

## General Article

### Drug Error beyond the Hospital and Role of Pharmacists in drug Safety Process

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#### *Abstract*

*Medication related error is one of the most common error prevailing in this time. Medication error can be defined as a 'failure in the treatment process that leads to or has potential to lead to harm to the patient. Medication error can occur from the process of ordering to the administration to the patient. Among the healthcare professionals; a pharmacist can be responsible in identification of contributing factors and reducing its occurrence. Great efforts are needed in this area, due to diversity in the types of errors, the relationship between the provider and the patient, information transfer, optimization of e-prescribing systems, the lack of adequate training in analyzing the collected data and poor practical strategies for maintaining accurate drug lists in electronic medical records. Recently healthcare professionals have started becoming aware about the risks of patients' medication exposure. After all, still the area of medication safety beyond the hospital setting needs community pharmacy intervention to avoid malpractice claims and misled decisions in solving medication safety-related problems in the outpatient setting. Approaches like medication reviews and reconciliation, monitoring drug therapy, reporting error will help in identify and prompt the detection of errors, open productive discussions, quality control checks, and effective system-based decisions like performing risk assessment subsequently reduces the harm and risks before patient is exposed to any form of drug error.*

**Key words:** *ADRs reporting, Drug error, Drug safety, Medication Error, Role of pharmacists*

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#### **Introduction**

There is a saying "To Err is Human, to forgive Divine", but medical errors cannot be excused because errors due to medical mistreatment, insufficient information, and inefficient processes are responsible for the leading cause of death in the developed country like United States. Medication error is defined as "the failure of a planned action to be completed as intended or the use of a wrong plan to achieve an aim". *Pharmacists are the key persons to prevent the medication error.* According to a research it is found that "an adverse drug event will, on average, lengthen a patient's stay in the hospital by 2.2 days" (Bates,1997). Central to the

problem our society faces in coping with medical errors is that the majority of the errors are preventable. Part of the overall problem is the delivery and administration of medications which can be controlled and improved upon to reduce adverse effects of potential errors. If decentralized and fragmented supply chain then the problem may arise as a lack of continuity with staffing at both ward and pharmacy level of supply. The poor supply results in delay, poor communication and leading to incorrect administration of medication. Additionally, in situation when patients see multiple providers for various treatments in different settings, patients can also be more susceptible to potential medication errors due to lack of continuity in maintaining their records (McMahon, 2018; Stoppler, 2018; ASHP, 2019).The paper helps to make the outline of the drug errors frequently encountered in the hospital setting and how pharmacist can play their integral role in minimizing the error and help in safety process of a hospitals setting.

**Causes of medications Errors**

Table 1

*Various Causes of Medication Error*

Medication Errors	Types of Error	
Prescribing 39%	Wrong Dose 28%	Drug-drug Interaction 3%
Transcription 12%	Wrong Choice 9%	Wrong route 2%
Dispensing 11%	Wrong Drug 9%	Extra Dose 1%
Administration 38%	Known Allergy 8%	Failure to act on a test 1%
Monitoring 1%	Missed Dose 7%	Equipment Failure 1%
	Wrong Time 7%	Inadequate monitoring 1%
	Wrong Frequency 6%	Preparation error 1%
	Wrong Technique 6%	Other causes 11%

While other causes associated with medication errors include unavailability of patient information, illegibility of physician handwriting, poor communication between nurses, pharmacy, physicians, and technicians, the majority of cases involve errors in drug selection and delivery. As shown in the table, if 28% of patients are given the wrong dose, layers of verification clearly need to be implemented and enforced throughout the process to reduce and control for errors associated with human interpretation (Saskatchewan, 2014; Farlex, 2012; Suahyo, 2016).

**Challenges in drug safety beyond the hospital**

Over the years, not many people have really been aware of the risks of medication exposure to patients outside hospital setting. In America, for instance, the majority of the patient-safety studies and safety-improvement agenda have been carried out within the walls of the clinics or hospitals and statistics has provided evidence that only about 10% of patient-safety studies have been done beyond hospitals (Gandhi TK, 2010). One striking challenge in terms of medication safety beyond hospital is that there are differences in the types of errors such as treatment errors and diagnostic errors. The treatment errors tend to predominate in inpatient settings, while diagnostic errors are more apparent in outpatient settings (Plews-Ogan, 2018). Another challenge lies in the nature of the relationship between the provider and the patient. It appears that

adherence is more critical in outpatient settings because self-management can lead to more problem than the inpatient ones. One also cannot turn a blind eye and a deaf ear to the issue of the organizational structure that also poses a challenge to ensure medication safety beyond hospital- it is a fact that ambulatory practices do not have adequate infrastructure and expertise to deal with the quality and safety improvement (Aziz Sheikh, 2017). Other than that, there are also regulatory and legislative requirements to consider (involving things like ratio of staff and requirement for accreditation for hospitals; private practices tend to suffer from these problems the most).

To add, the outpatient setting also poses greater challenges for information transfer. With regards to patients with complex medical needs, the responsibility for care is often shared by a lot of different providers. As it is, they never meet, more often than not, and they often use different medical-record systems, suggesting that shortcomings are inevitable. It is not rare that in the hospital, if a patient has an adverse drug event, clinicians were fast becoming aware of it; in the outpatient setting, a complication or missed diagnosis may not be identified for months, if ever (Gandhi TK, 2010; Wachter, 2006). Perhaps, we cannot overestimate or underestimate the fact that there are still too much to learn about the effects of e-prescribing systems on errors and about how these systems can be optimized. We start by bringing together data on outpatient-safety risks via a better reporting of events and near-misses from the clinicians themselves. Leaders also need to undergo training so that when they receive reports with respect to safety, they are able to dwell into them and start making changes. Provider organizations that have come to be aware of these challenges and respond to them will be the superior ones as the spotlight is increasingly focused on care delivered not just by hospitals but by truly accountable care organizations (Aziz Sheikh, 2017).

Another challenge is to provide better strategies to maintain the right medication lists in electronic medical records. Many integrated delivery systems, including ours, have to struggle with 'the nitty-gritty' like who is responsible in maintaining the accuracy of the medication list. Some concerns can also be raised if we look at the present systems- if a specialist is the only physician in an organization who attends to the patient, does that specialist have the responsibility to log in all the patient's medications and dosages in the medical record? As the responsible parties work out ways or even resorted to several trial-and-error methods to resolve the issues, clinicians would already have been further overworked (Aziz Sheikh, 2017; (Wachter, 2006). Also, missed or delayed diagnoses are the most common problem leading to malpractice claims in the outpatient setting. Tests revealing findings that are clinically significant but not critical require particular attention. These findings must be communicated appropriately to a responsible provider, where they must acknowledge their receipt, and systems must be put in place to ensure that any follow-up testing would take place and patients are informed about this in a proper manner.

Next, important information like follow-up plans and appointments and any other relevant details are sometimes not relayed. A study done by Roy et. al (2015) has shown that almost half of the total numbers of hospitalized patients have pending test results when they are discharged, and none of the health care authorities are informed about these test results. This failure of transmission suggests that the responsibility is not communicated and maybe distributed well. It

is also reasonable to anticipate that discharging hospitals need to implement high-quality discharge summaries that are transmitted in a reliable way, while outpatient physicians' offices need to ensure patient access to timely post-discharge visits where they can go through the discharge materials, reconcile medications, elaborate on symptoms, and perform appropriate follow-up so that the readmission rate can decrease (Roy CL, 2005).

### **How can these challenges be overcome????**

#### **Medication safety in community pharmacy**

It may be a great help if community pharmacies are equipped with adequate guidelines and manuals or some kind of written guidance on ensuring the safety of the medication used and delivered to patients. One tool that can be used to assist community pharmacies to prepare for the oncoming implementation of a barcode product verification system helps pharmacy leaders and staff evaluate their current workflow, standard operating procedures, and technology to identify what needs to be accomplished before implementing a barcode product verification system is the Assessing Barcode Verification System Readiness in Community Pharmacies. The assessment process makes the adoption of this technology less stressful and more efficient as the staff have a better preparation (Agrawal A, 2009).

Pharmacists and other pharmacy personnel also need to be able to do what they can to ensure the success of the organizations. This includes targeting at a specific system's weakness in the medication-use processes. The tasks of a community pharmacy personnel include:

- 1) Beginning a risk assessment process to identify system-based medication safety improvements in the community pharmacy setting,
- 2) Identify and prevent risk in daily practice,
- 3) Check on the flow diagrams or flow charts of the medication process to identify the variability in the current medication-use processes,
- 4) Be able to choose effective error reduction strategies that can avert patient harm,
- 5) Apply knowledge to identify breakdowns in the system that have to do with the error, and
- 6) Detect any medication error or near miss that has happened (ISMP, 2018).

Next, the ISMP Medication Safety Self-Assessment® for Community/Ambulatory Pharmacy should be actively used by pharmacists to raise awareness of distinctive characteristics of safe pharmacy systems; this will prepare the basis for pharmacy efforts to improve medication safety and evaluate these efforts (Suchayo, 2016). ISPM Medication Safety Self-Assessment® for Community/Ambulatory Pharmacy is a valuable tool which will help to identify safety risks, create an action plan for improvement. Every layer of the staff within each pharmacy site should be provided with a copy of the assessment and asked to complete the items collectively or individually. There should be a consensus on the responses and doors should be opened for improvement. The self-assessment should serve as an ongoing safety project in your medication safety program. This monthly innovative newsletter (Community/Ambulatory) gives vital and potentially life-saving information about medication-related errors, negative drug reactions, as well as recommendations that will help you reduce the risk of medication errors and other adverse drug events in your community practice site (ISMP, 2018; Horsham, 2010).

There should also be a confidential national voluntary reporting program that provides expert analysis of the system causes of medication errors and disseminates recommendations for prevention. Of course, we do not want such events to go unreported and to let important preventive and epidemiological information become unavailable. Regulatory agencies and manufacturers should be notified when the products are to be changed to a certain degree. Reporting errors to external reporting programs as an important element would be complementary to the medication safety program and demonstrates a practice's commitment to sharing information on medication errors which may definitely help others as well (ISMP, 2018). Some abbreviations, symbols and dose designations are also frequently misinterpreted and this can be detrimental to the patients. It is important to realize that these potentially ambiguous and misleading labels are not to be used when giving out and sharing medical information to others.

### **Medication safety at home**

Personal care is seemingly the way to go these days, especially in hospitals with too many patients, but the fact remains that many of the people who are cared for in their own homes need help with their medicines. The care provider must be very clear about their care workers- whether care workers are involved in medicine administration or are limited to providing general support for each child or adult they care for. This has to be monitored and reviewed regularly. All in all, the communications between care workers, their supervisors and prescribers must be robust and effective. Care workers also have to consider a few things - in the case where a person declines on his or her medications (ISMP, 2018).

### **As Little Distractions and/or Interruptions as Possible**

Interruptions and distractions (including noise) are proven to be two of the leading causes of prescription dispensing and medication errors in hospitals and health systems (45%). It is advisable to turn down the volume of your cell phone, turn off the radio and/or TV and choose a time when you are free and less distracted. Conversing with other while you are trying to dispense medication is also another possible cause for this kind of errors.

### **Well-organized Workspace or Storing Area**

Errors in dispensing medicine can occur too when medications are not properly stored, so proper organization is very important:

Important information should be within reach; frequently used items should also be within reach. Sorting the Items Together – Items that are related to a medical procedure should be stored together in a single bin. Follow the Medication Closely – Most medicines should be stored safely in a cool dry place well away from moisture. Nevertheless, some medications require special storage conditions so always adhere to the storage directions contained on the medicine label or the Medication Guide (ISMP, 2018; Aziz Sheikh, 2017).

### **Have Easy to Follow Prescription Labels**

If either the patient or the healthcare professional cannot read or cannot comprehend the label, pharmacist stays there for help as prescription last comes to pharmacy. One way how the difficulty can be reduced is by encouraging health care professionals to have the prescriptions written in large fonts. Also, for non-native speakers, the prescription can be written in patient's native language or language most familiar to him or her. Another way is to include the information on 'the purpose of use' on the label of the medicine so medication errors can be avoided and adherence further ensured. Next, important documents like the Patient information leaflets should be accessible to patients and the people close to them. Physicians and pharmacists can also make the initiative to create a system that works for the patient and promotes adherence, for instance (Kadia and Schroeder 2015).

Think of a better way for them to record their medication method and procedure. Tech-savvy patients and healthcare professionals can make use of the apps that concentrate on helping patients with their medication (ISMP, 2018).

### **Role of pharmacists in ambulatory medication safety process**

It is easy to understand that pharmacists should ensure that medicines are delivered to patients safely and securely. Upon dispensing, pharmacists are expected to reconcile prescriptions of the medicine and confirm the indications of medicine therapy with the patient or agent. They should also be able to perform counseling and refuse documents that are irrelevant to their patients' cases. They should be able to ask questions to evaluate patient and caregiver level of understanding. Last but not least, before dispensing the medicine, they must be able to motivate their patients and caregivers by way of asking questions or raising concerns about their medicines. Before any of these can be materialized, it is perhaps not too much to urge for pharmacists – locally and internationally- to have an in-depth understanding and genuine awareness of what is at stake if this safety process is neglected.

In short, medication safety leaders must collaborate with all types of health care professionals, support staff, and management and consider all components of the medication-use process in both inpatient and clinic settings to ensure that medication safety can be improved. The medication safety leader's role includes demonstrating the responsibility for leadership, influencing practice change, and various others.

### **Recommendations for improving medication safety beyond hospital**

Some recommendations are then considered imminent: first of all, pharmacies are to monitor regularly the medications works or studies on drug error information and take action for prevention. Secondly, pharmacies need to be accountable in confirming the entry for new prescription data. They also have to keep going through the error frequencies and near-misses so unfortunate incidents can be prevented and corrections can be made. They must always be ready to report errors to external reporting programs (ASHP, 2019). Next, as further recommendation, pharmacists should be able to verify patients' identity, other than educating consumers about

preventing errors. An equally important task for pharmacies is for them to be able to work on approaches or methods that can monitor prescription-filling machines to prevent errors. Follow-ups must also be done to see if patients have any side-effects especially as far as high-risk patients are concerned.

If we are to focus on a pharmacy and a patient under his or her care, there are several things that the former should do. Firstly, the pharmacist needs to review the patient's medication list routinely. He or she has to go through all the treatment options that the patient can undertake. The name and the purpose of the selected medication then have to be noted. A pharmacist should also be able to open himself to her to discussions- discussions like when and how to take medications are not only appropriate, but also crucial (McCarthy, 2014)

## Conclusion

The sole reason as to why medication management takes a very important position in the world of healthcare is because it is supposed to protect patients from harm or ill effects. We have been able to conclude that despite the fact that all healthcare practitioners have a role in preventing adverse drug events (ADEs), most medication treatments begin in the (proper) practice setting of physicians and this is further continued to be emphasized at home. Adverse events can result from many reasons. Among them the confusion about the medication schedules, two caregivers duplicating a dose and care givers using the wrong syringe size, or mixing up two different medications are major one encountered in daily life.

Factors like language barriers, financial barriers to medication refills and transitioning patients between multiple households can also impact the safe administration of medications at home. Proper medication management can be achieved and maintained by a collaborative effort of physicians, pharmacists, nurses, and other health care professionals together with patients and lay caregivers pursuing optimum and safe use of medication. Medication safety should be a standing item in the regular patient safety staff meetings and be a key part of your practice's patient safety plan as better health outcome can be achieved by implementing proper compliance of patient towards medicine. Most importantly, these various parties have to understand their respective role in ensuring the safety of medication beyond hospital settings.

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