PHARM.D • YEAR 3

Pharmaceutical Formulations

CHAPTER 1

Pharmaceutical Dosage Forms

PPT CHAPTER COVER



DOCTOR OF PHARMACY

DOSAGE FORMS – CORE CONCEPT

Active pharmaceutical ingredient (API)
Therapeutic effect

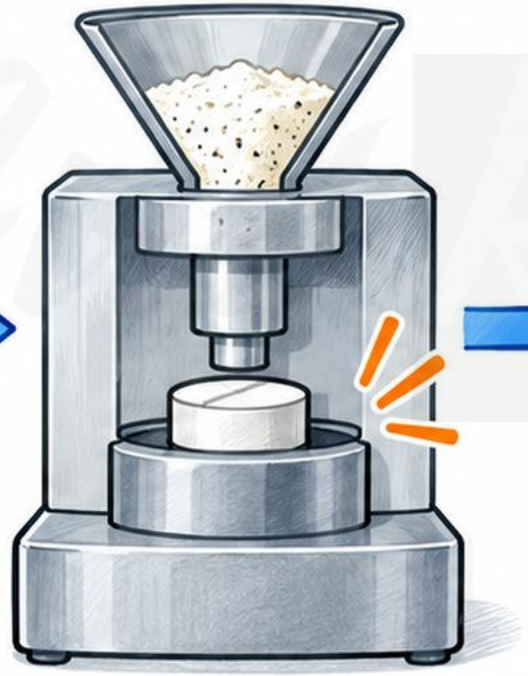


Excipients
Inactive ingredients (e.g. fillers, binders, disintegrants, etc.)



Combined and formulated

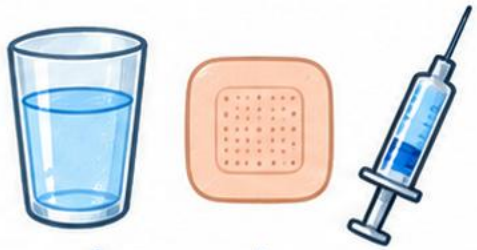
Manufacturing
(e.g. mixing, granulation, compression, etc.)



Dosage form
Usable medicine in a specific physical form



Route of administration



Oral | Topical | Parenteral

Patient use



Designed for effective, safe and convenient use

API + excipients → manufactured into a dosage form → designed for a specific physical form, route and patient use.

WHY DOSAGE FORMS MATTER

Active pharmaceutical ingredient (API)



Drug (therapeutic effect)

+

Excipients (inactive ingredients)



Enable suitable form and performance

Manufacturing — Critical process parameters (CPPs)



Dosage Form

Therapeutic use

Design choice links to patient needs.

1 Accurate dose

Ensures the right amount of drug in each unit.

2 Stability

Protects the drug (chemical & physical).

3 Administration & acceptability

Enables easy use and better patient acceptance (e.g. taste, appearance).

4 Release & bioavailability

Designed for desired drug release and efficient absorption to achieve therapeutic effect.

SOLID DOSAGE FORMS

1 Tablets

- Compressed solid with API(s) + excipients
- Swallowed whole, chewed or dissolved in mouth
- Common, convenient form

2 Capsules

- Gelatin or cellulose shell with powdered, granulated or liquid API(s)
- Easy to swallow
- Often masks unpleasant taste or odour



3 Powders

- Fine, dry API particles
- Used directly or mixed with food/beverages
- Can be reconstituted into liquid forms

4 Granules

- Larger, free-flowing agglomerates of powders
- Improved flow and dosing uniformity
- Can be filled into capsules or compressed into tablets

Key Takeaway:
Different solid forms suit drug, dose, stability and patient needs.

LIQUID AND SEMI-SOLID FORMS

LIQUID FORMS

- **Solutions:** API dissolved in a solvent (homogeneous).
- **Suspensions:** Insoluble API particles dispersed in a liquid.
- **Emulsions:** Two immiscible liquids (e.g. oil & water) stabilized by emulsifier.

COMPARISON

- **Solution** = molecularly dissolved (clear, uniform).
- **Suspension/Emulsion** = dispersed system (particles or droplets).

SEMI-SOLID FORMS

- **Ointments:** Greasy, hydrophobic base.
- **Creams:** Semi-solid emulsion (oil in water).
- **Gels:** API in a polymeric network.

LIQUID DOSAGE FORMS



Solution
(API dissolved)

Suspension
(dispersed particles)

Emulsion
(oil & water droplets)

SEMI-SOLID DOSAGE FORMS



Ointment
(greasy base)

Cream
(oil in water emulsion)

Gel
(polymeric network)

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