL

- **Clinical hospital** is a healthy care facility that is **primarily focused** on the **care of outpatients**.
- These are **privately operated** or **publicly managed and funded**.

➤ BASIS OF MAJOR DISEASES

- Psychiatric hospitals or mental hospitals
- T.B. hospitals
- Leprosy hospitals
- Cancer hospitals

➤ **BASIS OF ANATOMICAL – PHYSIOLOGICAL SPECIALIZATION**

- Ear, nose and throat hospitals
- Orthopaedic hospitals
- Eye hospitals
- Kidney hospitals

➤ **BASIS OF THE CLIENT GROUP THEY SERVE**

- Paediatric hospitals
- Gynaecological hospitals for women
- Maternity hospitals for mothers

➤ **BASIS OF SYSTEM OF MEDICINE**

- Allopathic hospitals
- Ayurvedic hospitals
- Homeopathic hospitals
- Unani hospitals

- Nature cure centres
- Physio-therapy centres

❖ BASED ON NON-CLINICAL

➤ PUBLIC OWNERSHIP

Central government hospitals

- Like the railway hospitals, defence hospitals, **All India Institute of Medical Sciences, P.G. Institute of Medical Sciences**, Pondicherry or Chandigarh

State government hospitals

- Like civil hospitals at district headquarters, **Sassoon hospitals, Pune; hospital, Mumbai**

Local self-government hospitals

- These are run by municipalities or corporations, e.g. **BMC hospitals like Bhagwati hospital in Mumbai**

➤ PRIVATE OWNERSHIP

Trusts

- The board of trustees manage the affairs, e.g. **Mumbai hospital; Jaslok hospital, Mumbai**

Religious bodies / orders

- **Ram krishna hospital, Kolkatta; Christian Medical college hospital, vellore**

Limited companies

- They can be incorporated as **public limited company**, where the public subscribes to the share capital
- e.g. **Apollo hospitals, ltd., Chennai; medinova centre's proposed limited hospitals at baroda**

➤ BASIS OF SIZE

Large hospitals

- Beds **1000 and above**
- Example – **J.J. group of hospitals in Mumbai, K.E.M, Mumbai**

Medium hospitals

- Beds between **500 – 1000**
- Example – **Mumbai hospital, Jaslok hospital**

Small hospitals

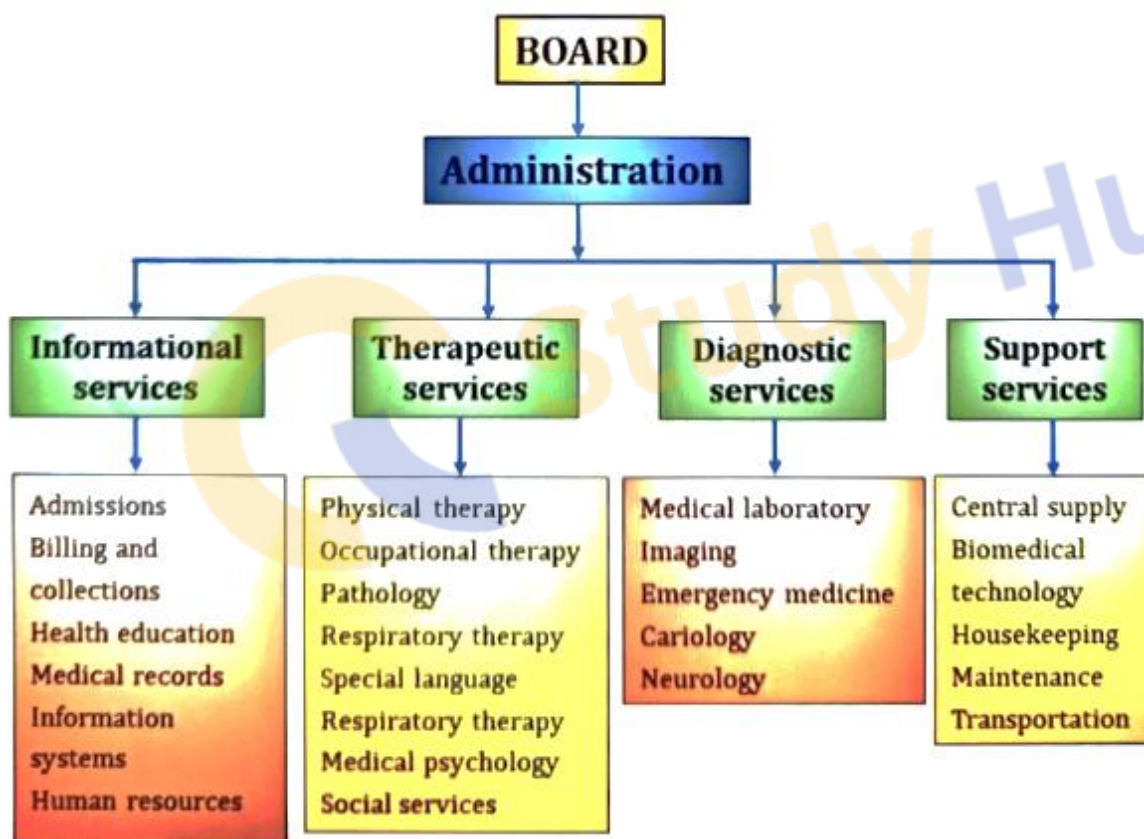
- Beds between **100 – 500**
- **branch candy hospital, Mumbai** has a bed capacity of **130 beds**

Very small hospitals

- Bed less than **100**

ORGANIZATION STRUCTURE OF HOSPITAL

- If the **organizational structure** of a hospital is not planned and coordinated, there can be **disastrous and potentially life-threatening consequences**.
- Therefore, **hospitals need to have a clearly defined and precise organizational structure** to ensure that **no mistakes are made during the healthcare provision and administrative process**.
- **Comprehensive and holistic organizational structures** can help hospital employees understand their **day-to-day responsibilities**, facilitate **decision-making**, and **revitalize employee performance and productivity**.



❖ THE BOARD OF DIRECTORS

- The **board of directors** is a governing **regulatory body** that helps hospitals make **higher-level organizational decisions**.

- The board of directors for hospitals usually **consists of medical experts and influential members of local communities**.
- Hospitals that are **affiliated or overseen by universities** may also include **teaching faculty** on the board of directors.
- The board of directors is responsible for **guiding the hospital's mission statement and future goals**, and they ensure to achieve them.
- Furthermore, the board of directors must create **long-term strategic plans for growth and stability**.

❖ EXECUTIVE MANAGEMENT

- **Executives are responsible** for successfully performing the hospital's **day-to-day managerial decision-making**.
- A hospital executive's **organizational role** is usually **extremely specified** depending on which **specific function** they are responsible for.
- This includes **financial resource allocation**, medical executive decision making, and **administrative operations**.

❖ HOSPITAL AND DEPARTMENTAL ADMINISTRATION

- **Department administrators** are responsible for **reporting to hospital executives** about the **specific daily departmental operations** of the organization and **carrying out decisions made by executive management**.

- These include **supervising the provision of emergency healthcare services**, **overseeing supply and purchase of necessary medical equipment**, **monitoring departmental surgical activities**, and much more.

❖ PATIENT CARE SERVICE MANAGEMENT

- **Patient care managers** are hospital employees that oversee and manage **healthcare service providers**.
- This includes **creating employee schedules**, ensuring that the overall **healthcare provision process** is carried out **appropriately**, confirming that the **hospital complies** with legal, **regulatory requirements**, and **addressing patient concerns**.

❖ PATIENT SERVICE PROVIDERS

- Patient service providers include **all employees that directly provide medical care to patients**, including **doctors, nurses, laundry workers, therapists** and more.
- Patient service providers are responsible for **communicating with patients personally**, **maintaining individual patient medical records**, and **ensuring that patients receive the best care possible**.

MEDICAL STAFF AND THEIR FUNCTIONS

- A **hospital care team** includes many **different practitioners**.

❖ ATTENDING PHYSICIAN

- The **attending physician** is the **leader of the team** and has responsibility for **all decisions made** that affect a person's



care, including **diagnosis, treatments, and supervision of the remainder of the team.**

- Based on the **problem** that brought the person to the hospital, the attending physician may be a **hospitalist** (a doctor who is trained in **internal medicine** and works only with people who are hospitalized), a **surgeon**, or another **specialist physician**.
- In **smaller communities**, the person's **primary care doctor** may act as the attending physician.

❖ RESIDENTS, INTERNS, AND MEDICAL STUDENTS

- Some hospitals are **designated as teaching hospitals**.
- That is, the hospital team includes **medical students** who are at various **stages of education** and who are **supervised by the attending physician**.
- A **resident or intern** is a fully **licensed doctor** who is **engaged in further training after graduating from medical school**.
- Although these team members are **not attending physicians**, they are often **active members of the team**.



❖ SPECIALISTS

- When people have **complex or serious medical problems**, the attending physician sometimes requests that **specialists evaluate** the person and recommend how to **best diagnose and treat** the problems.
- For example, the specialist may be a doctor who is **extensively trained** in the **diagnosis and treatment of disorders** of the **heart (cardiologist)**, **kidneys (nephrologist)**, or **cancer (oncologist)**.



❖ REGISTERED NURSES

- People usually have **more contact with registered nurses (RNs)** assigned to their care than any other member of the team.

- RNs **give drugs to people** and **monitor and evaluate** their **physical and emotional needs**.

- When a person's condition suddenly changes, **RNs are often the first to detect the change**.



- RNs then **report the change** to the **attending physician or house staff**.

- RNs may be **charge nurses or nurse supervisors**, organizing and **monitoring overall nursing care in a hospital unit**.

❖ LICENSED PRACTICAL NURSES

- **Licensed practical nurses (LPNs)** are supervised by RNs and provide **basic medical and nursing care**.

- For example, LPNs **check blood pressure**, **insert catheters**, and **help people bathe and dress**.

- LPNs also **talk to people about their health care**, answer their questions, and **report how they are doing to RNs and doctors**.



❖ NURSE PRACTITIONERS AND PHYSICIAN'S ASSISTANTS

- **Nurse practitioners and physician's assistants (PAs)** work closely with the **attending physician** to **coordinate a person's daily care**.

- They also help with **doing physical examinations** and **ordering drugs and treatments**

when people have more **common or routine medical** or **surgical problems**.

- Although nurse practitioners and PAs are **not doctors**, they have **advanced training in diagnosis and treatment**.
- Nurse practitioners and PAs are **supervised by doctors**.



❖ PATIENT ADVOCATE

- **Patient advocates** are **non-medical administrators**, employed by the hospital to **assist patients receiving care** there.
- In general, they **handle complaints** that people have about their **treatment or health care providers**.
- People can meet with a patient advocate if they **feel uncomfortable discussing concerns directly** with their health care providers or feel that their concerns have **not been addressed**.



❖ PATIENT CARE TECHNICIANS

- Traditionally called **nurse's aides**, patient care technicians help nurses with **people's care**. Their duties may include:
 - Obtaining **vital signs** (measuring blood pressure and temperature)
 - **Moving people** to and from a bed or wheelchair
 - **Helping people with walking**
 - **Providing items for people's comfort** (such as pillows and



blankets)

- Sometimes, **helping feed people** who cannot feed themselves

❖ PHYSICAL THERAPISTS

- **Physical therapists** evaluate and **treat people** who have **difficulty functioning** — for example, **difficulty walking, changing positions, or transferring from a bed to a chair.**

- These problems may develop or worsen in the hospital because people have to stay in **bed a long time** as may occur **after surgery**, or because their **disorder worsens.**



☐ OCCUPATIONAL THERAPISTS

- **Occupational therapists** assess **people's ability** to do their **daily activities.**
- These activities include **eating, dressing, grooming, bathing, using the toilet, cooking, and cleaning.**
- **Occupational therapists** can **recommend strategies and devices** to help people function more **independently.**



☐ HOSPITAL PHARMACISTS

- **Pharmacists specialize** in how **drugs work and interact** with each other.
- Hospitals have **pharmacists** on their staff who **supervise the use of drugs in the hospital.**
- If needed, **hospital pharmacists teach people** how to



safely and effectively take the drugs prescribed for them.

- For example, pharmacists may **advise people to avoid specific foods** that **interact with** their prescribed drugs or teach people how to inject drugs (**such as insulin**) at home.

DIETITIANS

- **Registered dietitians** have **specialized nutritional and medical training** that helps them determine a person's **dietary needs** and plan the **person's meals** in and out of the hospital, as requested by the **attending physician**.

- When **planning meals**, dietitians consider the person's **personal, cultural, and religious food preferences**.



RAPID RESPONSE TEAM

- **Rapid response teams** are groups of designated hospital staff (**often a doctor, nurse, and respiratory therapist**) who **quickly come** to a person's hospital room if there is any indication that **their condition is deteriorating**, such as:

- abnormal vital signs
- trouble breathing
- chest pain
- signs of a stroke



- After **ordering tests or starting treatments** to **stabilize a person's condition**, the team contacts the **attending physician** and may move the person **to another area of the hospital** for **specialized monitoring or treatment**.

HOSPITAL PHARMACY AND ITS ORGANIZATION (PART - 2)

Points to be covered in this topic

- INTRODUCTION
- FUNCTIONS OF HOSPITAL PHARMACY
- ORGANIZATION STRUCTURE
- LOCATION AND LAYOUT
- STAFF REQUIREMENTS
- RESPONSIBILITIES AND FUNCTIONS

INTRODUCTION

- **Hospital pharmacy** is one of the most important department among **several departments** of a hospital.
- Hospital pharmacy may be defined as that **department of the hospital** which deals with **procurement, storage, compounding, dispensing, manufacturing, testing, packaging and distribution of drugs**.
- It is also concerned with **education and research in pharmaceutical services**.
- A hospital pharmacy is controlled by a **professionally competent and qualified pharmacist**.



FUNCTIONS OF HOSPITAL PHARMACY

The following functions are performed by a **hospital pharmacy**:

1. The **dispensing of drugs, chemicals and pharmaceutical preparations.**
2. The **filling and labelling of drug containers.**
3. The **inspection of all pharmaceutical supplies.**
4. The **dispensing of all narcotic drugs and alcohol** and the maintenance of a **perpetual inventory** of them.
5. **Specifications of the quality of drugs, chemicals, antibiotics, biologicals and pharmaceutical supplies** used in the treatment of patients.
6. **Sources to get the above products.**
7. To maintain a **satisfactory system of records and book-keeping** for the above products.
8. To maintain **adequate control over requisitioning and dispensing** of all drugs and pharmaceutical supplies.

9. To make **large volume injection fluids and other parenterals**, and to maintain **aseptic conditions** while doing so.
10. To do **in-house production of drugs**, the buying of which from **outside sources** is **not prudent**.
11. To **furnish information concerning medications** to **physicians, interns and nurses**.

❏ OBJECTIVE OF HOSPITAL PHARMACY

- To ensure the **availability of right medication**, at **right time**, in the **right dose** at the **minimum possible cost**.
- To **professionalize the functioning** of pharmaceutical services in a hospital.
- To act as a **counseling department** for **medical staff, nurses and for patient**.
- To act as a **data bank on drug utilization**.
- To **participate in research projects**.
- To **implement decisions** of the **pharmacy and therapeutics committee**.

ORGANIZATION STRUCTURE

- The **pharmacy manager** identifies a **relatively standard organizational design** that most closely fits the **pharmacy's needs**.
- The design is **molded** to match with **unique requirements** of the pharmacy and hospital administrator.
- The **size and nature** of a pharmacy department's management staff will depend on the **number of personnel** in the department and the **scope of services delivered**.
- **Small pharmacies** tend to have much **simpler organizational structures**, this is usually

generally understood and no problems arise (for example: the pharmacy in **primary health center**).

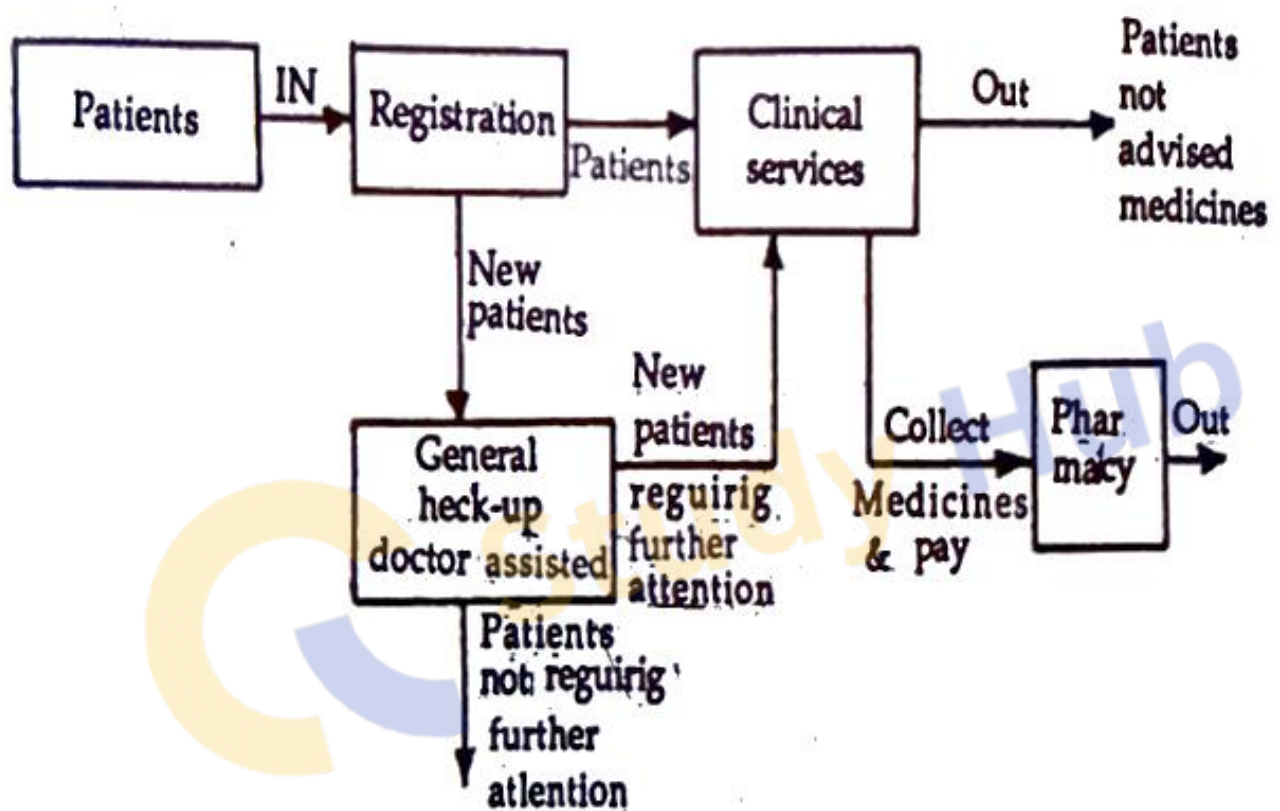
- **Large pharmacies** with **assistant chief pharmacists, supervisors, and unprofessional personnel** have **complex organizational structures**.
- Therefore, the **authority must be delegated** by the **chief pharmacist**.

LOCATION AND LAYOUT

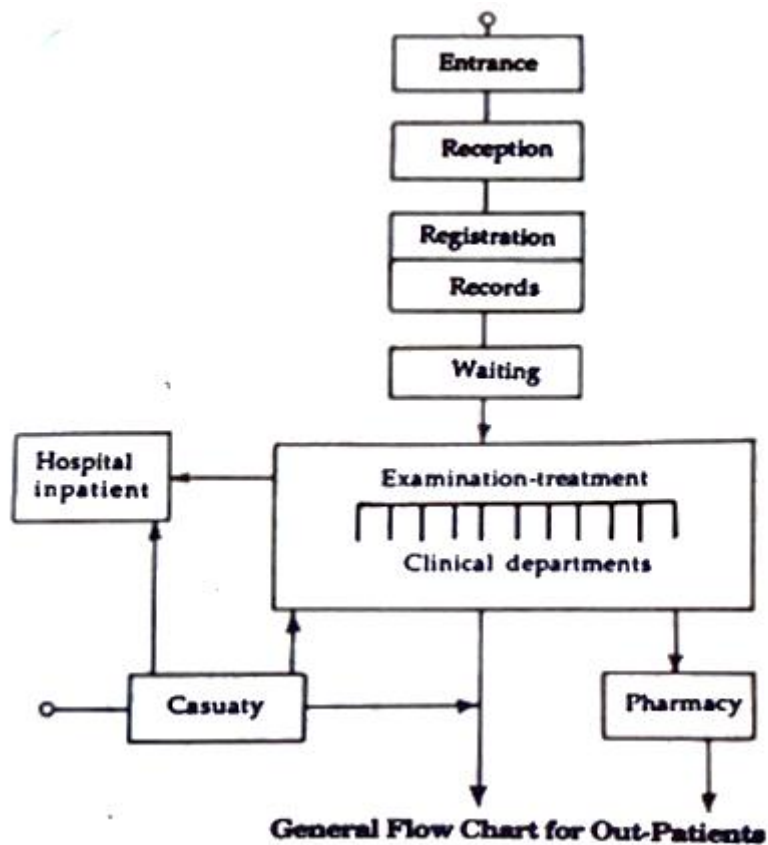
- Wherever possible, the pharmacy should be **located on the first floor**, or on the **ground floor** of the hospital, such that it is **readily accessible to the elevators**, to ensure **sufficient and effective service** to the various **departments and nursing stations**.
- In case the hospital has an **outpatient department**, the pharmacy or a **branch thereof** should be **conveniently located near it**.
- In a **multi-storeied hospital**, if necessary, **floor pharmacies** should be provided.
- The departments should be so **laid out** that there is a **continuous flow of men and materials**.
- The departments should be **vertically separated**.
- **Outpatient pharmacy** must have a **pleasant look** and must have enough **space for seating patients** who are **waiting for medicine**.
- The interior **should not be congested**.
- **Outpatient pharmacy's waiting room** should have **professional look**.
- It should **display educative posters** on **health and hygiene** and can offer **light literature** for reading to **fill up the waiting time**.
- **Visitors should carry a positive image** of pharmacy.

- Space must be assigned for **routine manufacturing of preparations** which can be processed **profitably** e.g. **stock solutions, bulk powders, ointments**, etc.
- The **manufacturing room** can be adjacent to the **pharmacy** or can be located in the **basement directly below** the pharmacy.

FLOW CHART OF PATIENTS



FLOW CHART OF OUT PATIENT







STAFF REQUIREMENTS

- A **staff requirement** in the **hospital pharmacy** depends upon the **strength of patients** available in the **hospital wards** or **hospital premises**.
- Based on the strength, the following table shows the **requirement of staff i.e. pharmacists** in the **hospital pharmacy department**.

Bed strength	Number of pharmacist
Up to 50 beds	3
Up to 100 beds	5
Up to 200 beds	8
Up to 300 beds	10
Up to 500 beds	15



RESPONSIBILITIES AND FUNCTIONS

- The hospital consists of various departments like **outpatient department (OPD)**, **inpatient department (IPD)**, **manufacturing of sterile products**, **therapeutics committee**, etc.
- **Every department dealing with drugs** plays a role by a **hospital pharmacist**.
- Following should explain briefly the **roles of hospital pharmacists**:



HOSPITAL AND THERAPEUTIC COMMITTEE

- The pharmacist is an **important member** of the **hospital and therapeutic committee**.
- A pharmacist usually comes **second in command**, after a **physician** in the committee.
- Pharmacists work toward **maximizing and maintaining rational drug use**.



DISPENSING TO IPD / OPD

- Before dispensing a drug, the pharmacist must make sure about the **proper prescription** of the drug and its **validity** with regards to **diagnosis and treatment**.
- Pharmacists should also check for **any modification** concerning the **dose regimen**.
- A pharmacist is responsible for the **distribution of drugs** within the ward and he is **co-ordinating with nurses**.



DRUG DISTRIBUTION

- Pharmacist has a **major role in supervising** regarding proper **distribution of drugs** across **inventory, pharmacy, floor pharmacy, ward pharmacy, IPD, OPD**, etc. to **avoid ambiguities or any other failures**.



PURCHASING, INVENTORY CONTROL AND BUDGET

- Hospital pharmacist plays an important role in **purchasing drug account**.
- There are **varieties of products** with **similar characteristics**; in such cases pharmacist has to choose the **best few from a variety of products**.
- The pharmacist has to take **balancing and rational decisions** considering the **economy, health, and end-user service**.



CONTROLLED SUBSTANCES, PROCUREMENT AND DISTRIBUTION

- Hospitals procure **controlled substances** in **large volumes**, thus **supervising this unit by the pharmacist has crucial**.
- For the **procurement of controlled substances**, there is required **complete legal paperwork** and the **pharmacist is authorized by law** for procurement.
- Without the **consent of a pharmacist**, the **hospital cannot procure** the same.
- A pharmacist has also a **responsibility to regulate** the use of such substances on **hospital premises** because such substances are **very likely to misuse**.

MANUFACTURING BULK AND STERILE PRODUCT

- Large hospitals **manufacture their bulk drugs** to **save cost** and allow a **steady supply** of commonly used drugs, for example: **Paracetamol, Ranitidine, Saline solution, Dextrose solution, etc.**
- In such a hospital, the **manufacturing plant or unit is segregated** into several departments like **manufacturing, packaging, labeling, QA, etc.**
- A pharmacist has to **supervise the activities of manufacturing** as well as have a **responsibility to control them**.

HOSPITAL FORMULARY

- **Hospital Formulary** is a **brief and compilation** of all information related to **drugs** and **guidelines for regulation in hospitals**.
- It is **similar to pharmacopoeia** but intended towards incorporating **better and cheaper, condition-specific drugs** in the hospital pharmacy.

- It generally contains the **drug information** which is **particularly preferred** by **hospital pharmacists** for the patient.
- A pharmacist plays actively involved in the **preparation, updating, reviewing, and following a hospital formulary**.

INVESTIGATIONAL DRUG USE

- Based on the **technical expertise** hospital pharmacist are work in **phase 1 and phase 2 clinical trials**.
- Drugs used in **clinical trials** are generally reviewed by **hospital pharmacists and HTC before use**.

EDUCATIONAL AND TRAINING PROGRAMS

- The **majority of hospitals provide training programs** for healthcare practitioners.
- Such training programs run under **diverse faculty of physicians, administrators, nurses, pharmacists, etc.**
- In such a program pharmacist has played a **role in training fresh or junior pharmacist**.
- They provide **theoretical and practical training** to trainers.

ADVERSE DRUG REACTION (PART - 3)

Points to be covered in this topic

- INTRODUCTION

- CLASSIFICATIONS
- TOXICITY FOLLOWING SUDDEN WITHDRAWAL OF DRUGS
- DRUG INTERACTION
- METHODS FOR DETECTING DRUG INTERACTIONS

INTRODUCTION

- An **adverse drug reaction** (ADR) is a **harmful, unintended result** caused by **taking medication**.
- ADRs may occur following a **single dose** or **prolonged administration of a drug** or result from the combination of **two or more drugs**.
- The meaning of this term differs from the term “**side effect**” because side effects can be **beneficial as well as detrimental**.
- The study of ADRs is the concern of the field known as **pharmacovigilance**.
- An **adverse drug event** (ADE) refers to any **unexpected and inappropriate occurrence** at the time a drug is used, whether or not associated with the **administration of the drug**.
- ADRs are only one type of **medication-related harm**, as harm can also be caused by **omitting to take indicated medications**.



REASONS FOR ADVERSE REACTION

DISPENSING AND MEDICATION ADMINISTRATION ERRORS

- In many cases, the **physicians overprescribe** to the patient.
- These prescriptions generally contain **potent antibiotics**.
- Similarly, **self-medication by the patients** leads to **overuse or misuse** of the drugs leading to adverse drug reactions.

FAILURE TO SET THERAPEUTIC END POINT

- Potent medicines when **abused or misused** may cause **adverse effects or even death**.
- Failure of the physician to set the **therapeutic end point** is the reason for adverse reactions for drugs like **digitalis**, **corticosteroids**, **diuretics** etc.

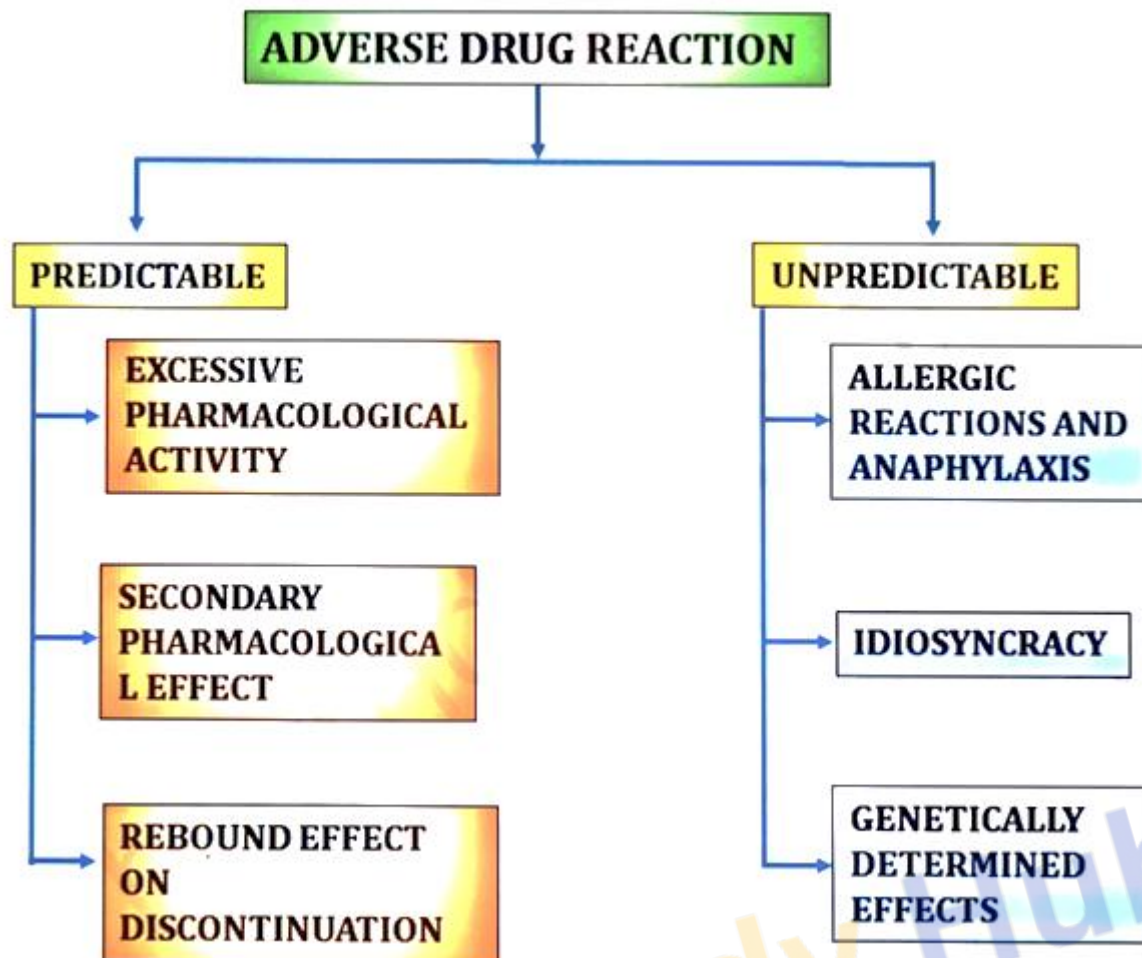
BIOAVAILABILITY DIFFERENCE

- Difference in the **bioavailability** from different formulations or **brands of the drug** may also cause the adverse.
- Difference in bioavailability from various brands of **digoxin, phenytoin, oxytetracycline** have resulted in **toxicity in some cases**.

PATIENT FACTORS

- **Physiological and disease status** of patient affects adverse drug reactions.
- **Very young and old patients** are more susceptible to adverse drug reaction as compared to the adult.
- This is due to **marked difference in the metabolism and excretion** pattern at this age.
- Similarly, patients with **renal and hepatic damage or dysfunction** are prone to adverse drug reaction due to **disturbed metabolism and excretion of drugs**.
- Adverse drug reactions may be due to **inherited absence or deficiency of certain specific enzymes**.

CLASSIFICATIONS



PREDICTABLE ADVERSE DRUG REACTIONS

- Some adverse drug reactions are **not related to the drug's therapeutic effect** but are usually **predictable**, because the mechanisms involved are **largely understood**.
- For example, **stomach irritation and bleeding** often occur in people who regularly use **aspirin** or other **nonsteroidal anti-inflammatory drugs (NSAIDs)**.

EXCESSIVE PHARMACOLOGICAL ACTIVITY

- It mostly occurs due to **CNS depressants**, **hypoglycemics**, **cardioactive agents**, and **hypotensive agents**.



- This type of reaction develops in all patients if **excessive dosage** are given.

Example:

- **Bradycardia** in patients receiving **excessive digoxin**.
- **Respiratory depression** in patient suffering from **severe bronchitis** if **morphine** or **benzodiazepine hypnotics** are given.

SECONDARY PHARMACOLOGICAL EFFECT

- An adverse drug effect is the **pharmacological effect**, other than the one for which the drug was initially administered.
- e.g. patient receiving an **antihistaminic** for the prevention of **motion sickness** may become **drowsy**.
- Large proportion of adverse drug effects are attributed to **secondary pharmacological effects**.



REBOUND EFFECT AFTER DISCONTINUATION

- Chronic use of certain drugs produces **tolerance at cellular level**, and **sudden withdrawal** of such drugs produces **severe adverse effects**.
- This type of reactions are common with drugs affecting **CNS** and some **hypotensive agents**.



Example:

- **Rebound hypertension** on sudden discontinuation of a **hypotensive agent clonidine**.
- Sudden withdrawal of **corticosteroids** causes **acute adrenal crisis** characterized by **weakness and hypotension** in patients.

UNPREDICTABLE ADVERSE DRUG REACTIONS

- The least severe unpredicted adverse drug reaction is **intolerance**, which appears to be an **exaggeration of pharmacological or toxic effects** of the drug among **vulnerable subsets of patients**.
- Some of the most severe and **life-threatening adverse drug reactions** are **allergic**.

ALLERGIC DRUG REACTIONS

- Allergy is an adverse response to a **foreign substance** resulting from a **previous exposure** to that substance.
- It is manifested only after a **second or subsequent exposure**.
- Only a small proportion of the population exposed to the drug exhibits **allergic reactions**.

IDIOSYNCRASY

- The term **idiosyncrasy** has long been used to denote both **quantitatively and qualitatively abnormal drug response**.
- Idiosyncrasy covers **unusual, bizarre, or unexpected drug effects** which cannot be explained or predicted in individual recipients.
- It also includes drug-induced **foetal abnormalities** e.g. **phocomelia**, which developed in the offsprings of mothers exposed to **thalidomide**.

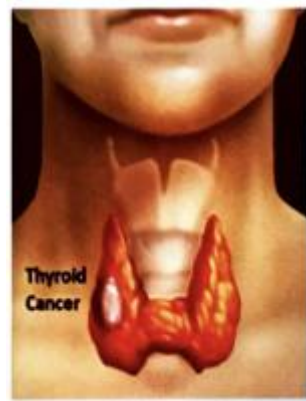
Example:

- **Analgesics** may induce **tumours of kidney and pelvis** in patients



with **renal disease**.

- **Thyroid cancer** may develop in patients who have received **^{131}I therapy** in the past.



GENETICALLY DETERMINED EFFECTS

- In case of patients with special **genotype or genetic make-up**, there is increased risk of **drug toxicity**.

Example:

- Patients with **hereditary deficiency of pseudocholinesterase** are unable to metabolise the muscle relaxant **succinyl choline** and may develop **prolonged paralysis and apnoea** following its use.

TOXICITY FOLLOWING SUDDEN WITHDRAWAL OF DRUGS

INTRODUCTION

- Drug withdrawal is a **physiological response** to the **sudden quitting or slowing of use of a substance** to which the body has grown **dependent** on.
- The various types of drug withdrawal syndromes may involve different combinations of **physical, mental, and emotional symptoms**, some of which can prove **dangerous if left unmanaged**.



SYMPTOMS OF WITHDRAWAL

- The symptoms of withdrawal from substances may be different depending on the substance used.

Common symptoms of withdrawal may include:

- ✓ Trembling and tremors
- ✓ Muscle pain or aches
- ✓ Hunger or loss of appetite
- ✓ Fatigue
- ✓ Sweating
- ✓ Irritability and agitation
- ✓ Depression
- ✓ Anxiety
- ✓ Nausea
- ✓ Vomiting
- ✓ Confusion
- ✓ Insomnia
- ✓ Paranoia



✓ Seizures

✓ Dilated pupils

TYPES OF WITHDRAWAL

- The specific withdrawal symptoms you experience depends on the **type of drug you were taking**.

- There are a number of different drug types that can result in withdrawal, including the following:

✓ Antidepressants

✓ Barbiturates

✓ Cannabis

✓ Depressants

✓ Hallucinogens

✓ Inhalants

✓ Opioids

✓ Stimulants

- The following are some examples of **specific substances** that may lead to withdrawal and the **expected duration** of those symptoms:

Alcohol

- When a **heavy drinker** suddenly stops or significantly reduces their **alcohol intake**.
- With **AWS**, you may experience a combination of **physical and emotional symptoms**, from **mild anxiety and fatigue to nausea**.
- Some symptoms of AWS are as severe as **hallucinations and seizures**.
- At its most extreme, **AWS can be life threatening**.



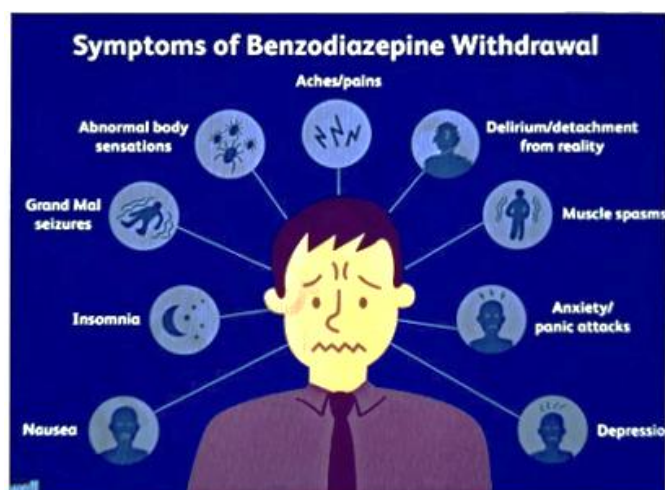
Heroin

- Heroin belongs to the **opioid class of drugs**.
- Opioid receptor activation is associated with a subsequent release of **dopamine in the brain**, which serves to reinforce the continued use of opioid drugs for their **pleasurable effects**.



Benzodiazepine

- Benzodiazepines, or “**benzos**” as they are sometimes referred to, are a **class of drugs** that effectively treat **anxiety, panic disorder, and certain types of seizure disorders**.
- These medications are **CNS depressants** and work on the brain by increasing activity at receptors for the inhibitory neurotransmitter **gamma-aminobutyric acid (GABA)**.
- This increase in GABA activity also increases **inhibition of brain activity**, producing a **drowsy or calming effect** that may be medically beneficial.



Cocaine

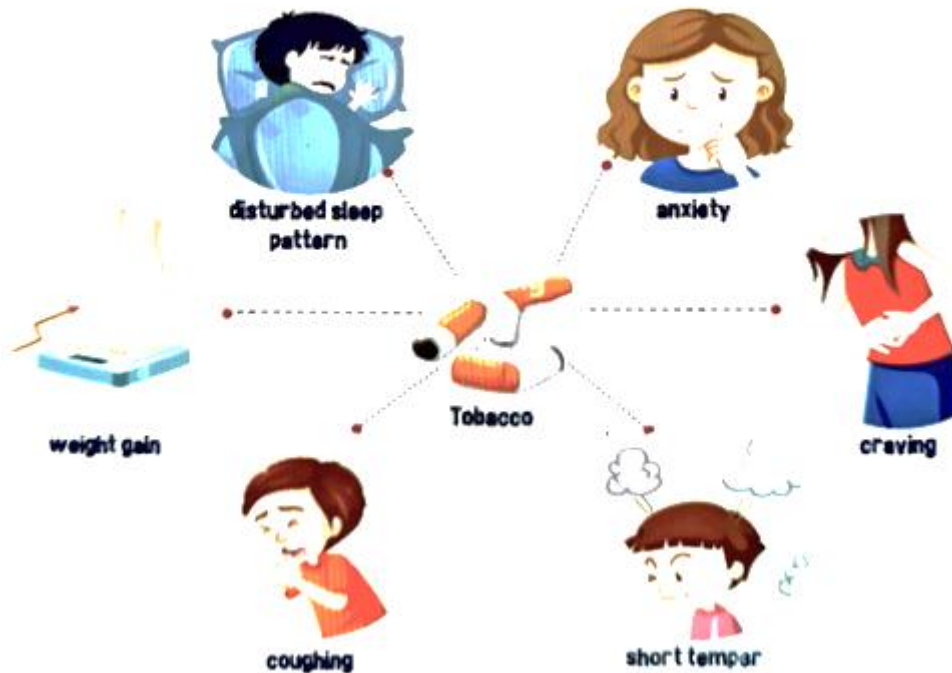
- Cocaine is an exquisitely **addictive stimulant drug** that influences the brain's **reward center** by blocking the **removal of dopamine from the synapses**.
- This effect in the brain reinforces cocaine use and lays the groundwork for **eventual compulsive patterns of use**.
- In turn, this can drive the development of **physiological dependence** to the drug.



Nicotine

- **Nicotine withdrawal** is the term used to describe the **physical and psychological symptoms** you experience when you **quit smoking**.
- These **discomforts are normal and temporary**, as long as you **stay smoke free**.

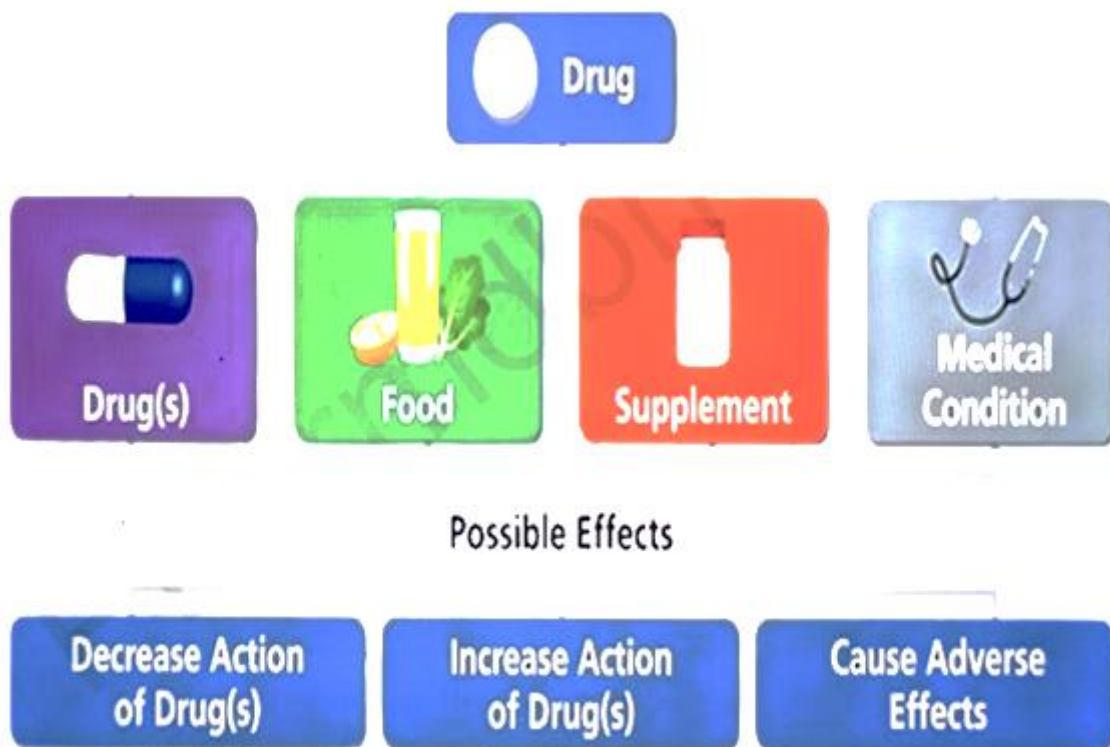
Nicotine Withdrawal Symptoms



DRUG INTERACTION

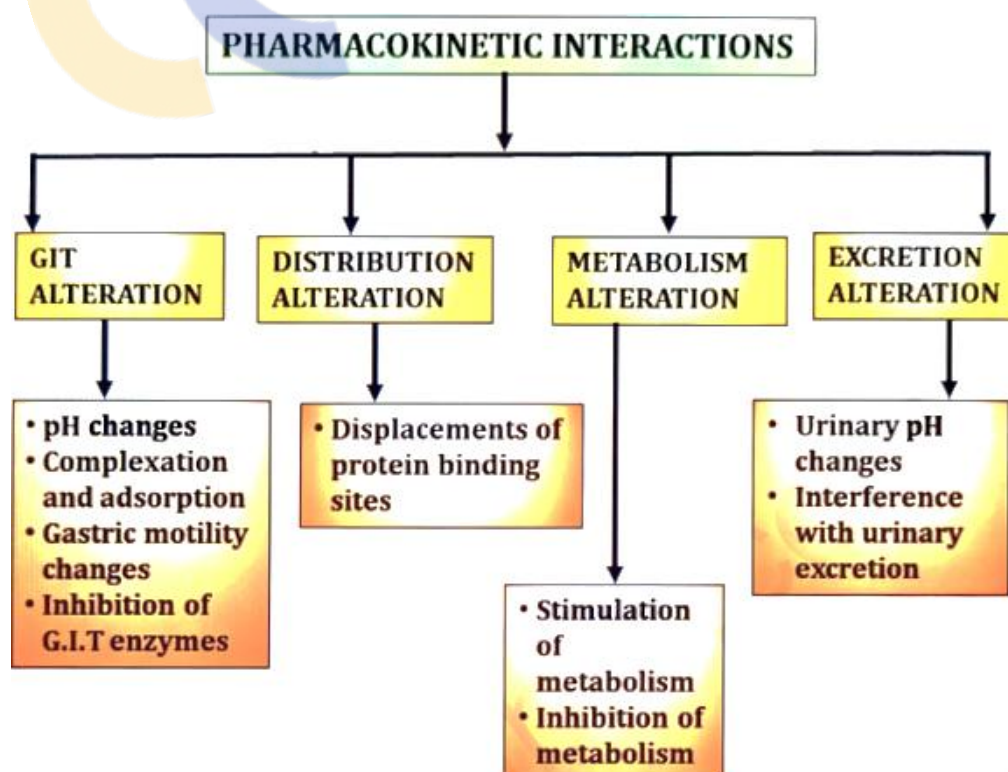
INTRODUCTION

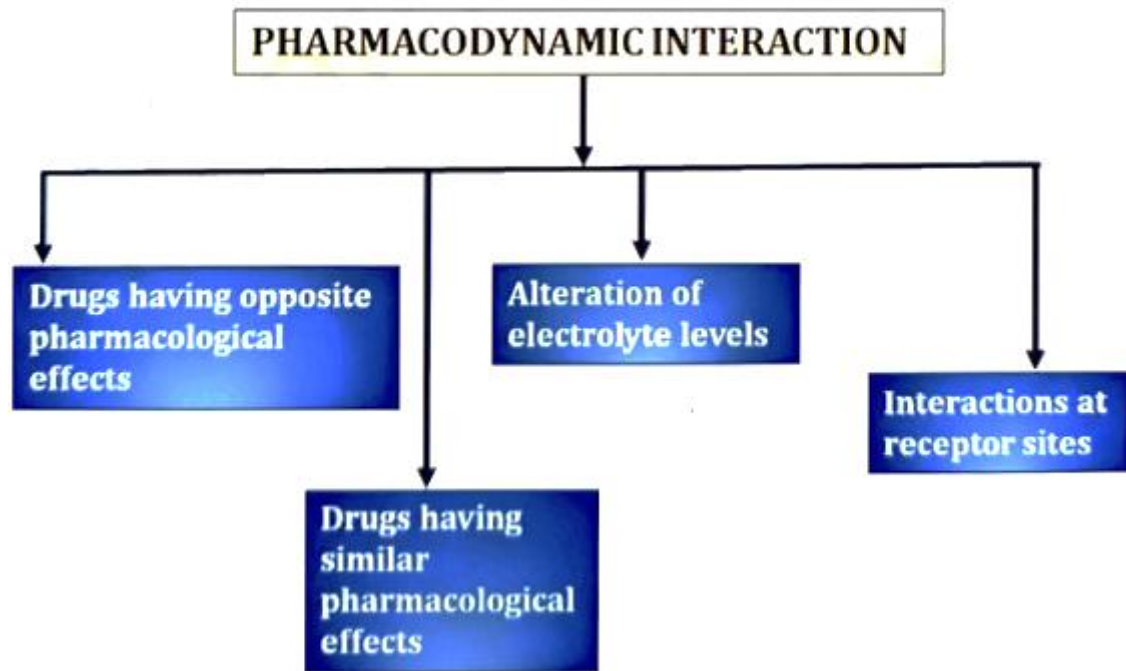
- **Drug interactions** occur when a **drug's mechanism of action** is disturbed by the **concomitant administration** of substances such as **foods, beverages or other drugs**.
- The cause is often the **inhibition of the specific receptors** available to the drug, forcing the **drug molecules** to bind to other **non-intended targets** which result in an **array of side-effects**.



MECHANISMS OF DRUG INTERACTIONS

1. Pharmacokinetic interactions
2. Pharmacodynamic interactions





1. PHARMACOKINETIC INTERACTIONS

- These interactions alter **absorption**, **distribution**, **metabolism** and **excretion** of a drug.

i. GIT ALTERATION

- Drug interactions may reduce the **total amount of drug absorbed**.
- This reduces the **therapeutic activity** of the drug.
- Sometimes there is **delayed absorption process** and **onset of action is prolonged**.

✓ Alteration of pH

- **Non-ionised** form of drug is more **lipid soluble**, hence it is **rapidly absorbed** than the ionised form.

- **Acidic drugs** (eg. aspirin) remains unionised at the **stomach pH** and get rapidly absorbed from stomach.
- Similarly, **basic drugs** are better absorbed from the **intestine** where they are in **unionised state**.

✓ **Complexation and adsorption**

- Certain substances can bind with **other drugs** thereby **preventing absorption**.
- **Tetracycline** combines with **metal ions** such as **Fe, Al, Mg and Ca** in the **GIT**.

✓ **Gastric motility changes**

- A drug like a **cathartic**, increases gastric motility and thereby **shortens gastric emptying time**.
- This will **enhance the absorption of acidic drugs** and **decrease absorption of basic drugs**.

✓ **Inhibition of gastrointestinal enzymes**

- **Folic acid** is available from the **diet** in the form of **poorly absorbed polyglutamate**.

ii. **DISTRIBUTION ALTERATION**

✓ **Displacement from receptor binding site**

- Two drugs with an affinity for the same plasma protein binding sites may **compete for these sites**.

- This may result in displacement of **one drug from the binding sites**.

Bound drug	Displacing drug	Result
Tolbutamide	Salicylates, phenylbutazone	Hypoglycemia
Warfarin	Salicylates, clofibrate	Haemorrhage
Thiopentone	Sulphonamides	Prolonged anesthesia
Methotrexate	Sulphonamides	Agranulocytosis

iii. METABOLISM ALTERATION

✓ Stimulation of metabolism

- A drug may stimulate metabolism of another drug mainly by **increasing the activity of hepatic enzymes** which are involved in the metabolism of therapeutic agents.
- This increase in enzymatic activity is known as **enzyme induction**.

Drug	Inducing agent	Effect
Warfarin	Barbiturates, glutethimide	Decreased anticoagulant effect
Tolbutamide	Alcohol, phenytoin	Decreased hypoglycemia
Oral contraceptives	Rifampicin	Pregnancy

Drug	Inducing agent	Effect
Quinidine	Phenytoin, barbiturates	Reduced quinidine levels

✓ Inhibition of enzymes

- A drug that **inhibits microsomal enzyme production** may raise the **blood levels of the other drug or its toxic metabolites**, causing intensified drug effects and prolonged drug action.

Drug	Inhibiting drug	Effect
Phenytoin	Isoniazid, phenylbutazone, phenobarbitone	Phenytoin intoxication
Warfarin	Allopurinol, nortriptyline	Haemorrhage
Tolbutamide	Phenylbutazone	Hypoglycemia
Barbiturates	MAO-inhibitors	Prolonged sedation

iv. EXCRETION ALTERATION

✓ Changes in urinary pH

- Non-ionised drugs** diffuse from urine back into the blood, whereas **ionised form of drugs** is excreted easily.

- Thus any drug that will change urinary pH will alter the excretion of **weak acid or weak base**.

✓ **Interference with urinary excretion**

- **Competition for tubular transport** between concurrently administered drugs commonly interferes with urinary excretion.
- This can block or lower the excretion of the competing drugs.

Example:

- Probenecid competes with **penicillin for tubular transport**, therefore probenecid is used to prolong the action of penicillin.

Primary drug	Competing drug	Result
Indomethacin	Probenecid	Indomethacin toxicity
Salicylate	Probenecid	Salicylate toxicity
Digoxin	Spironolactone	Increased plasma digoxin levels

2. PHARMACODYNAMIC INTERACTIONS

i. DRUGS HAVING OPPOSING PHARMACOLOGICAL EFFECTS

- Many times patient may take concurrently two drugs having **opposite pharmacological actions**.

- A patient may be using a **cholinergic drug like pilocarpine** for eye problems and at the same time for gastric problems he might be prescribed an **anticholinergic agent**.

ii. DRUGS HAVING SIMILAR PHARMACOLOGICAL EFFECTS

- Drugs acting at the **same site or influencing same physiological system** cause **synergistic effect**.

Primary drug	Interacting drugs	Result
Alcohol	Other CNS depressants like barbiturates, antihistaminics, narcotics	Increased CNS depression
Tubocurarine	Aminoglycosides, antibiotics	Prolonged paralysis
Digitalis	Propranolol	Excessive hypoglycemia

iii. ALTERATION OF ELECTROLYTE LEVELS

- Drugs which cause alterations in fluid and electrolyte balance may modify responses of tissues to drugs.
- Diuretics losing potassium may cause **hypokalemia**, in turn making the heart more sensitive to digitalis.

Primary drug	Interacting drug effect	Result
Digitalis	Diuretic induced hypokalemia	Digitalis toxicity
Lignocaine, quinidine	Diuretic induced hypokalemia	Antagonism of antiarrhythmic effects
Tubocurarine	Diuretic induced hypokalemia	Antagonism of diuretic activity

iv. DRUG INTERACTIONS AT RECEPTOR SITES

- Effects of drug occur as a result of its **binding to specialized areas**, on or within the cells, known as **receptor sites**.
- The amount of drug associating with the receptor sites depends upon:
 - (a) Amount of drug in the body
 - (b) Accessibility of drug to the receptor
 - (c) Affinity of drug for the receptor

BENEFICIAL INTERACTIONS

- Simultaneous oral intake of **herbs, supplements, foods and drugs** with other drugs may result in pharmacokinetic or pharmacodynamic interactions.

- Although these interactions are often associated with unwanted effects such as adverse events or inefficacy, they can also produce effects that are potentially beneficial to the patient.
- Beneficial pharmacokinetic interactions include improvement of **bioavailability of a drug** or prolongation of a drug's plasma level within its therapeutic window.
- Beneficial pharmacodynamic interactions include **additive or synergistic effects**.

ADVERSE INTERACTION

- **Nonsteroidal anti-inflammatory drugs** (NSAIDs) such as **ibuprofen** have a long history of safe and effective use as both prescription and over-the-counter (OTC) analgesics/antipyretics.
- The mechanism of action of all NSAIDs is through **reversible inhibition of cyclooxygenase enzymes**.
- Adverse drug reactions (ADRs) including **gastrointestinal bleeding** as well as cardiovascular and renal effects have been reported with NSAID use.
- In many cases, ADRs may occur because of **drug-drug interactions (DDIs)** between the NSAID and a concomitant medication.
- DDIs have been reported when NSAIDs are coadministered with **aspirin, alcohol, some antihypertensives, antidepressants**, and other commonly used medications.
- Because of the pharmacologic nature of these interactions, there is a **continuum of risk** and the potential for an ADR is dependent on total drug exposure.

- Health care providers can be instrumental in educating patients that using OTC NSAIDs at the **lowest effective dose for the shortest required duration** is vital to balancing efficacy and safety.
- This review discusses some of the **most clinically relevant DDIs** reported with NSAIDs based on major sites of ADRs and classes of medication, with a focus on **OTC ibuprofen**, for which the most data are available.

METHODS FOR DETECTING DRUG INTERACTIONS

- The various methods are given as follows

1. SPONTANEOUS CASE REPORTS

- It is common method of **arousing suspicion** about **drug related diseases**.
- A **prescriber suspects** that a condition arising in a **patient** may be **drug related**.
- He therefore reports either in a letter to the **medical journals** or to the **manufacturer of drug**.
- By this means **other prescribers** are alerted to the possibility of **drug–disease relationship**.
- “**Spontaneous Reporting Agencies**” are set up to **collect and collate** such **case reports**.
- Although the **resulting information** collected gives no idea of the **frequency** with which a given event is caused by a **drug**, it indicates that a **number of prescribers** feel that the event is **possibly drug-related**.

2. VITAL STATISTICS AND RECORD LINKAGE STUDIES

- The details of **cause of death** or of **hospitalization** are **routinely collected and analysed**.
- It gives **early warning** of an **epidemic of drug-related disease**.
- **Record linkage studies** can be used to **great effect** in the search for **drug-induced disease**.

3. COHORT STUDIES

- The term “**Cohort**” means **identifying a group of recipients** of a drug of **interest** and **observing these patients** for varying lengths of time and **recording what happens to them**.
- This type of study is used for **short-term clinical trial of a new drug**.
- Thus, this method is of **great value** for **detecting predictable adverse effects** due to **excessive pharmacological effects** arising during or immediately after **short-term treatment**.

4. CASE-CONTROL STUDIES

- It involves the **comparison of group of patients with a disease** which is thought to be **due to a drug** with a group of **patients who do not have the disease** (the controls).
- The **drug histories** of the **cases and controls** are obtained and compared.
- If a drug is **causing the disease**, then its use amongst the cases will be **far in excess** of that found in the **controls**.
- **Case-control studies** can be conducted **rapidly and efficiently** at **relatively low cost**.

TYPICAL FEATURES OF THE METHOD ARE

- (a) The cases must be **selected carefully**. The disease must be **defined clearly, precisely and accurately**. The disease under study must have **reasonable risk** of being **drug induced**.

(b) The controls obtained should be from **similar population** of cases with the **exception** that controls do not have the **disease of interest**.

Controls are usually **hospitalized patients**. They should not include **patients admitted for conditions** which are **indications of drug of interest** or which are **caused or prevented by the drug of interest**.

(c) The method used to **describe drug use** must be **identical in cases and controls**.

(d) Interpretation of **results must be accurate**.

COMMUNITY PHARMACY (PART - 4)

Points to be covered in this topic

→ INTRODUCTION

→ ORGANIZATION AND STRUCTURE

→ TYPES AND DESIGN

→ LEGAL REQUIREMENTS

→ DISPENSING OF PROPRIETARY PRODUCTS

→ MAINTENANCE OF RECORDS

INTRODUCTION

- The **main responsibilities** of a **community pharmacy** include **compounding, counseling, and dispensing of drugs** to the **patients** with **care, accuracy, and legality**, along with the proper procurement, storage, dispensing and **documentation of medicines**.

- The **community pharmacist** must be **qualified and pertinent** with **sound education, skills and competence** to deliver the **professional service to the community**.
- A **community pharmacist** should:
 - (i) Have a **sound background** of **pharmaceutical care, pharmacotherapy, and health promotion**.
 - (ii) Have **good communication skills** with **patients** and other **healthcare providers**.
 - (iii) Maintain a **high degree of standard** in **products, services, and communication**.
 - (iv) **Record and maintain** his **documents** in order.

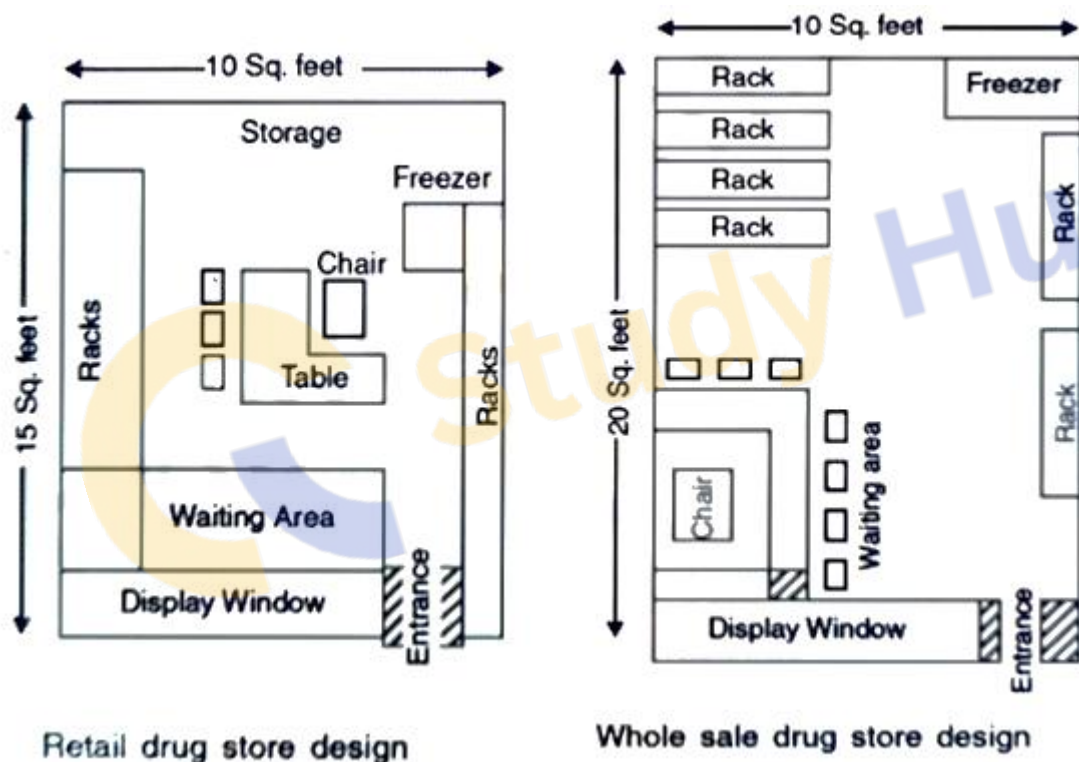


ORGANIZATION AND STRUCTURE

OBJECTIVE OF LAYOUT DESIGN

- To attract large number of customers.

- To **increase the sale of store**.
- To have proper **entrance of coming goods** and **space for reserve stock**, office and **resting place for employees**.
- To **reduce the selling expenses** and provide **customer satisfaction**.
- To **project a professional image** and **improve general appearance**.
- To **minimize the movement of customer** within the **premises of the drug store**.
- To **provide customer satisfaction**.



- A **modern drug store** should fulfill all **minimum requirements** as laid down in **Schedule N of D and C Act 1945**.
- To start a **retail drug store**, minimum of **10 sq. meter area** is required and for **wholesale drug store** same area is required.

The premises of drug store

- The **outer front of the drug store** should be **very attractive** and built with **innovated construction techniques**.
- The material used for **construction drug store front** is normally **glass, glazed tiles and marbles** which is **easy to clean**.
- Generally the **drugs stores** are located on **ground floor** of the building.
- They are usually constructed of **cement concrete walls** with **mosaic tiles on the floor**.
- The **internal fittings** usually consist of **racks** or proper **storage cupboards** having **glass doors, drawers for storing strips, shelves** and proper place for placing refrigerator.
- The **counters for store** are made from **wood** having **white sunmica** at its top.
- The **furniture** includes a **working table, wooden or steel chairs** for staff and customers.
- The **floor of the drug store** should be **smooth and washable**.
- The **walls** should be **plastered or tiled or oil painted** so as to maintain a **smooth durable and washable surface**, adequate lighting should be provided, **preferably tube lights** which is concealed.
- **Good lighting system** provides **cheerful atmosphere** for the customers and **merchandise stored and displayed appears more attractive**.

- It also **helps in identifying the medicines** etc **quickly and easily** and thus **increase the efficiency of the store**.
- The **name of drug store** and **insignia of pharmacy** in **neon lighting** is **very attractive**.
- The **fluorescent lighting** is also very attractive.
- The **illumination** should be **steady and without any glare** and should not put any **strain on the eyes**.

TYPES AND DESIGN

TYPES OF A DRUG STORE

- On the **basis of design**, it is classified as:

1. TRADITIONAL DRUG STORES

- These types of **drug stores** are **designed** in such a manner that the **entire area of Drug store is exposed to customers**.
- Such a design has **pleasing and professional appearance** and is **convenient** for both workers and customers.
- It provides opportunity for **maximum sales** but there are **good chances of theft** in such design.



2. PERSONAL SERVICE DRUG STORES

- In this type of design, the **whole of the area is not exposed to the customer** but the **customer is required to interact with the drug store personnel at the service counter**.

- During the **purchasing process** the **customer demands an article** and the **personnel provide the articles**.
- This service and design **facilitates maximum interaction** between **drug store employee and the customers**.



3. PRESCRIPTION ORIENTED DRUG STORE

- These types of **drug stores** provide a **comfortable waiting area** where the **customers are expected to wait while his prescription is proceeding**.
- In this type of design **health related items, drugs and prescription accessories** are displayed in the **vicinity** while **orthopedic and surgical appliances** are kept in a **separate room**.
- **Cosmetics and gifts** are arranged in a **suitable area** in the store.



4. PHARMACEUTICAL CENTRE

- These types of **centre sell medicines, convenience articles, orthopedic and surgical appliances**.
- The store has **sufficient floor space** and is **properly decorated**.



5. SUPER DRUG STORE

- Such types of **drug stores** have a **huge floor area ranging from 5,000 to 10,000** with a **square design**.

- The customers have access to **all-most all the area in the drug store** and can **inspect, handle and select articles themselves**.
- The design is on **self service pattern** except for the **prescription department** where self service is not possible.

LEGAL REQUIREMENTS

LICENSE

- A **license** is required to **sell, stock or exhibit for sale or distribute drugs**.
- In order to **open a retail drug store** in any state, the following **documents** are needed for a new license:

1. **Application (in duplicate)** on **Form 19* of D & C Rules 1945**.

- One copy is for **biological drugs** and the other copy for **non-biological drugs**.



2. A fee of **Rs. 1500/- per license** (Total 3000/-) to be deposited in **State Bank of India / Government Treasury** under **specific head** for grant of **retail sale license**.
3. a) An **attested copy of Diploma in Pharmacy** from any institution duly **recognized by PCI**.
 b) An **attested copy of registration certificate** issued by **State Pharmacy Council**.
 c) An **attested copy of Matriculation certificate**.
 d) **Affidavit** from the **qualified person** in case he is an **employee of drug store**.

4. **Affidavit on non-judicial stamp paper**, duly attested by **First Class Magistrate** by each partner in case of **partnership concern** and by the **proprietor himself** in case of **proprietorship concern**.
5. A **map of retail drug store** duly signed by **proprietor / partners** of firm.
6. **Rent receipt** in case of **rented premises** or an **affidavit** to that effect if person himself is the **owner of premises**.
7. A **copy of partnership deed** in case of **partnership concern**.
8. **Refrigerator purchase receipt**.
- **PCI is planning to make mandatory to wear white coat bearing name of Pharmacist** who is running the **retail pharmacy**.
- The **license is valid for 5 years**, which is to be **renewed before expiry**.

DOCUMENTS REQUIRED FOR RENEWAL OF RETAIL SALE LICENSE

1. **Application in duplicate** on **Form 19 of D & C Rules 1945**.
 - One copy for **biological** and other copy for **non-biological**.
2. A fee of **Rs. 1500/- per license** (Total 3000/-) be deposited in **SBI / Government Treasury Challan form** in the specified head for **renewal of retail sale license**.
3. A late fee of **Rs. 500/- per license per month** or part thereof.
4. **Original license** in case of **first renewal** and **latest renewal certificate** in case of **subsequent renewals**.

5. **Affidavit** to be given on **non-judicial stamp paper** by partner if any, duly attested by Oath Commissioner.

DOCUMENTS REQUIRED TO OPEN A WHOLESALE DRUG STORE

- Attested copy of the experience certificate of minimum **4 years** in **sale distribution of drugs** after **matriculation** on **salary basis**.

OR

- Attested copy of experience certificate of minimum **1 year** in **dealing with drugs** after **graduation** in any discipline from a **recognized university** on **salary basis**.

SEPARATE LICENSE ARE REQUIRED FOR RETAIL SALE OF

- Schedule C and C1 drugs.
- Schedule X drugs.
- All drugs other than those specified in **Schedule C and C1 and Schedule X**.
- In order to get license to **sell, stock or exhibit for sale or distribute retail drugs** specified in **Schedule C and C1**, an application is filled in **Form No. 21**, and **Form No. 21-B** is filled to apply for **license to sell Schedule C and C1 drugs by wholesale**.
- The drugs which are covered under **Schedule X** cannot be sold on retail except on **prescription of registered medical practitioner**.

STORAGE OF DRUGS

- Drugs should be **stored in a manner that preserves their** potency for the **desired period of time**.
- The **manufacturer's instruction** on the label regarding the **storage of the product** should be complied.

STORAGE OF SCHEDULE X DRUGS AND DRUGS WITH EXPIRY DATES

- Substances specified in **Schedule X** should be **stored under lock and key** in cupboard or drawer reserved solely for the **storage of these substances**, or in a part of the **premises separate** from the remainder of the premises and for which **only responsible persons have access**.
- **Other drugs with an expiry date** should be stored in a **separate cupboard**.

STORAGE OF VETERINARY DRUGS

- **Veterinary drugs** should be **stored in a cupboard or drawer** reserved for the **storage of veterinary drugs** in a portion of the **premises separated** from the remainder of the premises to which **customers are not permitted to have access**.

DISPENSING OF PROPRIETARY PRODUCTS

- **Prescriptions**, now-a-days, are usually written for **preformulated proprietary medicines** and the **pharmacist has only to dispense them** in a **proper manner**.
- However, **all dispensing of proprietary products** is required to be done either by the **Registered Pharmacist himself** or under his **direct supervision**.



- The following procedure may be adopted during **dispensing of such products**:

1. RECEIVING THE PRESCRIPTION

- The **prescription should be received** by the **pharmacist himself**, wherever possible or a **person trained properly** to do so in a **professional manner**.

2. READING AND CHECKING THE PRESCRIPTION

- On **receiving the prescription**, the **pharmacist should first read the prescription completely and carefully**.
- He should **verify** that the **name and address of the patient are correct**, the **prescription is legally valid** and is **written correctly**.
- He should **not express any doubt regarding the contents of the prescription** either to the patient or to his messenger, in manner which **questions the wisdom of the prescribing physician**.
- The **pharmacist should not add, omit or substitute any content of the prescription** without the **consent of the physician**.



3. DISPENSING, PACKING AND LABELLING

- The medicine should be selected from the stock and if unit dosage form such as tablets or capsules, the correct number should be counted and filled into previously selected containers.



- The labels of all containers of stock drugs should be checked when selected from and replaced in stock, as well as at the time of actual dispensing, making three checks in total.
- Any subsidiary label required should be properly affixed to the container.
- The container must be thoroughly polished to remove any finger prints.

4. FINISHING

- The final product, the prescription and the labels should be rechecked before handing over to the patient.
- All records must be completed including those required by legislation.
- The patient or his representative should be explained about the proper mode of administration and storage of the medicine.
- Preferably in their local language.



MAINTENANCE OF RECORDS

RECORDS OF PURCHASE OF DRUGS

- The records pertaining to the purchase of all drugs whether intended to be sold by retail or by wholesale should be maintained under the following headings:
 - (i) Date of purchase.
 - (ii) Name and address of the licensee from whom purchased.
 - (iii) Name and quantity of the drug purchased and his licence number, and its batch number.

(iv) Name of the manufacturer of the drug. Purchase bills including cash or credit memos should be kept as records.

RECORDS OF SALE OF DRUGS

SALE OF DRUGS OTHER THAN THOSE SPECIFIED IN SCHEDULE X

- Sale of any drug other than those specified in Schedule X is required to be recorded at the time of supply in a prescribed register maintained for the purpose or in a cash or credit memo book.
- The following particulars are required to be entered:
 1. Serial number of the entry.
 2. Date of supply.
 3. Name and address of the prescriber.
 4. Name and address of the patient or the name and address of the owner of the animal if the drug is supplied for the veterinary use.
 5. Names along with the quantities of drugs supplied.
 6. In case of Schedule H and C drugs, the name of the manufacturer, its batch number and the expiry date, if any.
 7. Signature of the registered pharmacist under whose supervision the medicine was made or supplied.

SALE OF DRUGS SPECIFIED IN SCHEDULE X

- Supply of Schedule X drugs should be recorded at the time of supply in a bound and serial numbered register maintained for this purpose and separate pages should be allotted for each drugs.

- The following particulars should be entered in the said register:

1. Date of purchase, supplier.
2. Quantity received, if any, the name and address of supplier and the licence number of the supplier.
3. Name and quantity of the drug supplied.
4. Manufacturer's name, batch or lot number.
5. Name and address of the patient/purchaser.
6. Reference number of the prescription against which supplies were made.
7. Bill number and date of receipt of purchase and supply made by him.
8. Signature of the person under whose supervision the drugs have been supplied.