Ointments

Definition:

"Semi-solid preparations intended for skin application are referred to as ointments."

Types of Ointments

- Medicated ointments
- Non-medicated ointments

Medicated ointments

Ointments contain a medicament that is either dissolved or dispersed within the vehicle as fine or micronized powders. For example, Gentamicin ointment is a type of ointment.

Non medicated ointments

Medicated ointments can be prepared using these semi-solid preparations as a vehicle, or they can be used for their physical effects. For instance, soft paraffin is an example of such a preparation.

Properties of ideal ointments

Ideal ointments are non-sensitizing, non-irritating, pharmaceutically elegant, release the medicament effectively at the site of application, and are water-washable.

Ointment Bases

The United States Pharmacopeia (USP) generally classifies ointment bases into four groups, including

- oleaginous bases
- absorption bases
- water-removable bases
- water-soluble bases

1)Oleaginous bases

Hydrocarbon bases are also referred to as oleaginous bases.

On application to the skin

emollient effect

occlusive dressings

protect against the escape of moisture

Examples of Oleaginous Bases

Petrolatum (USP) is a purified mixture of semisolid hydrocarbons obtained from petroleum, with Vaseline being one example of a commercial product that utilizes this substance.

White Petrolatum (USP) is a purified mixture of semisolid hydrocarbons obtained from petroleum that has been entirely or nearly decolorized.

Yellow ointment (USP) is a mixture of 50g of yellow wax and 950g of petrolatum, totaling 1000g.

White ointment (USP) is similar to yellow ointment in formula, but instead utilizes white wax and white petrolatum as substitutes.

2) Absorption bases

Absorption bases are classified into two types: those that allow for the incorporation of aqueous solutions, resulting in the formation of water-in-oil emulsions (such as hydrophilic petrolatum), and those that are water-in-oil emulsions and permit the incorporation of additional quantities of aqueous solutions (such as Lanolin).

Examples of Absorption bases

a) Hydrophilic petrolatum

Hydrophilic petrolatum, USP has the following formula for the preparation of 1000 g:

Cholesterol	30 g
Stearyl alcohol	30 g
White wax	80 g
White petrolatum	860 g

b) Lanolin

- obtained from the wool of sheep;
- is a purified, wax-like substance that has been cleaned, deodorized, and decolorized.

3) Water-removable bases

Water-removable bases are oil-in-water emulsions that appear similar to creams. Due to their aqueous external phase, they are simple to wash off of the skin and are often referred to as "water-washable" bases. Water or aqueous solutions, such as hydrophilic ointment, may be used to dilute them.

4) Water-soluble bases

Water-soluble bases do not contain oleaginous components and are entirely water-washable, often referred to as "greaseless." However, due to the significant softening that occurs with the addition of water, large quantities of aqueous solutions cannot be effectively incorporated into these bases. Water-soluble bases are primarily used for the inclusion of solid substances, such as certain medications.

Polyethylene glycol ointment

Selection of appropriate Base

The key factors to consider when utilizing ointments include the rate of release, the absorption of drugs via topical or percutaneous means, occlusion, drug stability, how the drug interacts with the ointment base, the ease of removal, and the characteristics of the surface where the ointment will be applied.

Preparation of ointments

Ointments are prepared by two general methods:

- Incorporation
- Fusion

Incorporation

During the incorporation method, components are mixed until a uniform preparation is achieved.

Incorporation of solids:

To utilize the incorporation method, the ointment base is applied to one side of the working surface, while the powdered components are placed on the opposite side. The powdered components have been previously reduced to fine powders and thoroughly blended in a mortar.

Incorporation of solids

Typically, the drug (represented by the pink powder) is the lesser of the two components in terms of quantity.

Add an amount of ointment that is roughly equivalent in size to the quantity of the drug.

Incorporation of solids

- Spatulate the mixture.

Keep adding the ointment until all of it has been used, while spatulating after each addition.

Incorporation of Liquids

Before adding liquid substances to an ointment, it is necessary to evaluate the base's ability to accommodate the required volume.

While only small amounts of aqueous solutions can be incorporated into an oleaginous ointment, hydrophilic ointment bases are better suited to accept aqueous solutions.

To incorporate an aqueous preparation into a hydrophobic base, the aqueous solution must first be added to a small quantity of a hydrophilic base.

The resulting mixture is then added to the hydrophobic base.

Fusion Method

Fusion is the process of liquefying or melting substances by applying heat.
During the fusion method, some or all of the ointment components are melted together and cooled with constant stirring until congealed.
When adding heat labile substances, it is best to do so last, when the mixture's temperature has cooled enough to prevent ingredient decomposition.

Fusion Method:

For small-scale processes, the fusion method is conducted using a porcelain dish or glass beaker. Large-scale processes are conducted in large steam-jacketed kettles.

After congealing, the ointment may be passed through an ointment mill (in large scale production), or it may be rubbed with a spatula or mortar in small scale production to ensure a uniform texture.

Packaging, storage, and labeling

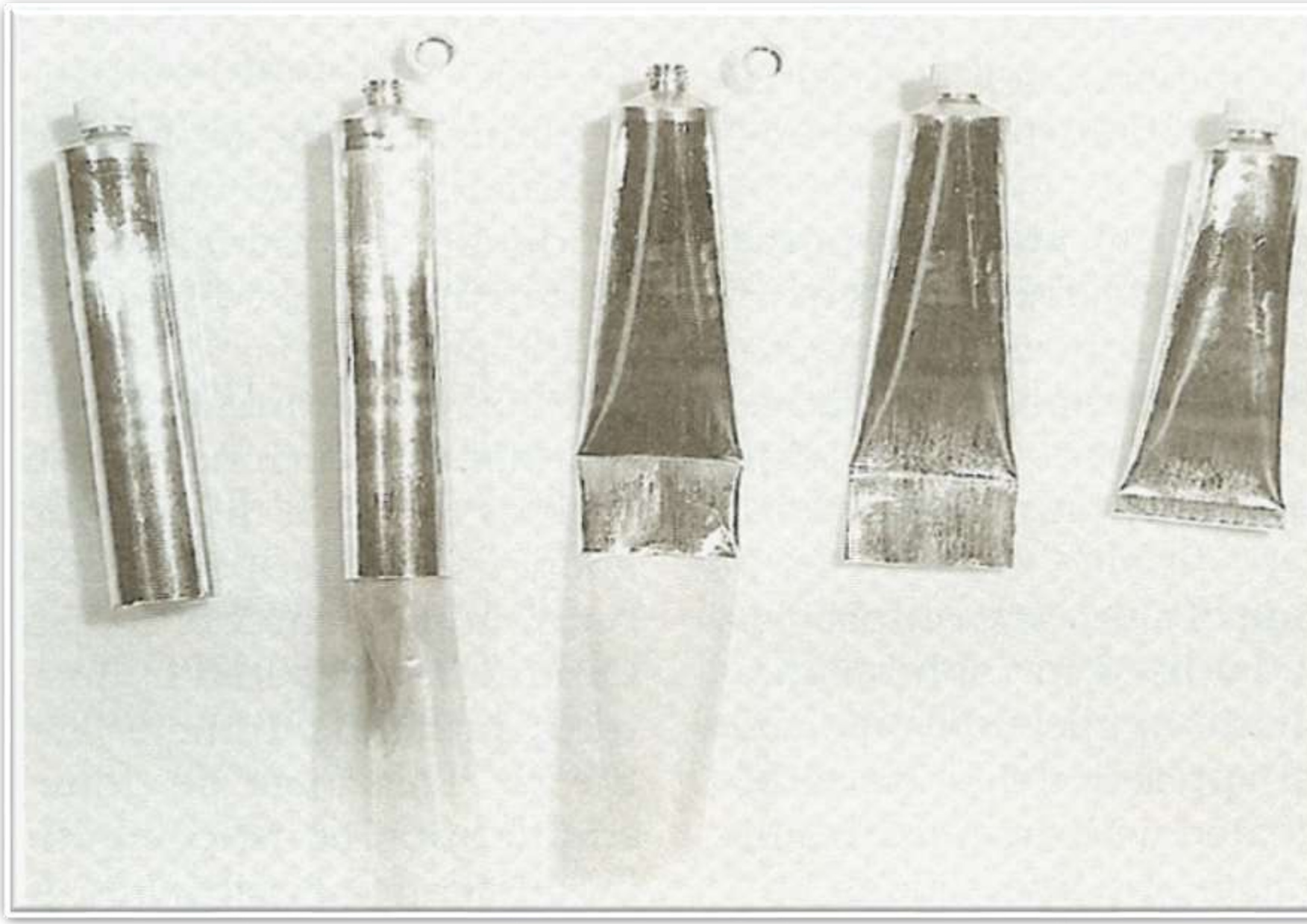
Ointments can be packaged in large-mouth jars or metal and plastic tubes.

It is important to store them in well-closed containers to guard against contamination and in cool places to prevent separation due to heat.

Light-sensitive preparations require packaging in light-resistant containers.

Additionally, as with other pharmaceutical products, ointments must meet standard labeling requirements.

The USP specifies that certain ointments and creams must include labeling that identifies the type of base used, such as water-soluble or water-insoluble.



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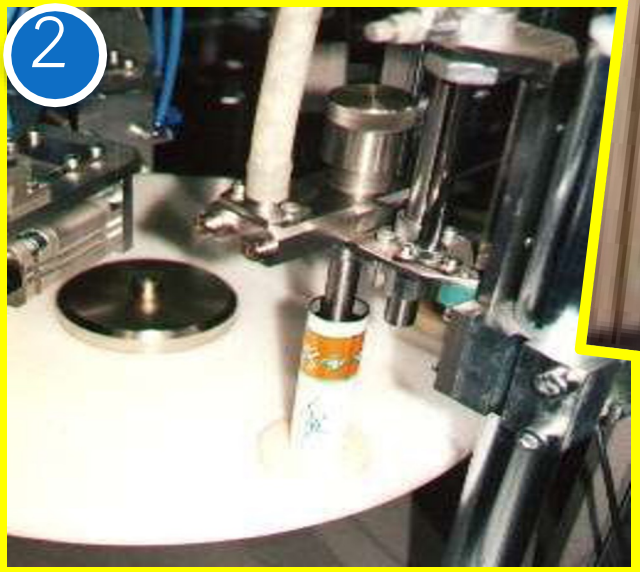

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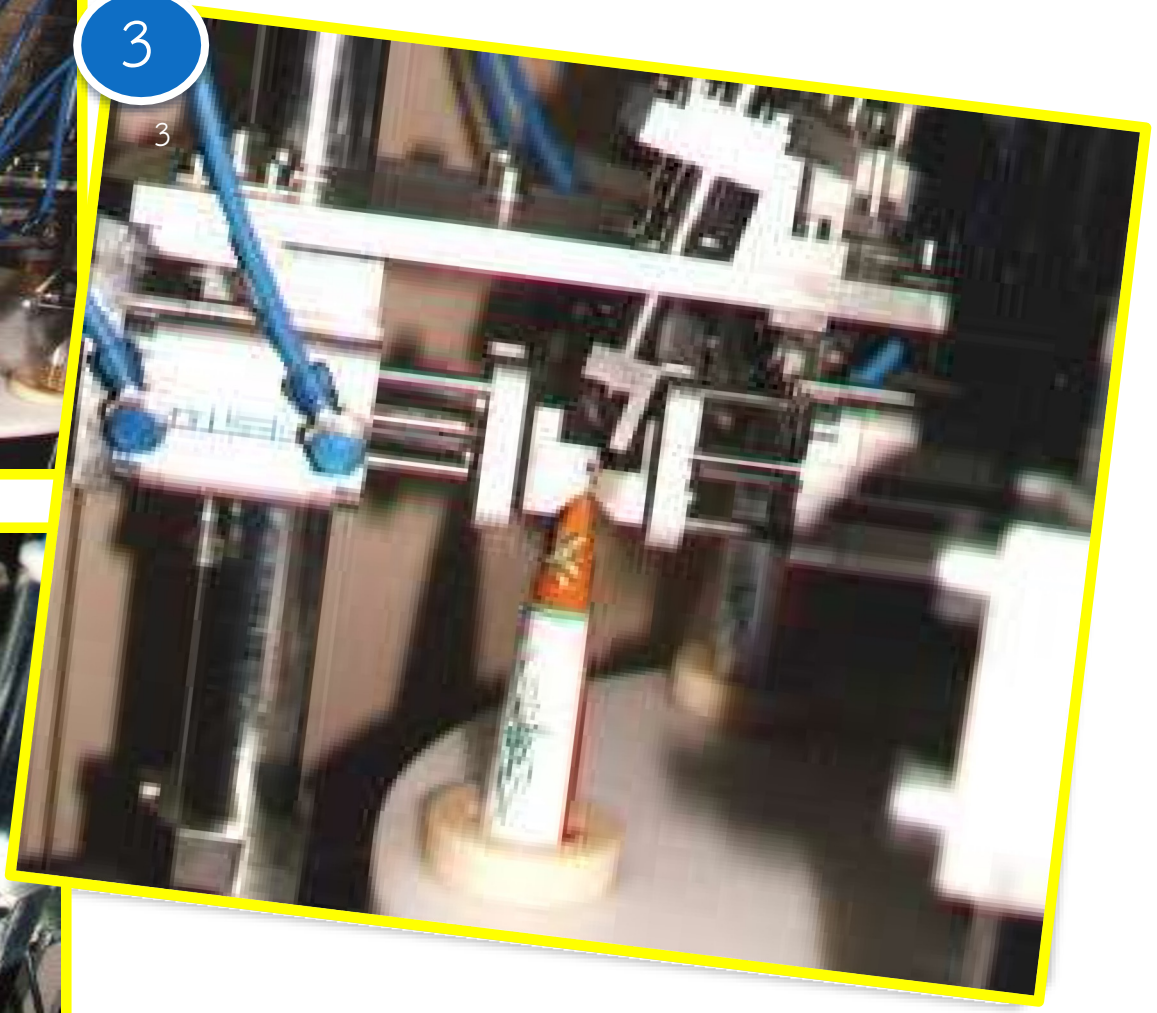

Pharmaceutical Creams:

Creams are semisolid preparations that contain one or more medical agents either dissolved or dispersed in an oil-in-water emulsion or another water-washable base. Compared to ointments, many patients and physicians prefer creams because they are easier to spread and remove.

Ointment VS Cream

Ointments

- Contains more than 50% hydrocarbons and less than 20% water.
- Thicker consistency, greasy. difficult to spread over large areas of the skin.
- Stay longer on the surface of skin, prescribed for dry skin, keeps moisture for a longer period.

Creams

- Contains less than 50% hydrocarbons and more than 20% water.
- o/w or w/o type emulsion.
- Lighter in consistency, easy to spread over large areas.
- Due to high water content, skin dry up faster. Better for greasy/oily skin.