# Therapeutic Techniques
# Exfoliation & peels

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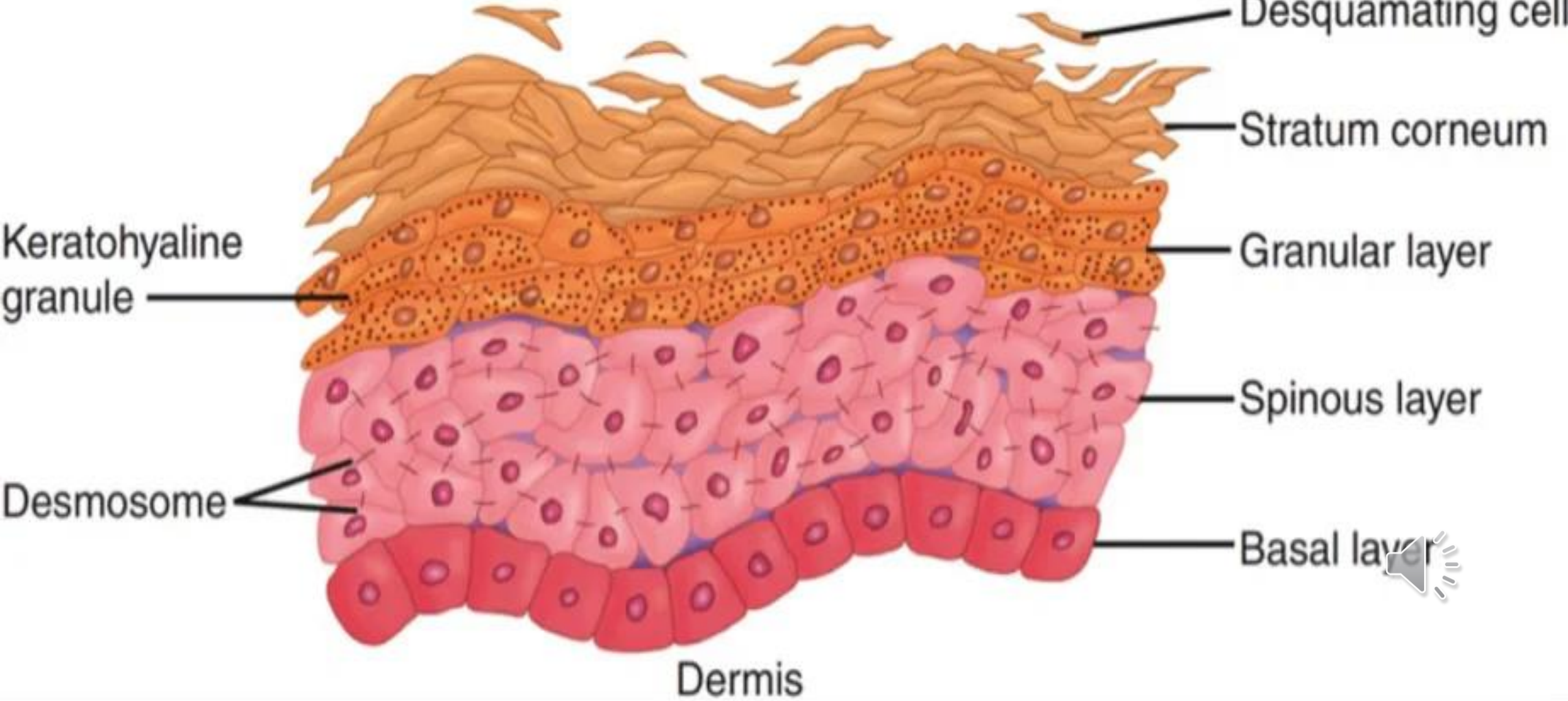
# Learning Objectives

- Differentiate between mechanical, enzymatic, and chemical exfoliation.
- Classify peels by agent and depth (superficial-medium-deep) and match to indications.
- Select protocols tailored to Fitzpatrick skin types and skin-of-color safety.
- Implement evidence-based pre/post-peel care and complication management.
- Interpret the latest regulatory safety updates for in-clinic vs at-home products.

# Introduction

- The outermost skin layer, the stratum corneum, is composed of corneocytes (dead, flattened keratinocytes) embedded in a lipid matrix looks like “brick-and-mortar” structure.
  - Bricks: corneocytes filled with keratin.
  - Mortar: intercellular lipids like ceramides, cholesterol, and free fatty acids.
- With aging and accumulate UV damage, corneocyte desquamation slows down. Dead cells cling too long, causing dullness, roughness, comedone formation, and uneven pigmentation.

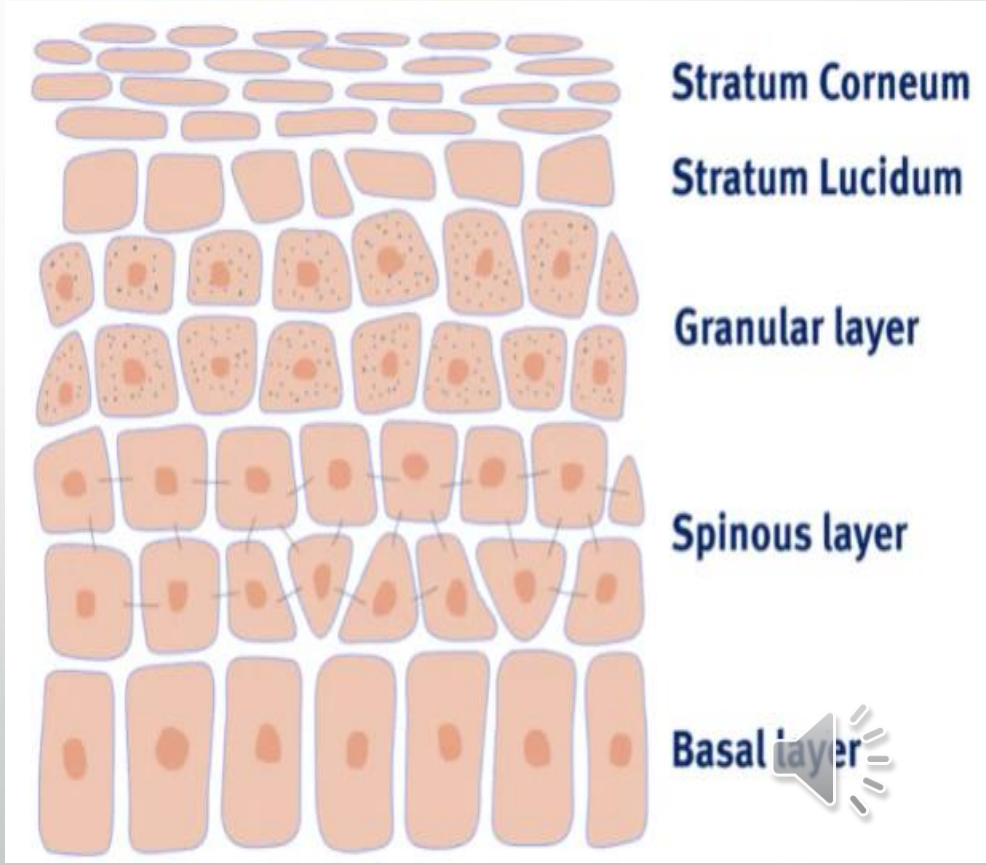

Desquamating cell
Stratum corneum
Keratohyaline granule
Granular layer
Spinous layer
Desmosome
Basal layer
Dermis

# Exfoliation and Peel

- Exfoliation and chemical peeling are key therapeutic techniques in modern skincare that remove damaged skin layers, promote cell renewal, enhance texture and tone.
- Accelerate desquamation through different mechanisms either mechanical disruption, enzymatic proteolysis, or chemical dissolution of the “mortar.”

# What is skin keratinization?

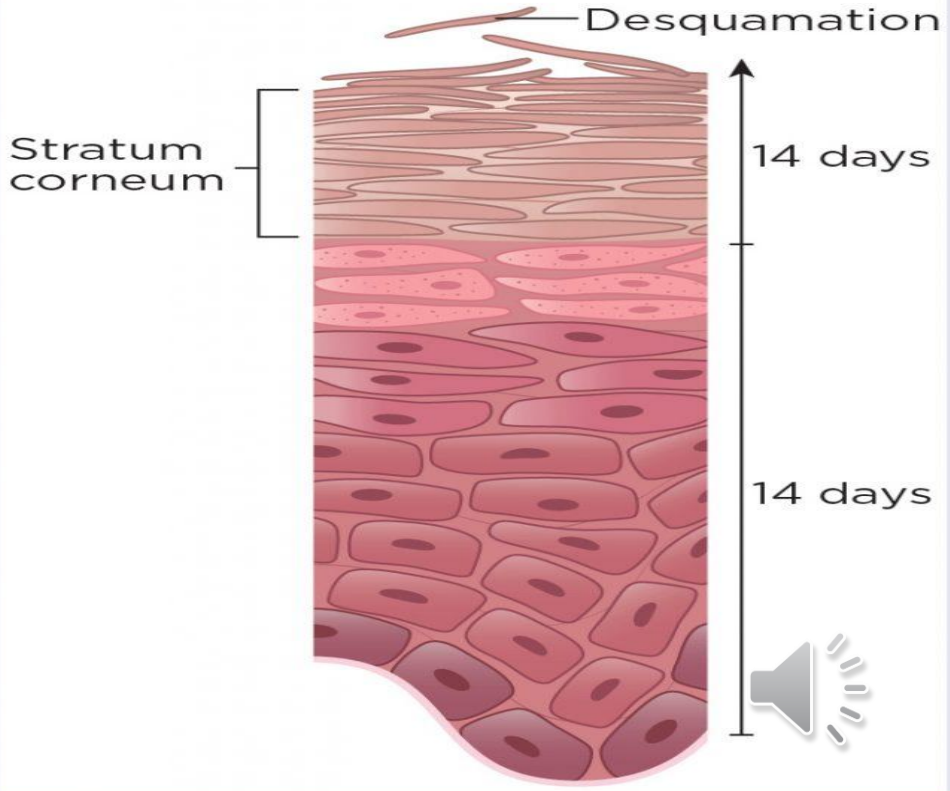
- Skin keratinization is the natural process in which skin cells (keratinocytes) in the lower layers of the epidermis mature, move upward, and produce keratin, a tough, protective protein.
- As these cells rise to the surface, they become flat, hard, and eventually die, forming the stratum corneum, the outermost protective layer of the skin.



# What is desquamation?

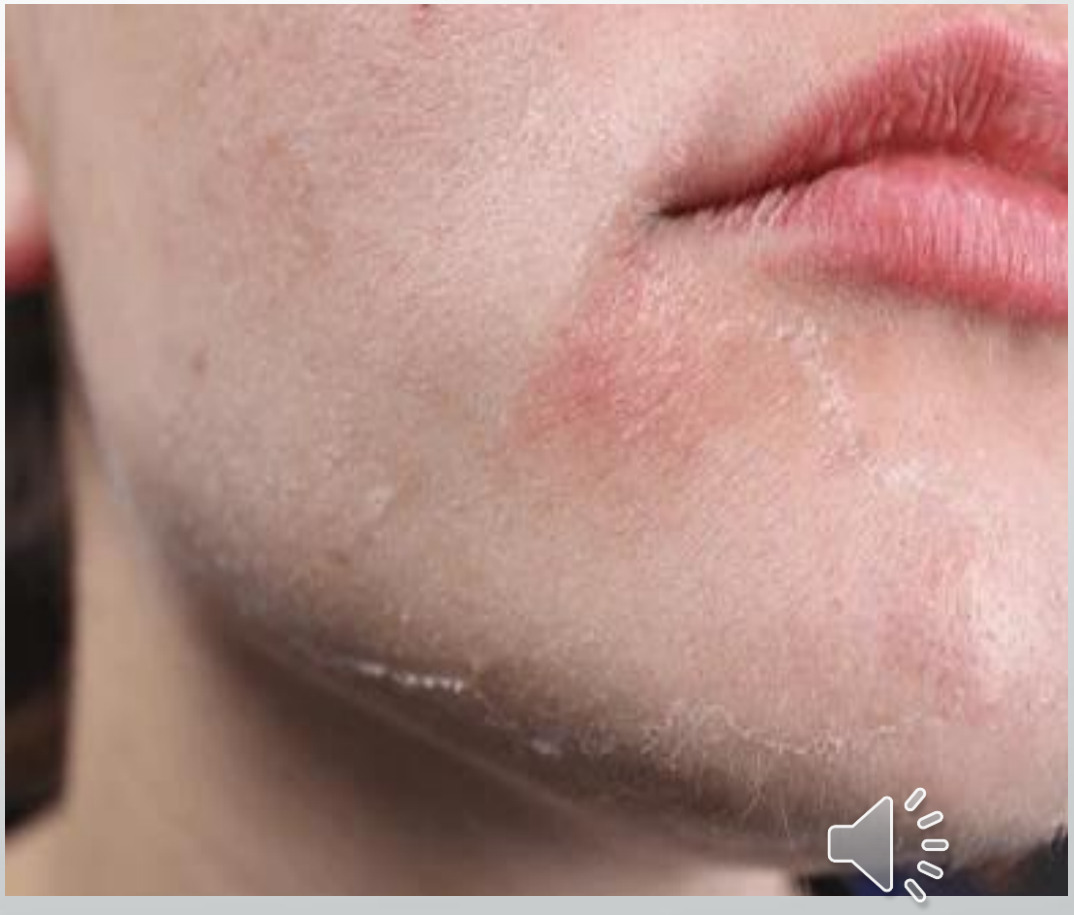
- **Desquamation is the natural process of shedding dead skin cells from the outermost layer of the epidermis, known as the stratum corneum.**
- **As new cells are produced in the deeper layers of the skin, older cells on the surface gradually loosen and flake off.**

Fig 3. **Desquamation process**



# Roughness

- Refers to an uneven skin texture caused by a buildup of dead skin cells or poor desquamation.
- The skin feels bumpy or coarse to the touch.
- Roughness can occur even in oily skin and is often linked to inadequate exfoliation or conditions like keratosis pilaris.



# Exfoliation modalities

# A.Mechanical Exfoliation

- Common mechanical exfoliation techniques include: Scrub , Dermaplaning and Microdermabrasion.

# Mechanism of Action

- Mechanical exfoliation uses a scrubbing or abrading action to dislodge and remove these dead cells manually.
- This stimulates skin renewal by:

1. Increasing cell turnover.
2. Enhancing microcirculation.
3. Improving absorption of topical skincare products.

- Mechanical exfoliation helps improve superficial roughness, dullness, and early photoaging but has limited effects on deeper skin layers or pigmentation.
- Overuse or poor hygiene can cause irritation or infection, so proper technique and aftercare are essential for safety and effectiveness.

# Precautions

- Should be avoided on inflamed acne, rosacea, or sensitive skin, as friction can worsen irritation.
- Always follow with a moisturizer and sunscreen since exfoliation increases photosensitivity and transepidermal water loss.
- Frequency depends on skin type — generally 1–2 times weekly for home use.

# 1.Facial Scrub

- Scrubs are one of the most common and accessible forms of mechanical exfoliation.
- They contain abrasive particles such as sugar, salt, microbeads, or natural powders (e.g., walnut shell, oatmeal, or coffee grounds) suspended in a cream or gel base.
- When massaged onto the skin, these particles physically remove dead corneocytes from the stratum corneum, helping to smooth texture, brighten the complexion, and enhance product absorption.

# Indications

1. **Dull, Tired-Looking Skin:** To slough off dead cells and reveal the brighter, fresher skin underneath.
2. **Uneven Skin Texture:** To smooth rough patches and improve skin's feel.
3. **Clogged Pores (Blackheads & Whiteheads):** To help clear out debris from pores, making them appear smaller.
4. **Prepping Skin for Other Products:** By removing the barrier of dead cells, subsequent products like serums and moisturizers can penetrate more deeply and work more effectively.
5. **Pre-Shave Exfoliation (for men):** Helps prevent ingrown hairs by clearing dead skin that can trap hairs.

# Precautions & Contraindications

- **Do Not Use on Active Acne, Cuts, or Sunburn:** Scrubbing can tear, irritate, and spread bacteria, worsening inflammation and delaying healing.
- **Avoid if there's Certain Skin Conditions:** Such as Rosacea, Eczema, or active Psoriasis. The physical friction will aggravate these conditions.
- **Beware of Over-Exfoliation:** Redness, stinging, tightness, increased sensitivity, shiny but tight skin, and increased breakouts.

➢ **If this happens:** Stop all exfoliation immediately. Switch to a very gentle, reparative skincare routine (gentle cleanser, fragrance-free moisturizer, and sunscreen) until your skin barrier recovers, which can take several weeks.

## Choosing the Right Scrub for Skin Type:

- **Sensitive Skin:** very fine, round particles like jojoba beads or oatmeal.
- **Oily/Acne-Prone Skin:** Avoid oil-based scrubs. Prefer gel-based one with salicylic acid.
- **Dry Skin:** A cream or oil-based scrub with hydrating ingredients is best
- **Mature Skin:** Be extra gentle. Fine particles are key to avoiding damage to thinner, more fragile skin.
- **Patch Test:** Always test a new scrub on a small area of your skin (like behind the ear or on the jawline) before applying it to your entire face to check for adverse reactions

# 2.Dermaplaning

- **Is a cosmetic procedure that uses a surgical scalpel to gently exfoliate the top layer of dead skin cells and fine vellus hair, resulting in a smoother and brighter complexion.**
- **Performed by a trained professional, it can help improve skin texture, reduce the appearance of fine lines, acne scars, and makeup application, and make skincare products more effective by improving their penetration.**

# Indication

1.Superficial Exfoliation.

2. Removal of Vellus Hair .

3. Enhancing Product Penetration.

4. Dull, Lackluster Complexion.

5. Improving the Appearance of Fine Lines and Superficial Scarring.

6. Managing Mild Textural Irregularities.

7. As a Treatment for "Pregnancy Safe" Skincare.

# Contraindications (Should NOT be done)

- **Active Acne, Cysts, or Cold Sores:** The procedure can spread bacteria, worsening breakouts. It can also spread the herpes simplex virus.
- **Inflammatory Skin Conditions:** Such as active rosacea, eczema, or psoriasis on the face. The scraping can cause severe irritation and flare-ups.
- **Sunburn:** The skin barrier is compromised and damaged.
- **Active Skin Infections** of any kind.
- **History of Keloid Scarring:** Any form of trauma can trigger keloid formation in prone individuals.
- **Fragile or Thinning Skin:** Often seen in individuals on long-term topical steroids or the elderly.
- **Uncontrolled Diabetes or Blood Clotting Disorders:** Due to impaired wound healing and bleeding risk.
- **Use of Blood Thinners:** This can increase the risk of bleeding and nicks.

# 3.Microdermabrasion

- Is a mechanical exfoliation technique that removes superficial dead skin cells using fine abrasive crystals or a diamond-tipped handpiece under controlled vacuum suction.
- It improves skin texture, promotes cell turnover, and enhances the penetration of topical agents.

# B. Enzymatic Exfoliation

- Enzymatic exfoliation utilizes proteolytic enzymes, primarily papain (from papaya) and bromelain (from pineapple), to gently break down corneodesmosomes the protein bridges that hold corneocytes together in the stratum corneum.
- This controlled enzymatic degradation promotes desquamation without significant disruption of the epidermal barrier.

# Enzymatic Exfoliation

- Papain exhibits keratolytic and anti-inflammatory properties and is often used in enzyme masks or peels for mild textural irregularities and dull skin.
- Bromelain has similar proteolytic effects but also provides mild anti-edematous and soothing actions.
- Both are effective in enhancing skin smoothness and radiance with minimal irritation risk.

# Enzymatic Exfoliation

- Enzymatic exfoliation is ideal for patients who cannot tolerate acids or mechanical abrasion. However, its limitations include a shallower depth of action and variable activity depending on pH, temperature, and enzyme stability. Hypersensitivity reactions are rare but may occur in individuals allergic to plant enzymes or latex.

# C. Chemical Exfoliation

- Chemical exfoliation, or chemical peeling, involves applying controlled concentrations of acids to the skin to induce keratolysis, stimulate cell turnover, and improve overall texture and tone.
- These agents vary in strength, penetration depth, and indication, depending on their molecular structure, and formulation.
- This process extends beyond surface exfoliation to include epidermal and dermal remodeling.


CHEMICAL PEEL
FOR ACNE
BEFORE
AFTER

# Chemical Peels: Classification and Depth

- **Chemical peels are categorized by depth of penetration:**

| Type | Depth of Action | Examples | Clinical Use |
|---|---|---|---|
| **Superficial Peel** | Stratum corneum to upper epidermis | Glycolic acid (20–50%), salicylic acid (20–30%), lactic acid, Jessner's solution | Acne, pigmentation, photoaging, dull skin |
| **Medium Peel** | Papillary dermis | Trichloroacetic acid (TCA 20–35%), glycolic acid (70%), Jessner's + TCA combination | Actinic keratoses, dyschromia, fine wrinkles |
| **Deep Peel** | Reticular dermis | Phenol (Baker-Gordon formula) | Severe photoaging, deep wrinkles, scars |

## Healing time increases with depth:

- Superficial: 2–4 days
- Medium: 5–10 days
- Deep: 10–21 days or more

## Mechanism of Action

**Chemical peeling works through controlled chemical injury:**

1. Coagulation of proteins in the epidermis and dermis.
2. Inflammatory response stimulates fibroblast activity.
3. Regeneration: new epidermal cells form from adnexal structures (hair follicles, sweat glands).
4. Remodeling: collagen and elastin fibers reorganize, improving skin firmness and texture.

## Adverse Effects

- **Immediate:** stinging, erythema, edema, frosting (controlled necrosis).
- **Delayed:** PIH, infection, scarring, milia, persistent erythema.
- **Prevention:** proper skin preparation, accurate timing, neutralization, and strict photoprotection.

## Post-Treatment Care :

1. Avoid UV exposure for at least 2 weeks.
2. Use bland cleansers, ceramide-based moisturizers, and broad-spectrum SPF 50+.
3. Avoid exfoliating products, retinoids, and harsh cleansers for 7–10 days.
4. For medium/deep peels: use prophylactic antivirals (acyclovir) if herpes history is present.

# Contraindications of chemical peeling

1. Active infections (herpes simplex, bacterial, or fungal).
2. Open wounds or eczema.
3. Recent isotretinoin use (<6 months).
4. Pregnancy (for certain acids).
5. Fitzpatrick skin types V–VI: higher risk of post-inflammatory hyperpigmentation.

# Clinical Pearls

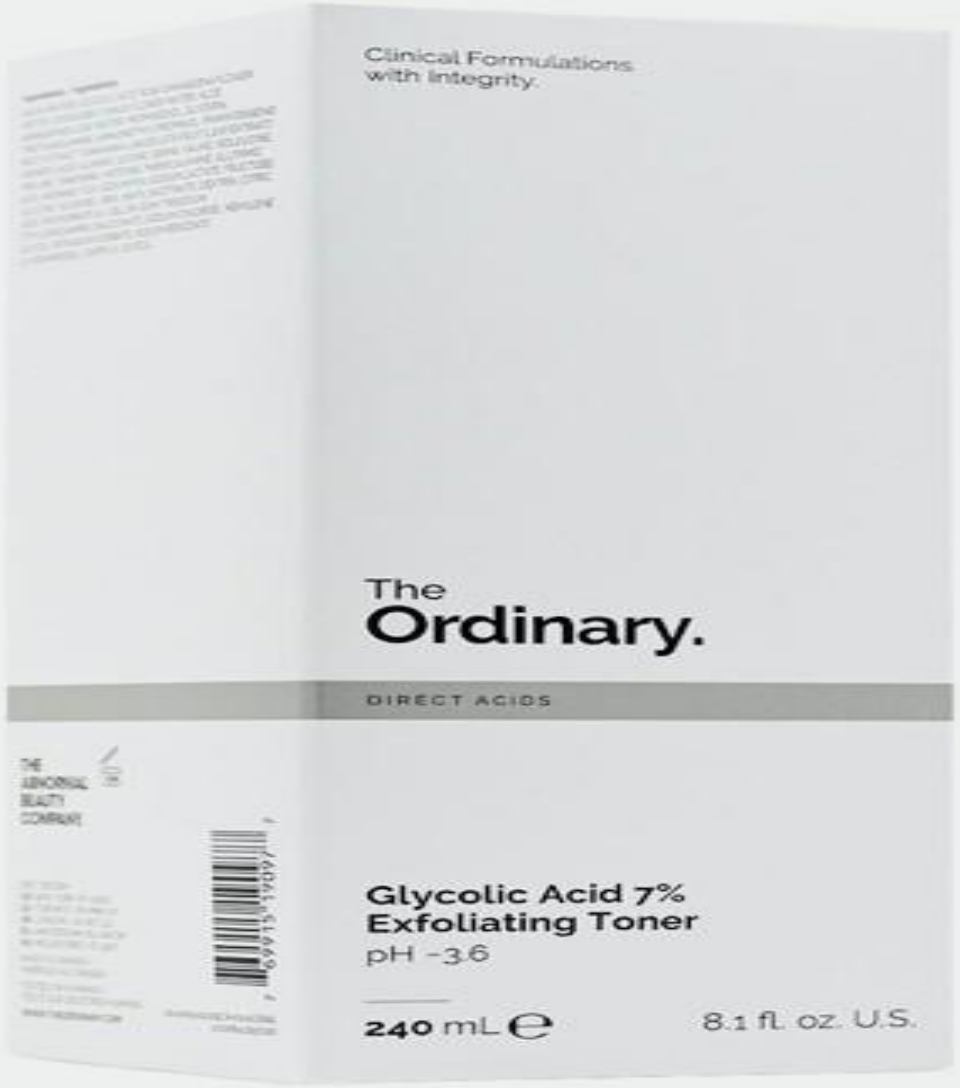
- Always prepare the skin with retinoids or AHAs for 2–4 weeks prior to medium peels to ensure even penetration.
- Perform test peels on darker skin types.
- Neutralize acid peels properly (especially glycolic acid) to prevent chemical burns.
- Patient education on realistic expectations and adherence to post-peel care.

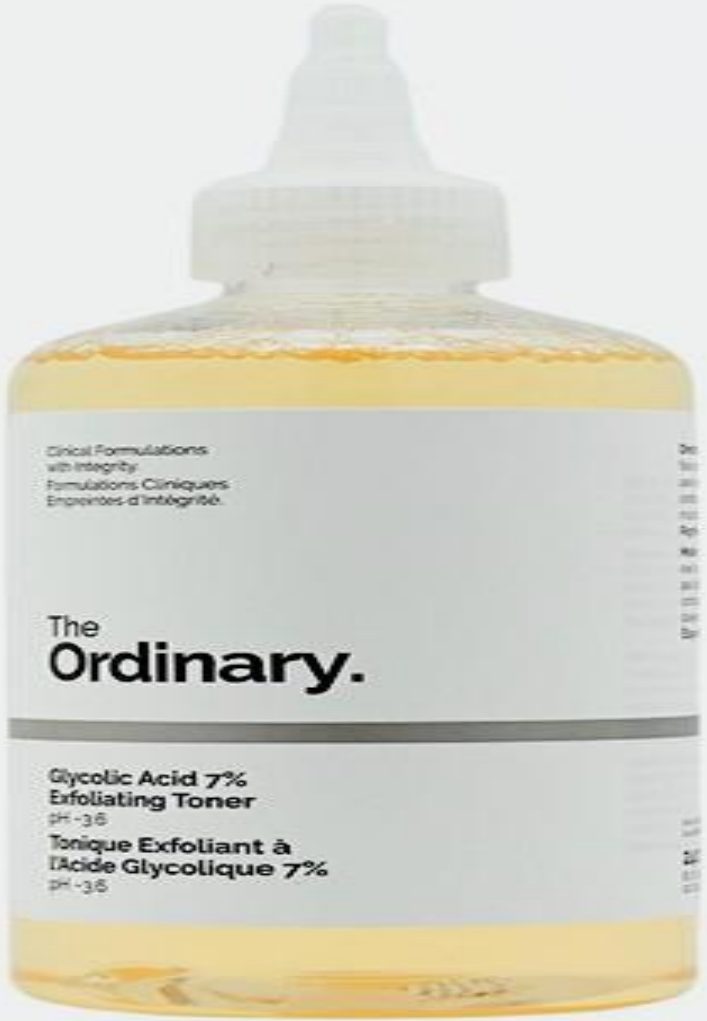
# 1. Alpha Hydroxy Acids (AHAs)

- AHAs are water-soluble acids that act by weakening the ionic bonds between corneocytes, promoting exfoliation of the stratum corneum (keratolysis).
- They also enhance Natural Moisturizing Factor (NMF) components, improve skin hydration, and upregulate collagen synthesis by stimulating fibroblast activity in the dermis.

# Glycolic Acid (AHA)

- Is the smallest alpha hydroxy acid, derived primarily from sugarcane.
- Its low molecular weight allows it to penetrate the stratum corneum efficiently, reaching deeper epidermal layers compared with other AHAs such as lactic or mandelic acid.


Clinical Formulations
with Integrity.
The
Ordinary.
DIRECT ACIDS
Glycolic Acid 7%
Exfoliating Toner
pH ~3.6
240 mL e
8.1 fl. oz. U.S.


Clinical Formulations
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The
Ordinary.
Glycolic Acid 7%
Exfoliating Toner
pH ~3.6
Tonique Exfoliant à
l'Acide Glycolique 7%
pH ~3.6

# Mechanism of action

- Glycolic acid exerts its exfoliative effect by disrupting ionic bonds between corneocytes and dissolving corneodesmosomal linkages, leading to controlled desquamation. Additionally, it reduces corneocyte cohesion and accelerates epidermal turnover.
- At the dermal level, glycolic acid can stimulate fibroblast activity, increasing synthesis of collagen, elastin, and glycosaminoglycans. This remodeling effect contributes to smoother texture, improved elasticity, and reduction of fine wrinkles.

# Clinical indications

- **Photoaging: improving roughness, fine lines, and mild atrophy through dermal stimulation.**
- **Melasma and hyperpigmentation: by enhancing epidermal turnover and facilitating even pigment dispersion.**
- **Acne-prone skin: reducing follicular hyperkeratinization and post-inflammatory pigmentation.**
- **Dull or thickened skin: restoring brightness and even tone.**


Improve blemishes and acne
Reverse and prevent skin aging
7% Glycolic Acid+ Shrink pores
GLYCOLIC ACID 7% TONING SOLUTION
HIDLY
A
B

# Concentration and application

**Low concentrations 5–10% (Home-care / Daily use)**

- **PH: 3.5–4.0**
- **Depth: Very superficial.**
- **Use: Gentle exfoliation, improving texture and radiance, maintaining hydration.**
- **Notes: Found in cleansers, toners, and creams; safe for regular use; minimal irritation.**

# Concentration and application

**Low professional strength 20–30%**

- **PH: 3.0–3.5**
- **Depth: Superficial peel.**
- **Use: Mild photoaging, early pigmentation, acne-prone skin, dull complexion.**
- **Notes: Common in treatments; minimal downtime; well-tolerated by most skin types.**

# Concentration and application

**Medium professional strength 35–50%**

- **PH: 2.5–3.0**
- **Depth: Superficial to near-medium**
- **Use: Moderate photoaging, melasma, uneven tone, post-acne marks**
- **Notes: Requires professional supervision; mild erythema or peeling may appear for 1–3 days.**

# Concentration and application

**High professional / medical strength 60–70%**

- **PH: 2.0–2.5**
- **Depth: Medium-depth peel.**
- **Use: Resistant pigmentation, fine wrinkles, rough texture, thickened skin.**
- **Notes: Performed only by trained professionals; strict timing and neutralization required; higher irritation and PIH risk in darker skin types.**

# Clinical Tips

- Always begin with lower concentrations and gradually increase with tolerance and clinical need.
- Contact time (1–5 minutes) and preparation (degreasing, pretreatment with retinoids or pigment suppressors) influence penetration depth.
- Neutralization is mandatory for peels ≥20% (commonly with sodium bicarbonate or cool water).
- For Fitzpatrick IV–VI, use ≤30% or switch to mandelic/lactic acids to minimize PIH risk.

# Lactic acid

- Lactic acid is a mild alpha hydroxy acid (AHA) derived from milk.
- It gently exfoliates the skin by loosening dead cells while acting as a humectant, attracting moisture to improve hydration and smoothness. Commonly used in concentrations of 20–50%, it suits dry, sensitive, or mature skin, enhancing texture and brightness with minimal irritation risk.

# Mandelic acid

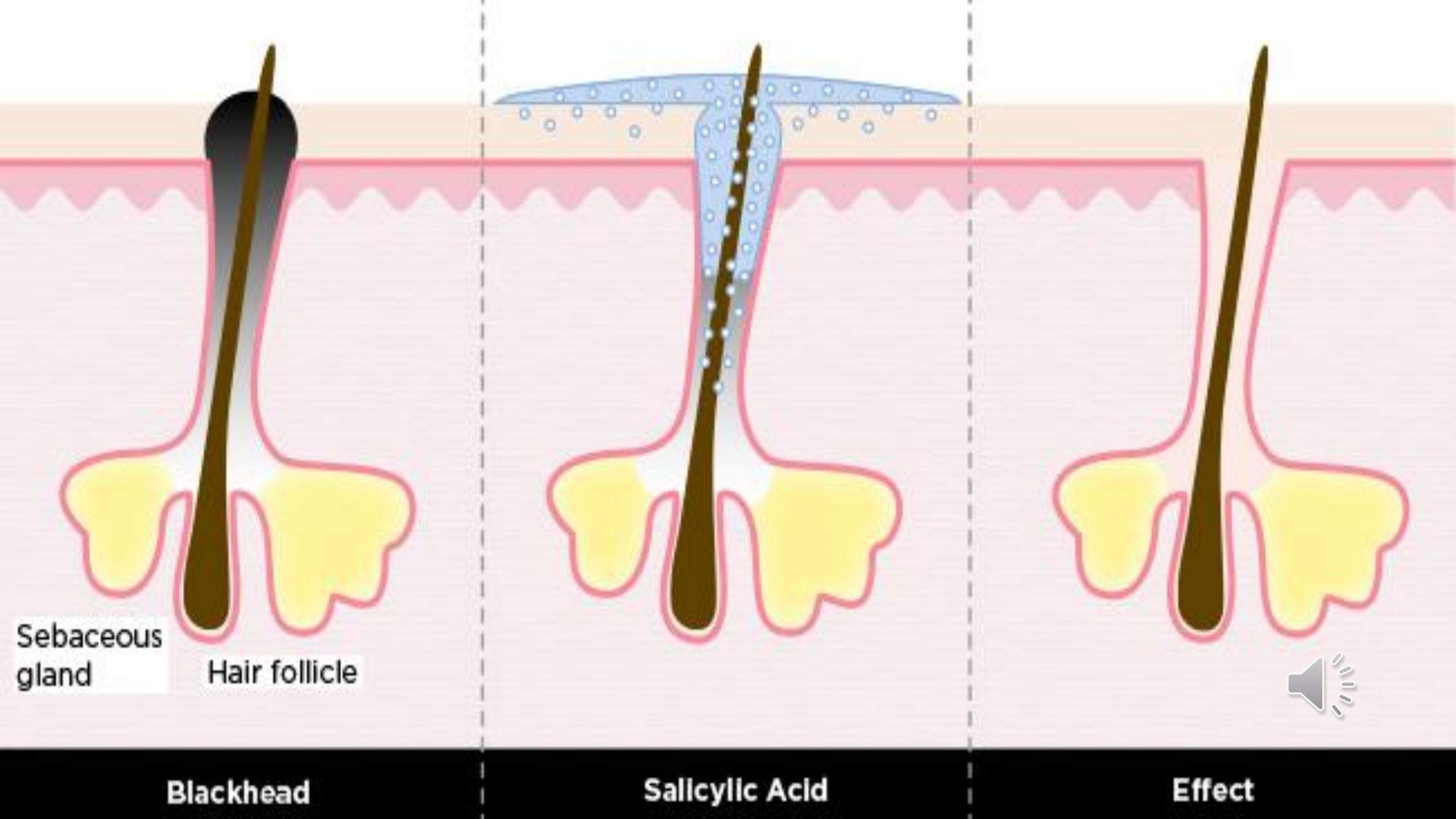
- Mandelic acid is a gentle AHA derived from bitter almonds.
- Its larger molecular size makes it absorb slowly, reducing irritation and inflammation.
- It is especially suitable for acne-prone, sensitive, and darker skin types (Fitzpatrick IV–VI), helping to treat acne, uneven tone, and pigmentation while minimizing the risk of post-inflammatory hyperpigmentation (PIH).

# 2. Beta Hydroxy Acid (BHA)

- **Beta Hydroxy Acid (BHA), mainly salicylic acid, is a lipid-soluble exfoliant that penetrates deep into pores to remove excess oil and dead cells.**
- **It is especially effective for acne-prone and oily skin, helping to clear comedones and reduce inflammation.**

# Salicylic acid

- It works by disrupting the intercellular bonds between corneocytes in the stratum corneum, promoting exfoliation and clearing clogged pores.
- It has strong keratolytic and comedolytic properties, meaning it helps remove dead skin cells and dissolve blackheads and whiteheads.


Sebaceous gland
Hair follicle
Blackhead
Salicylic Acid
Effect

# Clinical Indications

- **Acne vulgaris: Especially comedonal and mild inflammatory acne due to its comedolytic and anti-inflammatory effects.**
- **Seborrheic dermatitis and oily skin: Helps control excess sebum and flaking.**
- **Post-inflammatory hyperpigmentation (PIH): Improves uneven tone and smooths texture.**
- **Photoaging (mild): Enhances skin brightness and reduces superficial roughness.**
- **Keratosis pilaris and psoriasis (adjunctive): Softens hyperkeratotic lesions through keratolysis.**

# Concentration and Application

**Low concentrations (0.5–2%)**

- Found in OTC cleansers, toners, and creams.
- Used for daily home care to maintain clear pores and prevent acne.
- Safe for most skin types with minimal irritation.

**Medium concentrations (20–30%)**

- Used in professional superficial chemical peels.
- Applied for acne, oily skin, enlarged pores, and post-acne pigmentation.
- Produces a self-limiting "frost" effect due to crystallization, not true coagulation.
- Usually left on for 3–5 minutes and self-neutralizes; no external neutralizer required.

# Concentration and Application

**High concentrations (>30%)**

- **Rarely used and limited to specialized medical procedures for localized lesions such as warts or keratoses.**
- **Must be performed under strict medical supervision due to irritation and potential burns.**


Before treatment

Pseudofrost after application of 30% salicylic acid

# 3. Polyhydroxy and Lipohydroxy Acids (PHAs/LHAs)

- **PHAs and LHAs represent a newer generation of hydroxy acids, designed to provide exfoliation with enhanced tolerability. Their larger molecular size leads to slower skin penetration, minimizing irritation while maintaining gradual keratolytic effects.**
- **These acids are ideal for sensitive, rosacea-prone, or post-procedure skin, as well as for skin of color, where minimizing barrier disruption and inflammation is crucial to avoid PIH.**

- **Gluconolactone** acts as a gentle exfoliant and antioxidant, improving hydration and reducing oxidative stress.
- **Lactobionic acid** adds humectant and chelating benefits, promoting barrier repair and reducing inflammation.

# 4. Trichloroacetic Acid (TCA)

- TCA is a medium-depth peeling agent that causes protein coagulation and keratocoagulation, leading to controlled necrosis of the epidermis and upper dermis.
- The resulting wound healing process stimulates collagen remodeling and improves photoaging, actinic keratoses, acne scars, and dyschromia.

# Concentration and Application

**TCA peels are classified by concentration:**

- **10–25%** → **superficial (epidermal level)**
- **30–40%** → **medium-depth (papillary dermis)**
- **>50%** → **deep peels (used with caution, higher risk of scarring)**


Cosmetics Store


CHEMICAL
PEEL
MÔOYAM
TCA ACID
SKIN PEEL
45%
MALIC ACID & CITRIC ACID
ANTI-AGING, REDUCE
ACNE AND DARK SPOTS,
EVEN SKIN TONE
1 FL OZ / 30 ML

# Jessner’s Solution

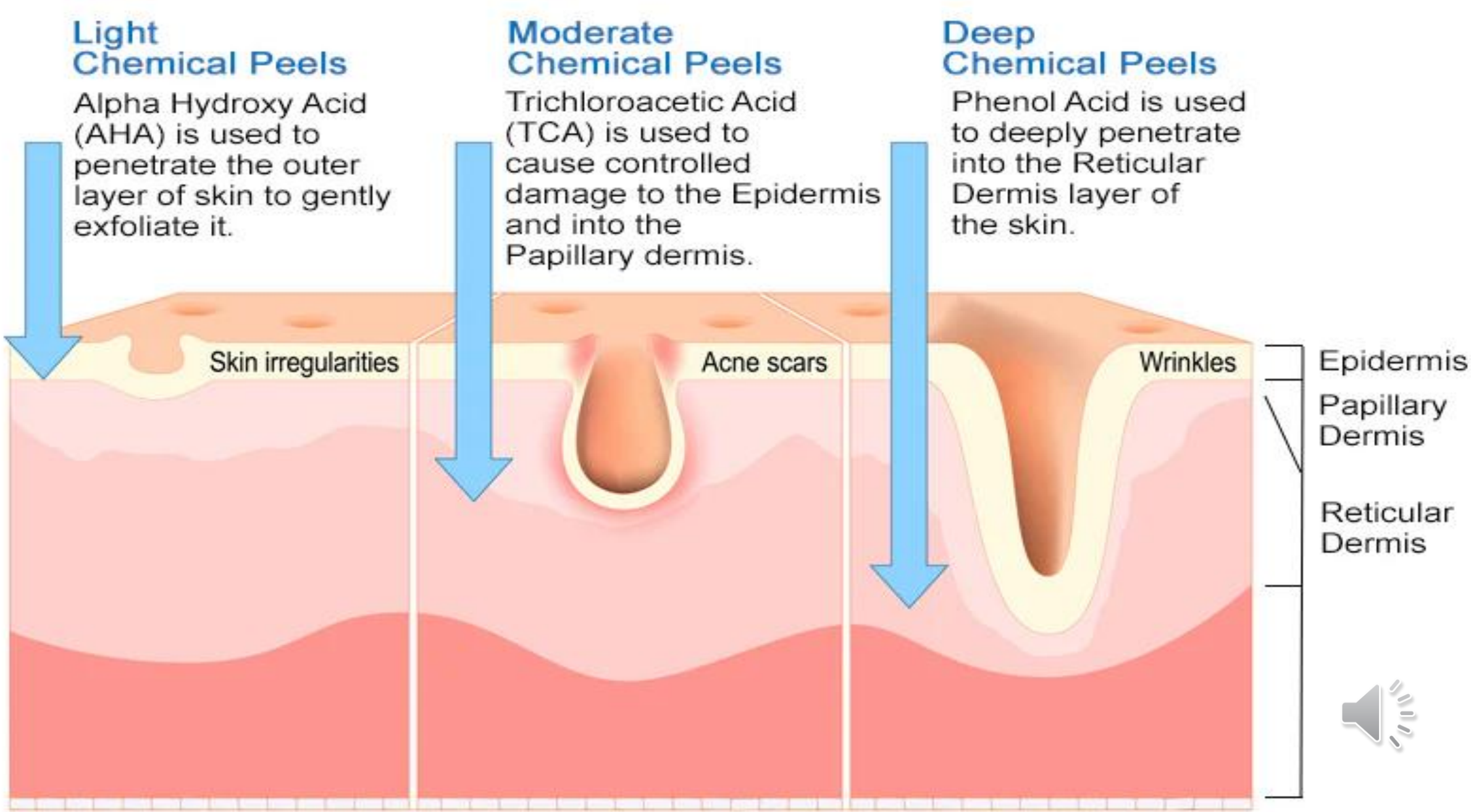
- The original Jessner's solution contains 14g of resorcinol, 14g of salicylic acid, and 14mL of 85% lactic acid, diluted in 100mL of 95% ethyl alcohol.
- Modified versions may exclude resorcinol to avoid allergic reactions or hyperpigmentation.

1. Treating photoaging (fine lines, actinic keratosis).
2. Improving pigmentary disorders like melasma.
3. Treating oily and acne-prone skin, including comedones (blackheads).
4. Improving the appearance of thick or rough skin and large pores.


MEDPEEL
Jessner Solution
Medium Strength Peel
1 fl oz / 30ml

# Phenol Peels

- Is the deepest and most potent type of chemical peel, using a phenol solution to deeply exfoliate the skin to treat severe wrinkles, sun damage, and scars.
- It stimulates new collagen and elastin to create a significant and long-lasting tightening effect, similar to a facelift but without surgery.
- Due to its intensity, it is typically recommended for fair skin on the face and requires a skilled professional for administration, with a lengthy recovery period.
  - Deepest acting; causes coagulative necrosis of the dermis.
  - Requires cardiac monitoring due to systemic absorption risk.
  - Long-lasting results but higher risk of scarring and pigment alteration.


Light
Chemical Peels
Alpha Hydroxy Acid (AHA) is used to penetrate the outer layer of skin to gently exfoliate it.
Moderate
Chemical Peels
Trichloroacetic Acid (TCA) is used to cause controlled damage to the Epidermis and into the Papillary dermis.
Deep
Chemical Peels
Phenol Acid is used to deeply penetrate into the Reticular Dermis layer of the skin.
Skin irregularities
Acne scars
Wrinkles
Epidermis
Papillary Dermis
Reticular Dermis


THANK YOU