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Improving Medication Safety

Objectives:

1. To provide an overview of medication Safety.
2. To encourage students to learn and practice ways to improve the safety of medication use.
3. Understand the scale of medication error.
4. Understand the steps involved in a patient using medication.
5. Identify factors that contribute to medication error.
6. Learn how to make medication use safer.
7. Understand the benefits of a multidisciplinary approach to medication safety.

Color index:

Slides

Important

Doctors notes

Extra



Medication Errors

- 1 Medication use has become increasingly complex in recent times.
- 2 Medication errors are a major cause of preventable patient harm.
- 3 As future health-care workers, you will have an important role in making medication use safe.
- 4 The **drugs** errors are the most common cause of medical errors in hospitals, affecting 3.7% of patients.

What is it?

Is any preventable event that may cause or led to **inappropriate medication use or patient harm**.

An adverse event if a patient is harmed.

A near miss if a patient is nearly harmed.

May result in:



Side Effect of A Drug:

- ❖ A **known effect**, other than that primarily intended, relating to the pharmacological properties of a medication, e.g. opiate analgesia often causes nausea¹.



Adverse Reaction of A Drug:

- ❖ **Unexpected harm** arising from a justified action where the correct process was followed for the context in which the event occurred, e.g. An unexpected allergic reaction in a patient taking a medication for the First time, e.g **being allergic to penicillin**.



Adverse Drug Event:

- ❖ An **incident** in which a patient is harmed. It includes both errors & side effects of the medication.

May be preventable (e.g. the result of an error).

May not be preventable (e.g. the result of an adverse drug reaction or side-effect)

Steps in Using Medication

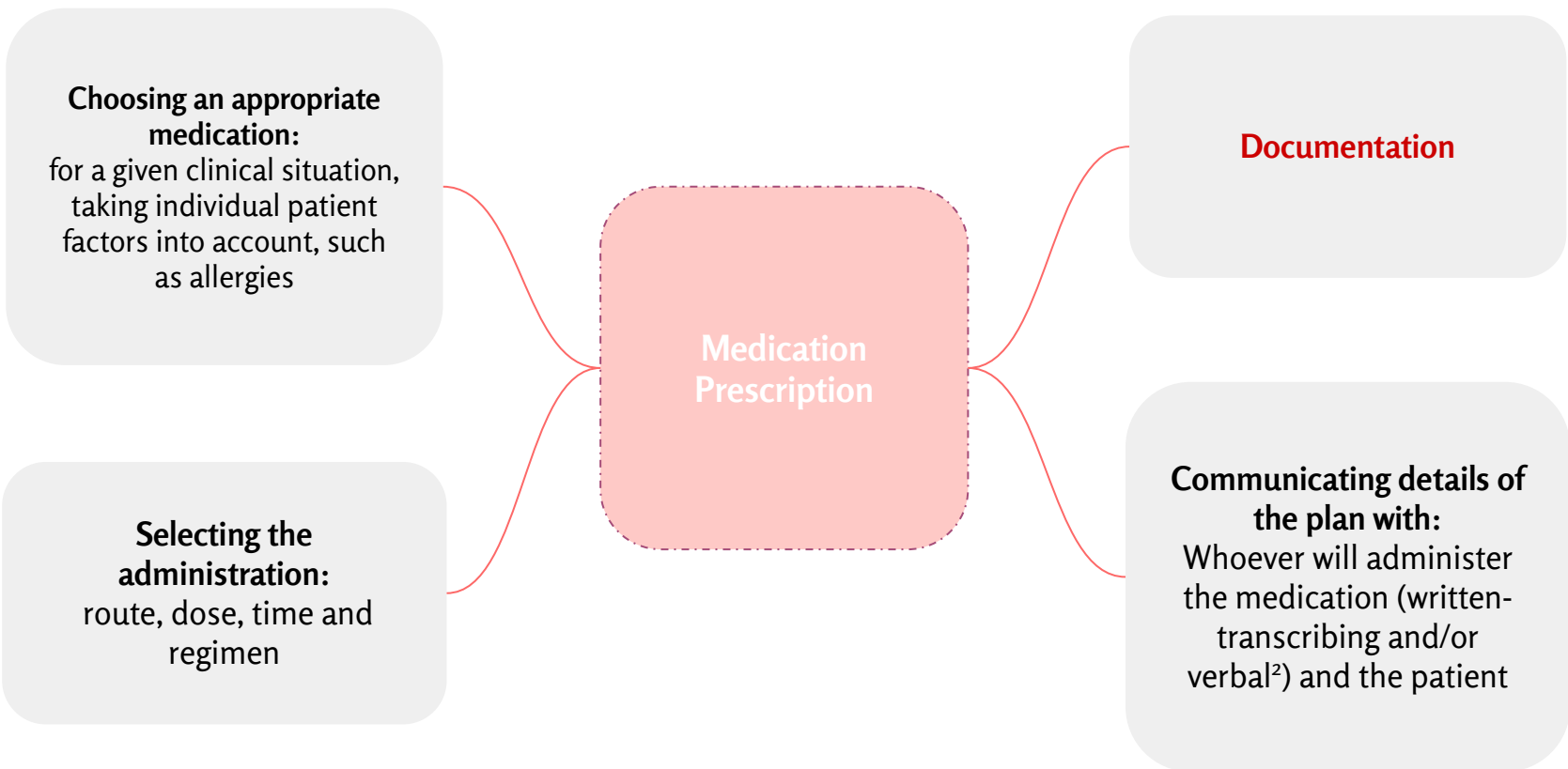
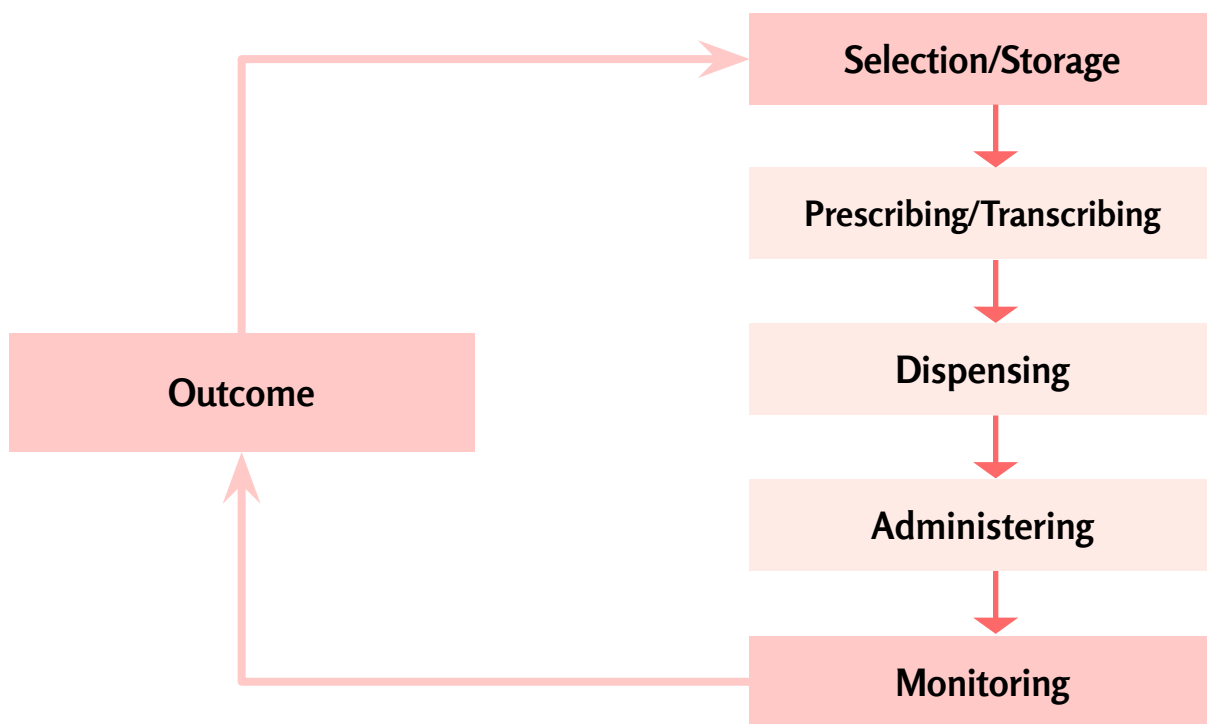
1 Prescribing.

2 Preparation and Dispensing.

3 Administration.

4 Monitoring.

Medication Use Process in The Institutional Setting¹

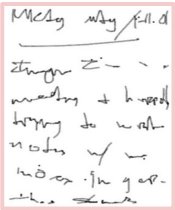




Sources of Error in Prescribing

- ★ Inadequate knowledge about drug indications and contraindications.
- ★ Not considering individual patient factors such as allergies, pregnancy, comorbidities, other medications.
- ★ Wrong patient, wrong dose, wrong time, wrong drug, wrong route.
- ★ Mathematical error when calculating dosage.
- ★ Documentation: incomplete, ambiguous & dangerous abbreviation.
- ★ Inadequate communication (written, verbal).
- ★ Incorrect data entry when using computerized prescribing e.g. duplication, omission, wrong number.

Example for
prescribing error
Illegible
Handwriting:



Strategies To Reduce Prescribing Errors

1 “Avoid Illegible Handwriting”

- ★ Write/Print More Carefully.
- ★ Use Computers.

2 “Write Complete Information”¹

- ★ Patient’s Name, Patient’s Specific Data, Generic and Brand Name, Drug Strength, Dosage Form, Amount, Directions for Use, Purpose, Refills.

3 “Look at Patient-Specific Information”

- ★ Age, Weight, Renal and Hepatic Function, Laboratory Test Results, Concurrent Medication², Allergies, Medical/Surgical/Family History, Pregnancy/Lactation Status.

4 “Decimals”

- ★ Avoid whenever possible: -Use 500 mg For 0.5 g. -Use 125 mcg For 0.125 mg.
- ★ Never use a terminal zero: -Colchicine 1 mg not 1.0 mg.
- ★ Space between name and dose: -Inderal40 mg (✗) → Inderal 40 mg (✓).

5 “Do Not Use Abbreviations”

- ★ Drug names, “QD” or “OD” for the word daily, Letter U for unit, “µg” for microgram (use mcg), “QOD” for every other day.

U (for units)	Mistaken for “0” (zero), “4” Write “unit” (the number four), or “cc”	Write “unit”
µg (for micrograms)	Mistaken for mg (milligrams) resulting in one thousand-fold overdose	Write “mcg” or “micrograms”
IU (for international units)	Mistaken for “IV” (intravenous), “10” (the number ten)	Write “international unit(s)”
OD, O.D., od, or q.d. (for daily)	Mistaken as “right eye” (oculus dexter) which could lead to administration of liquid medication in the eye	Write “daily”
QD, Q.D., q.d. (for daily)	Mistaken as “q.i.d.” especially if the period after the “q”, the letter “O”, or the tail of the “q” is misinterpreted for the letter “I”	Write “daily” or “every other day” as appropriate
Trailing zero AFTER decimal point (ex: 2.0 mg)	Decimal point can be missed leading to a 10-fold increase in dose (ex: 20 mg)	Do not use (unless necessary for expressing the level of precision of a lab value, size of a lesion, etc.)

No leading zero BEFORE decimal point (ex: .5 mg)	Decimal point can be missed (ex: 5 mg)	use a leading zero when a dose is less than a whole unit (ex: 0.5 mg)
Ms MSO, and MaSO	Can mean morphine sulfate or magnesium sulfate Confused for one another	Write “morphine sulfate” Write “magnesium sulfate”
> (greater than) < (less than)	Misinterpreted as the number “7” (seven) or the letter “L” Confused for one another	Write “greater than” Write “less than”
Abbreviations for drug names	Misinterpreted due to similar drug names abbreviations for multiple drugs	Write full drug names
Apothecary units	Unfamiliar to many practitioners Confused with metric units	Use metric units
@	Mistaken for number “2” (two)	Write “at”
cc	Mistaken for U (units) when poorly written	Write “mL” or “ml” or “milliliters” “mL” is preferred

6 “Be Alert To Drug Name”

(Use generic name rather than trade names)

- ★ “Look-Alike” or “Sound-Alike” Drug Names.
- ★ Celebrex (celecoxib, anti-Inflammatory).
- ★ Cerebyx (fosphenytoin, anticonvulsant).
- ★ Celexa (Citalopram, antidepressant).

7 “Write The Medication Reconciliation”

Learn and practice thorough medication history taking:

- ★ Include Name, Dose, Route, Frequency.
- ★ Duration of Every Drug That The Patient is Taking.
- ★ Enquire About Recently Ceased Medications.
- ★ Ask About Over-The-Counter Medications.
- ★ Dietary Supplements and Complementary Medicines.

8 “Know The High Alert Medications”

- ★ Oral Anticoagulants, Insulin.
- ★ Chemotherapeutic Agents.
- ★ Neuromuscular Blocking Agents.
- ★ Concentrated Electrolytes, Emergency Medications (Potent and Used in High Pressure Situations).

9 “More Attention to Dosage Calculations”

- ★ Use patient specific information: Age, Weight, Height & Body System Function.

10 “Verbal Orders”

- ★ Avoid When Possible.
- ★ Pronounce Slowly and Distinctly.
- ★ State Numbers Like Pilots (i.e., “one-five mg” for 15 mg).
- ★ Spell Out Difficult Drug Names.
- ★ Specify Concentrations.

Strategies to Reduce Dispensing Errors

Standardized concentrations for all IV Medication.

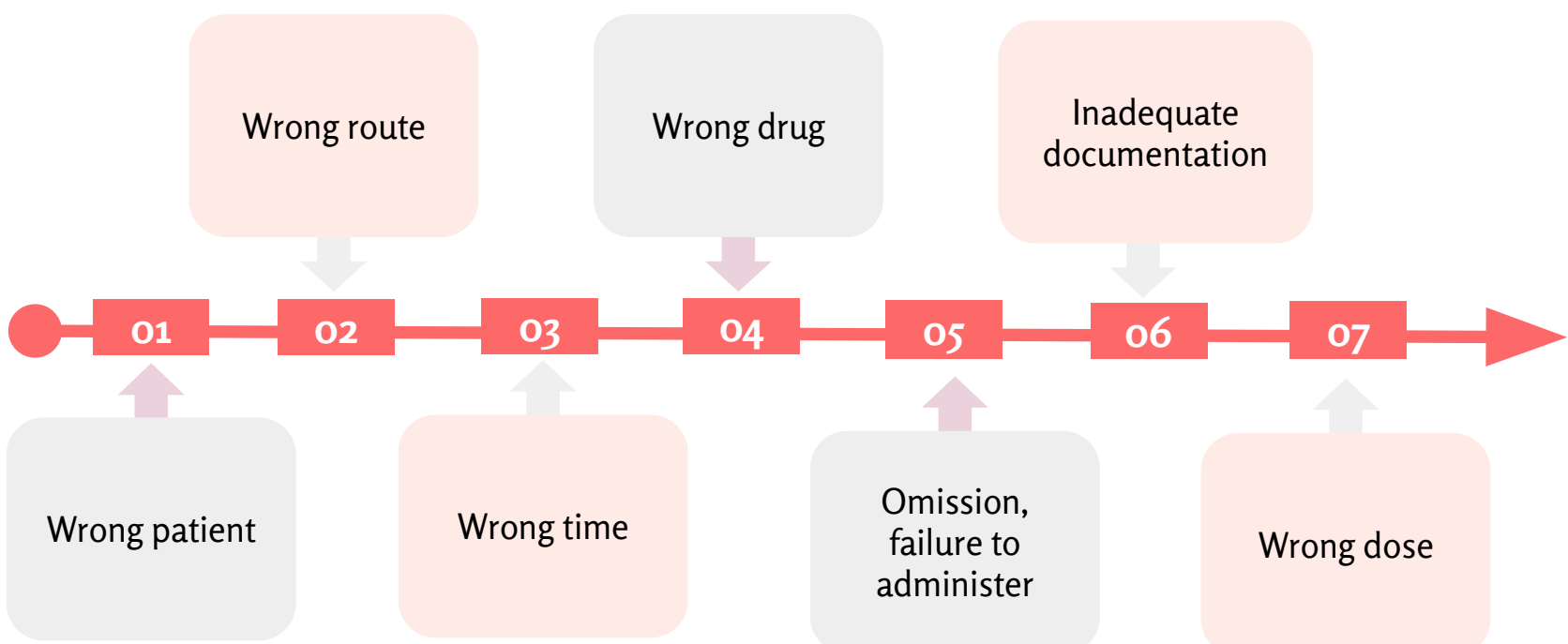
Use commercially prepared solutions.

Dispense a unit of use.

Administration

- 1 Obtaining the medication in a ready-to-use form; may involve counting, calculating, mixing, labeling or preparing in some way (inpatient).
- 2 Giving the right medication to the right patient, in the right dose, via the right route, at the right time.
- 3 Checking for allergies.
- 4 Documentation.

How Can Drug Administration Go Wrong ?



Strategies to Reduce Administration Errors:






Be familiar with the institution policy.

Pre-printed and standardized infusion rate charts.

Use programmable infusion device.

Infusion tubing should be traced from the infusion bag to the point of delivery.

5 Rs When Prescribing and Administering

	1:	Right Patient	Check the name in the order & the patient, use two identifiers & ask the patient to identify himself/herself.
	2:	Right Route	Confirm that the patient can take or receive the medication by the ordered route.
	3:	Right Time	Check the frequency of the ordered medication and confirm when was the last dose given.
	4:	Right Dose	Confirm appropriateness of the dose using a current drug reference and correct calculation.
	5:	Right Medication	Check the medication's label & order.

Medication Monitoring

Monitoring involves:

Observing the patient to determine if the medication is working being used appropriately and not harming the patient.

Documentation

How can drug monitoring go wrong?

Lack of monitoring for side-effects

Drug not ceased if not working, or course completed

Drug levels not measured, or measured but not checked or acted upon

Drug ceased before course completed

Communication failures (This is a risk if the care provider changes. For example, if the patient moves from the hospital setting to the community setting or vice versa)

Factors for Medication Errors “Staff Factors”

Inexperience

Doing two things at the same time

Rushing

Poor teamwork and/or communication between colleagues

Lack of checking and double checking habits

Interruptions

Fatigue, boredom, or stress

Patients who at high risk of medication errors

Patients on multiple medications.

Patients with another condition e.g. renal impairment, pregnancy.

Patients who cannot communicate well.

Patients who have more than one doctor.

Children and babies (dose calculations required?).

How can workplace design contribute to medication errors?

1

Inadequate staff number.

2

Absence of a safety culture in the workplace, e.g. poor reporting systems and failure to learn from past near misses and adverse events.

3

Absence of memory aids for staff.

Ways to make medication use safer

- 1: Use generic names where appropriate.
- 2: Tailor prescribing for individual patients.
- 3: Communicate clearly.
- 4: Develop checking habits.
- 5: Use memory aids.
- 6: Know the high-risk medications and take precautions.
- 7: Learn and practice collecting complete medication histories.
- 8: Be very familiar with the medications you prescribe.
- 9: Remember the 5 Rs when prescribing and administering.
- 10: Encourage patients to be actively involved.
- 11: Report and learn from errors.

Case Study-1

Case: A 21 years old drug addict male patient was admitted to ER at the Resuscitation Area. He was prescribed 20mg of **Naloxone** diluted in One liter of Normal Saline. In Pharmacy; Technician opened only one Ampoule of **Naloxone** 0.4 mg/ml and 49 Ampoules of **Naloxone** 0.02 mg/ml (by mistake). Upon checking, this mistake was discovered and the whole preparation was discarded and new accurate preparation was prepared.

Recommended actions for this case

- Pharmacists/Technician should **READ/CHECK** carefully the label of each medication they prepare.
- **DOUBLE CHECKING** is essential tool to avoid such mistakes.
- Look Alike medications should be stored separately with proper labeling to avoid such mistakes.



Case Study-2

Case: A 38-year-old woman comes to the hospital with 20 minutes of itchy red rash and facial swelling; she has a history of serious allergic reactions. A nurse draws up 10 mls of 1:10,000 adrenaline (epinephrine) into a 10 ml syringe and leaves it at the bedside ready to use (1 mg in total) just in case the doctor requests it. Meanwhile the doctor inserts an intravenous cannula. The doctor sees the 10 ml syringe of clear fluid that the nurse has drawn up and assumes it is normal saline.

- There is no communication between the doctor and the nurse at this time.
- The doctor gives all 10 mls of adrenaline (epinephrine) through the intravenous cannula thinking he is using saline to flush the line.
- The patient suddenly feels terrible, anxious, becomes tachycardia and then becomes unconscious with no pulse.
- She is discovered to be in ventricular tachycardia, is resuscitated and fortunately makes a good recovery.
- Recommended dose of adrenaline (epinephrine) in anaphylaxis is 0.3 - 0.5 mg IM, this patient received 1mg IV.

Identify the contributing factors to this error?

- Assumptions.
- Lack of communication.
- Inadequate labeling of syringe.
- Giving a substance without checking and double checking what it is.
- Lack of care with a potent medication.

Summary

- Medications can greatly improve health when used wisely and correctly.
- Yet, medication error is common and is causing preventable human suffering and financial cost.
- Remember that using medications to help patients is not a risk-free activity.
- Know your responsibilities and work hard to make medication use safe for your patients.

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