



CODEN [USA]: IAJPBB

ISSN : 2349-7750

**INDO AMERICAN JOURNAL OF  
PHARMACEUTICAL SCIENCES**

SJIF Impact Factor: 7.187

<https://doi.org/10.5281/zenodo.8018250>Available online at: <http://www.iajps.com>

Review Article

**TOPICAL CREAM: AS A DRUG DELIVERY SYSTEM****Mortate Pragati\*<sup>1</sup>, Fugate Ajay<sup>1</sup>, Sameer Shafi<sup>1</sup>.**Shivlingeshwar College of Pharmacy, Almala Dist. Latur-413520,  
Maharashtra (MH), India.**Abstract:**

*Creams are considered an important part of ornamental product as topical medications from time immemorial due to their ease of operation to the skin and also their junking. From ornamental purposes, Pharmaceutical creams have a variety of operations similar as sanctification, beautifying, altering appearance, moisturizing etc. to skin protection against bacterial, fungal infections as well as mending cuts, becks, injuries on the skin. These semi solid medications are safe to use by the public and society. Skin care products are extensively available and play an important part in health and nursing care. The emphasis on skin care is shifting as people get aged. Soothing, restoring, and buttressing come more important, and sanctification should be done with caution. As people get aged, their skin's structure and function change, making them more vulnerable to a variety of clinically applicable skin problems. It distributed under the pharmaceutical product and is prepared by colourful ways which are developed by the pharmaceutical assiduity, are by mixing the two- phase (O & W) phase to form a cream after that estimated by using a colourful evaluation processing. of pH, density, spread ability, stability study.*

**Corresponding author:****Mortate Pragati Raghunath,**

Shivlingeshwar College of Pharmacy, Almala

Dist. Latur-413520, Maharashtra (MH), India.

**Email ID:** - [mortatepragati@gmail.com](mailto:mortatepragati@gmail.com)**Mobile No:** - 7057058139

QR code

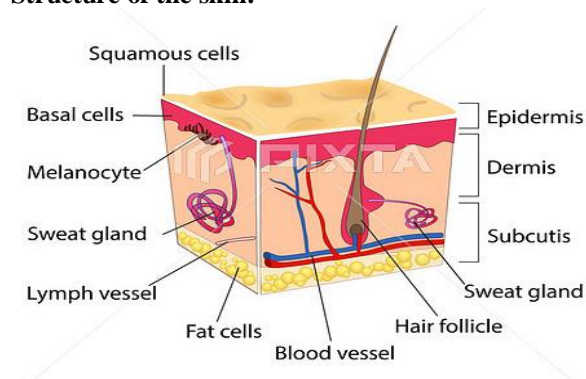


Please cite this article in press Mortate Pragati Raghunath et al., *Topical Cream: As A Drug Delivery System.*, Indo Am. J. P. Sci, 2023; 10(05).

## INTRODUCTION:

Topical medications that will be applied to the skin are called creams." Liquid or semi-solid thick mixes with varying thickness depending on the oil painting and water on the idea of way, the creams could also be prioritized in the form of o/ w or no/ o mixes. Skin cream is the age-old necessity of humanity. This necessity leads to the nonstop revision and invention of further and further skin care ornamental medications. The function of a skin cream is to cover the skin against harshness from the terrain and any dry conditions of the skin. A skin cream should prop the skin in carrying out its normal functions, that is, restoring humidity to dry skin, allowing the elimination of waste matter through the pores, and the cooling of the body by evaporation of water (perspiration) and radiation, therefore abetting in the conservation of the normal body temperature. Creams are circumfluous lozenge forms containing one or further medicine substances dissolved or dispersed in a suitable base. This term has traditionally been applied to semisolids that retain a fairly fluid thickness formulated as either water- in- oil painting (e.g., Cold Cream) or oil painting- in water (e.g., Fluocinolone Acetonide Cream) mixes.

### Structure of the skin:



The structure of the skin is presented in Figure 1. utmost of the target spots for topical skincare products are located at lower layers of skin, hence, these products need to be suitable to access through stratum corneum and to reach below. This is further complicated by the remaining layers of epidermis, which are hydrophilic in nature. Hence, if a substance is too lipophilic it might remain at stratum corneum, unfit to be distributed further into deeper layers of the skin. The medicine notes may still enter the skin via hair follicles, which by itself form a natural gap at stratum corneum subcase. Due to the limited face area of follicular route on skin, traditionally the follicular pathway wasn't considered as the main immersion pathway for transdermal medicines. still, newer

studies are now being carried out to review the significance and eventuality of this pathway.

Main factors affecting the substances' penetration includes the integrity of skin hedge, the opposition and molecular weight of the substance, and temperature of the penetration point. Increased skin hydration via perspiration or elevated moisture also enhances the penetration of medicines through transdermal route. The use of saturation enhancers may disrupt the integrity of skin hedge or increase hydration of the skin to ameliorate transdermal immersion. Due to the nature of stratum corneum and feasible epidermis, substances which parade both hydrophilic and hydrophobic characteristics may access better into the skin. Hence, a proper vehicle is generally used to endow similar parcels to the pharmacological agent. therefore, the solubility of the substance in vehicle, and the release rate of substance from the vehicle affects the transdermal immersion greatly. The colourful consistence of skin at different body spots, along with the number of follicles at different body corridor also affects the rate of immersion at the skin. Due to the complex nature of the skin, the development of topical products needs to factor I the point of operation, the biophysical parcels of the skin on that point, and the suitable vehicle or saturation enhancer compatible with the active constituents.

### TOPICAL DRUG DELIVERY

Over the last decades the treatment of illness has been fulfilled by presiding medicines to mortal body via colourful roots vicelike oral, sublingual, rectal, maternal, topical, inhalation etc. Topical delivery can be defined as the operation of a medicine containing expression to the skin to directly treat cutaneous complaint or the cutaneous instantiations of a general complaint (e.g. psoriasis) with the intent of containing the pharmacological or the effect of medicine to the face of the skin or within the skin circumfluous expression in all their diversity dominate the system for topical delivery, but lathers, spray, treated powers, results and indeed treated tenacious systems are in the use.

#### Advantages

- Avoidance of first pass metabolism.
- Accessible and easy to apply.
- Avoid of threat.
- nuisances of intravenous remedy and of the varied conditions of immersion like Ph changes presence of enzymes gastric evacuating time etc.
- Achievement of efficacy with lower total diurnal lozenge of medicine by nonstop medicine input.
- Avoid change of medicine situations inter - and interpatient variations.

**Disadvantages**

- Skin vexation of contact dermatitis may do due to the medicine and/ excipients
- Poor permeability of some medicines through the skin
- Possibility of antipathetic responses
- Can be used only for medicines which bear veritably small tube attention for action
- Enzyme in epidermis may denature the medicines
  - medicines of larger flyspeck size not easy to absorb through the skin.

**CLASSIFICATION OF CREAMS**

All the skin creams can be classified on different base

1. According to function. sanctification, foundation, massage, etc.
2. According to characteristics parcels. cold creams, evaporating creams, etc.
3. According to the nature or type of conflation.

Types of creams

according to function, characteristic parcels and type of conflation.

1. Make- up cream (o/ w conflation)

a) evaporating creams.

b) Foundation creams.

2. sanctification cream, sanctification milk, sanctifying embrocation (w/ o conflation). Winter cream (w/ o conflation)

a) Cold cream or moisturizing creams.

1. each- purpose cream and general creams.

2. Night cream and massage creams.

3. Skin defensive cream.

4. Hand and body creams.

1. Make- up cream- These are substantially o/ w type of conflation. It's cream- grounded product which leaves a smooth doused finish (either stain matte or luminous) on the skin. It nourishes skin and is principally sweat- resistant and creates a dewy-eyed lustre.

2.

• evaporating creams They're called evaporating creams because they feel to vanish when rubbed onto the skin. These phrasings are grounded on stearic acid. After operation, the cream leaves a dry but tacky residual film which also has a drying effect on the skin. Because of this reason, these are used particularly in hot climates which beget perspiration on the skin.

• Foundation creams These creams serve as a foundation base for make- up. It acts as a glutinous base for operation of make- up maquillas. They give emollient action and a defensive action against terrain to the skin which is neither too slithery nor too dry. It's multicoloured make up applied on the face to produce

an indeed, invariant colour analogous to the complexion, to cover excrescencies and to change the skin tones.

2. sanctifying creams These creams are used for body drawing purposes and it's used for particular hygiene and beautification which is important for cosmetics. sanctifying creams or poultices can be used for the junking of make- up, face grim, oil painting substantially from the face and neck.

3. Winter creams These are w/ o type of expression and in this expression oil painting content will be further than water content. These creams are substantially used for chapped and dry skin. Cold cream It's known as moisturizer or moisturizing cream. Cold cream must have an emollient action. It should produce a cooling sensation in use and the oil painting film on the skin should be nonocclusive.

4. All-purpose creams and general creams These creams are used more currently than ahead. These creams are kindly unctuous button-greasy type and can spread on the skin fluently. This can also be used as a night creams, nourishing creams, defensive creams for forestalment or relief of sunburns or for the treatment of planed skin areas.

5. Night cream or massage creams These creams are substantially used for the nourishing the skin or as a treatment to dry skin. Creams which are generally applied on skin and left for many or several hours over night are substantially known as night creams. Creams which acts as an emollient by rubbing the cream on the skin with massage is known as massage cream.

6. Skin defensive creams These creams are smooth, thick bodied creams formulated to give an unnoticeable, invariant defensive film hedge to the skin. It helps to maintain the hedge between the skin and pollutants that may irritate the skin (contact dermatitis and occupational dermatitis). Strengthens the natural parcels of the skin and maintains the balance of normal to combination skin.

7. Hand and body creams Hands are one of the first places to show signs of aging. We tend to wash our hand several times a day, stripping off humidity. Applying cream softens and protects the skin and it keeps the skin looks youngish. Since the skin on our triumphs and fritters needs oil painting to stay supple and to help it from chapping and cracking, it's sensible to use hand creams that puts plenitude of oil painting reverse in. It's used on the hands further than other corridor of the body.

## HERBAL OR PLANT MATERIALS

Human beings have been using herbs (plants) for different purposes like food, medicine, beautifying. In good old days many herbal and natural materials used to be employed for beauty treatment. Gradually with the advancement of science, readymade cosmetic preparations came into existence. Today variety of chemical substances of different origins are used in cosmetics. There is resurgence of use of herbal ingredients in creams.

### Evaluation parameters of creams :

**pH determination:** The pH of the cream can be determined using a sufficient quantum of the expression adulterated with a detergent in a teacup of the cream at room temperature.

**Physical appearance:** The cream's physical appearance is determined by its colour, roughness, and texture.

**Spread ability:** A needful quantum of sample is divided between two glass slides, and the slides are gladdened for 5 twinkles with a 100gm weight.

**density:** Viscometers can be used to determine the density of formulated creams.

Unity The unity of the expression was assessed visually and tactilely. junking the ease with which the creams applied could be removed was tested by washing the affected area with valve water.

**Type of smear:** The type of film or smear formed on the skin after operation of the cream was examined.

**Irritancy study:** vexation, erythema, and oedema were all examined, for regular intervals up to 24 hrs and reported.

**Stability study:** This study is performed on the prepared product as per the ICH guidelines.

**1. Agitation test:** - it is conducted with the help of a reciprocating shaker by placing the required quantity of non-aqueous cream container on shaker at room temperature for 24 hr. (60 cycle/ min) and observed signs of separation.

**2. Centrifugation test:** - it is conducted by placing the 5 g of non-aqueous cream in a centrifuge tube and centrifugation at 3500 rpm for 30 min. observed signs of separation

**3. Accelerated stability testing [13]:** -It was performed by observing the formulation at  $40^{\circ}\text{C} \pm 1^{\circ}\text{C}$  for 7 days. And the other two formulations at  $40^{\circ}\text{C} \pm 1^{\circ}\text{C}$  for 20 days at room and observed on 0th, 5th, 10th, 15th, and 20th days.

## MATERIAL AND METHODS :

Constituents used in cream -

The component used in the medication of cream are Water- it's a detergent to run other constituents of the cream. Water is an important and extensively used raw material and it's free of any poisons, adulterants, microbes, pathogens, etc.

**oil painting, fats, and waxes :** These are the essential constituents which are used for expression and evaluation of cream as an emulsifier( waxes), thickener( fats), and incensing agent, preservatives( oil painting) according to function canvases are two type mineral(e.g. – light liquid paraffin, heavy liquid paraffin, liquid petroleum) and glyceride( almond oil painting, Arachis oil painting, castor oil painting, coconut oil painting).

**Vegetable oil:** painting it works as a hedge to obviate the water loss of the skin. it also is used to increase the consistence of the liquid and oil painting phrasemes. - almond oil painting, origin oil painting, avocado oil painting, sunflower oil painting, etc.

**Waxes: it's** used in the medication of creaming. - carnauba wax, ceresin, spermaceti, etc.

**Fats:** colourful types of fats are listed for the expression of cream which is available from colourful sources like shops or minerals, creatures' origin. glyceride canvases and fats are conforming of an admixture of advanced adipose acids and glycerine. These combination form cleaner, or adipose acid (lauric, margaric, palmitic, stearic, are impregnated group, and oleic acid unsaturated group) and glycerine, after saponification by using a different process.

**Lanolin:** Lanolin act as a lubricant, which gives skin appearance smooth. It's distributed into two types- 1) hydrous lanolin contains between 25- 30 water, and 2) anhydrous lanolin has a point of  $380^{\circ}\text{C}$ -  $420^{\circ}\text{C}$  and has a slight odor.

**Colours-** colour are the element that makes the cream's physical appearance good. It attained from natural sources as well as synthetically made in a laboratory.

**Emollients-** emollient act as a moisturizing agent and helps to soften skin or to treat skin that becomes dry. It helps to skin with water loss, and slick the skin.

**Humectants-** these are the multifunctional component of the cream. It acts as a moisturizing, slipping agenting. - glycerine, hydroxyethyl urea, betaine, sodium PCA, sodium- L- Lactate, etc.

**Scents-** scents are help to hide the bad smell and bettered the order of the cremate. of natural scents are used for the medication of cream are – white blossoms, rosy reams, orange blossom.

**Vitamins-** vitamins are the important component. it helps to maintain the physiological function of the skin and whole boyleg. - vit A, B, C, Emetic.

**Preservatives-** preservatives are the most important component of the cream. It helps to save the expression from colourful types of microorganisms and impurity during storehouse and consumer use.

#### **Composition for preparation of skin creams :**

The selection of excipients should be given special attention as it has an impact on the performance, manufacturability and stability of the final product. This decision is based on the dosage form, route of administration, safety profile, manufacturing process and regulatory considerations. The release of the drug from the dosage form, the characteristics of the skin barrier and the penetration/diffusion of the drug are all influenced by the nature and concentration of the excipient, affecting the duration and extent of therapeutic action. at the target skin layer. The excipients are used to enhance the solubility and entrap the drug, to control the release, to increase the skin permeability, formulation stability, and inhibit microbial growth. Pharmaceutical excipients acceptable for the development of pharmaceutical products are listed in the international pharmacopoeia.

In cream phrasings, water is an abecedarian component. Water is frequently used as a liquid vehicle in skincare products. The creams are made with water free of fungicides, adulterants, contagions and other pollutants. It can also form mixes, depending on the quantum of water used in the admixture. One of the most important factors of cream is oil painting, fats and waxes. Depending on the operation, waxes bear as an emulsifying agent, fats act as a thickening agent, and oil painting acts as a preservative Mineral oil painting is largely refined, clear, and odourless oil painting that doesn't solidify or clog skin pores, and it infrequently causes antipathetic responses. It's light in weight and affordable, and helps to reduce water loss and keep the body doused. Liquid paraffin, liquid petroleum, paraffin oil painting, liquid petrolatum, petroleum oil painting and other mineral canvases are generally used in cosmetics. Vegetable oil painting forms a subcase on the skin's face that helps the skin retain its wholeness by decelerating water loss.

Vegetable canvases can also be added to creams or particular care particulars to cake the lipid or unctuous element like almond, seed, avocado, and sunflower. Beeswax, carnauba wax, ceresin, spermaceti and other constituents are used to make

cream. Waxes are used in cosmetics as they grease the separation of unctuous and liquid factors from mixes These waxes frequently cake the lipid part of the skin and beget it to cleave to the face. Creams are made up of numerous types of fats. creatures, trees and minerals will give all of these accoutrements. Lanolin is made from the fat of lamb's hair. Lanolin is divided into two types doused and on-hydrated. Doused lanolin contains between 25 and 30 water. The melting point of anhydrous lanolin is 38 to 42 °C and it has a slight odour. These constituents serve as lubricants on the skin's face, making it appear soft and smooth. Lanolin helps in the conformation of mixes and mixes well with other constituents in cosmetics and particular care products. Colours were largely deduced from natural substances similar as turmeric, saffron, and indigo. utmost skin care phrasings contain these important multifunctional constituents. Humectants are organic composites that have high hygroscopicity.

These are the accoutrements that have the capability to absorb and hold water. These have multitudinous advantages, including hydration, decolorizing, and so on. Glycerine, hydroxyethyl urea, betaine, sodium- L-lactate, and other humectants are some exemplifications. Humectants are also used in soap to help hydrate hair and fight the drying effect of surfactants. They also help with low temperature stabilization and snap/ thaw, acting as antifreeze and maintaining soap clarity at low temperatures. A wide range of products are added to gain an affable scent and mask the smell of certain constituents. Vitamins are necessary for the proper functioning of the physiological functions of the body and the skin. Vitamins A, B, C, E and others are generally used in the expression of the cream. Skincare products contain preservatives to help stop microbe impurity and insecurity during expression shipping, storehouse, and consumer use. Antioxidants are also used to offset the goods of oxygen exposure. Synthetic preservatives are effective in conserving products when used at low attention. They've a wide range of antibacterial exertion.

#### **REFERENCE:**

1. Chauhan L, Gupta S, Creams: A Review on Classification, Preparation Methods, Evaluation and its Applications, Journal of Drug Delivery and Therapeutics. 2020; 10(5-s):281-289
2. Tarun G, Goutam R, and Amit K. Comprehensive review on additives of topical dosage forms for drug delivery. Drug Deliv, Early Online: 1-19
3. V. Sarovar Reddy\*, FORMUALTION AND EVALUATION OF ANALGESIC VANISHING



CREAM, *Journal of Global Trends in Pharmaceutical Sciences*

2021

4. Rai R, Poudyl AP, Das S, Pharmaceutical Creams and their use in wound healing: A Review, *Journal of Drug Delivery and Therapeutics*. 2019; 9 (3-s):907-912
5. AK Mohiuddin. Skin Care Creams: Formulation and Use. *American Journal of Dermatological Research and Reviews*, 2019, 2:8
6. Osborne DW, Henke JJ, Skin Penetration Enhancers Cited in the Technical Literature, *Pharm.Tech*, 1997;21;50-66.
7. Bolzinger, M.-A., Briançon, S., Pelletier, J., and Chevalier, Y. (2012) Penetration of drugs through skin, a complex rate-controlling membrane. *Current Opinion in Colloid & Interface Science*, 17 (3): 156–165.
8. Mohd, F., Todo, H., Yoshimoto, M., Yusuf, E., and Sugibayashi, K. (2016) Contribution of the hair follicular pathway to total skin permeation of topically applied and exposed chemicals. *Pharmaceutics*,
9. Poet, T. S., and McDougal, J. N. (2002) Skin absorption and human risk assessment. *Chemico-Biological Interactions*, 140 (1): 19–34.
10. Sinha, V. R., and Pal Kaur, M. (2000) Permeation enhancers for transdermal drug delivery. *Drug Development and Industrial Pharmacy*, 26 (11): 1131–1140.
11. Myers D, *Surfactant Science and Technology*, VCH Publishers: 1992, Pp. 209-247
12. Jamshiya S, “Formulation and Evaluation of Herbal Skin Cream for Wound Healing” (Doctoral dissertation, RVS College of Pharmaceutical Sciences, Coimbatore
13. Rani S, Singh N, Gautam SP, “Formulation, Evaluation Optimization and Evaluation of Dendricream for wound healing activity of Artemisia Indica” *World journal of pharmacy and pharmaceutical sciences*, 2016; 5(8):1483-1497.
14. Esimone CO, Ibezim EC, Chah KF, “Factors affecting wound healing” *Journal of Pharma Allied Sciences*, 2005; (1):294-299
15. Avinash G, Priyanka B, “Wound healing potential of Indian medicinal plants” *International Journal of Pharmacy Review & Res*, 2013; 2:75-87.
16. Sloan JB, and Soltani K, *Introduction to dermatological Products*,1986;12:30-72.
17. Aswal A, Kalra M, Rout A. —Preparation and evaluation of polyherbal cosmetic cream| *Der Pharmacia Lettre*. 2013; 5(1):838
18. Pratikcha R, Adarsh P, Sujit Das, *Pharmaceutical Creams and their use in wound healing: A Review*, *Journal of Drug Delivery & Therapeutics*. 2019; 9(3-s):907-912
19. Priyadarsini SS, Kumar PR., Thirumal M., Formulation and evaluation of an herbal antibacterial cream from ethyl acetate extract of leaves of Spinacia oleracea Linn. against Aeromonas skin and soft tissue infections, from *International Journal of Green Pharmacy*, 2018.
20. Mittal A, Sardana S, *Herbal boon for wounds*, from *International Journal of Pharmacy and Pharmaceutical Sciences*, 2013; 5: 1- 12.
21. Tiwari VK, burn wound: How it differs from other wounds, frm *Indian journal of plastic surgery: official publication of the Association of Plastic Surgeons of India*, 2012; 45(2): 364.
22. Namjoshi S, Dabbaghi M, Roberts MS, Grice JE, and Mohammed Y. *Quality by Design: Development of the Quality Target Product Profile (QTPP) for Semisolid Topical Products*. *Pharmaceutics*. 2020 Mar;12(3):287.
23. Simões A, Veiga F, Vitorino C, Figueiras A. A tutorial for developing a topical cream formulation based on the quality by design approach. *Journal of pharmaceutical sciences*. 2018 Oct 1; 107(10):2653-62.