

Unit-4

Pharmacy Practice

B.Pharma 7 Sem Notes

1. Budget preparation and implementation

- Budget preparation and implementation

2. Clinical Pharmacy

- Introduction to Clinical Pharmacy, Concept of clinical pharmacy, functions and responsibilities of clinical pharmacist, Drug therapy monitoring – medication chart review, clinical review, pharmacist intervention, Ward round participation, Medication history and Pharmaceutical care. Dosing pattern and drug therapy based on Pharmacokinetic & disease pattern.

3. Over the counter (OTC) sales

- Introduction and sale of over the counter, and Rational use of common over the counter medications.

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Budget Preparation and Implementation

Introduction

DEFINITION

A budget is a written financial plan that shows the estimated income and expenditure of an organization for a fixed period, usually one year. In a hospital pharmacy, budget preparation means planning how much money will be needed to purchase medicines, equipment, and to run the pharmacy services smoothly.

A well-prepared budget helps the hospital pharmacy to work efficiently without wasting money and to avoid shortage of medicines. It is one of the most important duties of the chief hospital pharmacist and the hospital administration.

Importance of Budget in Hospital Pharmacy

- Helps in proper planning of income and expenditure.
- Ensures continuous supply of essential medicines.
- Controls unnecessary spending and wastage.
- Helps in fixing purchase and sales policies.
- Provides a record for audit and financial review.
- Assists in decision making by the hospital management.
- Helps in evaluating the performance of the pharmacy department.

Types of Budget

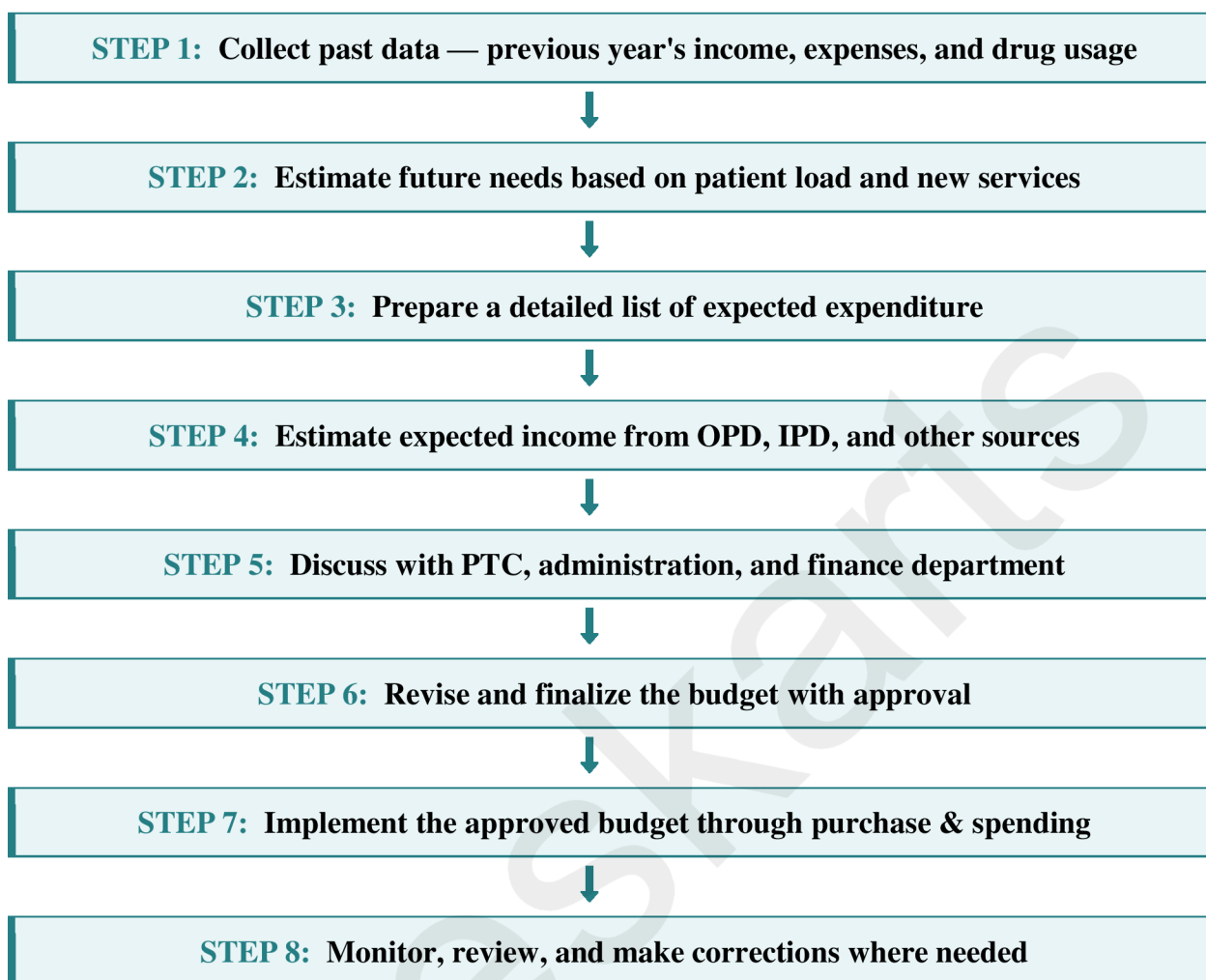
A hospital pharmacy may prepare different types of budgets based on purpose and duration:

- **Capital Budget:** Money needed for machinery, equipment, furniture, and building modifications.
- **Operational / Revenue Budget:** Day-to-day expenses such as purchase of drugs, salaries, electricity, and maintenance.
- **Annual Budget:** Prepared for one year and divided into monthly or quarterly targets.
- **Project Budget:** Prepared for a specific project like starting a new IV admixture unit.
- **Zero-Based Budget:** A budget that starts from zero each year and re-justifies every expense.
- **Flexible Budget:** Changes according to the level of activity of the pharmacy.

Steps in Budget Preparation

Budget preparation should follow a systematic step-by-step method:





Items Included in Pharmacy Budget

A hospital pharmacy budget usually contains the following items:

Category	Examples
Drugs & Medicines	Tablets, injections, IV fluids, vaccines
Surgical Items	Syringes, gloves, bandages, catheters
Equipment	Refrigerator, computer, weighing balance
Furniture	Shelves, cupboards, counters, chairs
Salaries	Pharmacists, technicians, helpers
Utilities	Electricity, water, telephone, internet
Stationery	Registers, labels, prescription pads



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Category	Examples
Maintenance	Repair of equipment, building, AC
Training	Staff training and education programs
Miscellaneous	Taxes, licenses, insurance

Factors Affecting Budget Preparation

- Size of the hospital and number of beds.
- Average number of patients (OPD and IPD).
- Types of medical services offered.
- Previous year's consumption and expenditure.
- Rise in drug prices (inflation).
- New drugs added to the formulary.
- Government rules and taxation policies.
- Emergency reserves for epidemic or disaster situations.

Implementation of Budget

Preparing a budget is not enough — it must also be properly implemented. Implementation means following the budget plan during the year and making sure money is spent as per the plan.

Important points during implementation:

- Purchase of drugs as per the approved budget only.
- Monthly review of actual income and expenditure.
- Avoiding overstocking and understocking of medicines.
- Comparing actual spending with budgeted spending (variance analysis).
- Taking quick action if there is over- or under-spending.
- Maintaining proper records, bills, and vouchers for audit.
- Preparing monthly/quarterly financial reports for management.
- Re-allocating funds between categories if permitted.
- Controlling drug wastage and expiry losses.



Clinical Pharmacy

Introduction

■ DEFINITION

Clinical Pharmacy is a branch of pharmacy in which the pharmacist works directly with the healthcare team and patients to promote safe, effective, and rational use of medicines. It is a patient-oriented practice, as compared to the traditional product-oriented pharmacy.

The concept of clinical pharmacy began in the USA in the 1960s and has since spread worldwide. In India, it has grown rapidly with the introduction of Pharm.D and M.Pharm (Pharmacy Practice) programs.

Concept of Clinical Pharmacy

Clinical pharmacy focuses on the patient rather than the product. The main concept includes:

- The pharmacist is an active member of the healthcare team.
- The main aim is to ensure safe and effective use of medicines.
- It promotes rational drug therapy and individualization of doses.
- Pharmacists directly interact with doctors, nurses, and patients.
- It emphasizes patient care, drug monitoring, and counseling.
- It uses knowledge of pharmacology, pharmacokinetics, pathology, and therapeutics.

Functions & Responsibilities of a Clinical Pharmacist

◆ Main Responsibilities

- ▶ Reviewing prescriptions and medication charts
- ▶ Monitoring drug therapy and patient response
- ▶ Participating in ward rounds with doctors
- ▶ Taking detailed medication history of patients
- ▶ Providing drug information to healthcare staff
- ▶ Detecting and reporting adverse drug reactions
- ▶ Conducting Therapeutic Drug Monitoring (TDM)
- ▶ Counseling patients about their medicines
- ▶ Identifying and preventing drug interactions



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- ▶ Ensuring rational and cost-effective drug use
- ▶ Training pharmacy students and junior staff
- ▶ Participating in pharmacovigilance activities

Drug Therapy Monitoring (DTM)

Drug therapy monitoring is a continuous process of checking how the drugs are working in a patient and whether any adjustments are needed. It has three main parts:

A) Medication Chart Review

The clinical pharmacist goes through the patient's medication chart daily and checks:

- Correct drug, dose, route, and frequency.
- Duration of therapy and duplication of drugs.
- Drug interactions with other medicines.
- Appropriateness of the drug for the diagnosis.
- Whether the prescribed drug is available in the formulary.
- Allergy information and contraindications.
- Compliance with hospital policies and stop orders.

B) Clinical Review

This is a broader review that looks at the patient's overall condition and drug therapy together. It includes:

- Review of patient's diagnosis, symptoms, and lab reports.
- Assessment of drug effectiveness.
- Detection of adverse drug reactions.
- Checking for polypharmacy in elderly or chronic patients.
- Dose adjustment in renal or hepatic impairment.
- Ensuring patient is progressing towards therapeutic goals.

C) Pharmacist Intervention

When the clinical pharmacist finds any problem with drug therapy, he/she suggests changes to the doctor. This is called pharmacist intervention. Common interventions include:

- Suggesting dose adjustment or change of drug.
- Recommending stopping a drug causing side effects.
- Suggesting a cheaper or safer alternative.
- Advising discontinuation of duplicate therapy.



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- Recommending TDM for narrow therapeutic index drugs.
- Alerting about drug–drug or drug–food interactions.

All interventions must be documented clearly with date, reason, and outcome.

Ward Round Participation

Ward rounds are the daily visits made by doctors to the inpatients to examine them and plan treatment. A clinical pharmacist who participates in ward rounds contributes in the following ways:

- Provides drug-related information on the spot.
- Suggests appropriate drug, dose, and route.
- Warns about possible ADRs and interactions.
- Helps choose cost-effective drugs.
- Discusses TDM reports with the team.
- Answers queries from doctors and nurses.
- Counsels patients directly when needed.
- Documents changes in drug therapy.

Ward round participation strengthens the pharmacist's role as a member of the healthcare team.

Medication History

Taking a complete medication history is an important clinical pharmacy activity. It helps to know what drugs the patient has used in the past or is currently using. A good medication history should include:

- All prescription drugs (name, dose, duration).
- OTC and herbal medicines used.
- History of drug allergies and adverse reactions.
- Previous hospitalizations for drug-related problems.
- Vaccination history.
- Alcohol, tobacco, and social habits.
- Compliance with past therapy.

This information helps the doctor to avoid duplication, interactions, and unnecessary medications.



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Pharmaceutical Care

■ DEFINITION

Pharmaceutical care is the responsible provision of drug therapy by the pharmacist for the purpose of achieving definite outcomes that improve the patient's quality of life. The concept was given by Hepler and Strand in 1990.

The three main outcomes of pharmaceutical care are:

- Cure of disease.
- Elimination or reduction of symptoms.
- Prevention of disease or its progression.

Pharmaceutical care involves three main steps:

- **Assessment:** Collect and analyze patient's medical and medication history.
- **Care Plan:** Develop a plan to solve or prevent drug-related problems.
- **Follow-up:** Check whether the plan is working and modify it if needed.

Dosing Pattern Based on Pharmacokinetics

Pharmacokinetics deals with how the body handles a drug — its absorption, distribution, metabolism, and excretion (ADME). The dosing pattern of a drug depends on its pharmacokinetic properties.

- **Half-life:** Drugs with short half-life need frequent dosing; long half-life drugs are given once daily.
- **Bioavailability:** Determines how much drug actually reaches the blood.
- **Volume of Distribution:** Drugs with large volume of distribution need a loading dose.
- **Metabolism:** Drugs metabolized in liver need dose reduction in liver disease.
- **Clearance:** Drugs excreted by kidney need dose adjustment in renal failure.
- **Therapeutic Index:** Drugs with narrow TI require TDM for safe dosing.

Dosing Pattern Based on Disease

The same drug may be given in different doses and schedules depending on the type and severity of disease. Examples:

Condition	Dose Adjustment Principle
Renal failure	Reduce dose or increase dosing interval
Liver disease	Avoid hepatotoxic drugs; reduce dose



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Condition	Dose Adjustment Principle
Heart failure	Reduce dose of drugs like digoxin
Pregnancy	Avoid teratogenic drugs; minimum effective dose
Elderly patients	Start low, go slow
Children	Calculate dose based on weight / body surface area
Severe infection	Higher or loading doses of antibiotics
Chronic diseases	Long-term maintenance doses (HTN, DM, asthma)

Thus, clinical pharmacists use both pharmacokinetic principles and the patient's disease pattern to design individualized dosing for each patient.

Over the Counter (OTC) Sales

Introduction

■ DEFINITION

Over the Counter (OTC) drugs are medicines that can be sold directly to the public without a prescription from a registered medical practitioner. They are considered relatively safe when used as directed and are meant for self-medication of minor and common health problems.

The term "over the counter" comes from the fact that these medicines can be sold across the pharmacy counter without a doctor's prescription. In India, there is no separate written OTC list like in the USA or UK — drugs not included in the prescription-only schedules (like Schedule H, H1, or X) are generally considered OTC.

Examples of Common OTC Drugs

Category	Common Examples
Analgesics / Antipyretics	Paracetamol, Aspirin, Ibuprofen
Antacids	Digene, Gelusil, Eno
Cough & Cold	Cough syrups, Vicks, lozenges, decongestants
Antiallergics	Cetirizine, Chlorpheniramine
Antidiarrheals / ORS	ORS sachets, Lomotil, Eldoper



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Category	Common Examples
Vitamins & Tonics	B-complex, Vitamin C, multivitamins
Antiseptics	Dettol, Savlon, Povidone iodine
Laxatives	Isabgol, Milk of Magnesia, Lactulose
Topical products	Moov, Volini, calamine lotion
First aid items	Band-aid, antiseptic cream, burn ointment

Sale of OTC Drugs

Although OTC drugs do not need a prescription, a pharmacist still has important responsibilities while selling them. The pharmacist must:

- Ask the customer about symptoms, duration, and age.
- Rule out any serious illness that needs a doctor's consultation.
- Check for possible allergies or existing medications.
- Select the most suitable and safest product.
- Explain the correct dose, timing, and duration.
- Warn about possible side effects and interactions.
- Advise the customer to consult a doctor if symptoms do not improve.
- Maintain records of OTC sales where required.

Advantages of OTC Medicines

- Easy access for minor illnesses like cold, fever, indigestion, headache.
- Save time and cost of doctor consultation for trivial problems.
- Useful in remote areas where doctors are not easily available.
- Reduce burden on hospitals for minor complaints.
- Give the pharmacist a chance to educate the public.

Disadvantages / Problems with OTC Drugs

- Risk of self-medication and wrong diagnosis.
- Masking of serious underlying diseases.
- Drug interactions with existing medicines.
- Overdose and adverse effects (e.g., paracetamol overdose causing liver damage).
- Drug dependence (e.g., laxatives, nasal decongestants).
- Irrational use, especially antibiotics and cough syrups.



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- Misuse of codeine-based cough syrups for abuse.

Rational Use of Common OTC Medications

Rational use means using OTC drugs in the right dose, for the right indication, for the right duration, and in the right patient. The pharmacist plays a key role in ensuring this.

General Rules for Rational OTC Use

- Use OTC drugs only for minor, self-limiting problems.
- Always read the label, dose, and instructions carefully.
- Do not exceed the recommended dose or duration.
- Avoid multiple OTC drugs at the same time without advice.
- Consult a doctor if symptoms last more than 3–5 days.
- Pregnant women, children, and elderly should use OTC drugs with caution.
- Avoid self-medication in serious symptoms like chest pain, severe headache, or blood in stool.

Rational Use of Specific OTC Drugs

- **Paracetamol:** Safe at 500–1000 mg, 3–4 times daily; maximum 4 g/day. Avoid overdose — can cause severe liver damage.
- **Aspirin:** Avoid in children under 12 and in fever with viral illness (risk of Reye's syndrome). Take after food to avoid gastritis.
- **Ibuprofen:** Take after food; avoid in peptic ulcer and kidney disease. Short-term use only.
- **Antacids:** Take 1 hour after meals or at bedtime; not for long-term relief. Consult doctor if symptoms persist.
- **Cough Syrups:** Avoid in productive cough. Do not give to children under 2 without medical advice.
- **Antiallergics:** Second-generation antihistamines (cetirizine, loratadine) are preferred for day use because of less sedation.
- **ORS:** Mix with clean water; encourage frequent sips. For severe dehydration, hospital treatment is needed.
- **Vitamins:** Should not be used as a regular supplement without need. High doses can be harmful.
- **Nasal decongestants:** Should not be used for more than 3 days (risk of rebound congestion).
- **Laxatives:** Use only when needed; long-term use causes dependence and electrolyte imbalance.



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Role of Pharmacist in OTC Sale

- Act as a first-contact health advisor for minor ailments.
- Educate the public about correct and safe use of OTC drugs.
- Discourage misuse and self-medication of serious drugs.
- Provide counseling on lifestyle, diet, and home remedies.
- Refer serious cases to the doctor or hospital.
- Report any suspected adverse reactions from OTC drugs.
- Update knowledge about new OTC products and guidelines.





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