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**RESEARCH ARTICLE**

# PHARMACIST ROLE IN SUPPORT OF QUALITY PRACTICES IN HEALTH CARE SYSTEM

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**ABSTRACT**

The HR function holds a Providing high-quality, safe medical care is the primary goal of health systems. When the public is alerted to quality failures, such as preventable medication errors resulting in patient harm or death, concerns about the quality of healthcare arise. As experts in medication delivery, pharmacists play an integral role in preventing and managing medication errors; however, ensuring safety in the health system is a team effort. Pharmacists need to broaden their responsibilities by taking on roles in quality and performance improvement projects. Pharmacists are well positioned to assist the healthcare system in improving quality of care, and they are already established as experts in medication management processes. As pharmacists branch out into the quality arena, they will need to expand their knowledge base with respect to quality. This discussion guide is intended to provide health-system pharmacists with the basic tools they need to lead and participate in quality improvement and medication safety initiatives.



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## INTRODUCTION

Healthcare delivery is a complex process involving all types of integrated and inter-dependent steps, each of which has the potential to fail. Failure at any point can set off a chain of events that can result in patient injury. Medication ordering, preparation, and delivery are multidisciplinary processes in their own right; multiple checkpoints and safeguards should be in place to arrest errors before the medication reaches the patient. In all healthcare systems, continuous monitoring of medical care processes, including medication management, is critical to the identification and prevention of errors. Most healthcare systems have committees or teams that are charged with identifying and preventing errors, and a pharmacist is, or should be, a core member of the team. In particular, the input and participation of a pharmacist in creating and maintaining the medication management process are essential. Pharmacist leadership and involvement in the medication management process are key to improving safety and efficiency throughout the patient's stay. As discussed in the 1999 Institute of Medicine report, To Error is Human: Building a Safer Health System (The Institute of Medicine, 1999) medication errors are caused by failure of the system, not by an individual failure. Often, the system at the sharp end of the stick (or needle, as it might be more accurately described) is the medication management system.

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Because of their complexity and the many opportunities for breakdown, medication management procedures need to be continuously monitored and improved. Pharmacists who demonstrate a keen interest in quality improvement are logical choices as the individuals charged with performing quality reviews and implementing improvements to the system. Likewise, healthcare systems that are preparing for or currently undergoing information technology upgrades (e.g., electronic health records and medication administration documentation) would benefit greatly by including a pharmacist in the design and implementation of new technology. Including a pharmacist in system design and implementation makes sense, especially when one considers that it is the pharmacist who is closest to and has the most in depth knowledge of the intricacies of the medication-use system. In many instances, the pharmacist is or was involved in the design and implementation of the healthcare system's current software program for dispensing and billing. Dispensing and billing are two areas at high risk for error and are often audited for compliance by regulatory agencies.

**Overall Goal of best quality practices of pharmacist:** The overall goal of quality practices is to promote the correct and appropriate use of medicinal products and devices. These activities aim at:

- Maximising the clinical effect of medicines, i.e., using the most effective treatment for each type of patient

- Minimising the risk of treatment-induced adverse events, i.e., monitoring the therapy course and the patient's compliance with therapy
- Minimising the expenditures for pharmacological treatments born by the national health systems and by the patients, i.e., trying to provide the best treatment alternative for the greatest number of patients.[6]

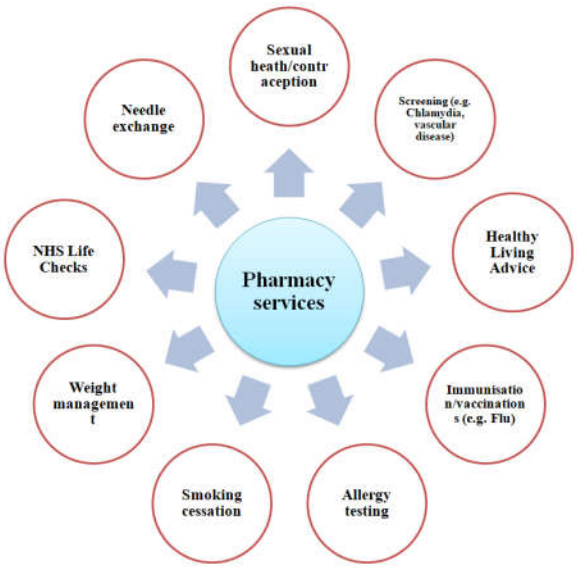
**Basic components of quality practice in health care**


The focus of attention moves from the drug to the single patient or population receiving drugs.

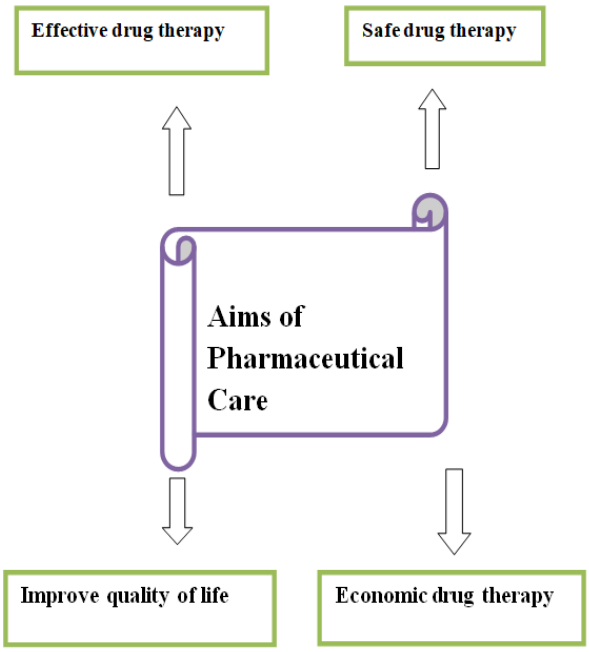
**Pharmacist role regarding patient safety:** Pharmacist is an important part of the healthcare team. The pharmacist works in coordination with the doctors for the better patient healthcare. They have some very specific roles which aim at assuring patient safety. Some of the roles are as follows:

- Patient medication history interview
- Medication order review
- Patient counseling regarding safe and rational use of drug
- Adverse drug reaction monitoring
- Drug interaction monitoring
- Therapeutic drug monitoring
- Participating in ward rounds
- Providing drug information at the drug information and poison information centre.[6]

**Pharmacy services in relation to public health:** [8,17,18,19]




**Pharmaceutical Care**[7]: A practice in which a practitioner takes responsibility for a patient's drug related needs and holds him or herself accountable for meeting these needs."




Aims of Pharmaceutical Care includes mainly:

**Medication Errors**[21]**:** A medication error is defined as any preventable event that may cause or lead to inappropriate medication use or patient harm, while the medication is in the control of the health care professional, patient, or consumer. Such events may be related to professional practice, health care products, procedures, and systems including: prescribing; order communication; product labeling, packaging, and nomenclature; compounding; dispensing; distribution; administration; education; monitoring; and use.[2]

**Categories of Medication Errors**[21]

**Medication Administration Errors**

**Omission Error:** The failure to administer an ordered dose to a resident by the time the next dose is due, assuming there has been no prescribing error. Exceptions would include a resident's refusal to take the medication and failure to administer the dose because of recognized contraindications.

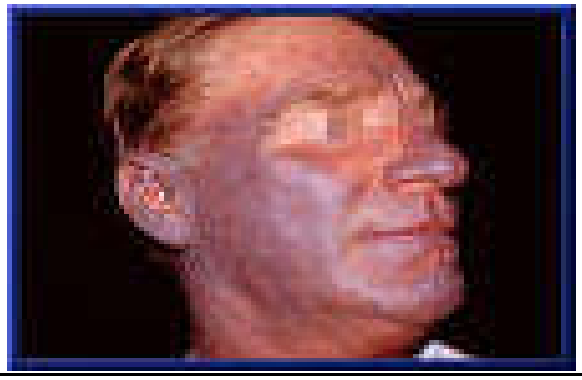
**Unauthorized Drug Error**: The administration of a medication to a resident for which the physician did not write an order. This category includes a dose given to the wrong resident, dose given that was not ordered, administration of the wrong drug or a discontinued drug, and doses given outside a stated set of clinical parameters or protocols.

**Extra Dose Error:** The administration of duplicate doses to a resident or administration of one or more dosage units in addition to those that were ordered. May include administration of a medication dose after the order was discontinued (which could also be considered an Unauthorized Drug Error).

**Wrong Dose Error**: When the resident receives an amount of medication that is greater than or less than the amount ordered by the prescriber.

**Wrong Route Error:** The administration of a medication to a resident by a route other than that ordered by the physician or doses administered via the correct route but at the wrong site (e.g., left eye instead of right eye).

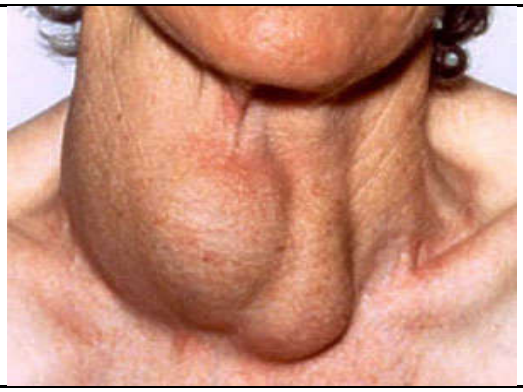
**Following are some examples of adverse drug reactions of drugs.**



**Photosensitivity from Amiodarone[7]**

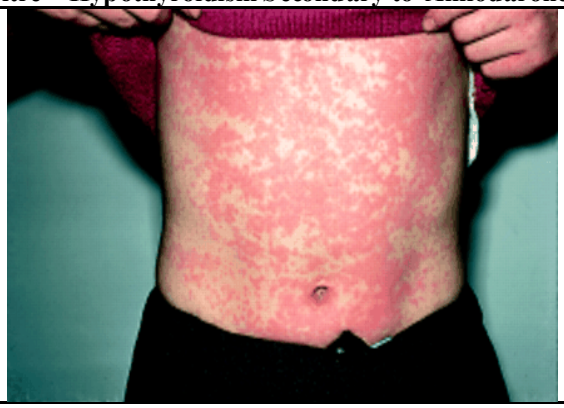
**Severe extravasation of amiodarone infusion[7]**

**NSAID or COX-2 induced peptic ulcer**



**Goitre – Hypothyroidism Secondary to Amiodarone 7**

**Bleeding due to anticoagulation[7]**



**Erythemal rash from penicillin – in patient with previous Known allergy/ adverse drug reaction7**

**Necrotising fasciitis – secondary to infection at site of IV injection7**

**Acute Liver failure from Black Cohosh - herbal medicine7**

**Wrong Rate Error:** The incorrect rate of administration of a medication to a resident. May occur with intravenous fluids or liquid enteral products.

**Wrong Dosage Form Error:** The administration of a medication in a dosage form different from the one that was ordered by the prescriber. This could include crushing a tablet prior to administration without an order form the prescriber.

**Wrong Time Error:** The failure to administer a medication to a resident within a predefined interval from its scheduled administration time. This interval should be established by each facility and clearly stated in the facility's policies. Different intervals may be established for different drugs or drug classes, based on the therapeutic importance of dosing.

**Wrong Drug Preparation Error:** A medication incorrectly formulated or manipulated before administration, such as incorrect or inaccurate dilution or reconstitution, failure to shake suspensions, crushing medications that should not be crushed, mixing drugs that are physically or chemically incompatible, and inadequate product packaging.

**Wrong Administration Technique Error:** Use of an inappropriate procedure or improper technique in the administration of a drug. Examples of wrong technique errors include incorrect manipulation of inhalers, failure to maintain sanitary technique with medications, not wiping an injection site with alcohol, failure to use proper technique when crushing medications, failure to check nasogastric tube placement or flushing NG tube before and after administration of medication, failure to wash hands or improper hand washing technique used.

**Deteriorated Drug Error:** Administration of a medication when the physical or chemical integrity of the dosage form has been compromised, such as expired medications, medications not properly stored, or medications requiring refrigeration that are left out at room temperature.

**Additional Types of Medication Errors**

**Prescribing Error:** The inappropriate selection of a drug (based on indication, contraindications, known allergies, existing drug therapy, and other factors); dose; dosage form; quantity; route of administration; concentration; rate of administration; or inappropriate or inadequate instructions for use of a medication ordered by a physician or other authorized prescriber.

**Dispensing Error**: The failure to dispense a medication upon physician order (omission error) or within a specified period of time from receipt of the medication order or reorder (time error); dispensing the incorrect drug, dose, dosage form; failure to dispense correct amount of medication; inappropriate, incorrect, or inadequate labeling of medication; incorrect or inappropriate preparation, packaging, or storage of medication prior to dispensing; dispensing of expired, improperly stored, or physically or chemically compromised medications.

**Monitoring Error:** Failure to review a prescribed regimen for appropriateness, or failure to use appropriate clinical or laboratory data for adequate assessment of resident response to prescribed therapy.

**Potential Error:** A mistake in prescribing, dispensing, or planned medication administration that is detected and corrected through intervention before actual medication administration.

**Compliance Error:** Inappropriate resident behavior regarding adherence to a prescribed medication regimen.

**Other Medication Error**: Any medication error that does not fall into a predefined category

- Deaths in India due to Adverse Drug Reactions estimated to be 400,000 annually.
- 720,000 adverse drug reactions every year.
- USA – Between 44,000 and 98,000 deaths in 1999 due to preventible medical errors.
- Patients take medicine to get well but Not to die because of errors in medication
- In one Norwegian Hospital one third of all indoor patients were there because of medicines not for disease.

**These medication errors occur due to**

- Wrong medicine prescribed
- Interactions because too many medicines prescribed
- Unnecessary medicines prescribed

**What Are These Errors[7]**

- Medicines prescribed for wrong length of time
- Wrong dose prescribed-Too Low
- Leads to drug resistance-Too High
- Suppose one case is there 44 year old lady with fever and green sputum and cough – no known previous medical history – Diagnosed with upper resp. tract infection
- Prescribed:
- Co-Amoxiclav 1 tds
- Doxycycline 100mg D
- Prednisolone 40mg D
- Theophylline 200mg bd
- Omeprazole 20mg D
- Metoclopramide 10mg tds
- Salbutamol 2 puff inhale prn .

What is the pharmacist role in this situation whether he think about the problems arising due to drug interactions or give the prescribed drug to the parient? He should think about fallowing problems:

- Common organisms for URTI?
- Need for atypical organism ?
- History of asthma – risk vs benefit?
- Need for acid suppression?
- Why is she nauseous ?
- Benefit of brochodilation?
- Does she know what to take?
- Will she take it?

**Why Are There Medication Error Deaths[20]**

- No training in rational use of medicines in undergraduate medical curriculum.
- Lack of knowledge results in inappropriate prescribing.
- Drugs today are too many.

- Powerful but toxic drugs easily available today.
- Lack of market control for prescribing any drug.

**Following are some examples of drug medication errors**

- A patient with leukaemia received Intrathecal vincristine instead of intravenously. Died in few days. 14th such case over the last 16 years.
- Patient being operated for a AAA( abdominal aortic aneurysm) received bupivicaine intravenously rather than epidurally. Patient died 3 days later.
- A 3 year old girl, who had a convulsion post flu vaccine. Attended hospital to get "checked out". Received nitrous oxide instead of oxygen in casualty
- A patient with leukaemia received Intrathecal vincristine instead of intravenously. Died within few days. 14th such case over the last 16 years.
- Elderly lady prescribed Methotrexate in 1997 for her rheumatoid arthritis. Dose increased to 17.5mg WEEKLY over a 6 month period.Jan 2000 patient undergoes right TKR in hospital. MTX given as one tablet a week (only 2.5mg).6th April 2000 patient asks GP to reduce number of tablets "as in hospital".Prescription for MTX 10mg/daily written and dispensed.30th April patient dies.

**Pharmacist role in Quality Improvement practices:** There are many compelling reasons to not only involve pharmacists in the quality and performance improvement activities of a healthcare system, but also to charge them with taking leadership roles in such activities. Following is a list of reasons that support pharmacist involvement in quality performance improvement activites:

- Pharmacists are skilled at analyzing complex systems, particularly those that involve medication- related processes, such as ordering, dispensing, and administration. A pharmacist is typically the best source of information about the institution's medication-use system and what the collateral effects would be in the event of changes to that system. Thus, an experienced pharmacist would be able to lead or complement any process redesign effort involving medications.
- Pharmacists have a core knowledge of medications, including their adverse effects, interactions, proper dosing, and monitoring parameters. Of healthcare professionals, pharmacists typically have the broadest knowledge base regarding the entire medication management system and are considered to be an authoritative source. This core knowledge would be especially useful when redesigning any system or process that affects timing of medication delivery or administration. It would also prove useful in quality activities for which such expertise is essential, such as peer review.
- Pharmacists are able to predict and anticipate the likely effects of medications on patients and would be able to recognize an opportunity to standardize a process that might improve quality of care.
- In many institutions pharmacists are available to provide medical care at all times of the day and night. As a result, they could easily anticipate the effects of any potential change in processes over an entire 24-hour period. Because of their constant presence in the health system, pharmacists would always be available to collect data.
- Pharmacists manage the institution's drug budget and are cognizant of drug costs. As keepers of the drug budget, pharmacists are typically the institution's source of information concerning ways to best use the institution's resources with respect to medications.
- Pharmacists generally have good collaborative skills and are comfortable in high-Pressure situations.
- Pharmacists understand the risks inherent in the medication-management process, can identify areas of weakness, and are able to create or redesign systems to improve risk areas.
- The Institute of Medicine (IOM) advocates the use of a medication safety officer. The pharmacist is a logical choice for the medication safety officer because he or she has a unique body of knowledge with respect to medications and their appropriate use.
- Pharmacists are the institution's advocates for medication-use safety.
- Pharmacists already manage and drive change within the medication management system, errors can have and understand the urgent need to improve when errors occur. often for quality of care and/or cost reasons, and are, therefore, accustomed to and often comfortable with, data-collection sources and methods.
- Pharmacists participate in and sometimes lead drug-related research. They also manage the use of investigational drugs in healthcare institutions.
- Pharmacists are often charged with developing unbiased evaluation medications for use in their institutions.
- Pharmacists are primarily responsible for ensuring that all medication-related regulations are followed within their healthcare systems. Pharmacists have access to the critical information needed to be in compliance and have a stake in seeing that the regulations are followed.
- Pharmacists continuously monitor medication- related literature and are comfortable educating other professionals and patients about their appropriate use as well as inspiring others to take action when problems arise.
- Pharmacists are involved in attaining compliance with regulatory standards regarding medication-related measures. They also understand that better outcomes are likely as a result of such efforts.
- Pharmacists' constant presence in the healthcare system allows them to participate in prospective activities.
- Pharmacists have observed first-hand, as have most medical practitioners devastating impact that medication errors can have and understand the urgent need to improve when errors occur.

**What changes can we make that will result in improvement?**

Answering this question leads to broad, general ideas and thoughts about change, which are called change concepts. Because these concepts apply to many different situations, they have been cataloged in different sources.[19] ASHP catalogs them in their Quality Resource Center. From here, change strategies, which are specific strategies or tests of change, are developed. Finally, the change is tested using the PDCA cycle.

**Plan, Do, Check, Act (PDCA) Cycle[6]**

The second part of the model for improvement puts into action everything that has been planned up to this point. Each test of change is carried out using the PDCA cycle as follows:

- **Plan**. Questions are asked and predictions are made. The following details are mapped out: who will make the test, what exactly will they do, when will they do it, where will they do it, and how long will they do it?
- **Do.** The change is made following the plan, and data measuring the single change are
- collected, and, if needed, the balancing measure(s) are determined. Any unexpected problems and observations are documented.
- **Check** (or Study). Study the effect of the test change on the single measure and on balancing measures, if necessary, and compare the data with the predictions. Summarize what was learned.
- **Act.** Select which change(s) to implement, develop an implementation and/or replication plan, determine additional improvements (additional PDCA cycles), and decide which actions will likely hold the gains.
- The PDCA cycle is also known as the Plan-Do- Study-Act cycle and has been incorporated into what is called Rapid Cycle Improvement.

**Steps Taken In Recent Years To Better Prescriptions[20]**

- List of essential drugs.
- Standard treatment guidelines.
- CME's in Rational Use of Medicines.
- Establishment of Drugs and Therapeutic Committees in hospitals.

**Much More Needed[20]**

- Medication errors still very high.
- WHO estimates that 50 percent of drugs prescribed are useless.
- Percent of persons go below poverty line every year due to cost of treatment.
- Percent of this go down because of expenditure on drugs- fifty percent of which are useless.

**Can Information Technology Help In Reducing This Human And Economic Waste[20]**

**Hopes and expectations are high**

Still needs to be demonstrated in quantitative human terms

- Reducing Morbidity.
- Reducing Mortality. Due to medication errors.

**What Can Be Done[20]**

- Introduce Computerized Physician Ordered Entry system (COPE)
- Introducing Clinical Decision Support System
- (CDSS)
- Introducing a computerized Pharmacovigilance system
- Other measures

**Conclusion**

- From this it is concluded that pharmacist play an important role in providing and maintaining health care to patients.
- Pharmacist is a connecting link between patients and physicians.
- Pharmacist can improve their quality practice by reducing medication errors and by alerting the patient about possible drug interactions and adverse drug reactions occurring due medication errors.

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