

Drug dosage form

Drugs can be administered to a patient in various forms. They are available in solid, semisolid and liquid dosage forms.

Solid dosage form

Solid dosage forms of a drug are tablet, capsule, powder, suppository, troche, lozenge, etc.

1. Tablet:

It is the commonly used solid dosage form. A tablet may be scored and can be easily broken along the line, if required, e.g. paracetamol. Tablets can be uncoated or coated (covered with a thin film of another substance) to improve the taste, delay absorption, prevent its degradation in the stomach, etc.

Sugarcoating of a tablet helps to improve its taste, e.g. metronidazole.

- **Enteric-coated tablet:** It is coated with a material that delays the release of medication till it reaches the intestine. Enteric coating of a drug prevents the destruction of the drug by gastric acid, e.g. enteric-coated tablet of erythromycin, or decreases the gastric irritation by the drug, e.g. enteric-coated tablet of diclofenac.
 - **Sustained-release preparations:** They help to prolong the duration of action of a drug, thereby decreasing the frequency of drug administration and improving patient compliance, e.g. sustained release tablets of diclofenac (for pain).
 - **Chewable tablet:** It should be chewed and swallowed. This helps to increase the effectiveness of the drug, e.g. chewable antacid tablet used for gastritis and chewable albendazole tablet for worm infestation.
 - **Dispersible tablet:** It is a tablet that has to be dispersed in water or milk before administration, e.g. aspirin dispersible tablet.
- 2. Capsule:** It is a solid dosage form where the drug is enclosed within a soluble sheath. Capsules can be oval, cylindrical or spherical, e.g. amoxicillin. Sustained-release and enteric-coated capsules are also available. Spansules and timsules are sustained-release forms. Time-release forms may have suffix like SR (sustained-release), CR (controlled release), ER (extended-release), SA (sustained action), contin (continuous), retard, etc.
- 3. Troche:** It is a solid dosage form to be placed in the mouth where it dissolves slowly to liberate the active ingredient. For example, clotrimazole troche for oral candidiasis (oral thrush).
- 4. Lozenge:** It is a solid dosage form placed in the mouth and sucked; it dissolves slowly to liberate the active ingredient. It soothes the irritated mucosa of the throat. Some lozenges have systemic effects, e.g. nicotine lozenges to reduce withdrawal symptoms and craving associated with cessation of smoking; dyclonine (local anaesthetic) lozenge for sore throat.

5. **Suppository:** A solid dosage form that is inserted into the rectum, e.g. bisacodyl suppository for constipation.
6. **Powder:** It is the finely divided form of a drug for internal or external use, e.g. oral rehydration salt (ORS) powder for dehydration, tooth powder for cleaning the teeth, etc.

Semi-solid dosage forms

1. **Ointment:** It is a semisolid preparation with a greasy base usually meant for application to skin or mucosa, e.g. lignocaine ointment for local anaesthesia, acyclovir ointment for herpetic infections.
2. **Cream:** It is a semisolid emulsion for local application, e.g. antifungal agent (nystatin cream) for oropharyngeal candidiasis; antiviral agents (acyclovir and penciclovir cream) for herpetic labialis; glucocorticoid (betamethasone and clobetasol) intraoral cream for severe aphthous stomatitis.
3. **Paste:** It is a semisolid preparation with a less-greasy base generally meant for topical use, e.g. triamcinolone acetonide paste for oral inflammatory conditions. Pastes are stiffer and easily washable than ointments.
4. **Gel:** It is a jelly-like substance formed by the aqueous suspension of insoluble drugs, e.g. diclofenac gel for pain, lignocaine gel as a local anaesthetic, povidone-iodine gel for sore throat, glucocorticoid (betamethasone and clobetasol) gel for severe aphthous stomatitis.

Liquid dosage forms

1. **Mixture:** It is a liquid containing two or more ingredients for oral use. For example, sodium salicylate mixture as an analgesic and antipyretic; gripe water mixture used in infant to reduce griping; carminative mixture to expel gas from the stomach and the intestine.
2. **Emulsion:** It is a mixture of two immiscible liquids (e.g. oil and water) made miscible by using an emulsifying agent, e.g. cod-liver-oil emulsion for vitamin D deficiency.
3. **Suspension:** It contains one or more insoluble ingredients suspended in a liquid, e.g. antacid suspension, amoxicillin suspension, etc. It should be shaken well before use.
4. **Syrup:** It is a concentrated solution of sugar-containing drugs to mask the bitter taste of the drug, e.g. cough syrup.
5. **Elixir:** It is a clear, pleasantly flavoured liquid dosage form that contains a drug dissolved in water and alcohol, e.g. promethazine elixir for suppressing dry cough.
6. **Linctus:** It is a viscous liquid preparation that should be sipped slowly to allow it to trickle down the throat. It is usually used for the relief of cough, e.g. linctus codeine.

7. **Gargle:** An aqueous solution used to prevent or treat throat infections, e.g. saline gargle for sore throat.
8. **Mouth rinses:** An aqueous solution used for rinsing the mouth for oral hygiene, e.g.:
 - Antiseptic mouth rinse (chlorhexidine or povidone-iodine) used in gingivitis.
 - Astringent mouth rinse (tannic acid) is used for gingivitis and aphthous ulcers.
 - Anticaries mouth rinse (sodium fluoride) to prevent dental caries.
9. **Tincture:** It is an alcoholic preparation of a drug, e.g. tincture of iodine used as an antiseptic.
10. **Paint:** It is a liquid preparation of a drug for application to the skin or mucosa, e.g. Mandl's paint (iodine in potassium iodide) for sore throat, tonsillitis, pharyngitis; astringent gum paint (tannic acid) for gingivitis and antiseptic gum paint (tincture iodine with phenol) for gingivitis, after scaling, etc.
11. **Irrigation solutions:** They are used for washing out a body cavity or wound and the procedure is known as irrigation. Water, saline and antiseptic solutions can be used as irrigants. Oral irrigation can be done for preventing and treating inflammatory conditions of the oral cavity.
12. **Drops:** They are liquid preparations meant for oral (vitamin drops, paracetamol drops) or local (eye, ear and nose) administration.
13. **Spray:** It discharges the drug in droplet form for topical application, e.g. lignocaine spray for local anaesthesia, nitroglycerine lingual spray for angina attack.

Injectable dosage forms

1. **Powder for injection:** The powder is mixed (reconstituted) with a diluent, e.g. sterile water or normal saline before administration to a patient. The drug should dissolve completely before administration, e.g. benzylpenicillin G.
2. **Suspension for injection:** Insoluble or sparingly soluble drugs are suspended in an oily or aqueous vehicle, e.g. procaine penicillin G.
3. **Solution for injection:** It is administered as such, e.g. adrenaline.

New Drug delivery systems

- **Orodonal patch,** e.g. lignocaine patch for local anaesthesia.
- **Microspheres,** e.g. minocycline microspheres for periodontitis.

- **Computer**-controlled local anaesthetic delivery devices.
- **Iontophoresis**, e.g. to deliver salicylates for deep-seated pain.
- **Nanoparticles**, e.g. nanoparticles loaded with chlorhexidine for antibacterial action.