Suppositories

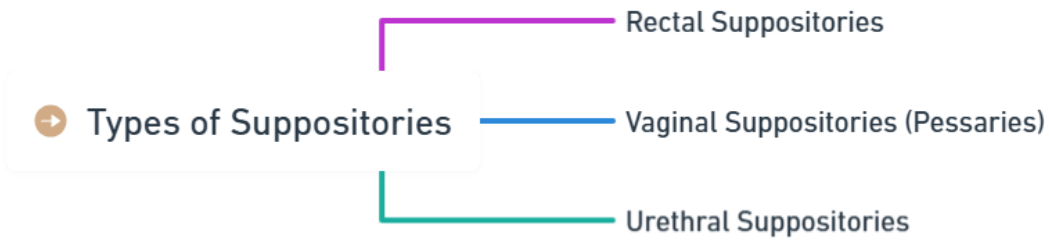
Suppositories

Definition

- Suppositories are solid dosage forms intended for insertion into body cavities, such as the rectum, vagina, or urethra, where they melt, soften, or dissolve to release the active pharmaceutical ingredient(s).
- Suppositories are typically made from a base material that is either lipophilic (fat-soluble) or hydrophilic (water-soluble).



Types of suppositories:



1. Rectal Suppositories

- These are the most common type of suppositories and are intended for insertion into the rectum.
- They are usually cone- or torpedo-shaped and are used for local or systemic drug delivery.

2. Vaginal Suppositories (Pessaries)

- These suppositories are inserted into the vagina and used to treat local infections or to deliver hormones for contraceptive purposes.
- They are usually oval or globular in shape.

Copyright © 2025 by Engacy Learning Private Limited. All rights reserved. Reproduction or distribution without written consent is strictly prohibited.

3. **Urethral Suppositories**
   - These are less common and are intended for insertion into the male or female urethra.
   - They are typically used for local anaesthesia or the treatment of erectile dysfunction.

Advantages of suppositories:

1. **Bypass first-pass metabolism:**
   - Drugs administered via suppositories can avoid first-pass metabolism in the liver, which may improve bioavailability for certain drugs.
2. **Alternative route for patients with difficulty swallowing:**
   - Suppositories are useful for patients who have difficulty swallowing oral medications, such as young children, the elderly, or those with swallowing disorders.
3. **Suitable for unconscious or nauseous patients:**
   - Suppositories can be administered to patients who are unconscious or experiencing nausea and vomiting, making them a practical alternative to oral medications.
4. **Local treatment:**
   - Suppositories can deliver drugs directly to the site of action for local treatment, such as treating haemorrhoids or vaginal infections.

Disadvantages of suppositories:

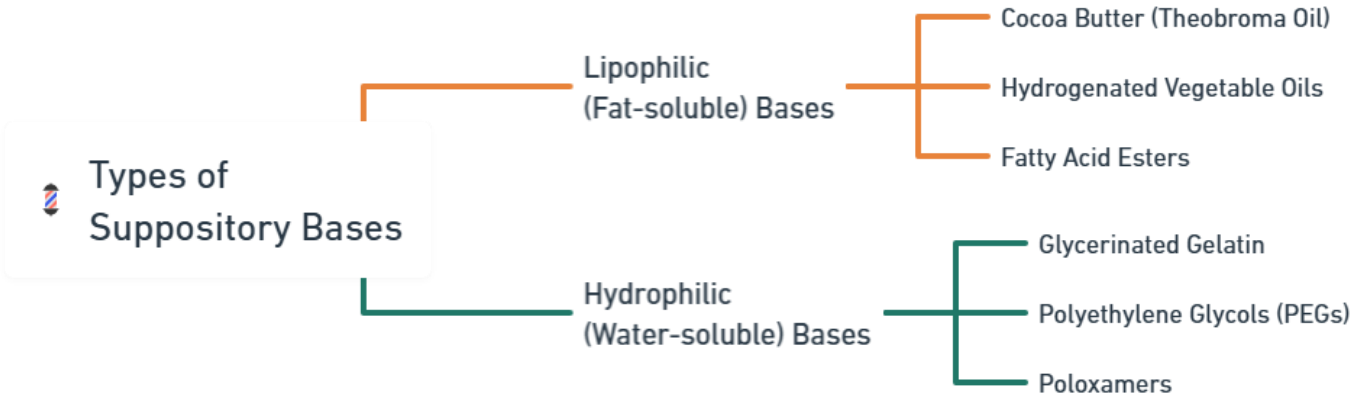
1. **Patient acceptability:**
   - Some patients may be reluctant to use suppositories due to the invasive nature of the administration route or cultural factors.
2. **Limited drug absorption:**
   - The absorption of certain drugs may be limited or erratic in the rectal or vaginal mucosa, which can affect their efficacy.
3. **Melting and leakage:**
   - Suppositories can melt or leak at body temperature, causing discomfort and messiness.
4. **Incompatibility with certain drugs:**
   - Some drugs may be incompatible with suppository bases or may have poor stability at the melting point of the base.

Types of Suppository bases

- Suppository bases are vehicles that carry the active ingredients in suppositories.

Copyright © 2025 by Engacy Learning Private Limited. All rights reserved. Reproduction or distribution without written consent is strictly prohibited.

- They are classified into two main categories: **lipophilic (fat-soluble)** and **hydrophilic (water-soluble)**.
- The choice of base depends on factors such as drug solubility, stability, and release characteristics.



1. Lipophilic Bases

A. Cocoa Butter (Theobroma Oil)

- A natural fat from cocoa beans, widely used in suppositories.
- Melts at 34-36°C, just below body temperature, releasing the drug upon insertion.
- Primarily used for rectal suppositories, but also suitable for vaginal use.

B. Hydrogenated Vegetable Oils

- Examples: palm kernel oil, cottonseed oil.
- Similar melting points to cocoa butter but may offer better stability and drug compatibility.

C. Fatty Acid Esters

- Examples: glyceryl monostearate, glyceryl monopalmitate.
- Synthetic bases with varying melting points, chosen for specific drug release profiles.

2. Hydrophilic Bases

A. Glycerinated Gelatin

- A mixture of gelatin and glycerin (1:2 ratio).
- Absorbs water, swells, and releases the drug.
- Suitable for vaginal and urethral suppositories.

B. Polyethylene Glycols (PEGs)

- Water-soluble polymers available in various molecular weights.
- Dissolve or erode in body fluids, releasing the drug.
- Used for flexible control of melting point and drug release.

Copyright © 2025 by Engacy Learning Private Limited. All rights reserved. Reproduction or distribution without written consent is strictly prohibited.

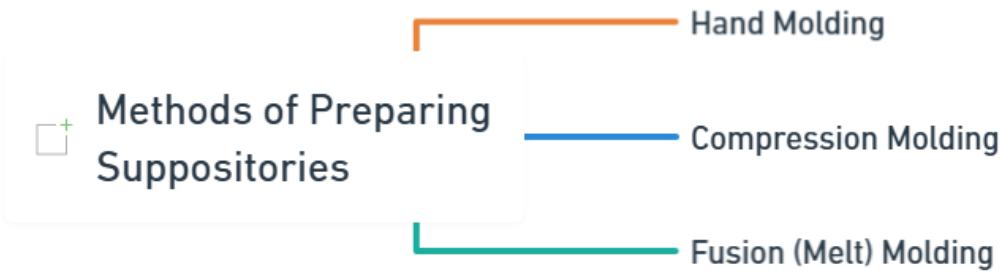
C. Poloxamers

- Nonionic surfactants with thermoreversible gelation (gel at body temperature).
- High water content, ideal for vaginal or rectal use.

Methods of preparations suppositories

- Several methods exist for preparing suppositories, each with pros and cons.
- The choice of method depends on factors like the base type, drug solubility, stability, and available equipment.

Below are the main methods:



1. Hand Molding

- Used for small-scale preparation in pharmacy settings.
- Involves manually shaping the suppository.

Steps:

- Melt the suppository base in a water bath.
- Mix in the active ingredient evenly.
- Let the mixture cool to a moldable consistency.
- Shape the suppository manually using a spatula or mold.
- Allow to harden before packaging or use.

2. Compression Molding

- Ideal for large-scale production and works with both lipophilic and hydrophilic bases.
- Involves compressing the mixture into molds using a machine.

Steps:

- Mix the active ingredient with the suppository base in powder or granule form.
- Load the mixture into a compression machine.
- Compress the mixture into molds.
- Remove and package the suppositories.

Copyright © 2025 by Engacy Learning Private Limited. All rights reserved. Reproduction or distribution without written consent is strictly prohibited.

3. Fusion (Melt) Molding

- The most common method, suitable for lipophilic bases.
- Involves pouring molten mixture into molds.

Steps:

- Melt the suppository base.
- Incorporate the active ingredient evenly.
- Pour the molten mixture into a mold, avoiding air bubbles.
- Allow to cool and harden.
- Remove from the mold and package.

Displacement value & its calculations

- Displacement value (D.V.) is a crucial concept in the preparation of suppositories, particularly when using the fusion molding method.
- It helps determine the amount of suppository base required to incorporate a specific amount of active pharmaceutical ingredient (API) while maintaining the desired weight of the suppository.

Key Concepts:

- **Displacement Value (D.V.)**: The amount of suppository base displaced by a given amount of API.
- It ensures proper dosage and uniformity in prepared suppositories.

Importance of Displacement Value:

- The displacement value is essential for:
  - Calculating the correct amount of suppository base needed.
  - Maintaining the intended weight and dosage of each suppository.
  - Ensuring uniformity across all suppositories.

Calculating the Displacement Value (D.V.):

Formula:

$$\text{D.V.} = \frac{\text{Weight of base displaced by the API (B)}}{\text{Weight of API in each suppository (A)}}$$

Information Needed:

1. **Desired weight of each suppository** (W)
2. **Weight of API in each suppository** (A)

Copyright © 2025 by Engacy Learning Private Limited. All rights reserved. Reproduction or distribution without written consent is strictly prohibited.

First Hope

FREE PREVIEW

Click here to visit our website

PHARMACY PREMIUM NOTES

Complete subject and semesters are available on FirstHope app only.

Scan or click here

Click here to get the app >

Available on Google Play

JOIN THE FIRSTHOPE COMMUNITY

Join our Telegram channel

Click here to join Telegram >

Scan or click here

@FirstHopeNotes

Instagram

@firsthope.official

Click here to follow >

YouTube channel

FirstHope-Pharmacy / Live streams

Click here to watch >

WhatsApp channel

Follow FirstHope on WhatsApp

Click here to join >

FirstHope website

firsthope.co.in

Click here to visit >

B.Pharm / D.Pharm / M.Pharm / Pharm.D

Preview notes. Complete subjects and semesters in the FirstHope app.