Medication Error – Does It Happen?

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Abstract:

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| A medication error is described as "any preventable event which may cause inappropriate use of medication or patient harm while the medication is within the control of the healthcare professional, patient, or consumer''. A medication error can occur because of prescribing errors like inappropriate, irrational or ineffective prescribing of medication and may also occur because of the dispensing error like wrong dispensing of medication including dispensing of medication in wrong dose and dosage form and therapeutic duplication of the medication and also inappropriate labelling. In healthcare, medication failures are a mutual concern which costs billions of dollars annually while causing substantial morbidity and mortality. While national attention has been paid to prescription dispensing problems errors, it remains a well-known issue. Developing a multi-faceted educational and preventive approach is the finest way to increase patient safety. Clinical pharmacists reduce the possible risks of medication errors by providing pharmaceutical care to patients within the hospitals. It is theprimary responsibility of the clinical pharmacists to review the medical charts within the ward by completing the patient's pharmacotherapy monitoring form and reporting related drug therapy problems. Accurate and complete medication reconciliation can prevent multiple prescribing and administration errors. Failure to act on reconciliation of medicines may be compounded by the practice of writing "blanket" orders, like "resume pre-op medications," They are extremely error prone and are known to lead to adverse drug reactions.  Introduction:  Medication is a product which contains a substance which has proven therapeutic or biological effects with additives or excipients. The active compound with therapeutic effect is known as a drug.  A medication error can be said to be a failure in the management process that may cause harm to the patient or have the potential to lead to harm. A medication error can happen at any stage of the treatment process from prescribing medicines to administering the medicines. A medication error can be happened due to prescribing errors like inappropriate, irrational, or ineffective prescribing of medicines and may also occur due to the dispensing error like wrong dispensing of medicines including dispensing of medicines in wrong dose and dosage form and therapeutic duplication of the medicines and also inappropriate labelling. A medication error can be happened not only in prescribing and dispensing of the medication but also wrong administration of the medicines like administration of medication in the wrong dose and dosage form and wrong frequency and route may also lead to the medication error.  It is essential to identify and rectify the medication error where they may lead to therapeutic failure or serious harm to the patient so medication errors can be avoided by improving the rationality of prescribing medicines and can also be avoided through proper dispensing of medicines in the appropriate dose, dosage form and also by providing proper patient counselling about the medication administration error can be also avoided.1  A medication error can be defined as 'a failure in the treatment process that results in harm to the patient, or has the potential to lead to it.' The use of the term 'failure' means that the practice has fallen below some attainable standard. The 'treatment process' consists of the treatment of symptoms or their causes, or the investigation or prevention of disease or physiological changes.  It contains not only therapeutic medications but also the above-mentioned compounds. It also involves the manufacture or compounding of a drug, its prescription, transcription (if applicable), distribution and administration, and the subsequent monitoring of its effects. 'Harm' also indicates 'lack of benefit' in the description, a type of failure of treatment. It does not specify who makes the mistake-it may be a physician, a nurse, a pharmacist, a caregiver, or another; nor does it specify who is responsible for avoiding mistakes.2  **What is Medication Error?**  According to the FDA or the National Coordinating Council for the Reporting and Prevention of Medication Errors (NCC MERP), a medication error is described as "any preventable event that may cause inappropriate use of medication or patient harm while the medication is in the control of the healthcare professional, patient, or consumer’’. The contributing factors leading to medication errors, which are commonly classified as the patient, system and personal factors have been recognized by numerous studies.3Medication errors can lead to adverse outcomes such as increased mortality, increased duration of hospitalization, and increased medical costs. Although all members of the health care team may be responsible for medication errors, nursing medication errors are the most common.  **Types of Medication Errors?**  Medication errors were classified according to the World Health Organization classification, which describes the errors of the medication: prescribing errors, administration errors, dispensing errors and monitoring errors. In addition, according to the National Coordinating Council for Medication Error Reporting and Prevention, we have also considered the severity  • Administration errors,  • Prescribing errors  • Monitoring errors  • Dispensing errors  In general, a drug error was defined as a dose administered differently than ordered on the patient's medical record. Medication errors have been viewed as system defects; Medication error categories were defined as follows  1. **Unauthorized drug**: The administration of a dose of medicine that was never ordered for that patient.  2. **Extra dose**: Any dose given more than the total number of times ordered by the physician, like the dose given based on the expired order, after the drug has been discontinued or after the drug has been stopped.  3. **Miscellaneous dose**: Any dose of preformed dosage units (such as tablets) that contained unacceptable strength or number; if an injectable product, any dose that was ±10 % or more different from the correct dosage; if any other dosage form, any dose that was ±17 % or more of the correct dose, in the opinion of the observer. In the estimation of the dosage, measuring devices and graduations were those provided for regular use by the institution: graduations on injection syringes, graduations on oral fluid medicine cups, and drops on the dropper provided. Wrong dose errors for ointments, topical solutions, and similar drugs were counted only when the dose was quantitatively determined by the physician.  4. **Omission**: Failure to give the daily dosage. If no attempt has been made to administer the dose, an error of omission has also been recorded. If the patient refused to take the medicine, an opportunity for error was not counted provided that the nurse responsible for administering the dose tried to give it. Doses withheld according to policies calling for the withholding of doses of medication, such as nothing by mouth before treatment, were not counted as errors or opportunities for error. Omissions were detected by comparing drugs administered at a given time with doses that should have been given at that time based on written doctor's orders and treatment protocols.  5. **Wrong Route**: Medication administered to a patient using a route different from that ordered. Doses given at the wrong site, such as the right eye instead of the left eye, were included in this category.  6. **Wrong form**: The administration of a dose in a different form than that ordered by the physician. If enteric-coated aspirin has been ordered but plain aspirin has been administered, an incorrect form error has been recorded.  Each dose observed to be administered or omitted was operationally defined as a dose and is the basic unit of data. Any dose could only be in error or not in error. The doses included only those for which an observer was aware of the preparation and administration of the medication or for which the observer was certain that it had not been administered.3  There are many kinds of medical errors that can occur anywhere in the healthcare system, from hospitals to nursing homes to pharmacies. We will examine different types of drug errors, how they occur, and preventative measures to reduce these errors. Medical errors are not only monetarily expensive but expensive in terms of patients' loss of trust in the healthcare system, reduced patient satisfaction and degraded morals among healthcare professionals, who often feel helpless to change the situation.4   |  |  | | --- | --- | | No Error | No Harm | | Category A | Events or circumstances have the potential to lead to error. | | Error | No Harm | | Category B | Error happened, but it didn't get to the patient. | | Category C | An error that reached the patient but did not do any harm (including omission errors) | | Category D | Error reached the patient; necessitating monitoring to make sure the patient wasn't harmedand/or requiring action to stop the harm. | | Error | Harm | | Category E | Error happened that may have caused the patient's momentary injury or resulted in it, necessitating action. | | Category F | An error was made that may have caused the patient's momentary injury or resulted in it, necessitating the patient's initial or extended hospitalisation. | | Category G | Error happened that may have caused the patient's irreversible injury or perhaps just contributedto it. | | Category H | Error happened that necessitated intervention to maintain life. | | Error | Death | | Category I | Error happened that could have caused the patient's death or contributed to it. |   Table 1: Categorization of Medication Error based on the harm score13  **DETECTION OF MEDICAL ERRORS**  Incident analysis is a valuable way of learning about healthcare institutions and, ideally, contributes to progress to improve patient safety, such as the introduction of procedures or systemic changes in the environment where the error is more possible to happen. The primary policy that would be implemented by medical staff to try to reduce mistakes is non-punitive incident reporting.6  If this is the purpose, it is essential to record not only injuries but also near misses, where a near miss is described as "any action or condition that might have caused an injury or damage." Near misses are valuable resources to boost patient safety, since they provide a wider explanation of the problem than just those accidents that occur. Incident reporting has its drawbacks as a way of determining the causes of human error in medicine: reports are not well distributed across all personnel grades, adverse effects can occur only over a matter of days, weeks or months, and voluntary reporting is occasionally used because workers are not sure of anonymity.6  **Detection**  Chart analysis, computerized tracking, injury detection, and scanning evidence for allegations are significant approaches for identifying adverse events. Medication errors are reported mostly by close observation, voluntary notification (by physicians, pharmacists, nurses, patients, and others) and chart analysis.  Based on relevant references (medical charts and laboratory records, drug data and administrative data), the chart analysis is retrospective. By using computerized evidence, such as electronic medical reports (EMR), computerized doctor order entry (CPOE), and computer-integrated stimuli, it can be strengthened.  The disadvantages of this approach are the challenge of educating reviewers (nurses, pharmacists, teachers, testing assistants) and the fiscal and human capital necessary. In addition, the outcomes depend on the consistency of reporting and the ability of reviewers to capture effects.12  **Computerized Monitoring**  The current version of voluntary pharmacist reporting (pharmacy logs) is computerized tracking. Pharmacists locate order mistakes, correct them, and complete a report. Therefore, drug failures before adverse effectsoccur should be intercepted. If CPOE is in use, errors can be easily found in prescribing and dispensing. The introduction of advanced software facilitates the convergence of laboratory and clinical evidence with Clinical Decision Support Systems (CDSS), including adverse effect identification and prevention. Protection is improved by CPOE systems but needs to be used in conjunction with CDSS. It is expensive and important for safety to incorporate information technology, but it can also give rise to new, unidentified risks. |

**Administrative databases**

Screen International Classification of Diseases Administrative Lists, 9th Edition Codes, for statistical purposes. From a mixture of discharge results, patient safety indices and adverse event adjusted rates are drawn up. However, because of the insufficiency of clinical records, adverse effects are poorly detected.

The importance of the screening of data on claims is constrained by the underlying, often irrational, motives for action and the presence of small numbers of local claims. Events also need to be constantly monitored, and almost one-third of claims lack proof of mistakes. Data on statements have a positive predictive benefit of about 50 % for adverse outcomes, of which just about 18 % point to a drug's source.

Direct examination is the lone available tool for the identification of drug management errors. A qualified nurse monitors the delivery of medications, documents each activity, and then compares what has been done with the original instructions of the doctor. It is essential to train the observer and visit various units in sequence.12

**Reporting systems**

Reporting of events where this is in effect, significant accidental events/deaths are compulsory and limited to (sentinel event list). With root cause analysis, a prompt narrative account of the incident must be submitted to the central agency that provides annual statistical analyses, captures all adverse effects and drug failures, and addresses questions for quality management.

**There are two safety‐oriented levels of reports:**

1. Voluntary reporting must be confidential, private and free of responsibility. To assist with reporting and review, a simple standardized form is needed. Feedback, daily reporting and corrective action execution are all essential. Near misses and prescription, mistakes are commonly registered, but adverse effects are hardly documented.

2. A rising number of studies do not generally reflect bad practice, but are due to increased incident capture. The results of voluntary notification are the detection of deficiencies in functioning and latent systems, proof of the sensitive existence of procedures, the elimination of contributory factors and the propagation of a safety culture.

Generally, an increasing number of studies do not represent poor practice but are attributed to improved capture of events. The discovery of defects in active and latent processes, evidence of the responsive nature of procedures, elimination of contributory factors and the spread of a protection culture are the effects of voluntary notification.12

**Information technology systems in medication management**

Clinical decision-making is a complex process that depends on the human ability to produce undivided attention and to memorize, recall, and synthesize huge amounts of information – all vulnerable areas. IT systems can improve access to pieces of data, organize them, and identify links between them. Clinicians often ‘know’ the data (such as a patient's allergies, a drug recall warning, or a drug-drug interaction) but forget to think about it at the time of prescribing. IT systems are effective in bridging this ‘knowing–doing’ gap, 7 by presenting the relevant information to the clinician during the time of decision making.

**Computerized physician order entry (CPOE) with decision support**

Since most medication errors occur at the prescribing step, computerized physician order entry (CPOE) with patient-specific decision support may be a potentially powerful intervention for improving patient safety. Common prescribing errors include using the incorrect drug or dosage form, incorrect dose calculation, not checking for allergies, and failure to regulate dosages in patients with renal or hepatic dysfunction. CPOE systems work by (i) ensuring that the order is legible and complete, including all necessary information, like dose, route, and dosage form; (ii) checking for problems like drug allergies and drug-drug interactions; (iii) providing dosage adjustment calculations supported clinical features like weight or renal function; (iv) checking for appropriate baseline laboratory results, like platelet count and international normalized ratio for patients receiving anticoagulants; (v) computing drug–laboratory interactions, like alerting the prescriber to a low potassium concentration when digoxin is being prescribed; and (vi) updating the prescriber with the most recent drug information, like the necessity to avoid rofecoxib after it had been withdrawn by the manufacturer.

Of the various systems used in the medication process, CPOE systems have the most important impact on reducing medication errors, with reported error reductions of 55–83%. Other studies have shown remarkable reductions in antibacterial drug-related adverse events, reduced lengths of stay, and improved dosage of psychoactive drugs in elderly people.

# Medication management in older adults

Managing medications is a major part of providing care to older adults. Polypharmacy is common among the elderly and is fraught with risks. A careful and systematic approach is required for managing drug therapy in these patients, recognizing the patient’s specific goals.

Medications started for suitable indications in middle age may need to be monitored more closely as the patient ages. Some drugs may become unnecessary or may be dangerous as the patient ages, functional status and renal function decline, and goals of care change.

Older adults tend to ownmultiple illnesses and thus take more drugs, and polypharmacy increases the chances of poor outcomes. The number of medications someone uses could be a risk factor for adverse drug reactions, nonadherence, financial burden, drug-drug interactions, and worse outcomes.

1. The prevalence of polypharmacy increased from an estimated 8.2% to 15% from 1999 to 2011 based to the National Health and Nutrition Examination Survey.
2. Guideline-based therapy for specific diseases may cause the addition of more medications to succeed in disease targets.
3. Older adults in the United States compound the chance of prescribed medications by also taking over-the-counter medications and dietary supplements.
4. In addition, medications are often used in older adults based on studies of younger persons without significant comorbidities. Applying clinical guidelines based on these studies to older adults with comorbidity and functional impairment is challenging.
5. Age-related pharmacokinetic and pharmacodynamic changes increase the threat of adverse drug reactions.

**Various guidelines for avoiding medication error:**

The purpose of these guidelines is to provide pharmacists with practical recommendations and best practices for the management and protection of patient harm from medication errors in the setting of the health care system. These guidelines are primarily intended to apply to acute care settings as a result of the special collaborative processes established in this setting. Medication errors may occur at any point in time.

1. **Planning for safe medication practices**:

Safe drug practices begin by placing drug safety as an organizational and departmental priority and by implementing a system that will support these practices. The organization must have a comprehensive program which includes a leader in the safety of drugs, key elements in place to provide a framework for safe medicine practices and a successful strategic plan. The error reporting and review system is an important component of the drug safety system; the goal is to improve patient safety and prevent harm to the patient.10

2. **Selection and procurement**:

Selection and procurement of medications include the appropriate selection of which medicines will be stored at the institution. Divided into

• Formulary assessment and management: A well-designed form system will guide clinicians to prescribe the safest and most cost-effective agent for the treatment of a particular disease or medical condition.

• Safety-alert monitoring: Medication safety evaluation does not end when a drug is added to the form. Pharmacists should be actively involved in evaluating the payment and replacement decisions of all therapeutic goods.

• Medication shortages management: In hospitals, the pharmacy department, should have a process to communicate shortages, Hospitals, via pharmacy department, should have a process to communicate drug shortages, Pharmacy department should play an essential role in developing and managing a contingency plan in close collaboration with affected physicians and health-system committees when faced with severe shortages.

•Storage: Proper storage of medications in the pharmacy and throughout the hospital can help reduce the risk of errors in medications. Ambiguous nomenclatures should be avoided. The same drug nomenclature should be used in all databases used throughout the drug use process using differentiation and screen alerts for drugs that may pose a risk of potential errors, Pharmacy inventor.11

**Prevention strategies for medication errors**

In healthcare, medication failures are a mutual concern which costs billions of dollars annually while causing substantial morbidity and mortality. While national attention has been paid to prescription dispensing problems errors, it remains a widespread issue. Developing a multi-faceted educational and preventive approach is the finest way to increase patient safety. Healthcare providers working as a group and engaging as well as empowering patients to be more knowledgeable about their drugs should be stressed. With a culture of protection, it is possible to minimize medication mistakes in dispensing. Hospitals have developed strategies to prevent errors in medications. Some of these strategies include:

• Double-check the dosage and frequency of all high-alert medications.

• Talk to the pharmacist if you are unsure of the drug or dose.

• If writing is illegible, don't give the medicine you think you know what it is.

• Call the health care provider to confirm the dose or the drug.

• Check the calculation to make sure that the right therapeutic dose is given to the patient.

• Ask another clinician to re-check your calculations.5

**ROLE OF CLINICAL PHARMACIST IN MANAGING MEDICATION ERRORS**

Clinical pharmacists reduce the potential risks of medication errors by providing pharmaceutical care to the patients in the hospitals. It is the primary responsibility of the clinical pharmacists to review the medical charts in the ward by completing the patient's pharmacotherapy monitoring form and reporting related drug therapy problems. Use of paper in medical records instead of using computerized registration of medication, unavailability of the medical record for pharmacists in the hospital pharmacy, patient overload in teaching hospital, and consequently working overload of physicians and nurses and unavailability or lack of treatment guidelines may be the cause of medical errors.

Participation in almost the entire drug phase, from delivery to patient administration, of clinical pharmacists, can minimize medication errors and are beneficial to patient care. This can be done by taking part in special rounds of prescription by the clinical pharmacist and testing the various pharmaceutical measures.7

**How Can We Avoid Prescribing Error?**

The medical reports were screened by clinical pharmacists for prescription errors and addressed with the senior physician in control. The clinical pharmacist attended ward rounds additionally. Clinical pharmacists' interventions led to a significant reduction in prescribing errors, contributing to a safer medication process.8

Reconciliation of medicines is to prevent drug mistakes including omissions, duplications, dose errors or medication. The new drugs should be ordered or current orders rewritten at every treatment change. Care transitions include changes in the community, program, practitioner or care level. This process comprises five steps:

1) Develop a list of current medications;

2) Develop a list of medications to be prescribed;

3) Compare the medications on the two lists;

4) Make clinical decisions based on the comparison;

5) Communicate the new list to appropriate caregivers and the patient.

Accurate and complete medication reconciliation can prevent multiple prescribing and administration errors. Failure to act on reconciliation of drugs may be compounded by the practice of writing "blanket" orders, such as "resume pre-op medications," They are highly error-prone and are known to result in adverse drug reactions.9

**CONCLUSION**

A medication error can be said to be a failure in the treatment process that may cause harm to the patient or have the potential to lead to harm. A medication error can be occurred due to prescribing errors like inappropriate, irrational, or ineffective prescribing of medication and may also occur due to the dispensing error like wrong dispensing of medication including dispensing of medication in wrong dose and dosage form and therapeutic duplication of the medication and also inappropriate labelling. In this case, it was done by drawing up scenarios and determining which would constitute an error under each of the definitions. It does not specify who makes the mistake-it may be a physician, a nurse, a pharmacist, a caregiver, or another; nor does it specify who is responsible for avoiding mistakes. It also involves the manufacture or compounding of a drug, its prescription, transcription (if applicable), distribution and administration, and the subsequent monitoring of its effects. The definition above, slightly modified, was the only definition that categorized all error scenarios and only error scenarios. Various definitions of drug errors have been tested, as all technical definitions should be. 'Harm' also implies 'lack of benefit' in the description, a type of failure of treatment. It is important to identify and correct a medicament error where it may lead to therapeutic failure or serious harm to the patient so that a medicament error can be avoided by improving the rationality of the prescription of the medicament and the proper dosage of the medicament can also be avoided, as well as by providing proper patient advice on the ad medicament. Chart analysis, computerized tracking, injury detection, and scanning evidence for allegations are the key approaches for identifying adverse events. Based on relevant references, the chart analysis is retrospective. The disadvantages of this approach are the challenge of educating reviewers and the fiscal and human capital necessary.

Mainly clinical pharmacist provides pharmaceutical care to the patients thus reducing the occurrence of medication errors. The clinical pharmacist completes the patient's pharmacotherapy monitoring form and then performs the medication chart review and then reported any drug-related problems. Clinical pharmacists should undertake special ward rounds and monitor any pharmaceutical measures. There are various guidelines available for medication errors and the purpose of these is to provide pharmacists with various recommendations for the management and protection of patients from various harm caused due to medication errors. These include planning for safe medication purposes, selection and procurements including formulary assessment and management, safety alert monitoring and medication shortage management. Careful storage of medicine in the pharmacy and the hospital setting helps to prevent the occurrence of medical errors. The goals of detecting medication errors include the following:

• Promote a culture of safety to reduce harm from medication errors.

• Increase detection and reporting of medication errors and potentially hazardous drug–use situations.

• Explore and understand the root causes of and factors that contribute to medication errors.

• Educate practitioners about the system-based causes of errors and their prevention.

• Recommend methods to facilitate the implementation of organization-wide, system-based changes to prevent medication errors.

• Respond to potentially hazardous situations before errors occur.

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