

**PHB**



**Dr. Arvind Kumar Gupta**  
(M.Pharm, PDCR, PGDMM & Ph.D)  
GATE 2003 Qualified with 97.2 percentile  
Dr. S. N. Dev College of Pharmacy  
Shamli (U.P.)

**OFFICE:** BUILDING No. 3/314, OFFICE-1, GAUSHALA ROAD, SHAMLI DISTRICT SHAMLI (U.P.) – 247776

**Mobile:** +91-9719638415

**Email:** arindrkgit@gmail.com

**Course Name : D. Pharm**  
**Year : First Year**  
**Subject Name : Pharmaceutics**  
**Topic Name : Ointments**

Pharmaceutical ointments are semisolid systems that are applied externally, primarily to the skin and also to mucous membranes. Ointments are semisolid preparation intended for application to the skin with or without inunction. they may be oleaginous e.g., white ointment; they may be entirely free of oleaginous substances e.g., polyethylene glycol ointment, or they may be emulsions of fatty or wax like material containing relatively high proportion of water e.g., hydrophilic ointment.”

**Ideal properties of topical ointment:**

- Should be inert, compatible
- should not retard wound healing
- release the medicament efficiently at the site of application
- non-dehydrating, non-greasy and neutral in reaction
- compatible with common medicaments
- have minimum number of ingredients
- easy to compound and remain stable on storage
- economic and easy to transport

**Classification of Topical medications:**

1. Topical solution
2. Lotion
3. Shake lotion
4. Cream
5. Ointment
6. Gel

**Factors affecting topical absorption of drugs:**

1. Lipid water solubility
2. Concentration
3. Duration of contact
4. Solubility of medication
5. Physical condition of the skin
6. Part of the body exposed including the amount of hair on the skin
7. Nature of the skin
8. Nature of the pharmaceutical product
9. Drug mixing and drug storage

## SELECTION OF THE BASE:

Selection of the base to use in the formulation of an ointment depends on careful assessment of a number of factors, including the following:

1. Desired release rate of the drug substance from the ointment base
2. Desirability of topical or percutaneous drug absorption
3. Desirability of occlusion of moisture from the skin
4. Stability of the drug in the ointment base
5. Effect, if any, of the drug on the consistency or other features of the ointment base
6. Desire for a base easily removed by washing with water
7. Characteristics of the surface to which it is applied

## BASES OF OINTMENT:

**1. Oleaginous bases:** these bases consist of water insoluble, hydrocarbons vegetable oil, animal fats and waxes. The constituents of hydrocarbons bases are soft paraffin, hard paraffin and liquid paraffin. The base is liquefied over low heat (not to exceed 70°C) and then the drug is added to the molten base. The mixing ingredients is then allowed to cool with occasional stirring.

### Type of oleaginous base:

- Hydrocarbons
- Vegetable oils and animal fats
- Hydrogenated and sulphated oils
- Alcohols, acid and esters
- Silicones

**2. Absorption bases:** An absorption base is an oleaginous base that contains a w/o emulsifying agent. When water is taken up into the base, it will form a w/o emulsion. Absorption bases typically can incorporate about 50% of their volume in water. Water soluble ingredients can be added to the water phase of the w/o emulsion.

### Types of absorption base:

- Cholesterol
- Cottonseed oil
- White petrolatum

**3. Emulsion bases:** these type bases are two type-o/w and w/o.

- **O/W Emulsion Bases:**
- **W/O Emulsion Bases:**

**4. Water-soluble bases:** Water soluble drugs can be dissolved in a small quantity of water and incorporated using a pill tile and spatula. Oils can be added into these bases by first mixing the oil with glycerin or propylene glycol, and then incorporating the mixture into the base. Heat may be necessary if the quantity of liquid to add to the base is large.

**Types of water-soluble base:**

- Glyceryl monostearate (GMS)
- Cellulose derivatives
- Sodium alginate
- Bentonite
- Carbopol 934

**Physical method of topical drug delivery for ointments:**

**1. Intophoresis:**

This method involving the transport of ionic, charged molecules into a tissue by the passage of direct or periodic electric current through an electrolyte solution containing the ionic molecules to be delivered use an appropriate electrode polarity.

**2. Electroporation:**

This method in process involves the application of transient high voltage electrical pulse to cause rapid dissociation of the stratum corneum through which large and undersized peptides, oligonucleotides and supplementary drugs can exceed in considerable amounts.

**3. Sonophoresis:**

Sonophoresis method in the use of the regularity ultrasound waves.

**4. Phonophoresis:**

This method in movement of drugs through living intact skin and into soft tissues under the ultrasound perturbation is called phonophoresis.

**5. Vesicular concept:**

This method in drug close in vesicle made from phospholipids and nonionic surfactants are used for transport of drug into and across the skin.

**6. Microfabricated microneedles method:**

This technology employed micron-sized needles made silicon. These microneedles after incorporation into the skin create conduits for transfer of drug through the stratum corneum.

## **PREPARATION OF THE OINTMENTS:**

Two type of method for preparation of ointments. Mechanical method and Fusion method.

**1. Mechanical method:** The quantity of ointment is not more than 50 g, white porcelain or marble ointment should be used in conjunction with a flexible steel spatula. A steel spatula should not be used as medicament may react with the metal. the substance reacts with metal such as mercury compounds, tannic acid, salicylic acid and iodine.

**2. Fusion method:** Ointment containing hard paraffin, beeswax, emulsified wax, wool alcohol are prepared by melting ingredients in a porcelain dish over a water bath. In this process higher melting point substance should be melted first and add then other ingredients of the bases in order of their melting point.

**Factors governing selection of the ointment base:** two type factors governing selection of the ointment base. dermatological factors and pharmaceutical factors.

**A. Dermatological factors:** dermatological factors are sub divided.

1. Absorption and penetration.
2. Effect on skin function.
3. Miscibility with skin secretion and serum.
4. Compatibility with skin secretions.
5. Irritant effect.
6. Emollient properties.
7. Removal.

**B. Pharmaceutical factors:**

1. Stability.
2. Solvent properties.
3. Emulsifying properties.
4. Consistency.

## **Evaluation method of ointments:**

- Organoleptic properties
- pH
- Drug content
- Spreadibility
- Consistency of an ointment
- Stability study
- Tube extrudability
- Viscosity
- In-vitro drug release