



University of Basrah \ College of Nursing
Branch of Basic Sciences
Pharmacology for Nurses1 (1st course)
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Principles of Drug Administration

Objectives: Upon completion of this lecture, we will be able to

1. Discuss medication order and its contents
2. Define medication errors and explain general principles of drug administration to prevent medication errors
3. Discuss the different routes of drug administration.

Medication Orders and Prescriptions are written directions provided by a **prescribing practitioner** (health care professionals, usually doctors) for a specific medication to be administered to a patient.

Typically a 'prescription' is used in the outpatient whereas medication 'order' is used in the inpatient (in hospitals). Traditionally a prescription is given to the patient to fill at a pharmacy, and an order is administered by a nurse.

Nurses play an essential role in the drug administration, but they must have a medication order before administration of medication in a hospital or other health care settings in order to preparing and administering the prescribed drug to the patients.

Prescription or medication order should include:

- The full name of the patient; age; sex. (even address)
- Name of the drug (preferably the generic); the dose, route, and frequency of administration; and duration of treatment.
- Date, time, name and signature of the prescriber, usually a doctors.

After the medication order written, a copy sent to the pharmacy, where the order recorded and the drug dispensed to the appropriate patient or patient care unit.

Most orders are handwritten on an order sheet in the patient's medical record or typed into a computer. Occasionally, verbal or telephone orders are acceptable – when taken, they should be written on the patient's order sheet, signed by the person taking the order, and later countersigned by the prescriber.

★For drugs to be taken at home, written prescriptions are given

Medication Errors: is any occurrence (preventable event) that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of healthcare professional, patient, or consumer.

Medication errors are a major problem in health care today – major cause of morbidity and mortality.

Because nurse is the last person who checks medications prior to administration, therefore the nurse responsible to detect and protect the patient against the mistakes made by other member of health care team. For example, the prescriber may overlook potential drug interactions, or may be unaware of alterations in the patient's status that would preclude use of a particular drug, or may select the correct drug but may order an inappropriate dosage or route of administration.

Types of Medication Errors: Medication errors fall into 13 major categories.

Some types of errors cause harm directly, and some cause harm indirectly. For example, giving an excessive dose can cause direct harm from dangerous toxic effects. Conversely, giving too little medication can lead to indirect harm through failure to adequately treat an illness.

1. Wrong patient
2. Wrong drug
3. Wrong route
4. Wrong time
5. Wrong dose
6. Omitted dose
7. Wrong dosage form
8. Wrong diluent
9. Wrong strength/concentration
10. Wrong infusion rate
11. Wrong technique (includes inappropriate crushing of tablets)
12. Deteriorated drug error (dispensing a drug after its expiration date)
13. Wrong duration of treatment (continuing too long or stopping too soon)

Source of medication errors

★★Prescribers ★★Pharmacist ★★Nurses ★★Drugs manufacturers ★★Consumer/patients and their families ★★Circumstances

Causes of medication errors among Nurses include:

- When one or more of the “Six Rights” and three checks of drug administration has not been followed. Each time a drug is prepared and administered, these guide lines must be a part of the procedure.
- When have inadequate knowledge about a drug or about the patient receiving the drug.
- Fail to question the medication order when indicated.
- Giving medications based on verbal orders or phone orders, which may be misinterpreted or go undocumented. The nurse should be sure that the medication orders are written before the drug administration.
- Nurses may have a heavy workload, with resultant rushing of administering medications. They may also experience distractions by interruptions, noise, and other events in the work environment that make it difficult to pay needed attention to the medication-related task.

The responsibility of nurses regarding medication errors

Prevention

Reporting

Informing or Notifying

Performing:

- Performing any necessary steps to counteract the action of the drug .
- Performing any observation can be made as soon as possible.

General principles of drug administration to prevent medication errors:

- ~ Concentrate on one task at each time.
- ~ Seek information about the patient’s medical diagnosis and condition in relation to drug administration
- ~ Understand the prescriber’s order accurately. If the nurse cannot read the physician’s order or if the order seems incorrect, he or she must question the order before giving the drug. For safer drug administration, the use of abbreviations for drug names, doses, routes of administration, and times of

administration should be minimized – because errors occurring with incorrect or misinterpreted abbreviations.

- ~ Never giving any medications based on verbal orders or phone orders, which may be misinterpreted or go undocumented. The nurse should remind the prescriber that medication orders must be in writing before the drug can be administered.
- ~ Never give a drug poured or prepared by someone else.
- ~ Omit or delay drug doses as indicated by the patient's condition; and then reporting or recording omitted drug dose appropriately in the patient's order sheet.
- ~ Learn essential information about each drug to be given.
- ~ Follow the "Six Rights" and three checks as guidelines for safe drug administration.

Drug Formulations and dosage forms

Pharmaceutical Formulation: صياغة المستحضرات الصيدلانية

It is the method by which a drug is prepared – the process in which different chemical substances, including the active drug, are combined to produce a final medicine product.

Dosage Form شكل الجرعة: It is the form in which the above formulation can be administered to a patient. e.g. as tablet, capsule, syrup or injection ...etc.

Drug Formulation and dosage forms vary according to the:

- 1) Drug's chemical and physical characteristics,
- 2) Reason for use, and
- 3) Route of drug administration.

Some drugs are available in only one dosage form; others are available in multiple dosage forms — choosing a form that is best received by the patient will lead to a better total outcome.

Most of drugs can be administered by a variety of routes – Major routes of drug administration include:

- 1) **Enteral,**
- 2) **Parenteral, and**
- 3) **Topical**

These are the common routes of drug administration used in nursing practice.

Additional methods of administration: These methods are used by physicians and in some cases by advanced practice registered nurses for medication administration.

- Intra-lesional (into a lesion)
- Intra-thecal (instilling drugs directly into CSF) or intra-spinal
- Intra-cardiac (into the heart)
- Intra-pleural
- Intra-arterial (administration is not by direct arterial injection but by means of a catheter that has been placed in an artery)
- Intra-articular (into a joint)

Factors that determine the choice of drug administration routes, include:

- 1) Physical and chemical properties of the drug (drug characteristics).
- 2) The formulations available (dosage form) in which the drug is available
- 3) Site of desired action, systemic or local effects
- 4) Rate and extent of absorption of the drug from different routes
- 5) Effect of digestive juices and first pass metabolism on the drug.
- 6) Rabidity with which the response is desired – onset of action (routine treatment or emergency).
- 7) Accuracy of dosage required (I.V. & inhalation can provide fine-tuning).

- 8) The patient's age and the clinical condition – unconscious, vomiting, etc. (Patient related factors or patient characteristics)
- 9) Which is the most convenient route is required for the patient and whether the patient is compliant or not

Self-assessment

- Discuss medication order and its contents
- Define medication errors
- Explain general principles of drug administration to prevent medication errors
- What are responsibilities of nurses regarding Medication Errors?
- What are different routes of drug administration?
- What are factors that determine the choice of drug administration routes?
- Discuss Advantage and Disadvantage of different routes of drug administration