Introduction to Dosage Forms

A dosage form is a medicine containing an API and relevant excipients to deliver a specific dose of drug in a specific manner to patients

API- active pharmaceutical ingredient, the actual drug molecule

Excipients – enhance the performance of a medicine, should be pharmacologically inactive

Major Forms of Dosage Forms

Oral (Solid Dosage Forms)

Solid medications administered through the mouth

Can be tablets, capsules, lozenges or effervescent tablets

Pros

- High patient compliance
- Accurate dosing
- Can be administered at home
- Cheap and convenient
- Lower comparable aseptic constraints

Cons

- Some cannot swallow solid dosage forms
- Tablet confusion
- Bioavailability
- Cannot avoid first pass metabolism
- Must be kept away from moisture

Effervescent aspirin is preferred in the instance of a heart attack because effervescent tablets disintegrate and dissolve in one step before they are absorbed unlike tablets which need to disintegrate first and then dissolve.

Solid dosage forms contain API, bulking agents, binders, lubricants, disintegrants etc.

Oral (Semi Solid Dosage Forms)

Semi solid medications administered through the mouth

Can be liquids, tonics, elixirs, syrups and suspensions e.g. Nurofen for children Pros

- Maximum dosing flexibility
- Suitable for all ages
- Can make it sweet by adding excipients

Cons

- Inaccurate dosing
- Particle instability
- Solubility considerations

Injections

Medications administered via a needle or syringe

Can be subcutaneous, intramuscular, intravenous (IV infusion >50mL) or intradermal

Pros

- Rapid action/absorption
- Accurate dosing
- Bypasses first pass metabolism

Cons

- Pain/swelling/discomfort
- Must be done by trained staff
- Injection must be in solution, isotonic and sterile **Ocular Dosage Forms**

Medications administered to the eye for localised effect

Can be aqueous solutions, ointments or inserts

Pros

- Localised effect
- Rapid action

Cons

- Must be isotonic (same salt/sugar concentration as the eye)
- Must be sterile
- Inaccurate dosing
- Can cause irritation

Topical Dosage Forms (cutaneous)

Medications administered on the skin

Can be creams, lotions, ointments, patches, implants, pastes, paints, gels or shampoos Pros

- Easy application
- Does not need to be sterile or isotonic

Cons

- Inaccurate dosage
- Not all drugs can be absorbed through the skin
- Need to select best formulation

Rate of dermal absorption of an API is proportional to both the concentration of the API and the surface area over which it is applied. The wider the contact area, and the more concentrated the API, the greater the absorption.

Respiratory Dosage Forms

Medications delivered to the lung as either solid particles or liquid droplets, ideally between 5 and 20 microns

Pros

- Localised treatment
- Rapid action

Cons

- Inconvenient
- Expensive

Suppository Dosage Forms

Medications administered in the anus/rectum, ideally between 1 and 8 grams

Work by either melting or dissolving in the anus

Pros

- Good when patients are unconscious/unable to swallow
- Bypasses first pass metabolism

- Systemic delivery

Cons

- Erratic absorption
- Patient acceptability
- Melts easily so must be stored/transported correctly
- Confusion as to how to use

Reasons why medicine is supplied in a particular dosage form

- Patient preference
- Medication stability
- Route of administration
- Onset of action
- Dosage accuracy