



## Role of Clinical Pharmacist in Healthcare System

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**ABSTRACT:** Pharmacy practice is still in the initial stages of development in India, but launching of Doctor of Pharmacy (PharmaD) study program has brought serious discussions about Clinical Pharmacy in the country. As the profession is in budding stage in the country, the patients, physicians, nurses, other healthcare providers, recruiters in pharmaceutical industries, prospective students and their parents have numerous questions about this profession and study course. The objective of this article is to create awareness about clinical pharmacy services (CPS) and to introduce the role of clinical pharmacists. The article describes the role of clinical pharmacists in the Hospitals, in Research, in Pharmaceutical / Contract research companies, in Community service. In Conclusion Clinical Pharmacists are going to be the major support to the Indian Healthcare System in near future.

**Key Words:** Clinical Pharmacists, Clinical Pharmacy Services, Doctor of Pharmacy, India.

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### I. INTRODUCTION

#### ROLE OF CLINICAL PHARMACISTS IN HOSPITAL

Clinical pharmacists have a valuable role in the hospital

#### MEDICATION HISTORY INTERVIEW

Accurate medication history of the patient is important to assess the medical concordance, rationale for the drugs prescribed previously, patient understanding toward medicines, evidence for drug abuse, patient acceptance for the treatment, documenting allergies and adverse drug reactions.

#### MEDICATION HISTORY INTERVIEW FORM (FORM-II)

<p><b>OTC medication:</b></p> <p>Do you take any medications other than prescribed one? If yes for what?</p> <p>Are you still using those medications or have stopped?</p> <p>Do you know the medicines you take are <b>Correct or Not?</b></p> <p><b>Response to drug therapy:</b></p> <p>Do you think the present medications are beneficial? If yes explain if No explain</p> <p>Was your past medications was better or the Present? Explain how</p> <p>Did you have any information regarding your medications in the past or present if yes who has given all those information?</p> <p><b>Affordability of medications:</b></p> <p>Do you purchase all the medications as per prescribed by physician? <b>YES/NO</b></p> <p>If not what may be the reason:</p> <p><b>Compliance:</b></p> <p>How do you remember to take your medications:</p> <p>What will you do if you forget your medications:</p> <p>Do you face any problems with your drug therapy with the present or the past medications?</p>
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### **Clinical Review**

In clinical review, Pharmacists have to check the drug therapy to ensure that the patient is getting the most appropriate dose, dosage, dosage form, duration of therapy for their medical /disease state. Also, he has to correlate the signs and symptoms of the patient, laboratory results, medical diagnosis and therapeutic goals with the medication history for better patient care.

#### **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 are to:

- 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 (to improve compliance).

### **Patient Counselling**

Patient counseling can be considered as the most important clinical pharmacists from the patient's point of view.

The Clinical Pharmacists may provide the information about current clinical condition/proceedings of the patient and educate him about the safe and appropriate use of medicines, thereby enhancing his therapeutic outcomes.

Generally, there are many questions in patient mind about disease, drugs, lifestyle modifications, diet, treatment, duration of therapy and medical devices.

E.g:- Metered dose inhalers for asthma patients or Insulin pen for diabetics.

Here the Pharmacists can educate the patients about all such areas as a part of Clinical Pharmacists.

A Clinical Pharmacist may provide information on ongoing care to the patient to ensure continuity of supply of drugs, continuity of medication concordance aids, communication of special problems, appropriate monitoring of the dosages and for minimal disruption.

The patient may be counseled / educated for the following points about the drugs by the pharmacists

Generic name, brand name of the drug

Dosage

Indications / Benefits of the medicine, and expected action

Proper storage

How to take the medication

When and how long to take medication

Information about ceased/New medication

Special precautions about the drug

Common Adverse Drug Reactions

Action to be taken when a dose is missed

Drugs and /or foods to be avoided

Benefits of patient counseling include patient satisfaction, prevention of medication errors better clinical outcomes and psychological support to the patient

Patient education especially plays an important role in chronic diseases

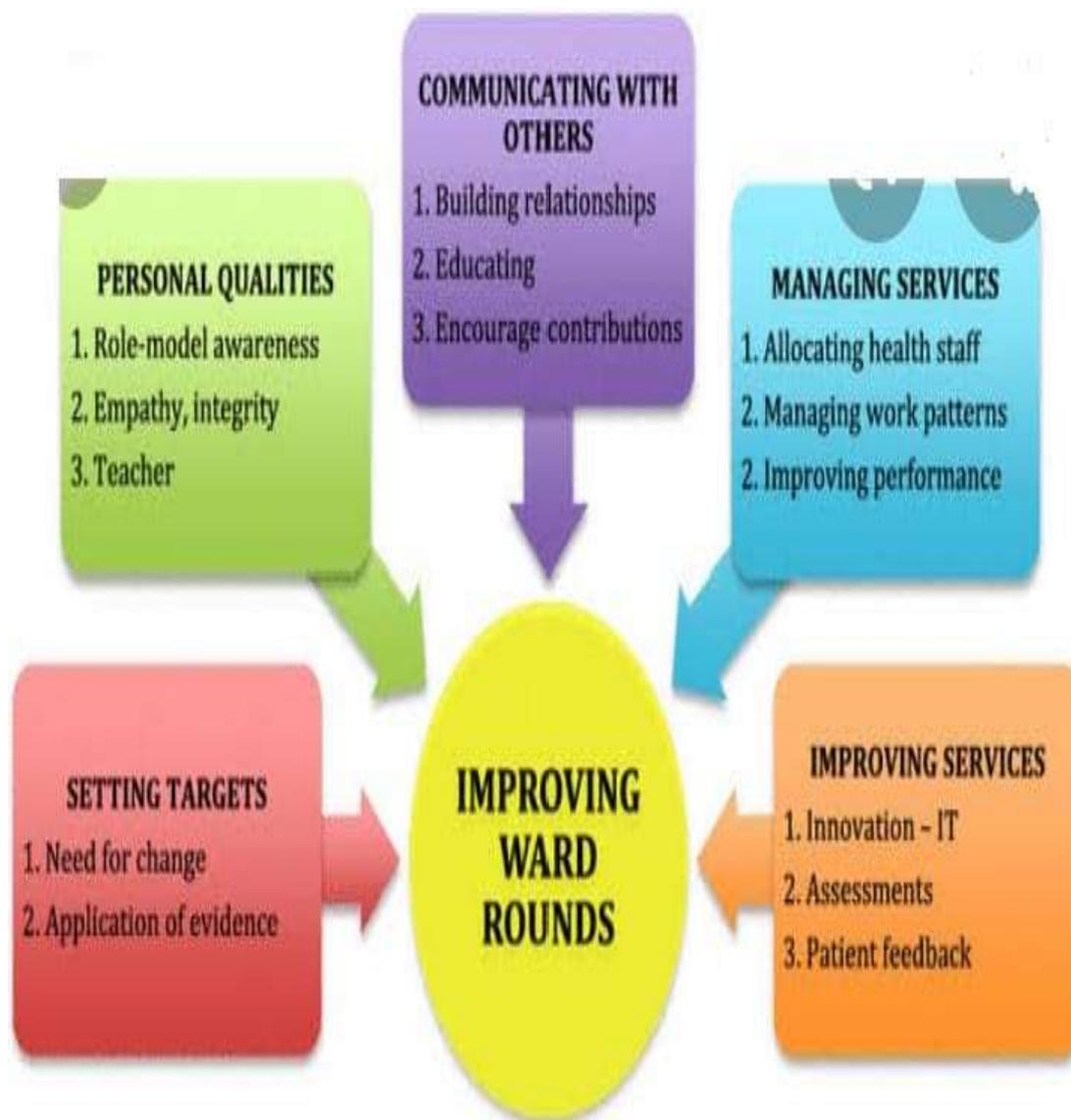
The major problems in front of India include diabetes, hypertension dyslipidemia etc, and patient education /counseling does matter in all such disease conditions.

PATIENT COUNSELLING (FORM-III)

<b>Counseling steps followed:</b>	
<input type="checkbox"/> Case sheet reviewed	<input type="checkbox"/> Patient was warned from taking other medications including OTC's, herbal drugs etc
<input type="checkbox"/> Self-introduction done	<input type="checkbox"/> Actual counseling carried
<input type="checkbox"/> Purpose of counseling achieved	<input type="checkbox"/> Patient's counseling aimed towards therapy was
<input type="checkbox"/> Initial drug related information obtained	<input type="checkbox"/> Ascertained counseling points summarized
<b>Points covered during counseling session:</b>	
<input type="checkbox"/> Name and purpose of medication	<input type="checkbox"/> Precautions to be taken
<input type="checkbox"/> Dosage regimen	<input type="checkbox"/> Storage recommendations/conditions
<input type="checkbox"/> Advice on missed dose/missing dose	<input type="checkbox"/> Benefits of completing the case
<input type="checkbox"/> Potential side effects	<input type="checkbox"/> Life style modifications
<input type="checkbox"/> Significant interactions (Drug-Drug, Drug-food, Drug-Disease, Drug-Body fluids)	
<b>Time taken for counseling:</b>	<input type="checkbox"/> Less than 10 min.
	<input type="checkbox"/> 10 to 20 min.
	<input type="checkbox"/> More than 20 min
<b>Counseling Provided to:</b>	<input type="checkbox"/> Patient
	<input type="checkbox"/> Patient's representative
<b>If patient's representative, give reason:</b>	<input type="checkbox"/> Patient is unconscious
	<input type="checkbox"/> Language problem Hearing Problem
	<input type="checkbox"/> Pediatric Patient

**Ward Round Participation**

- As a member of healthcare team, the Pharmacists can attend ward rounds.
- The goals are improved understanding of patient's history, progress, clinical details, to provide the information on clinical aspects of patient's therapy and to improve discharge planning.
- The Pharmacists can also help in decision making to select the quality low cost medicine; optimize the quality of patient care and clinical outcomes; ensure medicine selection as per formulary and local guidelines.



### Community Pharmacy

- Community Pharmacy services generally involve dispensing of drugs, Promotion of healthy lifestyles, support for self-care, provision of practice leaflets to the patients, medicine use review, smoking/alcohol cessation programs etc.
- Clinical Pharmacists can participate in various community service programs such as smoking cessation, alcohol consumption cessation, health promotion, health nutrition.
- As Community Pharmacy services are not common in India and are being provided by other professionals, after implementing, it will be very much helpful for the common man of India.



**Pharmacovigilance**

- World Health Organization defines Pharmacovigilance as the science and activities relating to the detection, assessment, understanding and prevention of adverse effects or any other drug related problem.
- Documentation, analysis and prevention of ADRS are needed for epidemiological studies and patient safety.
- Presently some hospitals in India are recruiting peoples in Pharmacovigilance.
- Various BPOS/KPOS in India are recruiting people for Pharmacovigilance.
- Skills needed to work in the area of Pharmacovigilance are: Sound knowledge of Pharmacology, ADRS, Laboratory results, and Clinical research

**ADVERSE DRUG REACTON/ MEDICATION ERRORS      FORM-V**

<b>Admitting Diagnosis:</b>					
Patient's other relevant history, including pre-existing medical conditions (e.g., allergies, race, pregnancy, smoking alcohol use, hepatic/renal dysfunction, etc.)					
<b>Date of onset of reaction:</b>					
<b>Brief description of reaction:</b>					
<b>SUSPECTED DRUGS OF ADR's:</b>					
Generic Name	Brand Name	Labelled Strength	Batch/Lot No.	Exp. Date	Manufacturer
<b>MANAGEMENT OF ADR:</b>					
<b>1. Fate of the suspected drug:</b>					
a) Drug withdrawn	<input type="checkbox"/>	b) Dose altered	<input type="checkbox"/>	c) No change	<input type="checkbox"/>
<b>2. Treatment given:</b>					
a) Specific	<input type="checkbox"/>	b) Symptomatic	<input type="checkbox"/>	c) Nil	<input type="checkbox"/>
<b>3. Outcome:</b>					
a) Fatal	<input type="checkbox"/>	b) Recovered	<input type="checkbox"/>	c) Un-known	<input type="checkbox"/>
d) Permanent harm	<input type="checkbox"/>	e) Conunung	<input type="checkbox"/>	f) Others (Specify)	<input type="checkbox"/>
<b>4. Patient interview:</b>					
a) Yes	<input type="checkbox"/>	b) No	<input type="checkbox"/>		
<b>5. Thank you note provided:</b>					
a) Yes	<input type="checkbox"/>	b) No	<input type="checkbox"/>	c) N/A	<input type="checkbox"/>
<b>6. Alert card provided:</b>					
a) Yes	<input type="checkbox"/>	b) No	<input type="checkbox"/>	c) N/A	<input type="checkbox"/>
<b>7. Was suspected ADR discussed with concerned physician?</b>					
a) Yes	<input type="checkbox"/>	b) No	<input type="checkbox"/>		
<b>8. Any appropriate suggestion given?</b>					
a) Yes	<input type="checkbox"/>	b) No	<input type="checkbox"/>		
<b>Physician Name:</b>			<b>Date:</b>		

**Clinical Research And Drug Development**

Both these things are related to clinical trials .There are countless clinical research organizations present in the country.

Clinical research Coordinator

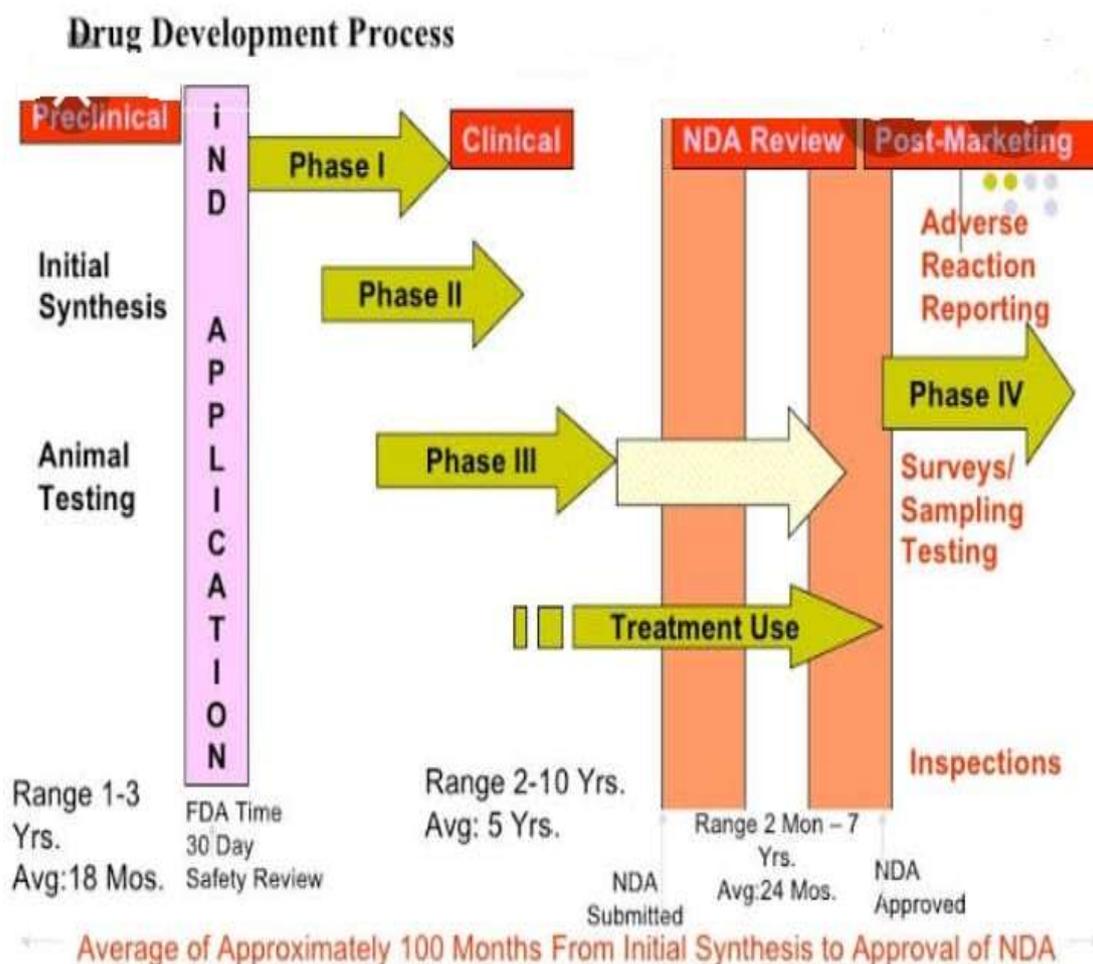
Clinical research Associate

Research Statisticians and higher positions with optimum experience are suitable posts for Clinical Pharmacists in Clinical research Organizations.

Clinical Pharmacists can even work as principal investigators, Patient educators in clinical trials.

Pharmacists can play a role in enhancing patient participation in clinical trial research.

Skills needed to work clinical research organization include knowledge of statistical ,medical ,pharmacologic terms , pharmacovigilance, sincerity in documentation, ability to travel extensively ( especially for CRAS) etc.



### Higher Education

The person who has completed PharmD can register for PhD in Abroad.

After PharmD, Somewestern countries offer specialty programs such as Oncology, Pharmacotherapy, Nuclear Pharmacy, Nutrition Support, Psychiatry, Ambulatory care etc.



### **Medical Writing**

This is also known as Scientific Writing or Medical Communications.

Medical writing involves writing different types of healthcare documents for different purpose and for different audiences.

The medical writers are required in Pharmaceutical / healthcare companies, Contract research organization (CROS), Business process outsourcing/knowledge process outsourcing companies (BPOS/KPOS).

Healthcare communication companies, media and publishing companies, medical journals, medical societies.

The skills needed to become a competent medical writer are:

Domain knowledge language

Grammar skills

Quick interpretation of medical data



### **Contract Research Organisations**

Contract research organizations are an organization that provides support to the product/ device, (Pharmaceutical/Biotechnological/Medical) in the form of research services on contract basis.

Clinical Pharmacists may get absorbed in CROS working in the following fields:

Pharmacoeconomics

Patient reported outcomes

Health technology assessment

Literature reviews

Systematic reviews

Quality of life studies etc.

A skill needed to work in CROS is excellent analytical skills, thorough knowledge of therapeutics, and statistics excellent grasping capacity, handling of databases.



### **Medical /Clinical Science Liaison**

Medical science liaison (MSL) is a healthcare consulting professional employed by Pharmaceutical, Biotechnology, Medical device and Managed care companies to provide unbiased (Nonpromotional) information about the product. MSL includes

Ensures that products are utilized effectively.

Serves as scientific peers and resources within the medical community.

Serves as scientific experts to internal colleagues at companies.

The professionals are also known as Medical liaisons/Medical science managers/Regional medical scientists /Regional medical advisors/ Directors.

In India, MSL is an evolving, highly paid field for Clinical Pharmacists.

Important skills needed to become MSL include

Excellent communication

Presentation skills

Therapeutic expertise

# Responsibilities of an MSL



## In A Hospital, Academics, And Further Education

As a Surgeon is known for Surgery, a Physician is known for diagnosis and treatment of a disease, a Clinical Pharmacist would be known /recognized for providing Clinical Pharmacy Services in India.

Providing Clinical Pharmacy Services is the first and foremost responsibility of a Clinical Pharmacist.

Clinical Pharmacy Services can work as a faculty member in an academic institute.

They may also join a suitable teaching position in a Diploma/Degree/Post graduate Pharmacy Institute such as Lecturer, Assistant Professor, Associate Professor, Professor, Head of the Department, Head of the Institution, Principal or Director with suitable experience.

As far as nonteaching hospitals are considered, currently some elite and US-based hospitals in India are recruiting Clinical Pharmacists.

Furthermore, Clinical Pharmacists may have role in hospital administration team, Pharmacy/Therapeutic Committees in hospital etc.

## Benefits Of Clinical Pharmacists

- Exposure to advanced subjects such as clinical pharmacokinetics, pharmacoepidemiology, pharmacoconomics, biostatistics, clinical toxicology, pharmacotherapeutics, clinical pharmacy, hospital pharmacy, community pharmacy etc.
- Enough exposure to hospital. Increasing number as numbers of pharmD colleges are increasing in the nation.
- Capability to perform well in clinical scenarios in hospitals as well as in industries.
- Professionally competent.
- PharmD people can prefix Dr in their names.
- Knowledge of disease and their managements.
- Can spend enough time with patients and solve their doubts about disease, drugs and lifestyle modifications.

- Can provide Clinical Pharmacy Services in different specialty wards in the hospital.

#### **Benefits To The Patient**

- Patients receiving pharmaceutical care.
- Patient counseling regarding proper use of medicines, disease, lifestyle modifications and diet.
- Psychological support to the patient.
- Prevention of drug abuse.
- Patient education for avoiding medication errors.
- Medication aids counseling.

#### **Benefits To Physicians, Nurses, And Other Healthcare providers**

- Getting unbiased drug and poison information.
- Reporting and assessment of adverse drug reactions.
- Determination and prevention of drug-drug, drug –food interactions.
- Drug-therapy monitoring.
- Determination of drug incompatibilities.
- Prevention of medication errors.

#### **Benefits To The Hospital As A Whole**

- Better patient care.
- Better new research opportunities, research assistance, assistance in community services of the hospital.

#### **Benefits To Industries**

Industries may get knowledge and clinically advanced people for recruitment.

Industries with new ideas in Pharmacy Practice may develop in India.

E.g. Pharmacoeconomics

Health technology assessment

Contract research organizations etc.

#### **Medical Coding**

Medical coding also known as Medical classification is nothing but transformation of descriptions of medical diagnosis and procedures into universally acceptable codes.

The codes are used in variety of fields such as medicine, public health and medical informatics for statistical analysis, reimbursement schemes.

Currently there are numerous medical coding companies in India.



### **Medical Billing**

Medical billing is different from medical coding.

It is the process of translation of healthcare service into billing claim.

There are many health insurance companies in the nation but, to the best of our knowledge, recruitment of Clinical Pharmacists is very much rare at present.

However we project the role of Clinical Pharmacists in medical billing as well.



### **Medical Transcription**

In simple language, medical transcription is transcribing (typing) the doctors reports from dictated audio files.

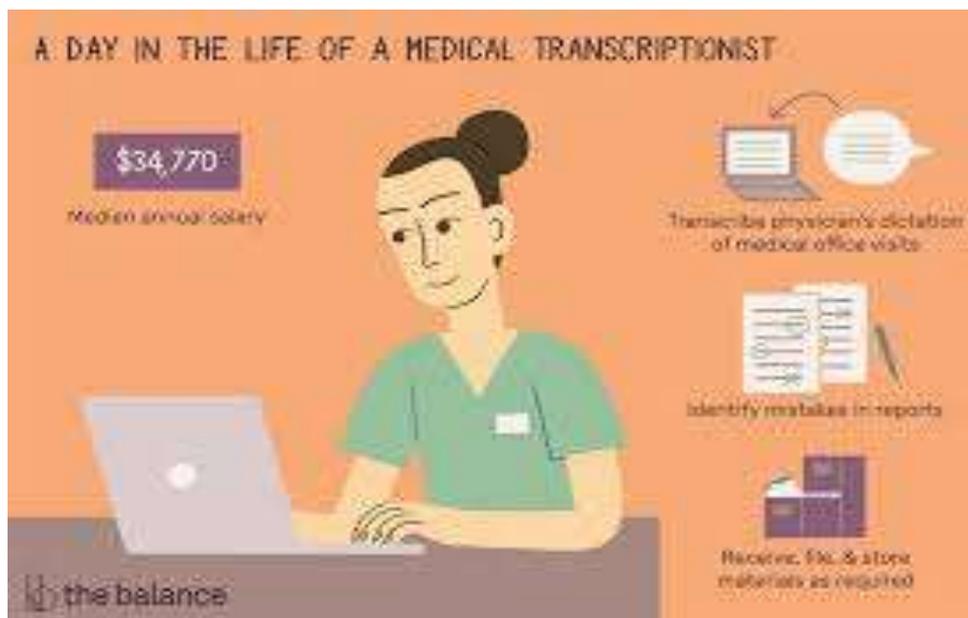
In developed countries, the health practitioner dictates what he has done after performing procedures on patient and the medical transcriptionist (MT)( also known as medical language specialist) transcribes the oral dictations and / or edits the reports.

Such patient specific health information is converted in written text document and maintained in printed, E-Version or kept in patient record files.

Nowadays speech recognition soft wares are used for better practice of medical transcriptions.

Medical transcriptionists may be hired by the hospital.

Skills needed to become a medical transcriptionist include sound knowledge of medical terminologies, disease conditions, anatomy, physiology, pharmacology, medical language, grammar, typing skills, effective communication skills etc.

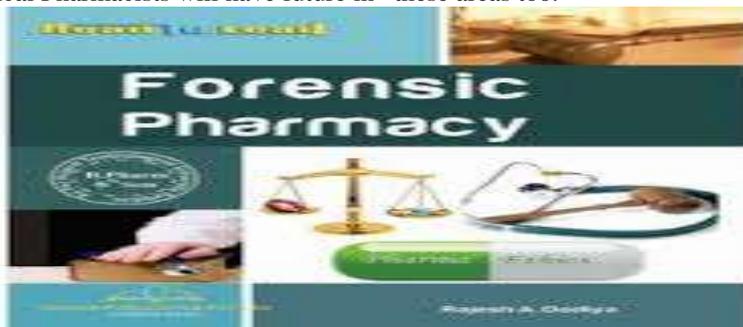


### **Forensic Pharmacy**

Forensic Pharmacy is the field where there is application of drug –sciences to medico –legal issues. In western countries, a Pharmacist can engage in legal cases, related to malpractice, ADRS, Drunk Driving, Drug abuse, Healthcare fraudulence, Poisoning/Toxicity, Various other types of civil and criminal cases.

Though India has very few Pharmacists working in these areas at this point of time.

We believe that Clinical Pharmacists will have future in these areas too.



### **Business Opportunities And Market Research**

With proper market knowledge, experience and investment, a Clinical Pharmacist can start a business with any of the ideas.

As they can analyze the comparative efficacy and unique selling property of the drugs.

Clinical Pharmacists also have a role in product management, team, market research and medico marketing.



### Bioavailability/Bioequivalence Studies

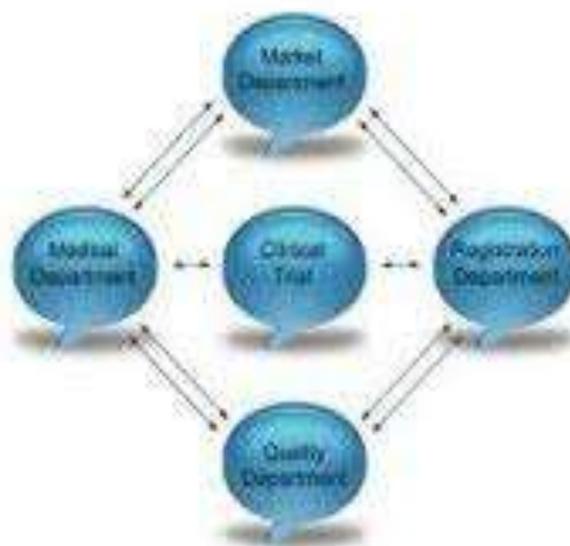
In simple words, Bioavailability (BA) is the fraction of the administered drug available in the blood circulation.

While Bioequivalence is the comparison bioavailabilities of two pharmaceutical products with same drug and dosage.

BA/BE studies are conducted for following important purposes.

Development and determination of dose and dosage form of a drug, quality control of drug products. Development of new formulation of the existing drug.

The companies working in the area of BA/BE exist in India. To enter in the field of BA/BE studies knowledge of Pharmacotherapeutics, Clinical Pharmacokinetics Clinical research is necessary.



### Public Health, Governmentsector And Nongovernmental Organization

Apart from community pharmacy, the pharmacists do have a role in public health.

The areas and the role of pharmacists are as follows

Immunization Programs: Administration and promotion of immunization.

Disaster preparedness and response:

Natural disaster,

Education of public

Planning of emergency response

Surveillance of notifiable syndromic conditions

Communication with public

Provision of mass medications etc.

Contraceptive services: Distribution of contraceptive measures and education about their use.

Prevention and control of disease and injury, promotion of healthy lifestyles, reduce hospitalizations.

In government sector and nongovernmental organizations, Clinical Pharmacists may have a role in Policy framing, Drug/ Poison information centers, Health camps, Awareness programs, Pharmacovigilance center, Patient counseling center etc.



## II. CONCLUSION

Clinical pharmacy education programs have taken root in India. Much dedication is needed to improve and expand this system in order to bring the benefits of clinical pharmacy practice to the great swath of Indian society.

Further, for the survival and growth of clinical pharmacy system in India, it must gain acceptance by the medical profession, and the outcome of this challenge depends on the quality and expertise of present pharmacy students and recent Pharm D. graduates.

Pharmacists is the first person of health care system by playing various roles like academic pharmacists, industrial pharmacist, community pharmacists, clinical pharmacists, hospital pharmacists, veterinary pharmacists etc.

All pharmacists working in different fields of the profession are directly or indirectly related to nation's health. Finally pharmacists are responsible for insuring that "Right drug to right patient at right time in right dose through right route in right way."

So that pharmacists is an integral part of health care system.

The profession of Pharmacy is at a significant crossroads between its conventional drug-dispensing identity and a pioneering clinical role with health care provider status.

In the coming decades, Pharmacists are expected to become more integral within the health care system. Rather than simply dispensing medication, Pharmacists are increasingly expected to be compensated for their patient care skills.

Specifically, Medication Therapy Management comprises the medical packages that Pharmacists are capable to make available for their patients.

These services contain the detailed examination of the entire medicines (prescription, non-prescription and herbals) presently being taken by a person. The consequence is an understanding of medicines and patient's learning ensuing in improved patient's wellbeing results and declined expenses to the health care system. Additionally, the Doctor of Pharmacy (Pharm. D.) degree at present is necessary prior to going into practice and several Pharmacists currently have to complete one or two years of residency or fellowship training subsequent to graduation course.

Besides, consultant Pharmacists, who customarily manoeuvre mostly in nursing homes, are at the present intensifying addicted to direct consultation with patients, underneath the poster of "Senior Care Pharmacy".

For Pharmacists, fresh responsibilities can be framed that facilitate to serve the ever-increasing patient inhabitants and requirements of the novel health concern system.

Within a further existing time, Pharmacists should have to show their significance inside the health care system. Inside the settings of health care system, their importance can produce alterations ranging from the new opportunity of jobs to the extension of services presented.

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