

# Introduction to Clinical Pharmacy

*"It is easy to get a thousand prescriptions, but hard to get one single remedy."*

— Chinese Proverb

## What is there in this chapter?

Clinical pharmacy deals with pharmacists which are trained in providing good patient care via the optimized use of medications that are aimed at promoting health, wellness and preventing disease. The current chapter deals with the same in a holistic way.

## WHAT IS CLINICAL PHARMACY?

Clinical pharmacy<sup>1</sup> is defined as the area of pharmacy concerned with the science and practice of rational medication use. It should be differentiated from pharmaceutical care which means: *Direct, responsible provision of medication-related care for the purpose of achieving definite outcomes that improve a patient's quality of life.*

Clinical pharmacy includes all the services performed by pharmacists practising in hospitals, community pharmacies, nursing homes, home-based care services, clinics and any other setting where medicines are prescribed and used. The

term “clinical” does not necessarily imply an activity implemented in a hospital setting.

### Hospital Pharmacy<sup>2</sup> and Clinical Pharmacy

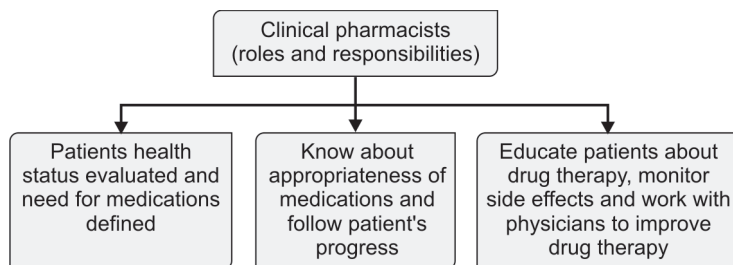
The discipline of pharmacy embraces the knowledge on synthesis, chemistry and preparation of drugs. Clinical pharmacy is more oriented to the analysis of population needs with regard to medicines, ways of administration, patterns of use and drug effects on the patients. The focus of attention moves from the drug to the single patient or population receiving drugs. In the hospital, the focus is on the patients coming to the hospital rather than the community.

### Aims and Objectives of Clinical Pharmacy<sup>3</sup>

The main aim of clinical pharmacy is to promote the correct and appropriate use of medicinal products and devices. Main roles and responsibilities are wide-ranging (Fig. 1.1).

#### Objectives

- Maximising the clinical effect of medicines (e.g. taking corticosteroids in morning or giving statins at night)
- Minimising the risk of treatment-induced adverse drug reactions (e.g. using low doses to begin with and build gradually).
- Minimising the expenditures for pharmacological treatments (using cost effective drugs, e.g. chlorpheniramine instead of cetirizine).



**Fig. 1.1:** Main roles and responsibilities of clinical pharmacists.

## Levels of Operation<sup>4</sup>

Clinical pharmacy activities may influence the correct use of medicines at three different levels: Before, during and after the prescription is written.

- a. **Before prescription:** This deals with the drugs before they are released with clinical use. The drugs in clinical trials, formularies, or drug information bulletin can be screened by the clinical pharmacists. Drug-related policies can be made using the information.
- b. **During prescription:** Patients can be counselled regarding the appropriate and safe use of drugs. Clinical pharmacists can influence the attitudes and priorities of prescribers in their choice of correct treatments by giving them evidence-based information.

The clinical pharmacists can monitor, detect and prevent the adverse drug reactions. Importantly, the clinical pharmacist should pay attention to the dosage of drugs which need therapeutic monitoring. Community pharmacists can also make prescription decisions directly, when over the counter drugs are counselled. During the monitoring, the clinical pharmacist can bring out medications related problems.

**Table 1.1:** Drug related problems detected by clinical pharmacists

- Untreated indications.
- Improper drug selection.
- Subtherapeutic dosage.
- Medication failure to receive.
- Medication overdosage.
- Adverse drug reactions.
- Drug interactions.
- Medication use without indication.

- c. **After prescription:** Counselling of the patient is the main activity regarding the use of drugs, monitoring of their side effects and preparation of personalised formulation

for individual needs. Drug use evaluation and outcome research is a major component. Nowadays, pharmaco-economic research has received a major boost for the same.

### **Roles and Responsibilities of Clinical Pharmacists<sup>5-6</sup>**

The roles and responsibilities of clinical pharmacists are growing in spectrum now. The principle activities of a clinical pharmacist include:

- a. Consulting:** Analysing therapies, advising health care practitioners on the correctness of drug therapy and providing pharmaceutical care to patients both at hospital and at community level is an important goal of clinical pharmacists. The selection of drugs, defining “drug formularies” or “limited lists of drugs” in collaboration with hospital doctors, general practitioners and decision makers could be valuable for hospitals, nursing homes or even for national drug formulary.
- b. Information dissemination:** Seeking information and critically evaluating scientific literature is crucial in modern world. Much of this training however is done at postgraduate level. Organising information services for both the health care practitioners and the patients is fast becoming a productive activity for clinical pharmacists globally.
- c. Medication review:** Clinical pharmacist has to review medication chart, and medication history. Attending ward rounds is important to know the pattern of drug use in particular hospital.
- d. Drug use studies and research:** Drug use studies/pharmacoepidemiology/outcome research/pharmacovigilance and vigilance in medicinal devices: Collecting data on drug therapies, their costs and patient outcome through structured and scientific methods.
- e. Pharmacokinetics/therapeutic drug monitoring:** Studying the kinetics of drugs and optimising the dosage. For example, Indian patients may need lower dose of antipsychotics compared to the west. Black patients may tolerate ACE inhibitors poorly.

- f. **Clinical trials:** Planning, evaluating and participating in clinical trials is an important and ongoing activity in clinical pharmacy.
- g. **Pharmacoeconomy:** Using the results of clinical trials and outcome studies to determine cost-effectiveness evaluations.
- h. **Teaching and Training:** Pre- and postgraduate teaching and activities to provide training and education programmes for pharmacists and other health care practitioners.

### Sources of Information for Clinical Pharmacists<sup>7</sup>

There are several sources of information for clinical pharmacists (Table 1.2).

**Table 1.2:** Sources of information gathering in clinical pharmacy

- Patient admission information
- Medical record
- Initial history and physical examination
- Patient progress notes
- Medical/surgical consultations
- Nursing notes
- Laboratory data
- Diagnostic procedures
- Radiology/surgery procedure orders
- Medication administration orders
- Consent forms

In addition, clinical pharmacists receive useful information from patients, their family and health care team.

### *Clinical Pharmacy Practice Areas*

Clinical pharmacy is an ever increasing branch in its scope now. However, the main areas of practice are given in Table 1.3.

**Table 1.3:** Main areas of clinical pharmacy practice

- Ambulatory care
- Critical care
- Drug information
- Geriatrics and long-term care
- Internal medicine and subspecialties
- Cardiology
- Endocrinology
- Gastroenterology
- Infectious disease
- Neurology
- Nephrology
- Obstetrics and gynecology
- Pulmonary disease
- Psychiatry
- Rheumatology
- Nuclear pharmacy
- Nutrition
- Pediatrics
- Pharmacokinetics
- Surgery

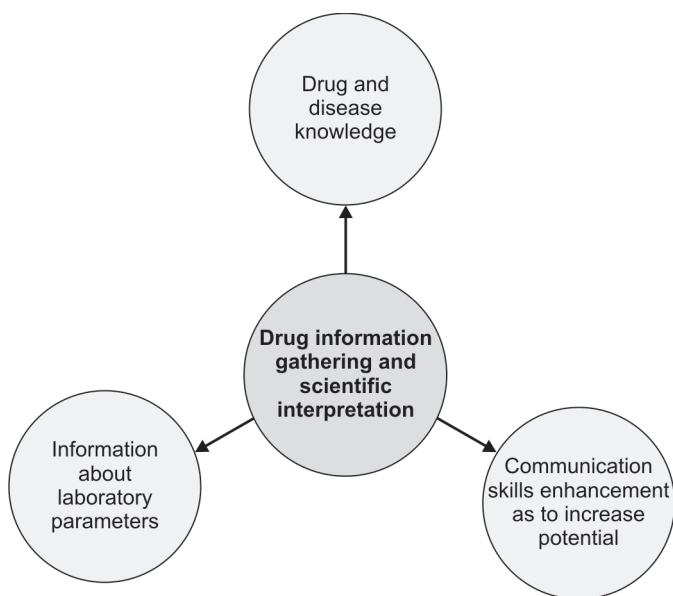
### *Clinical Pharmacy as a Specialization<sup>8-10</sup>*

The pharmacotherapy specialist designs, implements, monitors, evaluates, and modifies patient pharmacotherapy to ensure effective, safe and economical patient care. Time to time, guidelines come for proper conduct of clinical pharmacy.

- a. **Information gathering and interpretation:** Clinical pharmacists can retrieve, analyze, evaluate, and interpret the scientific literature as a means of providing patient- and population-specific drug information to health professionals and patients.
- b. **New knowledge:** Clinical pharmacists participate in the generation of new knowledge relevant to the

practice of pharmacotherapy, clinical pharmacy and medicine. The pharmacotherapy specialist educate health care professionals and students, patients, and the public regarding rational drug therapy.

- c. **Skill enhancement:** Clinical pharmacist continually develops his/her knowledge and skills in applicable practice areas and demonstrates a commitment to continued professional growth by engaging in a lifelong process.



**Fig. 1.2:** Core skills of clinical pharmacists and ways and means to improve competence.

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