



*University of Sulaimani
School of Pharmacy
Dept. of Pharmaceutics
Third level - Second semester*

Powder dosage forms

Outlines

- **Introductions**
- Definitions
- Medicated powder
- Classification

Introduction

- The term “powder” in pharmacy may be used to describe:
 - the physical form of a material; that is, a dry substance composed of finely divided particles.
 - type of pharmaceutical preparation; that is, a medicated powder intended for internal (i.e., oral powder) or external (i.e., topical powder) use.



- **Advantages**

- Solid preparations are more chemically stable than liquid ones.
- Powders and granules are a convenient form in which to dispense drugs with a high dose.
- Faster dissolution rate than tablets or capsules

- **Disadvantages**

- Bulk powders or granules:
 - They are less convenient for the patient to carry than a small container of tablets or capsules
 - Inconvenient to self-administer as liquid preparations
 - Bulk powders or bulk granules are not suitable for the administration of potent drugs with a low dose.
- Problems of masking unpleasant tastes
- Powders are not a suitable method for the administration of drugs which are inactivated in, or cause damage to, the stomach.

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Definitions

- **Hygroscopic and deliquescent powders**

- Hygroscopic powders will attract and hold moisture from the air like table salt and sugar.
- Deliquescent powders will absorb moisture from the air, to the extent that they will partially or wholly liquefy.
- They could be dispensed in tight containers with desiccant.

Definitions cont.

- **Efflorescent Powders**

- An efflorescent powder is a crystalline powder that contains water of hydration or crystallization.
- The substance holds the water molecule weakly.
- This water can be liberated either during manipulations or on exposure to a low-humidity environment.
- If this occurs, the powder will become sticky and pasty.
- E.g. caffeine, atropine sulfate

Outlines

- Introductions
- Definitions
- **Medicated powder**
 - **Bulk powder**
 - **Divided powder**
- Classification

Medicated powder

- Some medicated powders are intended to be used internally and others, externally.
- Most powders for internal use are taken orally after mixing with water or in the case of infants in their infant formulas.
- Some powders are intended to be inhaled for local and systemic effects.
- Powders intended for external use should bear a label marked external use only.
- Medicated powders for oral use may be intended for local effects (e.g., laxatives) or systemic effects (e.g., analgesics).



Bulk powder

- Among the bulk powders available in prepackaged amounts are
 - a) antacids (e.g., sodium bicarbonate) and laxatives (e.g., psyllium [Metamucil]), which the patient takes by mixing with water or another beverage before swallowing
 - b) Medicated powders for external application to the skin, usually topical anti-infectives (e.g., bacitracin zinc and polymyxin B sulfate) or antifungals (e.g., tolnaftate).
 - c) Douche powders (e.g., Massengill powder), dissolved in warm water by the patient for vaginal use



Divided powder

- After a powder has been properly blended (using the geometric dilution method for potent substances), it may be divided into individual dosing units based on the amount to be taken or used at a single time.
- Each divided portion of powder may be placed on a small piece of paper (Latin chartula; abbrev. chart.; powder paper) that is folded to enclose the medication.
- If the powder contains hygroscopic or deliquescent materials, waterproof or waxed paper should be used.

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- **Classification**

Classification

- Powders and granules for oral administration
 - Oral powders
 - Effervescent powders
- Powder for other routes of administration
 - Insufflated powder
 - Powder for inhalation
 - Nasal powder
 - Topical and dusting powders

Oral powders

- Oral powders are preparations consisting of solid, loose, dry particles of varying degrees of ne particle size.
- They contain one or more active substances, with or without excipients
- They are generally administered in or with water or another suitable liquid
- They are presented as single-dose or multidose preparations in suitable containers.
- Multidose oral powders are packed into a suitable bulk container, such as a wide-mouthed glass jar.
- Useful for medicaments which are non-toxic with a large dose.

Oral powders cont.

- Traditionally, single doses were wrapped in paper.
- Nowadays foil and plastic laminates are used.



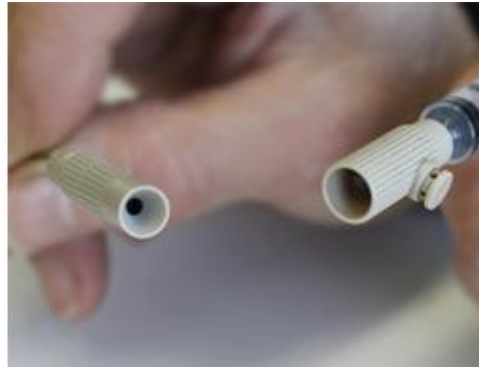
Effervescent powders

- Effervescent powders are presented as a single-dose or multidose preparations
- In addition to the drug, contain acid substances and carbonates, which react rapidly and effervesce when the patient adds the powder to water to produce a draught.
- Citric acid plus sodium bicarbonate is a common combination that releases carbon dioxide.
- It is important to protect the powder from the ingress of moisture during manufacture and on subsequent storage.



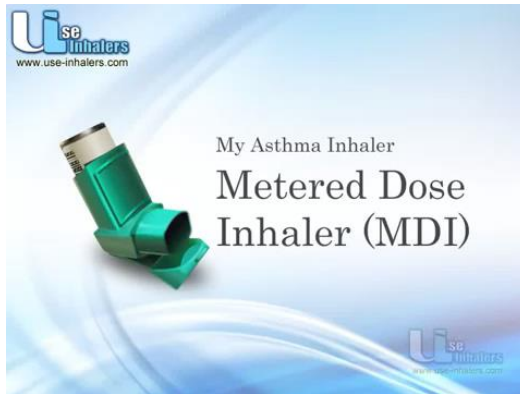
Insufflated powder

- Insufflated powders are finely divided powders that are intended to be applied in a body cavity, such as the ears, nose, vagina, tooth socket, or throat.
- When using an insufflator, or “puffer,” the patient simply “puffs” the desired quantity of powder onto the affected area or into the cavity.
- Polyox is an polyethylene oxide polymer with a high molecular weight that forms a viscous, mucoadhesive gel when in contact with moisture.



Powders for inhalation

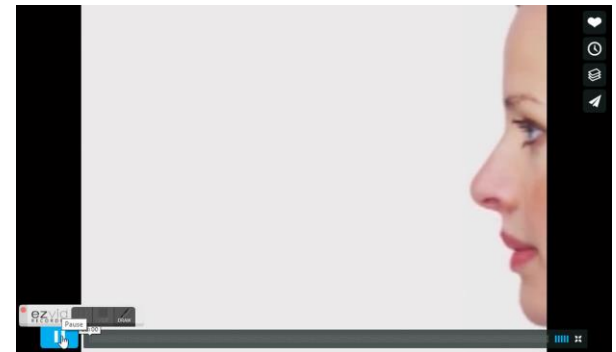
- Some medicated powders are administered by inhalation with the aid of dry powder inhalers (DPIs), which deliver micronized particles of medication in metered quantities.
- It is an effective method of delivering active ingredients to the lung for the treatment of asthma and chronic obstructive pulmonary disease



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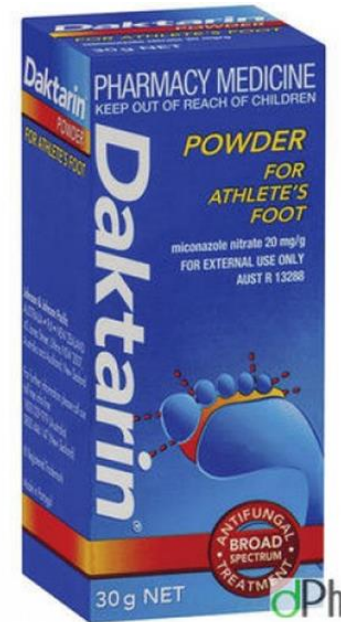
Nasal powder

- Nasal powders are medicated powders intended for inhalation into the nasal cavity
- To enhance convenience and ensure that a uniform dose is delivered on each occasion, delivery devices have been developed
- The size of the particles is such as to localize their deposition in the nasal cavity



Topical and dusting powders

- They should be free from grittiness.
- It should easily adhere to the skin
- Powders specifically intended for use on large open wounds or on severely injured skin must be sterile.
- Topical powders usually consist of
 - Base or vehicle, such as cornstarch or talc
 - An adherent, such as magnesium stearate
 - Possibly an active ingredient,



Topical and dusting powders cont.

- Dusting powders contain ingredients used for therapeutic, prophylactic or lubricant purposes and are intended for external use.
- Only sterile dusting powders should be applied to open wounds.
- Dusting powders are normally dispensed in glass or metal containers with a perforated lid.
- The powder must flow well from such a container, so that it can be dusted over the affected area.

Topical and dusting powders cont.

- Hexachlorophene Dusting Powder contains an antibacterial agent
- Talc dusting powder is used as a lubricant to prevent chafing.
- Canesten® Powder (clotrimazole) is used as an antifungal agent.



Thank you