Facial Cleansers

- Facial cleansing serves as a means to remove dead skin, dirt, oil and cosmetics
- Important first step in overall skin care routine, preparing the skin for other active ingredients

Four Goals of Facial Cleansing

- Clean skin (removing surface dirt and all make-up)
- Provide basic level of exfoliation
- Remove potentially harmful microorganisms
- Cause minimal damage to epidermis and dermis
Cleansing Mechanisms

- By chemistry
- By physical action
- By combination of chemistry and physical action

Cleansing by Chemistry

- Classes of chemicals used in facial cleansers
  - Surfactants
  - Solvents

Surfactants

- Amphiphilic compounds
- Contain both hydrophilic and hydrophobic groups
- Causing them to be oil and water soluble
**Surfactant Mechanism of Action: Emulsification**

- Reduce tension that keeps water and oil separated on the skin surface
- Once absorbed, surfactants form micelles

**Surfactant Mechanism of Action**

- When micelles form in water, their tails form core encapsulating oil droplets and their heads form outer shell maintaining contact with water
- Clean skin by emulsifying oily compounds on the surface of the skin with water

**Surfactant Categories**

- **Cationic Surfactants**
  - Poorly tolerated when used alone
  - Rarely used in skin care products
- **Anionic Surfactants**
  - Molecules with negatively charged “head” and hydrophobic “tail”
  - Good lathering and detergent properties
Surfactant Categories

- Amphoteric Surfactants
  - Well tolerated, lather well
  - Used in facial cleansers
- Nonionic Surfactants
  - Uncharged molecules
  - Very mild
  - Do not lather well

Solvents

- Liquid that dissolves a solid or another liquid into homogenous solution
- “like dissolves like”
- Cleans skin by dissolving sebaceous oil and external oil applied to skin

Solvent Categories

- Polar solvents
  - Alcohol family
- Nonpolar solvents
  - Oil family
- Usually not used in water
Physical Cleansing

- Friction caused by interaction of washcloth, cotton ball, etc. with surface of skin
- Friction increases interaction of chemical cleaning agents

Types of Facial Cleansers

- Lathering cleansers
- Emollient cleansers
- Cleansing milks
- Scrubs
- Toners
- Dry lathering cleansing cloths
- Wet cleansing cloths

Cleanser Technology & Skin Types

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Selecting Facial Cleansers

- Based on skin type
- Based on cleansing form
- Based on skin problems

Moisturizers

Characteristics of “Dry Skin”

- Visual: redness, lackluster surface, dry patches, flakes, cracks
- Tactile: rough, uneven surface
- Sensory: feels dry, uncomfortable, painful, itchy, stinging and tingling sensation
- Chemical: reduced water content, reduced NMF content, altered lipid composition
- Functional: impaired barrier function
Chemical Characteristics of Dry Skin

Water Content

- Epidermal barrier composition:
  - Cellular protein matrix
    - Keratinocytes
    - Corneocytes
  - Intercellular lipid bilayer matrix
- Epidermal barrier responsible for maintenance of skin integrity, water balance, hydration, desquamation

Water Content

- Lack of balance in epidermal barrier causes transepidermal water loss (TEWL)
- Results in dryness, scaling
- Ideal water content of stratum corneum 20-35%
**Natural Moisturizing Factor (NMF)**

- Moisture content of corneocytes maintained by NMF
- NMF components
  - Free amino acids
  - Pyrrolidone carboxylic acid (PCA)
  - Lactate
  - Sugars
  - Urea
  - Choline, sodium, calcium, etc.
- When water level of stratum corneum falls below 10%, enzymatic function needed for desquamation is impaired

**Lipid Composition**

- Epidermal barrier lipids
  - Free fatty acids
  - Cholesterol
  - Ceramides

**Lipid Composition**

- Lipids of extracellular matrix are bipolar
  - Hydrophilic heads
  - Hydrophobic tails
- Controls water permeability and regulates TEWL
Barrier Function

- Transepidermal barrier water loss (TEWL) is homeostatic signal for maintenance and repair of epidermal barrier function
- Moisturizers imitate role of lipids in restoring epidermal barrier function

Moisturizer Ingredients

- Occlusives
- Humectants
- Emollients

Occlusives

- Reduce TEWL
- Forms hydrophobic film on skin surface
- Often greasy in nature
**Occlusive Agents**

- **Hydrocarbon oils/waxes**
  - Petrolatum
  - Mineral oil
  - Paraffin
  - Squalene
  - Silicone derivatives
    - Dimethicone
    - Cyclomethicone

- **Fatty alcohols**
  - Cetyl alcohol
  - Stearyl alcohol
  - Lanolin alcohol

- **Fatty acids**
  - Stearic acid
  - Lanolin acid

- **Wax esters**
  - Lanolin
  - Beeswax
  - Stearyl stearate

- **Vegetable waxes**
  - Carnauba
  - Candelilla

- **Phospholipids**
  - Lecithin

- **Sterols**
  - Cholesterol

- **Polyhydric alcohols**
  - Propylene glycol

**Petrolatum**

- Purified mixture of semisolid hydrocarbons from petroleum
- Accelerates recovery of skin surface lipids
- Permeates throughout corneum layer allowing normal barrier recovery despite occlusive properties
**Stearyl Alcohol**

- Used in cosmetic formulations for emulsions, antifoaming, and lubricating actions
- Viscosity agent
- Saturated alcohol of high purity

**Stearic Acid**

- Emulsifier and thickening agent found in vegetable fats
- May cause allergic reactions in sensitive skin and is considered comedogenic

**Beeswax**

- One of the oldest raw ingredients used in skin care
- On skin’s surface can form a network
- Credited with anti-inflammatory, antiallergic, antioxidant, antibacterial, germicidal, skin softening, and elasticity enhancing properties
**Carnauba**

- Wax obtained from leaves and leaf buds of Brazilian wax palm
- Used to firm and texturize cosmetic preparations
- Forms protective layer on skin’s surface

**Humectants**

- Ability to attract water from dermis to epidermis
- Some humectants also possess emollient properties
- Combination of occlusive and humectant ingredients complement each other in maintaining epidermal hydration and barrier function

**Humectants**

- Glycerin (glycerol)
- Honey
- Sodium lactate
- Ammonium lactate
- Urea
- Propylene glycol
- Sodium PCA
- Hyaluronic acid
- Sorbitol
- Polyglycerylmethacrylate
- Panthenol
- Gelatin
**Urea**
- Found to increase absorption of active ingredients, relieve itchiness, and leave skin feeling soft and supple
- Attracts and retains moisture in corneum layer
- Desquamating action as it dissolves intercellular cement in the corneum layer
- Properties include anti-inflammatory, antiseptic, deodorizing, anti-microbial
- Does not include allergy, phototoxicity, or sensitivity

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**Sodium PCA**
- High performance humectant due to moisture-binding ability
- Derived from amino acids
- Exists naturally in skin as component of NMF
- Noncomedogenic, nonallergenic

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**Hyaluronic Acid**
- Glycocoaminoglycan component occurring naturally in dermis
- Excellent water-binding capabilities
- When applied to skin, hyaluronic acid forms viscoelastic film making it ideal moisturizer base
**Emollients**

- Fill gaps between desquamating corneocytes
- Responsible for smooth, soft texture of the skin


**Emollients**

- Protective emollients
  - Diisopropyl dillinolate
  - Isopropyl isostearate
- Fatting emollients
  - Castor oil
  - Propylene glycol
  - Octyl stearate
  - Glycerol stearate
  - Jojoba oil
  - Avocado oil

**Emollients**

- Astringent emollients
  - Dimethicone
  - Cyclomethicone
  - Isopropylmyristate
  - Octyl octanoate
- Dry emollients
  - Isopropyl palmitate
  - Decyl oleate
  - Isostearyl alcohol

**Jojoba Oil**
- Reduces TEWL without blocking transportation of water vapor and gases, providing suppleness and softness to the skin
- Naturally occurring ester

**Avocado Oil**
- Consists of oleic, linoleic, and linolenic acids
- Highest penetration rate among similar oils
- High concentration of vitamins A, D, and E
- May mobilize and increase collagen in connective tissue
- Bacteriocidal and soothing properties

**Isopropyl Palmitate**
- Emollient and moisturizer derived from coconut oil
- Produced from combination of palmitic acid and isopropyl alcohol
- Comedogenicity potential
Isopropyl Myristate

- Myristic oil found in nutmeg or coconut oil
- Emollient, moisturizer, and skin softener that assists in product penetration
- Considered comedogenic

Moisturizer Formulations

- Oil in water emulsions
  - Lotion
- Water in oil emulsions
  - Cream