



## Clinical Pharmacy Practice: An Activity Based Definition For Pharmacy Students Of Developing Countries

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**Citation:** Muhammad Amir. **Clinical Pharmacy Practice: An Activity Based Definition For Pharmacy Students Of Developing Countries.** Archives of Pharmacy Practice. 2012; 3(3) 193-196.

### Introduction

Clinical pharmacy practice is relatively a new discipline in pharmacy practice in which the emphasis is transferred from products oriented to patient oriented practice.[1] However, the definition of clinical pharmacy or clinical pharmacy practice has not been universally standardized; hence different academic institutions and pharmaceutical societies have attempted to define it in their own perspectives.[2] In doing so, the discipline "clinical pharmacy" now has numerous meanings through out world. Few of the recognized definitions are as follows:

*Clinical Pharmacy is a health science discipline in which pharmacists provide patient care that optimizes medication therapy and promotes health, wellness, and disease prevention.* [3]

*Clinical Pharmacy practice is the practice of pharmacy as a part of a multidisciplinary healthcare team directed at achieving QUM (Quality Use of Medicines).* [4]

### Key words

*Adverse drug reactions, pharmacist, pharmacovigilance, hospital, pharmacoconomics*

### Manuscript History

*Article Received on: 13<sup>th</sup> Feb 2012,*

*Revised on: 1<sup>st</sup> May 2012*

*Approved for Publication:15<sup>th</sup> May 2012*

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In developing countries where clinical pharmacy practice is still in evolutionary phase, such definitions are hard to comprehend for pharmacy students and practicing pharmacists. [5] Moreover, with no or litter clinical pharmacy practice, grasping terminologies such as quality use of drug, rational use of drug or optimizations of drug is hard to implement.[6]

A definition of clinical pharmacy based on the activities might be more comprehensible. Definition provided by European Society of Clinical Pharmacy (ESCP) has made a similar attempt and defines clinical pharmacy as "the activities and services of the clinical pharmacist to develop and promote the rational and appropriate use of medicinal products and devices." However, in elaborating activities of clinical pharmacist, it has included non-clinical activities such as dispensing and compounding along with clinical activities.[7] Overlapping of clinical activities with non-clinical activities may jumble up the responsibilities of hospital pharmacist and clinical pharmacist. The intention of the presenting a new definition is not to disprove previous definitions rather to support them and extrapolate the concept of rational use or quality use of drug for greater understanding. The article also tries to explain the clinical activities.

### Pharmaceutical care

Irrespective of words used in the definitions mentioned above, the core of clinical pharmacy lies in the concept of pharmaceutical care,[8] which is defined as, specific activities and services through which an individual pharmacist cooperates with a patient and other professionals in designing, implementing and monitoring a therapeutic plan that will produce specific therapeutic outcomes for the patient. [9] Thus such activities that promote rational drug therapy are clinical pharmacy.[10] Including such activities into the definition of clinical pharmacy may increase its understanding.

### Activities of clinical pharmacist

In developed countries, clinical pharmacists are performing various activities depending upon the available resources and healthcare system[11]. These activities ranges from prescription review to prescribing drugs. Australian's Society of Hospital Pharmacy identifies ten such activities and named them "clinical activities". [4] In order to simplify clinical activities are classified into six which are as follows:

#### 1-Patient Medication History

*"It involves gathering and recording of information regarding past and present medications used by the patient through interview and reviewing of past medical records."*

Patient medication history is a recognized clinical activity for clinical pharmacist. [12] Clinical pharmacist

had being designated this responsibility because researches has shown that pharmacist are more accurate. [13] The practice for patient medication history includes three stages; each stage has an objective and a methodology described in Table

**Table 1: Objective and methodology for Patient Medication History**

Stage	Objective	Procedure
Before taking medication history	Create rapport (Gaining patient's confidence)	Step 1: Confirm the patient's identity. Step 2: Pay regards. Step 3: Self introduction- Name, position. Step 4: Reason of visit and time required. Step 5: Start taking medication history of the patient.
During history taking	Gather information	Step 6: Ask question with respect to form format.
After history taking	Documentati-on & analysis	Step 7: Express gratitude Step 8: Collect and review past medical record. Step 9: Document essential data.

## 2- Profile Patient Review

*It involves evaluation of patient and its medical chart by the clinical pharmacist.*

It is often considered that medication review is a clinical activity; however, it is not unless conducted along with the patients. Patient involvement is mandatory for the provision of pharmaceutical care.[14] Term such as patient assessment, profile review and medication review are used when evaluation is conducted only of patient, patient profile or prescription, respectively. Hence, we used another term profile patient review which involves all the three components. Profile patient review can be conducted in a manner shown in Table 2

**Table 2: Objective and methodology for Patient Profile Review**

Steps	Review	Objective
1 <sup>st</sup> Step	Patient history review	To check patient's medical history, present condition, allergies and past medications.
2 <sup>nd</sup> Step	Medication review	To evaluate medication in term of prescribing error and clinical outcome.
3 <sup>rd</sup> Step	Laboratory test review	To recommend lab test to monitor drug toxicity. To correlates abnormal lab test result with drug prescribed.
4 <sup>th</sup> Step	Nursing chart review	To check whether the drug prescribed is administered at right time, way and dose.

## 3-Adverse Drug Reaction Management

*It involves prevention, detection, management and documentation (reporting) of Adverse Drug Reactions (ADRs).*

Clinical pharmacist carries out adverse drug reactions (ADRs) management through patient counseling, profile patient review and patient medication history. [15] ADRs treatment is mainly a concern of physicians.

### *Prevention of ADRs*

Clinical pharmacist play vital role in prevention of ADRs through history taking, monitoring and counseling.[16] History taking can reveals potential allergies, symptoms, suspected drugs etc. Monitoring of ADRs is carried out through lab review and clinical review, while counseling could help to increase compliance, avoid drug interaction, and polypharmacy practice.

### *Detection of ADRs*

Detection or identification of ADRs is challenging especially when co-morbid exist. Number of protocols had being suggested for ADR identifications. Clinical pharmacist can use any of them, since they are very similar to each other. Examples of such protocols are: WHO, Narangos, European ABO system, Kram et, Bayesian, Karch and Lasagna's, French imputation method.[17]

### *Treatment of ADRs*

The role of clinical pharmacist in treatment of ADRs is very limited. Rarely, situation occurs where clinical pharmacist treats ADRs.

### *Reporting of ADRs*

ADRs are reported to related agencies such as FDA, CSM, etc. if classified as serious suspected ADRs. The report should comprise of name of the reporter, an adverse event, an identifiable patient and a suspect drug.

## 4-Therapeutic Drug Monitoring (TDM)

It involves application of clinical pharmacokinetic for monitoring drug efficacy and toxicities. The drugs that are commonly monitored are gentamicin, amikacin, tobramycin, vancomycin, carbamazepine, phenytoin, valproic acid, lithium, theophylline, cyclosporine, digoxin, lidocaine, amitriptyline, nortriptyline and imipramine. [18] The procedure of TDM comprises of six steps which are:

1. Ordering: Physician request for consultation for clinical pharmacokinetic services
2. Sample taking: Biological sample is taken by the team
3. Analysis of sample: Analysis of biological sample takes place in the laboratory
4. Result issue: Laboratory issues the drug concentration level result and notifies if it is sub-therapeutic to the clinical pharmacist.
5. Interpretation of result: clinical pharmacist conduct the calculation with respect to results
6. Action: With respect to calculation, dose adjustment are carried out.

In setting where clinical pharmacokinetic services exist,

both laboratory and non laboratory based activities are the responsibilities of clinical pharmacist. Clinical pharmacist specializes in clinical pharmacokinetic services is considered as clinical pharmacokinetic specialist.[19]

### 5-Drug Information Management

*It involves appraisal, collection, utilization and presentation of information relating drug.*

Drug information management is a fundamental responsibility of a clinical pharmacist.

- Collection: Information can be collected from various resources. However, not every resource is equally effective, helpful and accurate. Hence, a clinical pharmacist should carefully select few of the resources and periodically review them.
- Appraisal (critical): The information is appraised in term of accuracy and applicability. Various tools are being formulated for appraisal. Important matter to keep in mind that information provided from a reliable source would be not always being accurate or applicability.
- Utilization: When the collected information is utilized by the clinical pharmacist is termed knowledge utilization. Activities in which information is utilized are patient profile review, multidisciplinary team, patient counseling, and pharmacy therapeutic intervention.
- Presentation: Presentation stands for providing information to other medical professional in a professional manner. Platform at which information are presented by clinical pharmacist are multidisciplinary team, therapeutic interventions, seminars etc.[20]

### 6-Discharge Patient Counseling

*It involves patient counseling regarding medication use at the time of discharge*

#### New definitions

On the basis of these activities, clinical pharmacy or clinical pharmacy may be defined as follow:

- *Clinical pharmacy practice / Clinical pharmacy*  
A specialized pharmacy practice which involves in providing pharmaceutical care through patient medication history, patient profile review, adverse drug management, drug information management and discharge patient counseling.
- *Clinical pharmacist*  
Hospital or community pharmacist responsible for any of the clinical activities: patient medication history, patient profile review, discharge patient counseling, therapeutic drug monitoring, adverse drug reaction management, and information management, along with traditional responsibilities is called clinical pharmacist.
- *Clinical Pharmacist Specialist*  
Hospital or community pharmacist specializes in providing pharmaceutical care through clinical activities are called clinical pharmacy specialist
- *Advance clinical pharmacy practice*

Clinical pharmacy practice which includes collaborative agreement between the clinical pharmacist and physician allowing clinical pharmacist to prescribe medication is called advance clinical pharmacy practice.

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