POWDERS

Solid dosage forms

- As such → Powders
  - → Simple divided
  - → Compound divided
  - → Bulk
  - → Effervescent
  - → Dusting Powder
  - → Insufflation
  - → Snuff
  - → Dentrifices
  - → For External Use
- Powders are enclosed → Cachets, Capsule
- Moulded → Tablets
  - → Tablets
  - → Suppositories
  - → Lozenges
  - → Pills
- Compressed → Tablets

① Powders → Powders are homogeneous mixture of drugs and chemicals in a dry fine state of subdivision.

⇒ These are solid dosage form of medicament which are meant for internal and external use.

* Character of good Powders :-

① Finest state of subdivision

② A perfectly homogenous preparation

③ Small Particle Size

④ Large surface area

⑤ Absorption capacity req. for → Antacid, Antidiarrhoeal and other used for local treatment on skin.

* Classification of Powders :-

- Powders
  - Internal [oral]
    - Divided
      - Simple
      - Compound
      - Enclosed
    - Bulk
      - Antacid
      - Laxative
      - Dietary
      - Effervescent
  - External
    - Bulk Powder
      - Dusting
      - Insufflation
      - Snuffs
      - Dentrifices
  - Parentral

* Advantages of Powders

① One of the oldest dosage form and are used both internally and externally.

② More stable than liquid and semi solid dosage form.

③ chances of incompatibility are less as compare to liquid dosage form.

④ Onset of action of powdered drug is rapid due to smaller particle size.

⑤ More easy to carry than liq. dosage form.

⑥ Small children and elderly patient easily take the powdered drug as such or in water or other liquid.

⑦ More economical as compared to other solid dosage form.

* Disadvantage of Powders :-

① Drug having bitter, nauseous and unpleasant taste cannot be dispensed in powdered form.

② Drug which get affected by atmospheric condition are not suitable in powder form.

③ Time Consuming

④ Inaccuracy of dose, particularly bulk powders.

[A] Divided Powders → They are dispensed in the form of individual doses.

* Following steps are involved in preparation :-

① Size Reduction → Trituration
→ Pulverization
→ Levigation

② Mixing of Powders → Spatulation
→ Trituration
→ Geometric dilution
→ Sifting
→ Tumbling

③ Dividing

④ Packing and labelling

ⓐ Simple Powder → It contains only one ingredient either in crystalline or amorphous form.

Eg → Dispense six powder of "aspirin", each powder contain 300 mg of aspirin.

Rx

Aspirin 300 mg

Make Powder

Direction → One powder to be taken after every eight hour.

ⓑ Compound Powder → It contain two or more than two substance which are mixed together and then divided into desired no. of individual doses

which are dispensed into powder paper.

Example → Dispense eight Powder of A, P, C

Rx

Aspirin	300 mg
Paracetamol	150 mg
Caffeine	50 mg

Make a powder

Direction → One powder to be taken when need arise.

© Powder Enclosed in Cachets → Cachets are solid unit dosage form.

→ They are moulded rice - flour capsule (Powder) container are formed by sealing two concave disk of wafer sheat.

Advantages :-

@ For administration of nauseating and unpleasant taste drug.

ⓑ Large dose can be enclosed than tablet or a capsule.

Types of Cachets [0.2 - 2g]

Dry Seal ——— Wet Seal

No moisture for sealing — Water is used to seal.

Administration of Cachets

Before intake, a cachets should be immersed in water for a few seconds. ⇓

Placed on toungue. ⇓

Swallowed with a draught of water

Bulk Powder for internal Use :-

Powder are dispensed in bulk, when accuracy of dosage is not important.

⇒ Supplied in wide mouthed container.

⇒ Non-potent substances like antacids, laxatives etc. are dispensed as bulk powders.

@ Effervescent Powders → They are the form of medication for internal use.

⇒ In presence of water, acid and base react to liberate CO_2 and producing effervescence.

⇒ They are dissolved in water and taken immediately after effervescence subside.

Advantage :- ① CO_2 hastens absorption, stimulates flow of gastric juice.

⇒ CO_2 acts as a carminative.

Preparation Methods

Wet Method ← → Dry or Fusion Method

• Wet Method :-

⇒ Powder each ingredients and mix them.

⇒ Bind the powder mass by moistening the non-solvent usually alcoholic mixture and prepare dough like mass.

⇒ Passed through a 8 sieve and granules are dried at temperature not exceeding 60°C.

⇒ Granule are again passed through sieve and packaged in air tight containers.

• Dry / Fusion Method :-

⇒ Ingredient except citric acid are dried and passed through a sieve 60.

⇒ Powders are mixed and freshly powdered citric acid is added last.

⇒ Mixture is spread in shallow dish (Porcelin dish) and placed on water bath (95°C - 100°C) without stirring.

⇒ A pestry mass is soon formed.

⇒ Granulation, drying and regranulation are then carried out.

Bulk Powder for external use :-

Bulk powder meant for external use are non-potent substance supplied in cardboard, glass or plastic containers.

Example → Dusting Powder
→ Insufflation → into body cavities, ear, nose
→ Snuffs → Inhaled into nostrils
→ Dentrifices → for cleaning teeth

- Dusting Powder → Meant for external use to the skin and generally applied in a every fine state of subdivision to avoid local irritation.

It should be passed through sieve no. 80 to enhance their effectiveness.

- Types ⇒ ⓐ Medical
ⓑ Surgical

Medical dusting powder are used mainly for superficial skin condition.

Surgical dusting powder are used in body cavities and also on major wounds and unbilical cords of infants.

⇒ Must be sterile before use.

⇒ Dusting powder are generally prepared by mixing two or more ingredient. ⇓

Talc and Kaolin are more commonly used because they are chemically inert. ⇓

Sterilised by dry heat method [160° for 2 hrs] before use.

Use → Antiseptic, Astrigent, absorbent, antipruritic action.

Example → Dispense 50 gm of dusting powder

℞

Purified talc, sterilised	50 gm
Starch in Powder	25 gm
ZnO in powder	20 gm
Salicylic acid in powder	5 gm

Make a powder

Direction → Applied on affected part two or three times a ~~time~~ day.

Method → Powdered all the ingredient.

⇒ weigh the required quantity of purified talc, starch, ZnO and salicylic acid.

⇒ Mix them in ascending order of their weight.

⇒ Pass through a seive no. 85.

⇒ Again mix tightly. ⇓
Transfer the powder in softer top container to protect it from atmospheric contamination.

Special Problems and Remedies

Some prescription require special treatment to permit their proper dispensing.

① Hygroscopic and Deliquescent :-

⇒ Powder containing hygroscopic and deliquescent ingredient

⇒ Substance absorb moisture from the air [hygroscopic] and liquefy forming a solution [Deliquescent]

Example → Ammonium Bromide , Sodium Bromide , Calcium Bromide , Sodium Iodide , Pepsin , Potassium citrate.

Remedies :-

ⓐ Dispense in granular form.

ⓑ Do not reduce to a very fine powder

ⓒ Use double wrapped or cellophane envelopes.

ⓓ Use of light magnesium oxide as absorbent.

② Efflorescent → Powder containing efflorescent ingredient.

⇒ Substance liberate their water and crystallisation are said to be efflorescent.

⇒ Due to liberation of water powder becomes pasty or tends liquify.

Example :- Alum , Sodium Acetate , Sodium Carbonate, Atropine Sulphate , Caffeine , Citric acid.

· Remedies :-

@ Use corresponding anhydrous salt and double wrapped to prevent absorption of moisture from the air.

③ Eutectic Mixture → when two or more substance are mixed together ⇓

They liquefy due to formation of a new compound which has a low melting point than room temperature.

⇓

Such substance are called eutectic substance.

Example → Menthol , Camphor , Phenol , Aspirin , tymol.

· Remedies :-

ⓐ When eutectic mixture is present in small proportion and other solid ingredient are present liquefiable substance first should be tolerate forming eutectic.

ⓑ All other liquid are added and other substance in the form of fine powder are gradually incorporated.

ⓒ Eutectic mixture substance is diluted the equal volume of absorbent [MgO] in divided powder.

Geometric Dilution → This method is used when potent substance are to mixed with a large amount of diluent.

⇒ The potent drug is placed upon an approximately equal volume of dilutent in a mortar and slightly mixed by titration.

⇒ A second portion of diluent equal in volume to powder mixture in mortar is added and tituration is repeated.

⇒ Process in continued, adding diluent equal in volume to mixture in mortar in each step until all diluent incorporate.

For example → If 100 mg of Potent drug is required to be mixed the 900 mg of tactose.

100 mg of Potent drug + 10 mg of lactose = 200 mg mixture

200 mg of mixture + 200 mg of lactose = 400 mg mixture

400 mg of mixture + 400 mg of lactose = 800 mg mixture

800 mg of mixture + remaining portion = 1000 mg mixture of lactose