Medication Error – Does It Happen?

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Abstract:

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| A medication error is represented as "any preventable circumstance which may cause inappropriate use of medication or patient harm while the medication is within the control of the health care professional, patient, or consumer’’. A Medication Error can be occurred because of transcribing error like non-appropriate, non-rational, ineffective order of medicine and could also happen because of the dispatching error like incorrect dispensing of medication which includes dispensing of medication in improper dose and dosage form and pharmaceutical duplication of the medicine and also non-appropriate labelling. In health care, medication management failures are a mutual concern which may cost millions of pounds per annum while causing significant morbidity and mortality. While national attention has been given to prescription, dispatching problems errors, it remains a well-known issue. Development of a multi-access educational and preventative approach is the finest way to increase patient clinical condition. Clinical pharmacists decrease the probable risks of the medication errors by providing the medicinal support to the patients within the hospitals. It is the firsthand duty of the clinical pharmacists to revaluation the medicinal charts within the ward by completing the patient’s pharmacotherapy monitoring form and reporting drug therapy related problems. Accurate and full medicine reconciliation may decrease many prescription and administration related errors. Failure to perform reconciliation of medicines may be compounded by the practice of transcribing "blanket" orders, like "resume pre-op medications," These are highly error prone and may lead to ADR.  Introduction:  Medicine 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 care process that may cause harm to the patient or have the potential to lead to harm”. A medication error may be happen at any phase of the treatment process, starting from prescribing a medicines to administering the medicines. A Medication Error can be happened because of prescribing errors like non-appropriate, non-rational, or non-effective prescribing of medicines and may also happen due to the dispatching error like incorrect dispatching of medicines including dispatching of medicines in wrong dose and dosage form and pharmaceutical duplication of the medicines and also due to not appropriate labelling. A Medication error can be happened not only in prescribing and dispatching of the medicines. But also wrong administration of the medicines like administration of medicine in the not appropriate 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 represented as 'a failure in the care process that results in harm to the patient, or have the potential to lead to harm.' The use of the word 'failure' means that the care practice has fallen below some possible standard. The 'care process' consists of the management of sign and symptoms or their reasons, or the investigation or prevention of disorder or biological alteration.  It contains pharmaceutical medications and the above-mentioned compounds. It may also involves the manufacture or preparation of a drug, its prescription, transcription (if applicable), distribution and administration, and the consequent monitoring of its actions. The word 'Harm' indicates 'lack of benefit' in the description, a type of non-accomplishment of treatment. It does not specify who makes the mistake-it may be a physician, a pharmacist, a nurse, a caregiver, or another; nor does it specify who is accountable for avoiding mistakes.2  **What is “Medication Error”?**  According to FDA or National Coordinating Council for the Reporting and Prevention of Medication Errors (NCC MERP), a medication error is represented as "any preventable circumstance which may cause not appropriate use of medication or patient harm while the medication is within the control of the health care workers, patient, or consumer’’. The contributing factors which lead to medication errors, that are commonly categorized as the patient and personal contributing factors have been recognized by many studies.3 Medication Errors can lead to harmful outcomes such as increased number of mortality, increased duration of hospital stay, and increased medical costs. Although most of the members of the health care team may be accountable for Medication Errors.  **Types of “Medication Errors”?**  Medication Errors were classified according to the WHO categorization, which depicts the errors of the medication: prescribing errors, dispensing errors, indenting errors, administration errors and monitoring errors. In addition, according to the NCC for Medication Error Reporting and Prevention, we have also considered the severity  • Administration errors,  • Prescribing errors  • Monitoring errors  • Dispensing errors  • Indenting errors  In general, a Medication Error was represented as a dose of medicine administered differently than ordered on the patient's medical chart. Medication Errors have been viewed as system fault; Medication Error categories were defined as follows:  1. **Non-authorized drug**: The administration of a drug which was never ordered for that particular patient.  2. **Excess dose of medicine**: Whatever dose given more than the total no’s of times ordered by the medical practitioner, like the dose ordered by referring the old guidelines, after the drug has been interrupted or after the drug has been stopped.  3. **Miscellaneous dose**: Any daily defined dosages units (such as tablets) that are quelled for desired number or strength. However, if any parenteral product, are titled to defined dose which should be ±10 % or should be different from the given dosages. If any other dosage form was ±17 % from of the accurate dose, in the opinion of the perceiver. Hence, the dosage calculation from measuring devices and graduations should be under proper regimen provided by the organization for consistent use. On the other hand the calibrate injection syringes, oral fluid medicine cups, and also drops on the dropper supplied. Inappropriate dose errors for ointments, topical solutions, and similar drugs is been counted only when the dose should be quantitatively determined by the medical practitioner.  4. **Omission**: Non-fulfillment to give the daily dosage. If attempt has not been made to administer the proper dose; an error of omission has also been recorded. If a patient do not wish to take the medicine, possibility of an error will not be countered by the allocated nurse until accounted for administered medicine.. Doses withheld as per the guidelines calling for the withholding of doses of medicine, such as “nothing by mouth” before treatment, were not counted as errors. Omissions were identified by comparing the drugs administered at a time with doses that should have been given at that time depend on written doctor's orders and treatment guidelines.  5. **Wrong Route of Administration**: Medicine administered to a particular patient using a route other than that ordered. Doses given at the incorrect area, such as the left ear instead of the right ear, were included in this class.  6. **Wrong form of medicine**: The administration of a dose other than that ordered by the medical practitioner. If enteric-coated tablet has been ordered but plain tablet has been administered, an improper form of error has been recorded.  All dose observed to be administered or excluded was defined as a dose and is the primary unit of any data. The doses included only those for which an perceiver was sensible about the formulation and administration of the medicine.3  There are so many kind of “Medication errors” which can take place at any point in the health care system, from hospitals to small nursing homes to dispensary. We will analyze many types of drug errors, how they occur, and preventative measures to reduce these errors. Medication errors are not only expensive but also loss of trust of patients' in the health care facility, reduced patients' gratification and degraded morals among health care workers, who feel hopeless to change the condition.4   |  |  | | --- | --- | | Category-A | Events or circumstances which have the potential to lead to error. | | 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 harmed and/or requiring action to stop the 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 hospitalization. | | Category-G | Error happened that may have caused the patient's irreversible injury or perhaps just contributed to it. | | Category-H | Error happened that necessitated intervention to maintain life. | | 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 precious way of learning about healthcare institutions and, ideally, contributes to progress to improve patient condition, such as the introduction of procedures or systemic alteration 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, a near miss is represented as "any act that might have caused an injury or damage." Near misses are precious resources to boost patient safety, since it provide a broader explanation of the problem than just those accidents that happen. Reporting of incident has its drawbacks as a way of determining the causes of human error in medicine: reports are not well circulated across all personnel grades, adverse reactions can occur only over a matter of days, weeks and months, and voluntary reporting is occasionally used because workers are not sure of namelessness.6  **Detection**  Chart analysis, computerized tracking, injury detection, and scanning evidence for allegations are significant approaches for identifying adverse events. Medication Errors are reported generally by close observation, self-imposed notification (by physicians, pharmacists, nurses, patients, and other healthcare workers) and medicine chart analysis.  Based on relevant references (medical charts and laboratory records, drug data and administrative data), the chart analysis is retrospective. By using computerised evidence, such as electronic medical reports (EMR), computerised doctor order entry (CPOE), and computer-integrated stimuli, it can be strengthened.  The disadvantages of this approach are the challenge of educating reviewers (pharmacists, nurses, 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 System**  The current variant of “self-imposed pharmacist reporting” (pharmacy logs) is computerized tracking. Pharmacists locate order mistakes, correct them, and complete a report. Therefore, drug failures before adverse effects occur 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 effects determination 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 hazards. |

**Administrative database**

“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 value of the monitoring of data on claims is constrained by the underlying, much irrational, motives for the action and the presence of little numbers of local claims. Incidental events also need to be constantly monitored, and almost 1/3rd of claims lack proof of mistakes. Data on statements have a affirmative predictive benefit of about 50 % for adverse outcomes, of which just about 18 % point to a drug's origin.

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 2 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 symbolize bad practice but are attributed to better capture of events. The discovery of defects in active and latent processes, evidence of the responsive nature of procedures, elimination of contributing factors and the spread of a protection culture are the effects of voluntary notification.12

**Information technology (IT) processes in medication management system**

“Clinical decision-making” may be a complicated procedure that rely on the human ability to produce united attention and to memorise, recall, and analyze immense amounts of information – all vulnerable areas. Information technology systems can modify access to portion of a data, organize them, and identify connection between them. Practitioner sometimes know the data (such as a patient's allergies, a drug-food / drug-drug interaction , or a drug recall warning) but not able to remember about the same during the time of transcribing or prescribing . Information technology processes are efficient in bridging this ‘knowing–doing’ gap, 7 by representing the associate data to the physician during the time of decision making.

**Computerized Physician Order Entry (CPOE)**

Since most of the “Medication Errors” happen during the time of prescribing, CPOE with patient-specific decision support may be a possibly strong intervention for improving the patient safety. Generally, prescription errors include using the incorrect drug or dosage form, improper dose calculation, no checking of allergies, and failure to regulate the dosages in patients with hepatic or renal dysfunction. CPOE systems work by (i) assuring that the medicine order is legible and complete, including all required details, like route, dose, and dosage form; (ii) assessment of problems like drug allergies and drug-food / drug-drug interactions; (iii) providing dose adjustment calculations supported medical features such as weight or renal function; (iv) checking for suitable baseline values of laboratory, such as platelet count and international normalized ratio for patients receiving anticoagulants; (v) checking for drug–laboratory interactions, like alerting the physician to a low potassium (K+) concentration when captopril and digoxin is being ordered; and (vi) updating knowledge of the physician with the most recent medicine information, like the necessary of keeping away rofecoxib after it had been withdrawn by the business concern.

Of the different systems utilized in the medication process, CPOE process have the most essential impact on decreasing the medication errors, with reported error reductions of 55%–83%. Other studies have shown significant reductions in antimicrobial drug-related adverse outcomes, decreased lengths of hospital stay, and altered dosage of psychoactive drugs in older patient.

# Medication management process for older adults

Medication management may be a leading part of providing care for older adults. Poly-pharmacy is common among the older adults and is fraught with risks. A systematic based approach is required for managing pharmacotherapy in these patients, by acknowledging the patient’s specific goals.

Medicines initiated for suitable indications in middle age may required to be supervised more closely as the patient ages. Sometimes other drugs become unneeded or may be hazardous as the patient ages, renal function decline and functional status, and aims of treatment change.

Older adults more prone to own multiple illnesses and thus consume more than one or two drugs, and poly-pharmacy increases the chances of unfortunate outcomes of treatment. The no of medicines someone uses could be a contributing factor for adverse drug reactions, non adherence, economical burden, drug-food interactions, and bad outcomes.

1. The prevalence of poly-pharmacy increased from an approximate 8.2% to 15% from 1999 to 2011 based to the National Health and Nutrition Examination Survey.
2. Guideline-based treatment for particular diseases may cause the addition of more medicines to succeed in disease targets.
3. Older adults in the United States compound the chance of prescribed medicines by also taking OTC medications and nutritional supplements.
4. In addition, medicines are commonly used in older patients based on studies of younger persons without remarkable co-morbidities. By applying medical guidelines based on these studies to older patients with co-morbidity and functional impairment is challenging.
5. Age-related pharmacodynamic and pharmacokinetic changes may increase the threat of ADR.

**Various guidelines for avoiding medication error:**

The intent of these protocol and guidelines is to provide clinical pharmacists and nursing professionals with practical recommendations and best available practices for the management and protection of patient harm from medication errors in the setting of the health care body. These protocol are mainly intended to apply to acute care settings as a result of the special collaborative systems established in this hospital premises. Medication Errors may happen at any point in time.

1. **Provision for safe use of medication practices**:

Safe drug use practices begin by placing drug safety as an departmental and organizational priority and by implementing a process which will assist these practices. The governing body must have a comprehensive plan which includes a leader in the safety of drugs, key elements in place to provide a framework for safe use medicine and a prosperous strategic plan. The error review and reporting process is an important element of the drug safety system; the ultimate aim is to improve patient well being and prevent harm to the patient.10

2. P**rocurement and Selection** :

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

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

• Safety-alert monitoring: Medicine safety assessment does not end when a drug is added to the form. Clinical pharmacist team should be actively involved in evaluating the payment and replacement decisions of all therapeutical goods.

• Medication deficiency management: In hospitals, the pharmacy and supply-chain department, should have a procedure to communicate shortages, Hospitals, via clinical pharmacy department, may have a process to communicate drug shortages, Pharmacy department should play an pivotal role in managing and developing a critical plan in close cooperation with required medical practitioner and various health-system committees when faced with multiple shortages.

•Storage: Proper storage of medicines in the store, pharmacy and throughout the hospital can help decrease the risk of errors in medicines. Ambiguous nomenclatures should not be used. The same drug nomenclature should be used in all databases used in the hospitals throughout the medicine use process using differentiation and screen alerts for drugs that may pose a hazard of possible errors, Pharmacy inventor.11

**Prevention strategies for medication errors**

In healthcare sector, medication management failures are a mutual concern which costs millions of pounds per annum while causing substantial morbidity and mortality. While national attention has been given to prescription, dispatching problems errors, it remains a well-known issue. Development of a multi-access educational and preventative approach is the finest way to increase patient clinical condition. Health care workers 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 should develop some strategies to prevent medication errors in medications. Some of these strategies include:

• Double-verify the dose, route and frequency of all listed high-alert medications.

• Talk to the clinical pharmacist or hospital pharmacist if you are unsure about the drug or dose.

• If prescription 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 of medicine dose to make sure that the right therapeutic dose is advised to the patient.

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

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

Clinical pharmacists decrease the possible risks of medication errors by providing therapeutical care to the patients in the health care system. It is the foremost and primary duty of the clinical pharmacists to review the medicine charts in the ward / ICU by completing the patient's pharmaceutical therapy monitoring form and reporting related pharmaceutical therapy issues. Utilization of paper in medical records instead of using computerized registration of medication, non-availability of the medical document or medical record for clinical pharmacists in the pharmacy, overload of patient in teaching hospital, and simultaneously working overload of physicians, pharmacists and nurses and non-availability or lack of treatment protocol may be the cause of medical errors.

Participation in almost the entire drug phase, from delivery to drug 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 medical practitioner in control. The clinical pharmacist attended ward rounds in addition. Interventions of clinical pharmacists' led to a remarkable reduction in prescription errors, contributing to a safer medication process.8

Reconciliation of medicines is to prevent drug errors including omissions, duplications, dose errors or medication. The new added drugs should be ordered or current orders rewritten at every treatment alteration. Care transitions include changes in the community, program, practitioner or care level. This process includes 5 steps:

1) Develop a list of on-going medications;

2) Develop a list of medicines to be prescribed;

3) Compare the medications on the two lists;

4) Make clinical decisions based on the comparison;

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

Accurate and full medicine reconciliation may decrease many prescription and administration related errors. Failure to perform reconciliation of medicines may be compounded by the practice of transcribing "blanket" orders, like "resume pre-op medications," These are highly error prone and may lead to ADR9

**CONCLUSION**

A Medication Error can be said to be a failure in the medication management process that may cause harm to the patient or have the potentiality to cause harm. A Medication Error can be occurred due to prescription errors like non-appropriate, non-rational, or ineffective order of medication and may also happen due to the dispatching error of medicines like improper dispensing of medicine including dispensing of medicine in wrong dose and dosage form and pharmaceutical duplication of the medicine and also for not appropriate labelling. In this case, it was done by drawing up scenarios and determining which would constitute an error. It does not specify who makes the mistake-it may be a medical practitioner, a pharmacist, a nurse , a caregiver, or another; nor does it specify who is accountable for avoiding mistakes. It also involves the manufacture or compounding of a drug, its prescription, transcription (if applicable), distribution and administration, and the consequent monitoring of its effects. The definition above, slightly modified, was the only definition that categorized all error scenarios and only error scenarios. Various explanation of Medication Errors have been tested, as all technical definitions should be. The term 'Harm' also indicates '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 event 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 and protocol available for medication errors and the purpose of these protocol 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 medicine management 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 decrease harm from medication errors.

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

• Explore and realize the root cause anlyzes of and factors that contribute to medication errors.

• Train health care professional about the system-based causes of medication errors and their strategy of prevention.

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

• React to possibly dangerous situations before medication errors happen.

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