

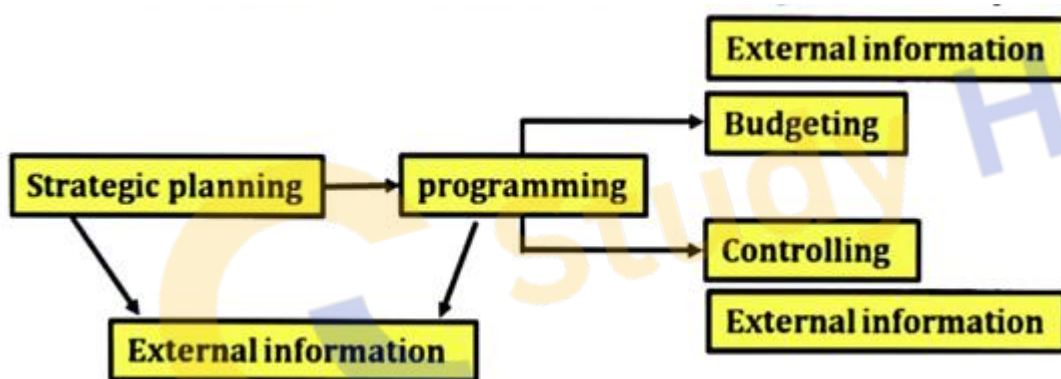
PREPARATION AND IMPLEMENTATION

Points to be covered in this topic

→ BUDGET PREPARATION AND IMPLEMENTATION

BUDGET

- Budget is described as an **instrument** through which **hospital administration, management at the departmental levels and the governing bodies** can review the hospital services in relation to the **prepared plan in a comprehensive and integrated form** expressed in **financial terms**.



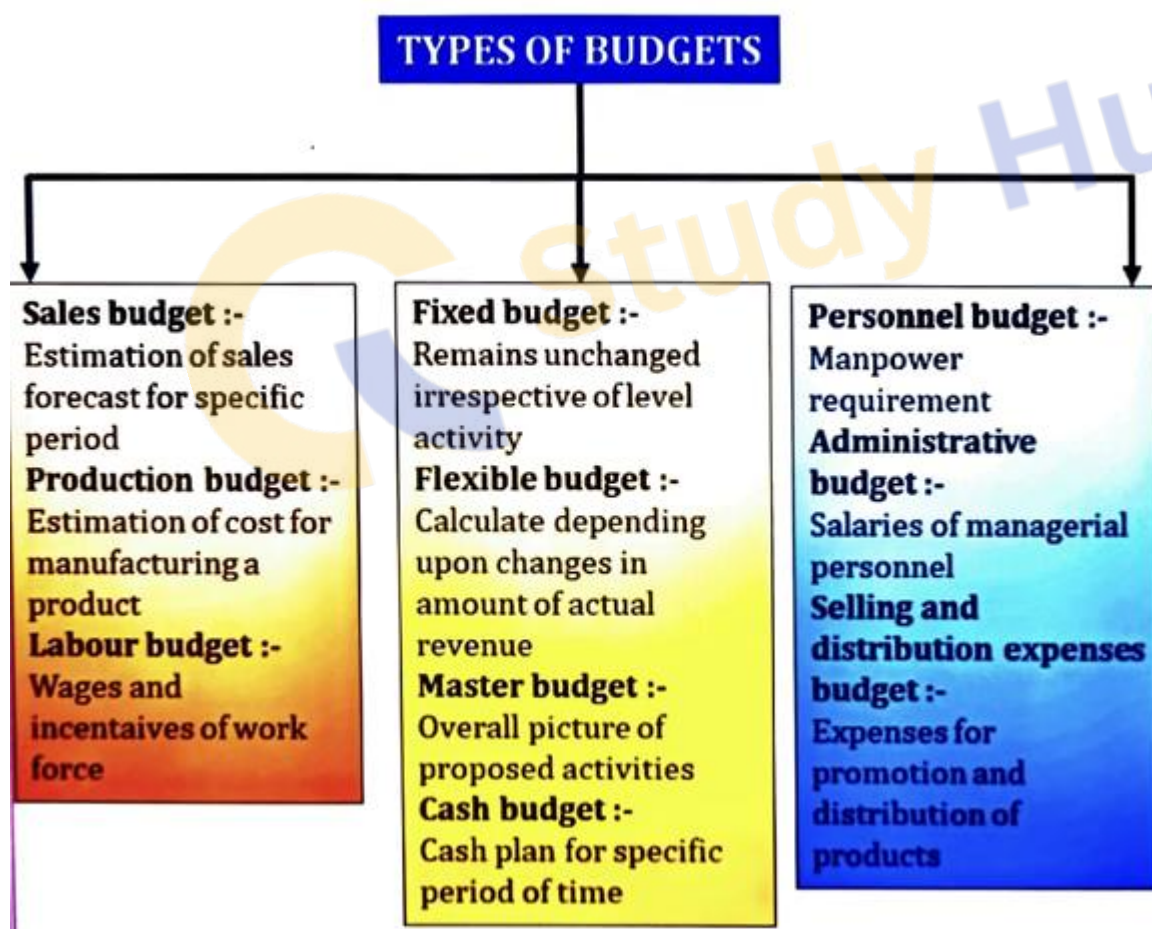
OBJECTIVES

- Development of standards
- Comparison of actual results with standards
- Identification of deviation and standards
- Analysis of deviation
- The responsible person will use the **budget details** to determine whether the **proposal is economically feasible and realistic**

- To monitor the **hospital financial activities**
- Estimate the **cost of completing objectives** identified in the proposal

ADVANTAGES

- Develop better **financial planning**
- Gives a better focus on **decision making** to the management
- Effectively manage the **financial aspects** of the hospital
- Exposes the **reason of over expenditure**
- Helps to focus on **hospital priorities**
- Enhance efficiency of **staffs and others**



PREPARATION BUDGETS

- Each budget is classified into **3 divisions**

1. **Income account**
2. **Expenditure account**
3. **Equipment and construction budget**

1. INCOME ACCOUNT

- Total income must be **calculated** for the implementation of the budget
 - Income is calculated by maintaining **daily / weekly / monthly and annual records**
 - The **avg. total sum up** represents income of the department from **various sources**
 - Pharmacy department or accounts department maintains **daily, weekly, monthly and annual cost** of the pharmaceuticals issued to the **patient services**
 - Hospital income further depends upon the type of patients i.e. **category of patients**
- ✓ No of prescription
 - ✓ No of prescription dispensed by each pharmacist
 - ✓ Hours of work put in prescription volume per hour of service
 - ✓ Medication cost per patient day
 - ✓ Average drug cost per clinic visit

✓ Average salary cost per prescription

✓ Average supply cost per requisition

2. EXPENDITURE ACCOUNTS

• Expenditure account further divided into following expenses:

✓ Administrative and general expenses

✓ Professional care of the patients

✓ Out-patient and emergency expenses

✓ Miscellaneous expenses

• The expenditure accounts include the following categories:

✓ Salaries and wages

✓ Supplies and expenses

✓ Drugs and pharmaceutical expenses

✓ Purchase expense

✓ Miscellaneous supplies and expenses

Salaries and wages

- Includes: Pharmacist, assistants, clerks
- Administrative, professional and non-professional staff
- Full time and part time staff
- New post and overtime

Drugs and pharmaceuticals

- Dispensed by prescriptions, hospital pharmacy department, out-patient, emergency and other departments

Purchase services

- Include the cost of prescription purchased from **outside pharmacy** in case hospital does not have its own pharmacy

Miscellaneous

- Bottles, labels, glasswares, stationary, pharmacist uniforms, reference books

3. EQUIPMENT AND CONSTRUCTION BUDGET

- It requires **major monetary funds**
- Budget for **immediate arrangements** of a new model equipment
- Budget for **remodeling and replacement of equipment**
- Construction of building

PROFESSIONAL EQUIPMENT		ADMINISTRATIVE EQUIPMENT
Balances	Prescription case	Bookcases
Cabinets	Pressure pumps , vacuum pumps	Bulletin boards
Capsule machine	Refrigerator	Calculators , computers
Chemical hoods	Sterilizers	Clocks
Distilling apparatus	Tanks	Lockers , metal
Metallic filters	Typewriters	Worktables
Homogenisers	pH meter , polarimeter	Filling cabinets
Autoclaves	Tabet manufacturing equipment	Work tables
	Granulator	

IMPLEMENTATION OF A BUDGET

For the implementation of a budget there is a requirement of different parameters:

ACTUAL FUND POSITION

- Successful implementation of the budget will depend on the financial position of a firm.
- The master budget will give insight into the plan.
- A cash budget will help to know the cash plan for a specific period.
- Overall, all types of budgets are studied at the micro level to implement the planned budget.

UTILITY OF PARTICULAR ITEM

- This depends upon **materials used** and **expressed in quantities**, whereas the **materials purchases budget** is expressed in **both ways i.e. quantitative and financial**.
- This **helps in scheduling** the purchase of **materials** to produce a given **volume of output during a particular period**.

COST OF PRODUCTS

- Study of the **cost required to manufacture / purchase a particular product** is very important in **budget planning**.
- Cost includes **direct costs and indirect costs**.
- It is the **production and non-production costs** required to manufacture a **particular product**.

QUANTITY OF PRODUCTS

- **Effective inventory management** is needed for the **successful implementation of a budget plan**.
- To **avoid stock out and over stock**, effective inventory control is needed, as a **huge amount of capital is invested in inventory**.

CLINICAL PHARMACY

Points to be covered in this topic

- INTRODUCTION
- CONCEPT

- FUNCTIONS AND RESPONSIBILITIES
- DRUG THERAPY MONITORING
- MEDICATION CHART REVIEW
- CLINICAL REVIEW
- PHARMACIST INTERVENTION
- WARD ROUND PARTICIPATION
- MEDICATION HISTORY
- PHARMACEUTICAL CARE
- DOSING PATTERN AND DRUG THERAPY

INTRODUCTION

- **Clinical pharmacy** may be defined as the **science and practice of rational use of medications**, where the **pharmacists are more oriented towards the patient care**, rationalizing medication therapy and **promoting health and wellness of people**.
- It is the **modern and extended field of pharmacy**.
- The discipline that embodies the **application and development (by pharmacist) of scientific principles of pharmacology, toxicology, therapeutics, and clinical pharmacokinetics, pharmacoeconomics, pharmacogenomics** and other allied sciences for the **care of patients**.



CONCEPT

- The concept of **clinical pharmacy** includes the **range of services** through which **all practising pharmacists exercise their responsibilities towards the care of patients**.
- Clinical pharmacy is concerned with the **rational selection and use of medications at the patient level**.
- It ensures the **appropriate and safe use of drugs in patient care**.
- The **appropriate drug** and the **dose, route, form, frequency and duration of treatment** must be **selected** and drugs have then to be **administered accurately**.
- The **active participation of the pharmacist in patient care** with the **long-term aim of giving advice on medication with an individual patient in mind and tailoring drug therapy for that individual**.
- Among the **major activities**, covered under the term clinical pharmacy, include involvement in:
 - Prescribing rounds
 - Patient counselling
 - Drug history taking
 - Parenteral nutrition service
 - Pharmacokinetic advisory services
 - Monitoring for **adverse drug reactions and interactions**

- Relatively minor activities are health education, training and education of own staff and doctors, nurses, clinical trials, case references, research and **clinical meetings**.
- A clinical pharmacist works side by **side with the physician**, by the patient's bed-side where he monitors the drugs, dosages and the side effects and advises the **physician** on these.
- Hence, we can say **clinical pharmacy** has brought the pharmacist into closer touch with the prescribers and the **details of treatment of patient**.

FUNCTIONS AND RESPONSIBILITIES

TAKING OF THE MEDICATION HISTORY OF THE PATIENT

- This includes **maintenance of the past and current medication history** of the patient for both prescription and non-prescription drugs, determining **drug allergies and sensitivities**, noting the side effects, toxicity, incorrect drug administration and any specific problem associated with the **administration of a drug to the patient**.



PATIENT EDUCATION

- Patients need to be educated on the mode of **administration**, use and storage of drugs, their possible actions and side effects, the importance of compliance, possible interactions with other prescription or **non-prescription drugs**, and reporting of an



adverse or unusual effect to the physician or the **clinical pharmacist**.

PATIENT CARE

- The **clinical pharmacist** is required to monitor the **drug therapy** of the patient making use of the available **pharmacokinetic data**.
- He may, if necessary, consult the **physician** or other **health care professional** regarding the drug therapy.



PARTICIPATION IN DRUG UTILIZATION STUDIES

- By virtue of his **professional training**, a **clinical pharmacist** is an important person to conduct **patient care audit** which could highlight the **deficiencies in the existing system** and devise **strategies for the overall improvement** in the quality of health care of the patient.

FORMULATION AND MANAGEMENT OF DRUG POLICIES

- Being in a **key position** in assessing and monitoring **drug therapy**, possessing sound knowledge about the various aspects of **drug action, adverse reaction**, etc., and his **active collaboration and interaction** with members of the **health care team**, he naturally commands considerable importance in **framing and implementation of drug policies**.



EDUCATION OF MEDICAL AND PARA-MEDICAL STAFF

- By virtue of his being a **source of knowledge on drugs**, a **clinical pharmacist** has a role to play in educating the **medical and para-medical staff** on **rational drug therapy**.



RESEARCH AND DEVELOPMENT

- The **clinical pharmacist** can be an important person in undertaking **research on drug development, formulations and bioavailability studies**.



DRUG INFORMATION

- A **clinical pharmacist** is well equipped to respond to **drug related queries** and to provide **information on drugs** to various members of the **health care team**.



DRUG THERAPY MONITORING

- One of the **fundamental activity** of the **clinical pharmacist** working in hospital.

Individualisation of patient drug therapy

Rational usage of drugs

- ✓ Appropriate drug
- ✓ Appropriate patient
- ✓ Appropriate dose

✓ Appropriate route

✓ Appropriate frequency

✓ Appropriate duration

- A reliable and responsive **drug therapy monitoring service** depends on **team work** between **nurses, doctors, pharmacist, scientist and technical staff**.
- The clinical pharmacist should provide advice to **medical staff** on the appropriate use of drugs and assist them in obtaining **better therapeutic results**.

GOAL

- To optimise the **drug therapy and patient outcomes** by implementing a strategy involving following components:
 - Collation and interpretation of **patient specific information**
 - Identification of desired **therapeutic outcomes**
 - Review of **drug therapy**
 - Formulation and interpretation of **monitoring strategy**
 - Review of outcomes
 - Modification of patient monitoring if required

COMPONENTS OF DRUG THERAPY MONITORING

- ✓ Medication order review
- ✓ Clinical review
- ✓ Pharmacist intervention

MEDICATION CHART REVIEW

- It is a **fundamental responsibility** of a pharmacist to ensure the **appropriateness of medication orders**.



- It serves as starting point for other **clinical pharmacy activities** (medication counselling, TDM, DI, and ADR).
- Organizing information according to **medical problems** helps breakdown a complex situation into its **individual parts**.

GOAL

- To optimize the **patients drug therapy**

- To prevent or minimize **drug related problems** / **medication errors**

PROCEDURE

- The **patients medical record** should be reviewed in conjunction with the **medication administration record**.
- Recent consultations, **treatment plans and daily progress** should be taken into account when determining the appropriateness of current medication orders and planning each patient's care.
- All current and recent **medication orders** should be reviewed.

CHECKPOINTS DURING MEDICATION CHART REVIEW

- Ensuring that the medication order is **comprehensible and unambiguous**, that appropriate terminology is used and that **drug name are not abbreviated**.
- Annotate the chart to provide **clarification** as required.
- Detecting orders for medication to which the patient may be **hypersensitive / intolerant**.
- The patient's **previous medication order**.
- Patient's **specific considerations** e.g. disease state, pregnancy.
- Drug dose and dosage schedule, especially with respect to **age, renal function, liver function**.
- Route, dosage form and **method of administration**.

- Checking complete drug profile for **medication duplication, interactions or incompatibilities**.
- Ensuring that administration times are appropriate e.g. with respect to **food, other drugs and procedures**.
- Checking the medication administration record to ensure that all ordered have been **administered**.
- Ensuring that the drug administration order **clearly indicates the time** at which drug administration is to commence.
- Special considerations should be given especially in **short course therapy** as in antibiotics and analgesics.
- Ensuring that the order is **cancelled in all sections** of medication administration record when the drug therapy is intended to cease.
- If appropriate follow up of any **non-formulary drug orders**, recommending formulary equivalent if required.
- Ensuring appropriate **therapy monitoring** is implemented.
- Ensuring that all **necessary medication** is ordered e.g. premedication, prophylaxis.
- Reviewing medication for **cost effectiveness**.

COMPONENTS OF MEDICATION ORDER REVIEW

- Checking that medication order is written in accordance with **legal and local requirements**

- ✓ Patient name and IP number
- ✓ Age, gender
- ✓ Drugs in capitals
- ✓ Dose, ROA
- ✓ Frequency
- ✓ Duration of the treatment
- ✓ Physician signature
- ✓ Physician address and phone number

Drug Chart
Apollo Hospitals Bangalore

UNIT NO: 200042 IPN: 200042
MR. N. S. SUNDAR
Age: 52 Years Sex: Male
DR. A. JAYARAM

Ward: 11A Bed No: 200114

Medicine (in CAPS)	Dose	Route	Start (Date/Time)	Stop (Date/Time)	Frequency	Remarks
Insulin - 2014R	2014R	IV	2/1/17		QID	
Insulin - 2014R	2014R	IV	2/1/17		QID	
Insulin - 2014R	2014R	IV	2/1/17		QID	
Insulin - 2014R	2014R	IV	2/1/17		QID	
Insulin - 2014R	2014R	IV	2/1/17		QID	
Insulin - 2014R	2014R	IV	2/1/17		QID	
Insulin - 2014R	2014R	IV	2/1/17		QID	
Insulin - 2014R	2014R	IV	2/1/17		QID	
Insulin - 2014R	2014R	IV	2/1/17		QID	
Insulin - 2014R	2014R	IV	2/1/17		QID	

QID - Once Daily, BID - Twice Daily, TID - Three Daily, QID - Four Times Daily, AC - Before Meals, PC - After Meals
Ins - Insulin, SOS - If Required

IDENTIFICATION OF DRUG RELATED PROBLEMS

- ✓ Untreated indication
- ✓ Inappropriate drug selection
- ✓ Sub therapeutic dose
- ✓ Adverse drug reaction
- ✓ Failure to receive drug
- ✓ Drug interactions
- ✓ Drug use without indication
- ✓ Over dosage

CLINICAL REVIEW

- Clinical review is one of the **integral components of medication review** and should preferably be performed on a **daily basis**.
- It is the review of the **patients progress** for the purpose of assessing the **therapeutic outcome**.
- The **therapeutic goal** for the specific disease should be **clearly identified** before the review.

GOALS

- The primary aims of the clinical review

- Assess the response to drug treatment
- Evaluate the safety of the treatment regimen
- Assess the progress of the disease and the need for any change in therapy
- Assess the need for monitoring, if any
- Assess the convenience of therapy

PROCEDURE

- Collection of **patient specific data** should be undertaken routinely.
- The data collected should be **clinically relevant**, and **documented** in the pharmacy patient profile.
- Results of **biochemical, haematological, microbiological, radiological** and other investigations should be reviewed.
- Information elicited from the **patient** should also be considered.
- Information obtained must be **interpreted and evaluated** with reference to:

- ✓ Clinical features
- ✓ Pathological condition
- ✓ Indication for investigation
- ✓ Patient medication history
- ✓ Planned outcomes of therapy

PHARMACIST INTERVENTION

- Any action taken by the pharmacist that directly results in a change in **management or therapy**.
- Intervention by pharmacist to assist prescribing can be:
 - ✓ Active – Use of therapeutic guidelines
 - ✓ Passive – Drug in service
 - ✓ Reactive – Seeking amendment of those that are unclear, inadequate or inappropriate
- Interventions can also be classified in accordance with categories of **drug related problems**.
- Documentation of **each and every intervention** is very important.
- That document should include the following details:
 - ✓ Patient details
 - ✓ Date, ward and pharmacist
 - ✓ Drugs involved
 - ✓ Description about the intervention
 - ✓ Details of response to intervention

FACTORS DETERMINING THE SUCCESS OF INTERVENTION

- Effective communication skills
- Appropriateness of the intervention
- Way of approach

WARD ROUND PARTICIPATION

- Ward round is a visit made by a **medical practitioner**, alone or with a team of **health professionals and medical students** to hospital inpatients at their bedside to **review and follow-up progress** in their health.
- At least one ward round is conducted **everyday** to review the progress of each inpatient. However more than one is not uncommon.
- Various countries has shown **pharmacist participation in ward round** helps patient as well as other health care professionals.
- Addition of pharmacist participation in ward rounds helps ensure **safe, effective and economic use of drugs** which ultimately results in **decreased adverse drug events**, improved patient care, induced length of hospital stay and reduced health care cost.



OBJECTIVE

- Gain an improved understanding of the patient's **clinical status and progress**, current planned investigations and therapeutic goals.

- Provide **relevant information** on various aspects of the patient's drug therapy, such as **pharmacology, pharmacokinetics, drug availability, cost, drug interactions and ADRs**.
- Optimise therapeutic management by influencing **drug therapy selection, implementation, monitoring and follow-up**.
- Investigate unusual drug orders or doses.
- Assimilate **additional information** about the patient such as **co-morbidities, medication compliance or complementary and alternative medicine use** that might be relevant to their management.
- Detect **adverse drug reactions and drug interactions**.
- Participate in **patient discharge planning**.

CLASSIFICATION OF WARD ROUND

1. **Pre round**
2. **Register / resident rounds**
3. **Professor / unit chief rounds**
4. **Teaching rounds**

1. PRE ROUND

- Interns or post graduates students perform a daily review of patients in their unit or ward.



- Learning opportunity to familiarise themselves with the cases.
- Trainee clinical pharmacists may join the intern or postgraduates in their pre rounds and complete the patient medication and clinical review.

2. REGISTER / RESIDENT ROUNDS

- Registrar or resident individually or in a team conduct ward rounds at least once a day at a fixed time.
- These rounds are extensive and may also involve clinical teaching to medical postgraduate students and interns.



- Useful rounds for clinical pharmacists of all level of experience to join.

3. PROFESSOR / UNIT CHIEF ROUNDS

- Unit/ward chief conducts the round together with their registrar, residents, postgraduate students and interns for all the patient under their care.

- These rounds are extensive and address more complex issues regarding diagnosis and management.



- These rounds may be more challenging for clinical pharmacists in terms of their clinical knowledge.

4. TEACHING ROUNDS

- In teaching hospitals, academic medical staff conduct bedside clinical teaching rounds for residents, medical postgraduate students, interns and medical undergraduate students.
- Conducted few times a week.
- These round provides opportunity for pharmacist to improve their clinical knowledge.



MEDICATION HISTORY

- A medication history is a detailed, accurate and complete account of all prescribed and non-prescribed medications that a patient had taken or is currently taking prior to a initially institutionalized or ambulatory care.
- It provides valuable insights in to patient's allergic tendencies, adherence to pharmacological and non-pharmacological treatments and self medication with complementary and alternative medicines.



IMPORTANCE

- Preventing prescription errors and consequent risk to patients.
- Useful in detecting drug-related pathology or changes in clinical signs that may be the result of drug therapy.

- It should encompass all currently and recently prescribed drugs, previous adverse drug reactions including herbal or alternative medicines and adherence to therapy for better care plan.

GOALS

The information collected can be utilized to:

1. Compare medication profile with the medication administration record and investigate the discrepancies.
2. Verify medication history taken by other staffs and provide additional information where appropriate.

The following information is commonly recorded

1. Currently or recently prescribed medicines
2. OTC medication
3. Vaccinations
4. Alternative or traditional remedies
5. Description of reactions and allergies to medicine
6. Medicines found to be ineffective
7. Adherence to past treatment and the use of adherence aids

INFORMATION SOURCES

1. Patient

2. Family or caregiver
3. Medication vials / bubble packs
4. Medication list
5. Community pharmacy
6. DPIN (Drug programs information network)

PHARMACEUTICAL CARE

- The responsible provision of drug therapy for the purpose of achieving definite therapeutic outcomes that improve the patients quality of life.
- Pharmaceutical care involves the process through which a pharmacist cooperates with a patient and other professional in designing, implementation, and monitoring a therapeutic plan that will produce specific therapeutic outcomes for the patient.

OUTCOMES OF PHARMACEUTICAL CARE

- Cure of a disease
- Elimination or reduction of patients symptomology
- Arresting or slowing of a disease process
- Preventing a disease or symptoms

MAJOR FUNCTIONS OF PHARMACEUTICAL CARE

- Identifying potential and actual drug related problems
- Resolving actual drug related problems

- Preventing potential drug related problems

SKILLS REQUIRED FOR THE CLINICAL PHARMACIST FOR A BETTER PHARMACEUTICAL CARE

- He must possess knowledge and skill in pharmaceutics and clinical pharmacology.
- He must be able to mobilize the drug distribution system by which drug use decisions are implemented.
- He must be able to develop relationship with the patients and other health care professionals needed to provide pharmaceutical care.
- He must be available in the society / community for patient in time.
- He should have commitment to quality improvement and assessment procedure.

PROCESS OF PHARMACEUTICAL CARE

- Establish pharmacist
- Patient relationship
- Collect data
- Interpret data identify drug related problems
- Determine priority of drug related problems
- Determine desired outcomes (clinical or therapeutic)
- Develop therapeutic plan
- Develop monitoring plan

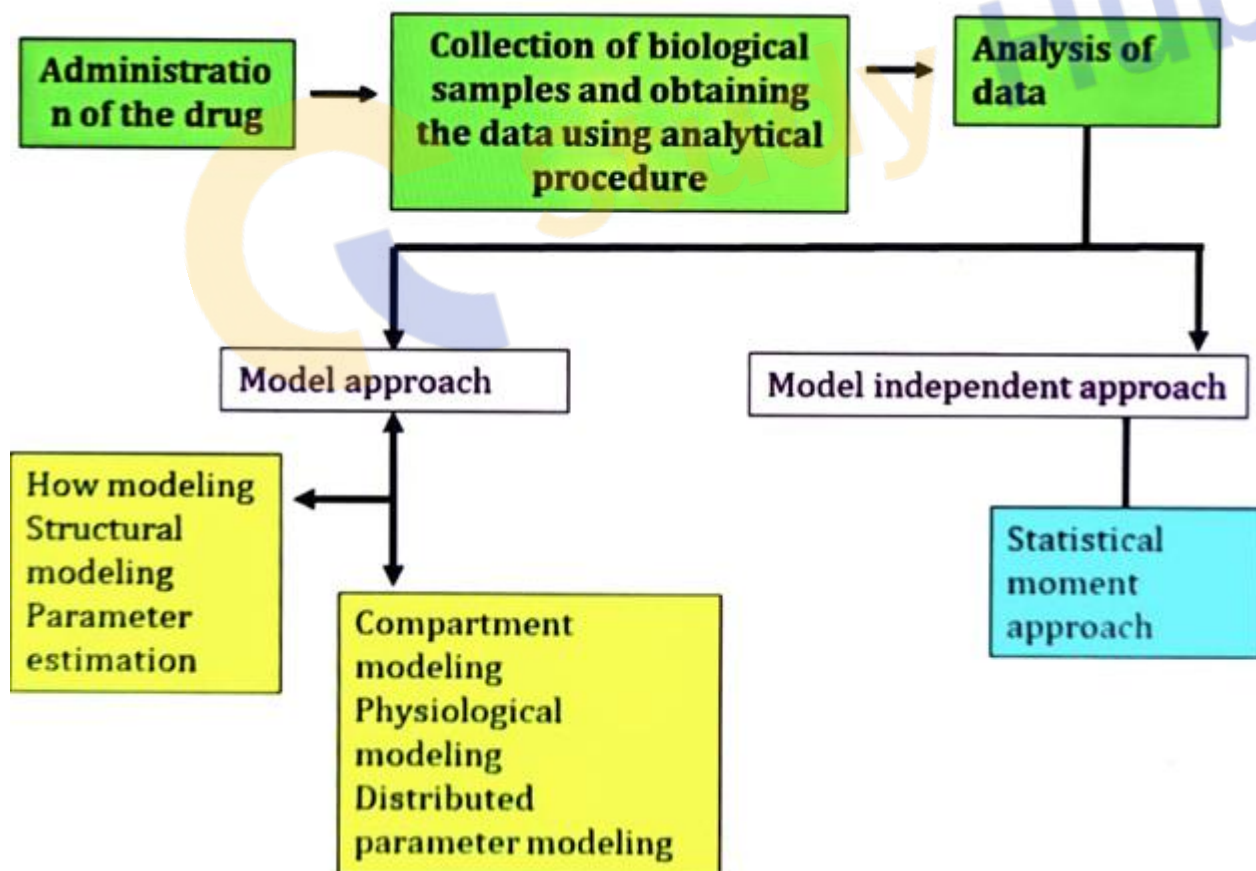
- Implement and follow up pharmaceutical care plan

DOSING PATTERN AND DRUG THERAPY

PHARMACOKINETIC

- Pharmacokinetics is the study of the **time course of drug absorption, distribution, metabolism and excretion**.
- It also concerns the relationship of these processes to the **intensity and time course of pharmacologic effects** of drugs and chemicals.
- Pharmacokinetic is a **quantitative study**.

OVERVIEW OF PHARMACOKINETICS



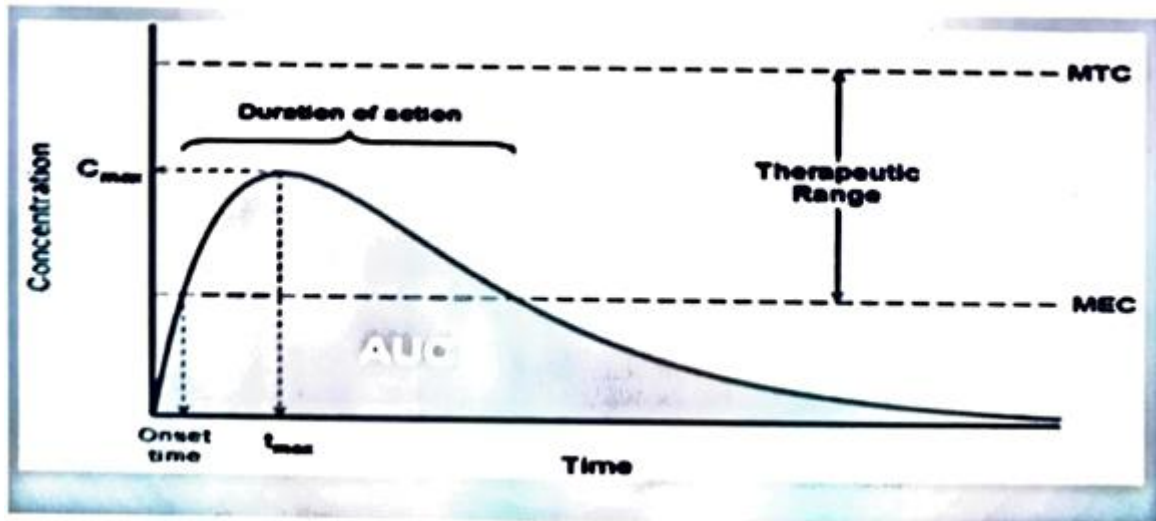
APPLICATION OF PHARMACOKINETICS

- Design and development of **drugs with lesser side effects** and improved therapeutic effectiveness.
- Design and development of **optimum formulation for better use of drug**.
- Design and development of **targeted and controlled release formulation**.
- Design of **multiple dosage regimen**.
- Selection of **appropriate route of administration**.
- Select of **right drug for particular illness**.
- Predict **interactions**.
- TDM
- **Dosage adjustments** at times of altered physiology.

DESIGN OF DOSAGE REGIMEN AND MULTIPLE DOSING

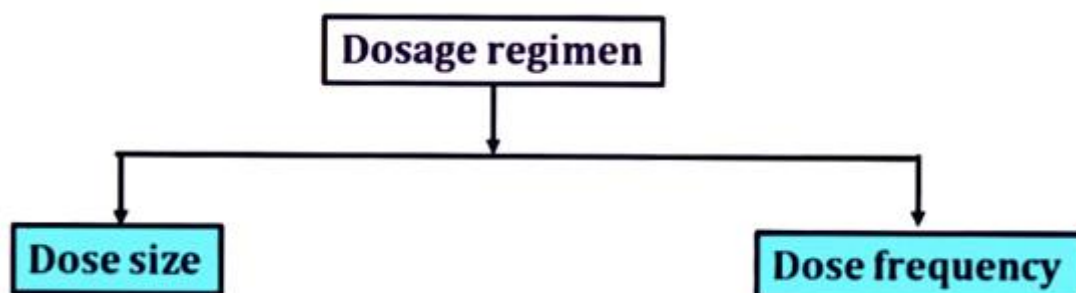
- Dosage regimen is the manner in which a **drug is taken**.
- It is the selection of **drug dosage, route and frequency of administration** in an informed manner to achieve **therapeutic objectives**.
- Duration of most illness is longer than a **single dose**.
- Therefore to prolong the therapeutic effect **multiple dosing dosage regimen** is preferred.

- An **optimal dosage regimen** is the one in which the drug is administered in suitable doses, with sufficient frequency that ensures maintenance of **plasma concentration within the therapeutic window** for the entire duration of therapy.



APPROACHES TO DESIGN OF DOSAGE REGIMEN

- Empirical dosage regimen
- Individualized dosage regimen
- Dosage regimen on population averages
- Fixed model
- Adaptive model



DOSE SIZE

- The magnitude of both **therapeutic and toxic responses** depend upon dose size.
- Dose size calculation requires the **knowledge of amount of drug absorbed after administration of each dose.**

DOSE FREQUENCY

- Dosing frequency means the **number of times per day** that effluent is applied to an absorption system or sand filter.
- Dosing tank means a **watertight receptacle** receiving effluent from the septic tank or another treatment device, equipped with a siphon or a pump designed to **discharge effluent.**

FACTORS TO BE CONSIDERED

Pharmaceutical factors

- Type of dosage form
- Route of administration

Patient related factors

- Individual patient's tolerance of the drug
- Genetic predisposition
- Concurrent administration of other drugs
- Patient's age, bodyweight, gender

- Length of illness
- General physical health
- Liver and kidney function in the patient

OVER THE COUNTER SALES (PART - 2)

Points to be covered in this topic

- Introduction
- Rational use of common over the counter medications

INTRODUCTION

- Over-the-counter (OTC) drugs are medicines **sold directly to a consumer without a requirement for a prescription** from a healthcare professional, as opposed to prescription drugs, which may be supplied only to consumers possessing a **valid prescription**.

TYPES OF OTC MEDICATIONS

1. Analgesics
2. Antibiotics
3. Cough suppressants
4. Anti acne drugs
5. NSAIDs



6. Antiseptics
7. Decongestants
8. Antacids
9. Antifungals
10. Anti histamines
11. Smoking cessation drugs

SIDE EFFECTS OF OTC

- Nausea
- Vomiting
- Diarrhea
- Dizziness
- Drowsiness

ADVANTAGES

- The use of OTC drugs allows the patient to have **greater access to a variety of drugs available in the market** to treat some medicinal conditions.
 - Low misuse
 - Self treat
 - Self manage
 - Health practitioners are not needed

DISADVANTAGES

- Poorer compliance
- More difficult to study a drug's effects
- Misdiagnosis occurs

RATIONAL USE OF COMMON OVER THE COUNTER MEDICATIONS

- Rational use of medicines refers to the **correct, proper and appropriate use of medicines**.
- Rational use requires that **patients receive the appropriate medicine**, in the **proper dose**, for an **adequate period of time** and at the **lowest cost**.

1. ANALGESIC

- An analgesic drug, also called simply an **analgesic, pain reliever, or painkiller**, is any member of the **group of drugs used to achieve relief from pain**.
- **Example** – Acetaminophen, Aspirin, Ibuprofen, and Naproxen.

2. ANTIBIOTICS

- An antibiotic is a type of **antimicrobial substance active against bacteria**.
- It is the **most important type of antibacterial agent** for **fighting bacterial infections**, and **antibiotic medications** are widely used in the **treatment and prevention** of such infections.
- **Example** – Bacitracin, Polymyxin, Neomycin, Benzoyl peroxide.

3. COUGH SUPPRESSANTS

- Cough is **protective reflex**, its purpose being **expulsion of respiratory secretions or foreign particles from the lungs and upper airway passages**.
- **Example** – Dextromethorphan.

4. ANTIACNE DRUGS

- Antiacne drugs are the **medicines that help clear up the pimples, blackheads, whiteheads**, and more severe forms of lesions that occur when a **teen has acne**.
- **Example** – Benzoyl peroxide, salicylic acid, sulfur, sulfur with resorcinol.

5. NSAIDS

- **Non-steroidal anti-inflammatory drugs** are members of a **therapeutic drug class** which **reduces pain, decreases inflammation, decreases fever, and prevents blood clots**.
- **Example** – Aspirin, Ibuprofen, Naproxen sodium.

6. ANTISEPTIC

- An antiseptic is an **antimicrobial substance or compound** that is applied to **living tissue/skin** to reduce the **possibility of infection, sepsis, or putrefaction**.
- **Example** – Hydrogen Peroxide and Rubbing Alcohol.

7. DECONGESTANTS

- Decongestant, any drug used to **relieve swelling of the nasal mucosa** accompanying such conditions as the **common cold and hay fever**.

- **Example** – Afrin, Dristan, Vicks Sinex, Sudafed PE, Suphedrin PE, Silfedrine, Sudafed.

8. ANTACIDS

- An antacid is a substance which **neutralizes stomach acidity** and is used to **relieve heartburn, indigestion or an upset stomach**.
- Some antacids have been used in the **treatment of constipation and diarrhea**.
- **Example** – Aluminium hydroxide, Magnesium carbonate, Magnesium trisilicate, Magnesium hydroxide, Calcium carbonate.

9. ANTIFUNGAL

- Antifungals are medicines that **kill or stop the growth of fungi** that cause infections.
- They are also called **antimycotic agents**.
- **Example** – miconazole, terbinafine, clotrimazole, butenafine, tolnaftate.

10. ANTIHISTAMINES

- A drug that **reduces or eliminates the effect mediated by the chemical histamine**.
- Histamine is released by your body during an **allergic reaction** and acts on **specific histamine receptors**.
- **Example** – Brompheniramine, Cetirizine, Chlorpheniramine, Clemastine, Diphenhydramine.

11. SMOKING CESSATION DRUGS

- Smoking cessation, usually called **quitting smoking or stopping smoking**, is the **process of discontinuing tobacco smoking**.
- Tobacco smoke contains **nicotine**, which is **addictive** and can cause **dependence**.
- **Examples** – Nicorette, Nicotine patches, gum, and lozenges.

IRRATIONALITY

- Ineffective and unsafe drug treatment.
- Inappropriate self medication.
- Worsening or prolonging of illness.

CONSEQUENCES OF IRRATIONAL USE OF MEDICINE

Antimicrobial resistance

- Incorrect use of medicine occur in all countries, causing **harm to people and wasting resources**.
- Overuse of antibiotics **increases antimicrobial resistance** and the number of medicines that are no longer effective against **infectious disease**.

Adverse drug reactions & medication errors

- Harmful reactions to medicine caused by **wrong use or allergic reactions** to medicine can lead to **increased illness, suffering and death**.

Lost resources

- **10–40% of national budget** are spent on medicines.

- **Out of pocket purchase of medicines** can cause severe **financial hardship** to individuals and their families.

Eroded patient confidence

- Exacerbated by the overuse of limited medicine, drugs may be often **out of stock or at unaffordable prices** and as result erode **patient confidence**.
- Poor or negative health outcomes due to **inappropriate use of medicine** may also **reduce confidence**.

FACTOR CONTRIBUTE TO INCORRECT USE OF MEDICINES

- Lack of skills and knowledge.
- Inappropriate unethical promotion of medicines by pharmaceutical companies profit from **selling medicine**.
- Unrestricted availability of medicines.
- Overworked health personnel.
- Unaffordable medicines.