Medications Errors

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Medications Errors

- Mistakes can be made when practitioners prescribe or dispense drugs (Physicians, Pharmacists, Nurses, and Patients).
- Close to 6,800 prescription medications and countless over-the-counter drugs are available in the United States.
- There are also thousands of health supplements, herbs, and alternative medicines used by the public regularly to treat their health problems.
- Interactions among these products are associated with an added risk to the patients.

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- **Patients experience psychological and physical pain and suffering as a result of medication errors.**

Medication errors lead to:

1. **Decreased patient satisfaction.**
2. **Lack of trust in the healthcare system.**

- **The total cost of looking after patients with medication errors in the USA is > $40 billion each year.**

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- **Medications errors constitute two thirds of medical errors which, according to a Johns Hopkins study, were the third-leading cause of death in the USA.**
- **Medication errors are under-reported to authorities because of fear of accusation.**

➢ **They result in significant morbidity and mortality.**

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Definitions of Medication Error:

- **It is any preventable event that may cause inappropriate medication use or patient harm while the medication is in the control of the healthcare professional or the patient.**

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Such events may be related to:

1. Professional practice.
2. Health care products.
3. Procedures, and systems, including prescribing.
4. Order communication.
5. Product labelling.
6. Packaging.
7. Nomenclature.
8. Compounding (the making of a medication that is not commercially available).
9. Dispensing.
10. Distribution.
11. Administration.
12. Education.
13. Monitoring.
14. Use.

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Common Reasons for Medication Errors:

1. **Failure to communicate drug orders.**
2. **Illegible handwriting.**
3. **Wrong drug selection chosen from a drop-down menu.**
4. **Confusion over similarly named drugs (sound-alike drugs)**
5. **Confusion over similar packaging between products (look-alike packaging)**
6. **Errors involving dosing units or weight.**

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Medication errors may be due to:

A. **Human errors.**
B. **Flawed (weak and imperfect) institutional system with inadequate backup to detect mistakes.**

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In general, medication errors usually occur at one of these points:

1. **Ordering/prescribing: most common (50% of medication errors)**

A. **wrong medication**
B. **wrong route**
C. **wrong dose**
D. **wrong frequency**
E. **wrong time**
F. **wrong dose preparation**

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2. **Administration errors:**

A. incorrect route of administration
B. giving the drug to the wrong patient
C. extra dose
D. wrong rate
E. Omission (of administration of prescribed drug)

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3. **Monitoring errors:**

A. failing to take into account patient liver and renal function
B. failing to document allergy
C. failing to document potential for drug interactions

4. **Documenting errors:**
5. **Dispensing errors:**
6. **Compliance errors:** Not following protocol or rules established for dispensing and prescribing medications
7. **Unauthorized drug use:**

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The most common system failures include:

1. **Inaccurate order transcription (when prescription order is copied and transferred to other places such as to pharmacist for dispensing, or to nursing files for administration…)**
2. **Failing drug knowledge dissemination**
3. **Failing to obtain allergy history**
4. **Incomplete order checking**
5. **Mistakes in the tracking of the medication orders**
6. **Poor professional communication**
7. **Unavailability or inaccurate patient information**

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Types of Medication Errors:

1. **Expired Product:** due to improper storage resulting in deterioration or use of expired products.
2. **Incorrect Duration:** when medication is received for a longer or shorter period of time than prescribed.
3. **Incorrect Preparation:** This error usually occurs with compounding or some other type of preparation before the final administration. An example is choosing the incorrect diluent to reconstitute the medication for IV injection or infusion.

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4. **Incorrect Strength:** Incorrect strength may occur at many points in the medication process. It usually occurs due to human error when similar bottles or syringes with the incorrect strength are selected.
5. **Incorrect Rate:** Most often occurs with medications that are given as IV push or infusions. This is particularly dangerous with many drugs and may result in significant adverse drug reactions. Examples include tachycardia due to rapid IV epinephrine or red man syndrome due to the rapid administration of vancomycin.

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6. Incorrect Timing:

- In both home and institutional settings, it is challenging to be completely accurate with scheduled doses.
- Some medication's absorption is significantly altered if taken with or without food.
- This may lead to under or overdosing.

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7. Incorrect Dose:

- This error includes overdose, underdose, and an extra dose.
- It may be an error of omission when a scheduled dose of medication is not given.
- It may be an error of an incorrect route, (example: there is a difference between oral and intravenous doses of propranolol).
- It may occur with multiple connectors/lines of access.
- Incorrect routes often result in significant morbidity and mortality.

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8. **Incorrect Dosage Form:** This occurs when a patient receives a dosage form different than prescribed, such as immediate-release instead of extended-release.
9. **Incorrect Patient Action:** This occurs when a patient takes a medication inappropriately. Patient education is the only way to prevent this type of error.

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10. **Known Allergen:** Dispensing a drug that the patient has an allergy for. This is often due to failure to communicate with the patient, inappropriate chart review, inaccurate charting, or lack of technological interface.
11. **Known Contraindication:** This occurs when medications are not vigilantly reviewed for drug-drug, drug-disease, or drug-nutrient or drug-herb interactions.

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12. Pharmacists'-related errors:

- **Errors by pharmacists are usually judgmental or mechanical.**

A. Judgmental errors include failure to detect drug interactions, inadequate drug utilization review, inappropriate screening, failure to counsel the patient appropriately, and inappropriate monitoring.

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B. A mechanical error is a mistake in dispensing or preparing a prescription, such as administering an incorrect drug or dose, giving improper directions, or dispensing the incorrect dose, quantity, or strength.

- The most common causes involve workload, similar drug names, interruptions, lack of support staff, insufficient time to counsel patients, and illegible handwriting.

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13. Distractions:

- Can cause ~ 75% of medication errors.
- Physicians have many duties in a hospital (examining patients, ordering laboratory and imaging studies, speaking to consultants, rounding on their patients, speaking to patient family members, and write drug orders and prescriptions.
- In the rush to be done with writing drug orders, sometimes a lapse of judgment develops, and a medication error occurs.

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- **The physician may quickly scribble in a drug order, not paying attention to the dose or frequency.**
- **Unscheduled events, like attendance at meetings, and answering telephone calls disrupt patient care.**
- **Many physicians do not acknowledge that these distractions are a problem, but these distractions may be a cause of medication errors.**

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- **Administrators at health facilities must take measures to reduce such medication errors.**

a) **Physicians are urged to order drugs at a set time after rounding on their patients; this is when they also write their daily progress notes.**

b) **Other clinicians are requested not to disturb the physician at this time of the day.**

c) **Clinicians are asked only to disrupt the physician for an emergency case.**

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d) Physicians are urged to develop a structure for their patient care that is organized so that distractions are limited.

e) Many hospitals recommend that physicians not answer calls until patient duties are completed.

f) Healthcare institutions may penalize physicians who continue to have medication errors because of distractions (such as a restriction in prescribing privileges).

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14. Distortions:

- Are prevalent cause of medication errors.
- Due to poor writing, misunderstood symbols, the use of abbreviations, or improper translation.
- Some time substitution of the drug prescribed for a similar drug, can lead to major errors.
- Hospital must have a formulary which lists available drugs, and physicians should limit the ordering to this list.

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15. Illegible Writing:

- **Illegible orders and prescriptions result in major medication mistakes.**
- **Taking shortcuts in writing drug orders make the physician susceptible for a lawsuit.**
- **Often the pharmacists and other practitioners involved are not able to read these order and they make their best guess.**
- **If the drug required is for emergency, this also adds more risk to the patient.**

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- To eliminate such errors, when drug order is illegible, the physician must be called and asked to rewrite the order clearly.
- The practitioner or the pharmacist should never guess what the drug or its dose is.
- This error can be avoided by complete elimination of handwritten orders and prescriptions.

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16. Approach every prescription with caution.

- **Many new drug releases and generics with similar names have flooded the market (sound-alike medications AND look-alike medications), leading to a high risk of error.**
- **In addition to having similar names, many of these medications have multiple uses and alternative names.**
- **If the diagnosis is not stated on the prescription, there is a risk that the drug may be prescribed for too long or too short duration.**

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17. Write down the precise dosage.

- **Distortion of a dose can easily occur when nonspecific abbreviations or decimal points are used without thought.**
- **One abbreviation that is often the cause of medication errors is the "Ug" symbol for micrograms (µg).**
- **It is often mistaken for units and should be avoided at all costs.**
- **It is best to spell out the quantity (do not use abbreviations in the prescription).**

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18. Use metric measures:

- **When writing a prescription or order, use the universal metric measures.**
- **When using metric measures, be careful when and where you use the decimal point.**
- **For example, when writing dexamethasone 2.0 mg, if the decimal point is not visualized, the nurse or the pharmacist may think it is 20 mg.**
- **On the other hand, a zero should always precede a decimal point. For example, when writing digoxin, it should be written as 0.25 mg and not just .25 mg. If the decimal point is not seen, it can easily lead to a hundred-folds increase in dose.**

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19. Consider patient age:

- **The two populations that are very sensitive to medications errors are the elderly and children.**
- **Always check the patient’s age and body weight to ensure that the dose administered is correct.**
- **Also, if you write a prescription, write the patient's age and weight on it so that the pharmacist understands how you derived the dose.**
- **In children, most drugs are prescribed based on body weight.**

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20. Liver and kidney function:

- **Another widespread reason for medication errors is not considering renal or liver failure.**
- **Patients with renal and liver dysfunction may need lower doses.**
- **Otherwise, toxicity can result because of the failure to excrete or metabolise the medication.**

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21. Provide directions for use:

- **Physicians who write drug orders and prescriptions should never assume that the patient knows what they mean.**
- **Provide clear instructions on doses, the number of pills, and how and when the medication is to be taken.**
- **Do not use "take as directed". It could lead to a disaster.**
- **Similarly, "PRN" without an indication should never be used. "PRN" means use when needed.**

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- **Write down when the drug is to be taken and for what purpose (e.g., take 2 mg of morphine by mouth for pain, or take the morphine every 3 - 4 hours as needed for pain).**
- **Reducing medication errors requires open communication between the patient and the practitioners.**

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22. Use of Abbreviations:

- One widespread cause of medication errors is the use of abbreviations.
- Often the frequency of administration is abbreviated using suffixes like QD, OS (left eye), TID, QID, PR, etc.
- QD (meaning once a day) can easily be mistaken for QID (four times a day).
- Additionally, these abbreviations can have several other meanings and can be misinterpreted.
- It is recommended that abbreviations not be used at all when writing medication orders and prescriptions.

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23. Duration of treatment:

- **Some physicians would simply write down the total number of pills that a patient is supposed to get without specifying the duration of treatment.**
- **It is vital to specify the duration of treatment and that the duration of treatment matches the number of pills prescribed.**
- **Another reason for specifying the number of doses is that it requires the patient to comply with follow-up and prevents them from just collecting older medications.**

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- **If the patient has a chronic disorder, the practitioner should be treating each flare-up as a single event with a finite number of pills.**
- **If the patient has a flare-up or exacerbation, tell him/her to come to the clinic for an exam and, at that time, determine if more pills are needed.**
- **Just empirically prescribing pills for a theoretical recurrence of a flare-up only leads to confusion and a high risk of adverse reactions.**

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24. Remain alert for high-risk medications.

- **For example, if a patient has a deep vein thrombosis or a prosthetic heart valve and requires warfarin, only prescribe for 4 weeks at a time and reassess the patient on each visit.**
- **Do not give warfarin for many months at a time.**
- **The patient needs to be monitored by measuring INR, and the dose may have to be adjusted.**

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25. Always specify the indication for the drug.

- **Writing the indication for the drug is highly recommended because many drugs have multiple uses.**
- **Omitting this information increases the potential for complications.**
- **Writing the diagnosis informs the pharmacist of the diagnosis and reminds the patient of the medication's purpose.**
- **This small step can facilitate counselling by the pharmacist, reinforce the patient's treatment plan, and provide ample opportunities for patient education.**

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26. Choose the appropriate drug for the patient population:

- **When dealing with elderly patients, healthcare providers should avoid ordering drugs listed on the Beers criteria - this list addresses drugs known to have the potential to cause adverse reactions in elderly individuals.**

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27. Add supplemental instructions and precautions when necessary.

Examples:

1. **When prescribing tetracyclines, the patient should be warned about sun exposure.**
2. **When taking ibuprofen, the patient should be told to take the medication with food.**
3. **When prescribing metronidazole, warn the patient about alcohol use.**
4. **etc**

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- **Do not assume that the pharmacist will add these extra warnings when dispensing the drugs.**
- **For patients who cannot read or understand the instructions for prescribed medications, educate a family member, and provide verbal counselling when required.**

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28. Adopt a reporting system.

- A reporting system reduces medication errors.
- Make changes to prevent similar errors from reoccurring.
- Even a near miss should be reported.
- The staff should be encouraged to report without any repercussions.
- It is a great learning experience and enhances safety.

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29. Discuss the patient's preferences.

- **Considering the many drugs available to treat the same disorder, involve the patient in decision making.**
- **The patient should be told about the potential adverse effects and cautions.**

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30. Write your contact number.

- **Many healthcare providers write prescriptions or orders in the chart and often do not leave a contact number.**
- **If there is a query about the drug, then the pharmacist and nurse are left on their own, and consequently, the patient misses out on the medication.**

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31. Who Is to blame, the Healthcare Professional or the System?

- In the past, when medication errors occurred, the individual who caused it was usually blamed for the mishap.
- Medication errors related to employees may be due to the following:

a. Negligence
b. Forgetfulness
c. Hurrying
d. Poor motivation
e. Vengeance (انتقام)
f. Carelessness

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- In such situations, disciplinary actions may include:

a. Blame and shame
b. Loss of privileges
c. A threat of a medical malpractice lawsuit
d. Relief from certain duties
e. Transfer to another department

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- **Medication errors may be a systemic problem.**
- **There must be measures to introduce safeguards at every level so that a mistake can be caught before the drug is given to the patient.**
- **In many cases, errors occur in recurrent patterns, irrespective of the healthcare worker involved.**

Medication Error Risk Factors

1. High volume work
2. Poor handwriting
3. Inexperienced staff
4. Challenging patient populations
5. Lack of follow-up
6. Lack of appropriate monitoring
7. Lack of policy enforcement
8. Medically complex patients
9. Medications requiring calculations
10. Environmental factors
11. Poor communication
12. Shift work
13. Workplace culture
14. Verbal orders
15. Interpersonal factors such as external stress

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Pharmacy Error Prevention:

- **Many adverse drug effects are preventable, as they are often due to human error.**
- **Common causes of error related to the pharmacists include failure to:**

1. **Deliver the correct dosage.**
2. **Identify contraindication to drug therapy.**
3. **Identify a drug allergy.**
4. **Monitor drugs with narrow therapeutic index.**
5. **Recognize drug interaction.**
6. **Recognize knowledge deficits.**

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- These errors can be avoided by giving information to the patient and double-checking their understanding of the dose, drug allergies, and concomitant medications.
- Barriers to successful communication include the inability to reach prescribers, unclear verbal and written orders and time constraints that make it challenging to check drug interactions.
- A pharmacist's responsibilities often include supervising patients' medication treatment and notifying the healthcare team when a discrepancy is found.
- Most medication discrepancies are found at discharge.

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Systems-Based Drug Safety:

- **Putting the blame for medication errors on practitioners has resulted in underreporting and failure to promote safety improvement.**
- **Many errors are due to poor system design and over expectation of human performance.**
- **Improving patient safety starts with developing a cultural focus on safety improvement.**
- **The team must work together, and when an error is identified, the goal is to prevent it from happening again rather than blame the individual.**

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Clinical Significance:

- **Medication errors are a common issue in healthcare and cost billions of dollars while inflicting significant morbidity and mortality on patients.**
- **Medication errors are more widespread than those of medication dispensing.**
- **Emphasis should be put on healthcare providers to work as a team and to communicate with each other, as well as encouraging patients to be more informed about their medications.**

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Other Strategies to Reduce Medication Errors:

- Hospitals should developed strategies to prevent medication errors:

1. Double-check the dosing and frequency of all high-alert medications.
2. If unsure about the drug or the dose, look it up or get assistance.
3. If the writing is illegible, tell other health professionals not give the medication and not guess what it is.
4. Call the healthcare provider to confirm the drug or dose.
5. Recheck the calculation to ensure that the patient will get the right therapeutic dose.
6. Ask another clinician to recheck your calculations.

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Preventing Medication Errors:

1. Always write one prescription for each medication.
2. Besides signing the prescription, spell your name on the pre-printed prescription pad.
3. Do not hesitate to check the dose and frequency if you are not sure.
4. Always remember that each medication has the potential for adverse reactions.
5. Do not use drug abbreviations when writing orders.

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6. Always add the patient's age and weight to each prescription.
7. Check for liver and renal function before ordering any medication.
8. Spell out the frequency and route of dosage; do not use abbreviations.
9. Always specify the duration of therapy; do not say give out "XX" number of pills.
10. Always be aware of high-risk medications.
11. When writing a prescription, state the condition being treated.

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Enhancing Healthcare Team Outcomes:

- Writing prescriptions and medication orders is an everyday job duty for many physicians.
- However, the increased demands to see more patients who require many medications often become monotonous, and one can become careless.
- The majority of healthcare workers never anticipate an adverse drug reaction, and drug interactions.
- Healthcare workers should change their work habits and adopt a culture of safety when writing drug orders and prescriptions.

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- **An inter-professional team working together is important to achieve accurate medication utilization and decrease errors.**
- **Clinicians order medications, pharmacists fill them, and nurses and patients administer them.**
- **Improvements in this chain of communication will ultimately provide better patient care with decreased morbidity and mortality.**
- **Better patient education on their medication increases safety and compliance.**