University of Tikrit
College of Pharmacy
Department of Pharmaceutics

Practical Industrial Pharmacy II

Lab 2

Direct Compression Method for Preparation of Tablets

Part 1

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Tablets

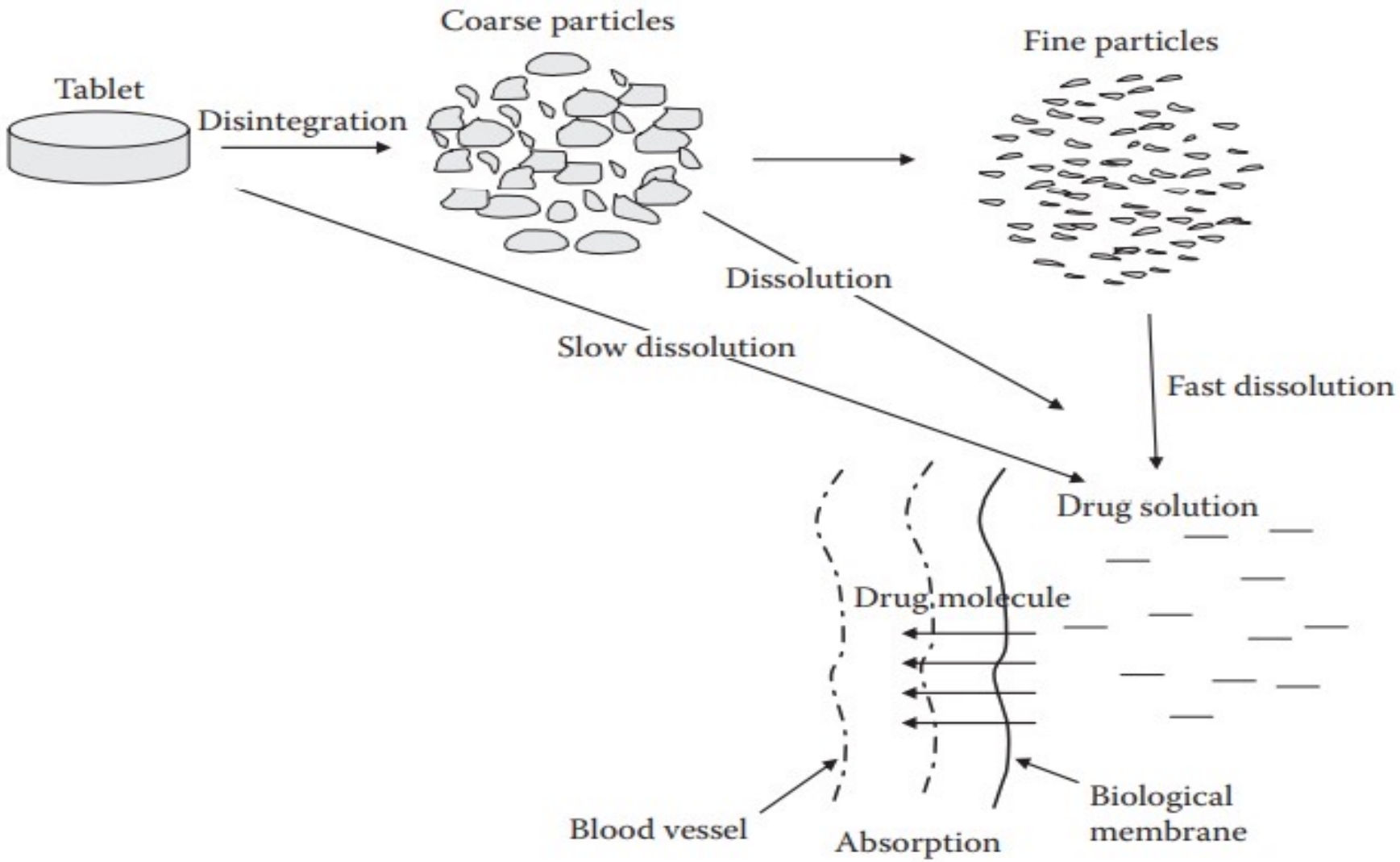
- **Tablets** are solid dosage forms usually prepared with the aid of suitable pharmaceutical excipients.

- They may vary in size, shape, weight, hardness, thickness, disintegration, and dissolution characteristics and in other aspects, depending on their intended use and method of manufacture.

- Most tablets are used in the oral administration of drugs.
- Many of these are prepared with colorants and coatings of various types.

- Other tablets, such as those administered sublingually or buccally are prepared to have features most applicable to their particular route of administration.

Tablets Absorption



Advantages of Tablet Dosage Form

1. Unit dosage forms (high dose precision with low content variability).
2. The lowest in cost (for the patients).
3. Easy to swallow.
4. Convenient (light to be carried by the patient).
5. The easiest and cheapest to package and ship.

Advantages of Tablet Dosage Form

6. Suitable for large scale production.
7. Easily identifiable.
8. Could be formulated enteric or delayed-release to ensure special release profiles.
9. Could be formulated as coated tablets to mask bad odor or taste.
10. Good mechanical, chemical and microbiological stability.

Disadvantages of Tablet Dosage Form

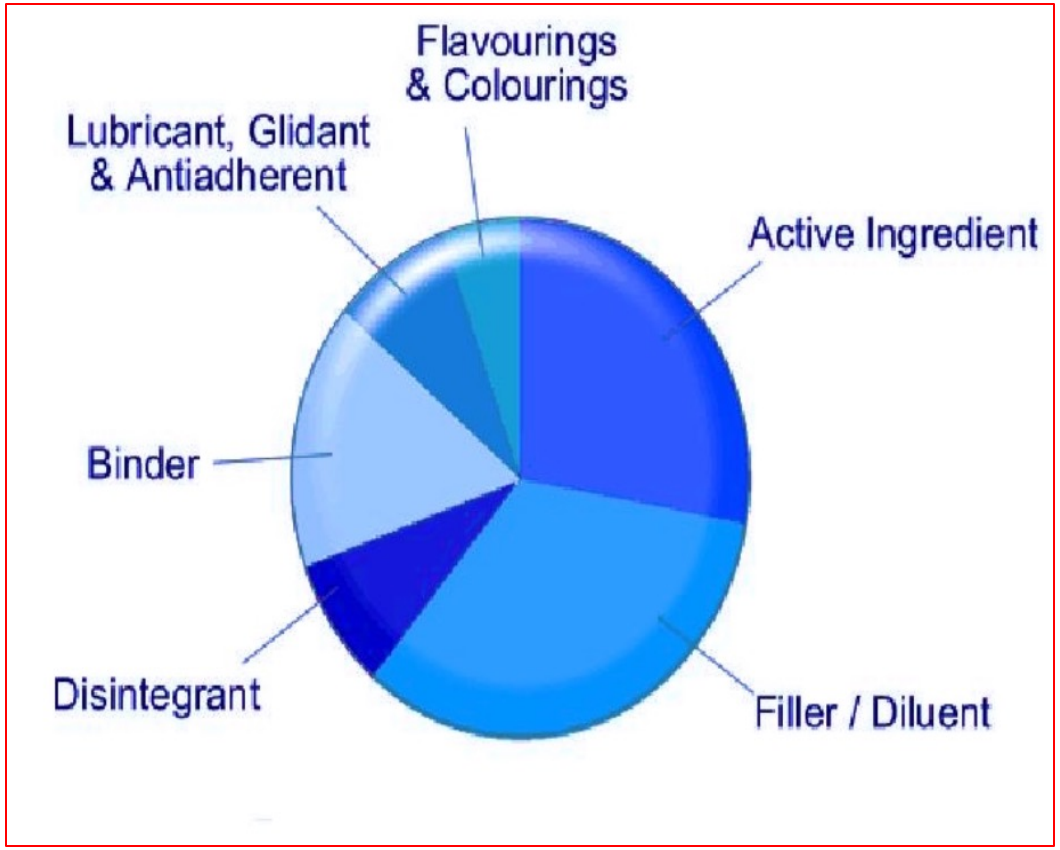
1. Can not be used for children and unconscious patients.
2. Some drugs resist compression into dense compact (due to their amorphous nature).
3. Drugs with poor wetting or slow dissolution properties are difficult or impossible to be formulated as tablet.
4. Bitter testing drugs, drugs with an objectionable odor or drugs that are sensitive to oxygen may require encapsulation or coating.

Tablet Ingredients

- Tablets usually contain materials in addition to the active ingredient.
- All "nondrug" materials of the formula are called excipients.

•Excipients are necessary for the following reasons:

- Some drugs have small doses that cannot be compressed alone, e.g., Digoxin 0.25 mg.
- Some drugs have poor compressibility and flowability that cannot be compressed alone.
- If the tablets are compressed alone, they will not disintegrate **or** disintegrate very slowly.



Diluents

- **Diluent or bulking agent:** to increase weight and improve content uniformity (act as fillers).
- Diluents are materials used to make up the required bulk of the tablet when the drug itself is inadequate to provide this bulk.
- Examples are: Lactose, Starch, and Mannitol.

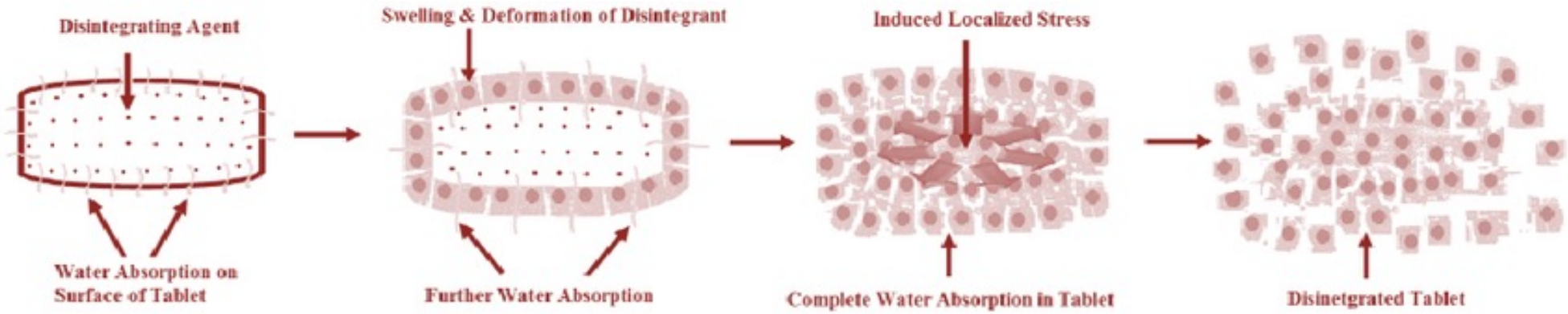
- **Lactose** is The most widely used diluent in tablet formulation that has no reaction with most drugs.

Binders

- **Binder:** binds all the powder together to make it as a cohesive paste.
- Examples are: PVP, acacia, starch
- **Starch:** One of the most commonly used granulating agents (binder). It is prepared by dispersing starch into water which is then heated for certain time. A properly made paste is translucent rather than clear.
- Amount of starch used: it is used as **diluent** in the ratio of 50-60%, **binder** in the ratio of 2-10% and **disintegrant** in the ratio of 5-20%.

Disintegrant or disintegrating agent

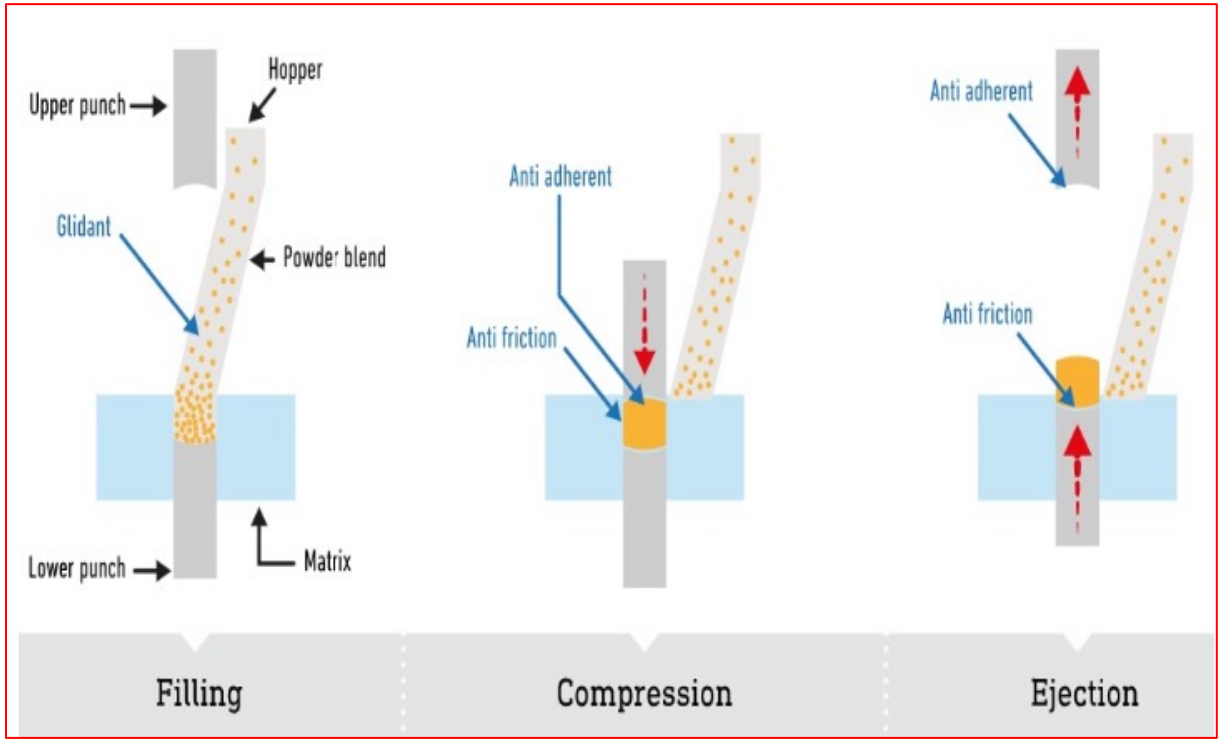
- Helps the tablet to break up and dissolve to release the medicament.
- https://youtu.be/s5aGmUQIzSs
- Examples are: Starch, cellulose derivatives, avicel pH 101, 102, Crosspovidone and Croscarmellose.
- It's absorb water and swell thus increase the internal pressure of tablet then rupture of tablet into small granules.



Lubricants and Glidants

- **Lubricants:** reduces the friction between the particles and the stickiness of the tablet to the die.
- Examples are: Stearic acid and its derivatives.

- **Glidant:** promotes the flowability of the powder by reducing the friction between the particles themselves
- Examples are: Silica derivatives such as Talc.



Other Tablet Ingredients

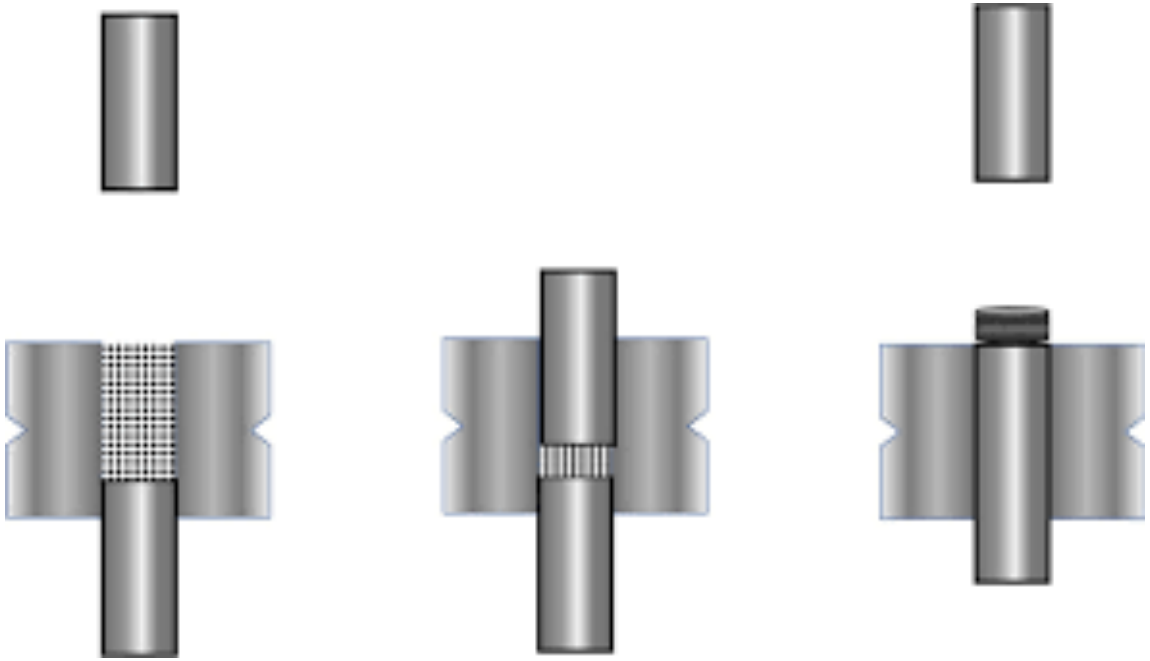
- **Other ingredients:** dyes, flavors, sweetening agents, adsorbents, and buffers are sometimes needed in tablet formulation. e.g. mannitol and artificial sweetener.

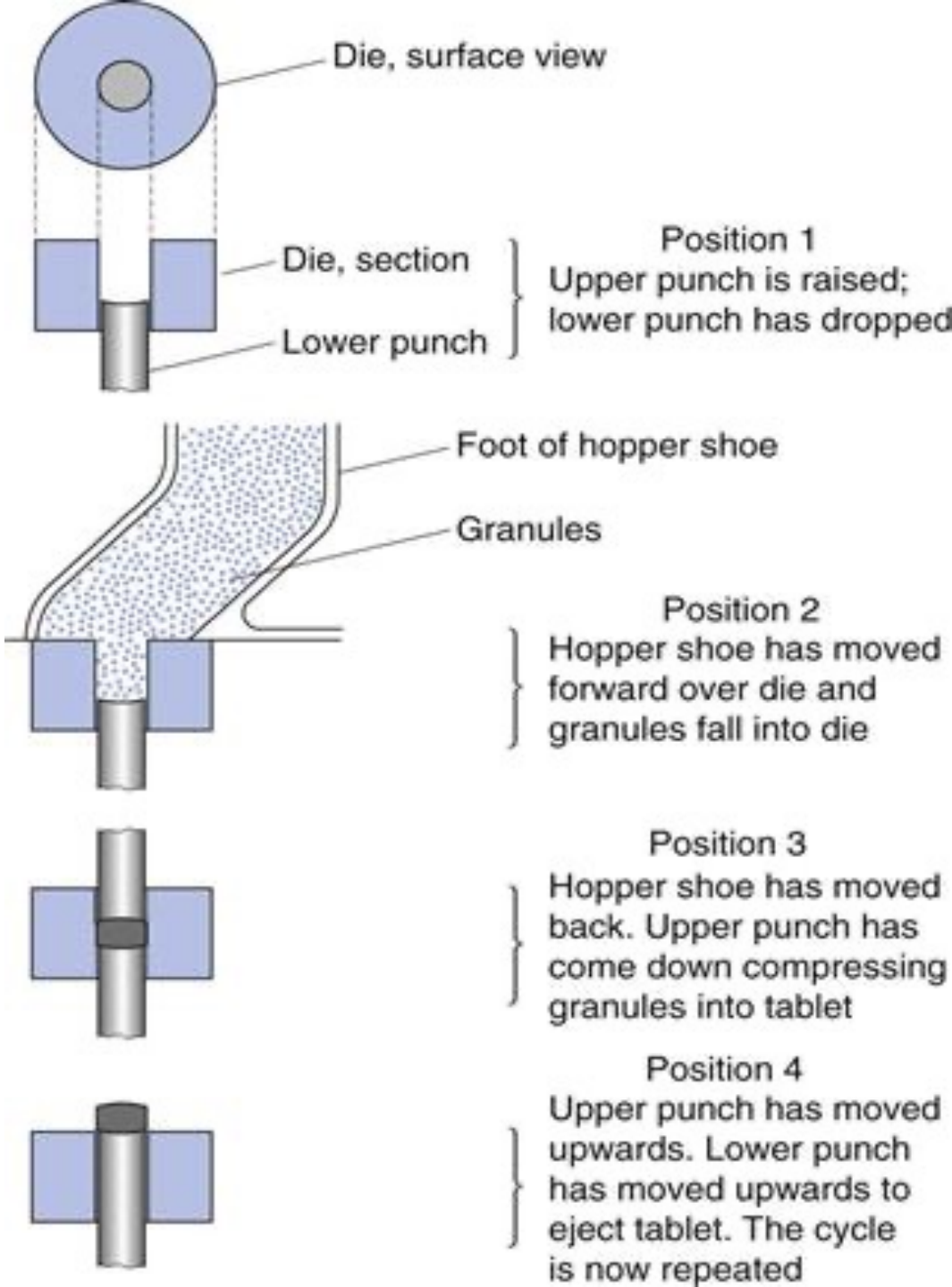
- We can use direct compression when we have a drug with poor compressibility by adding a diluent having good compressibility (70% diluent & 30% drug) but this is not an ideal technique.

- Ideally: all the ingredients should have good compressibility.

Types of Compression Machines

Parts of Tablet Machine





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