ESSENTIALS OF CHEMICAL PEEL TREATMENT

CBAM Aesthetic Mastery Series



PRINCIPAL AUTHORS:

Dr. Reza Akef

Dr. Mohsen Talani

PRINCIPAL AUTHORS:

Dr. Reza Akef MD, CCFP-EM

Dr. Mohsen Talani MD, Anatomist

CO-AUTHORS:

Dr. Ali Birooni Miyanaji

ABOUT AUTHORS



Dr. Reza Akef is a highly experienced and respected cosmetic physician, with over 15 years of experience in teaching and practicing cosmetic medicine. He is currently the Assistant Professor at McMaster University and the Chairman of the Canadian Board of Aesthetic Medicine (CBAM), where he shares his knowledge and expertise with other healthcare professionals to provide the best care for their patients.

Dr. Akef is board certified by the College of Family Physicians of Canada in both Family and Emergency Medicine. Additionally, he is deeply involved in interventional pain practice cooperation for the treatment of Migraines, chronic pain, TMJ, Myofascial pain, and Fibromyalgia. He is a leading cosmetic physician and an internationally recognized specialist in non-surgical cosmetic procedures.

Dr. Akef is dedicated to understanding his clients' concerns and creating personalized treatment plans that meet their needs and goals. He is committed to thoughtfully and strategically creating individualized combinations of leading, safe treatments that exceed client expectations. He is also the founder of Angel Gloss spa in Toronto, an established, leading destination for non-surgical cosmetic procedures for individuals seeking leading physicians with proven experience, the latest technology, and cutting-edge techniques.

Dr. Akef is actively involved in multiple training courses, webinars, and conferences all around the world, including prestigious international conferences such as IMCAS, AMWC, and Dubai Derma. He participates as a speaker at these events and is always looking to stay up to date with the latest developments in the field of cosmetic medicine.

Mohsen Talani is the Director of CBAM. He has over 18 years of experience teaching anatomy in Canada and internationally to students and healthcare practitioners in different fields of medicine such as physicians, dentists, nurses, chiropractors, and physiotherapists.

After graduating from medical school at a young age, he became a medical doctor in his home country, Iran, and practiced in the field of emergency medicine. While pursuing his Master's thesis in neuroscience at McGill University, he discovered his passion for teaching. Since then, he has been working in the field of medical science education, with a focus on anatomy.

He strongly believes that with the rapidly growing aesthetic industry, all practitioners should have a profound knowledge of skin basics, fat compartments, muscles, blood vessels, and nerves, in order to provide safe and effective care to clients and prevent or minimize post-treatment complications linked to lack of anatomy knowledge.

He is currently training healthcare practitioners who seek to have a deep knowledge of anatomy. He incorporates fun, innovative, and easy-to-understand methods of teaching in all of his classes, guest lectures, and presentations. Additionally, he supervises the cadaver lab dissections and hands-on practicals.



TABLE OF CONTENTS

INTRODUCTION	5
SKIN ANATOMY	10
INDICATIONS, CONTRAINDICATIONS, AND PATIENT SELECTION	17
CONSULTATION, ASSESSMENT, AND INFORMED CONSENT	27
PRE-PEEL PREPARATION (PRIMING) AND PROTOCOL DESIGN	33
SUPERFICIAL PEELS	39
MEDIUM-DEPTH PEELS	50
DEEP PEELS	66
POST-PEEL CARE	76
COMPLICATIONS	83

CBAM BOOK
Canadian Board of Aesthetic Medicine

INTRODUCTION





Introduction

1.1. What Are Chemical Peels?

Chemical peels are controlled skin treatments designed to improve the visible quality and structure of skin through the external application of caustic chemical solutions. Depending on the agent used and the manner in which it is applied, a peel may simply accelerate natural exfoliation or, in stronger formulations, induce complete epidermal destruction with variable penetration into the dermis. Regardless of depth, every peel influences the dermis directly or indirectly, where it stimulates regenerative processes that ultimately lead to clinically observable improvement.

As one of the oldest documented methods of skin rejuvenation, chemical peeling holds a unique position in aesthetic medicine. These treatments form a distinct group within the broader category of non-surgical rejuvenation procedures—supported by clear histological, chemical, toxicological, and clinical foundations. Their long history, combined with continuous innovation, has transformed chemical peels into flexible, highly adaptable tools that can be tailored to a broad range of patients and indications.

Most peeling agents, to different extents, produce similar histological changes that result in smoother texture, more even pigmentation, and an overall rejuvenated appearance of treated skin. Yet, categorizing peels remains challenging. Although the common terms “superficial,” “medium,” and “deep” are widely used, they oversimplify a highly nuanced procedure influenced by many overlapping variables.

A classic example is glycolic acid. While often perceived as a predictable superficial AHA peel, its behavior in practice varies enormously. The treatment depth can shift depending on factors such as the patient’s skin type, active dermatologic conditions, degree of priming, formulation vehicle (liquid, gel, mask, self-neutralizing system), concentration, pH and free acid fraction, presence of other acids, method of application, pressure applied, number of layers, body area treated,

contact time, neutralization method, and overall post-peel care. A peel that begins as a mild exfoliating treatment can unexpectedly behave like a medium-depth peel—potentially reaching the deeper dermis—if, for example, it is not neutralized correctly. This principle applies to all caustic agents used in chemical peeling.

Such variability underscores an essential truth: safe and effective peeling requires a solid understanding of both skin anatomy and the complex interplay of chemical, procedural, and patient-related factors. Every practitioner should work toward standardizing their approach—minimizing unnecessary variables and maintaining precise technique—to achieve predictable results. Fortunately, modern peel formulations have become safer and more user-friendly, allowing practitioners, including early-career aesthetic physicians, to perform peels with greater confidence. Even so, deeper peeling—particularly treatments reaching the papillary dermis—still demands sound clinical judgment, extensive training, and hands-on experience.

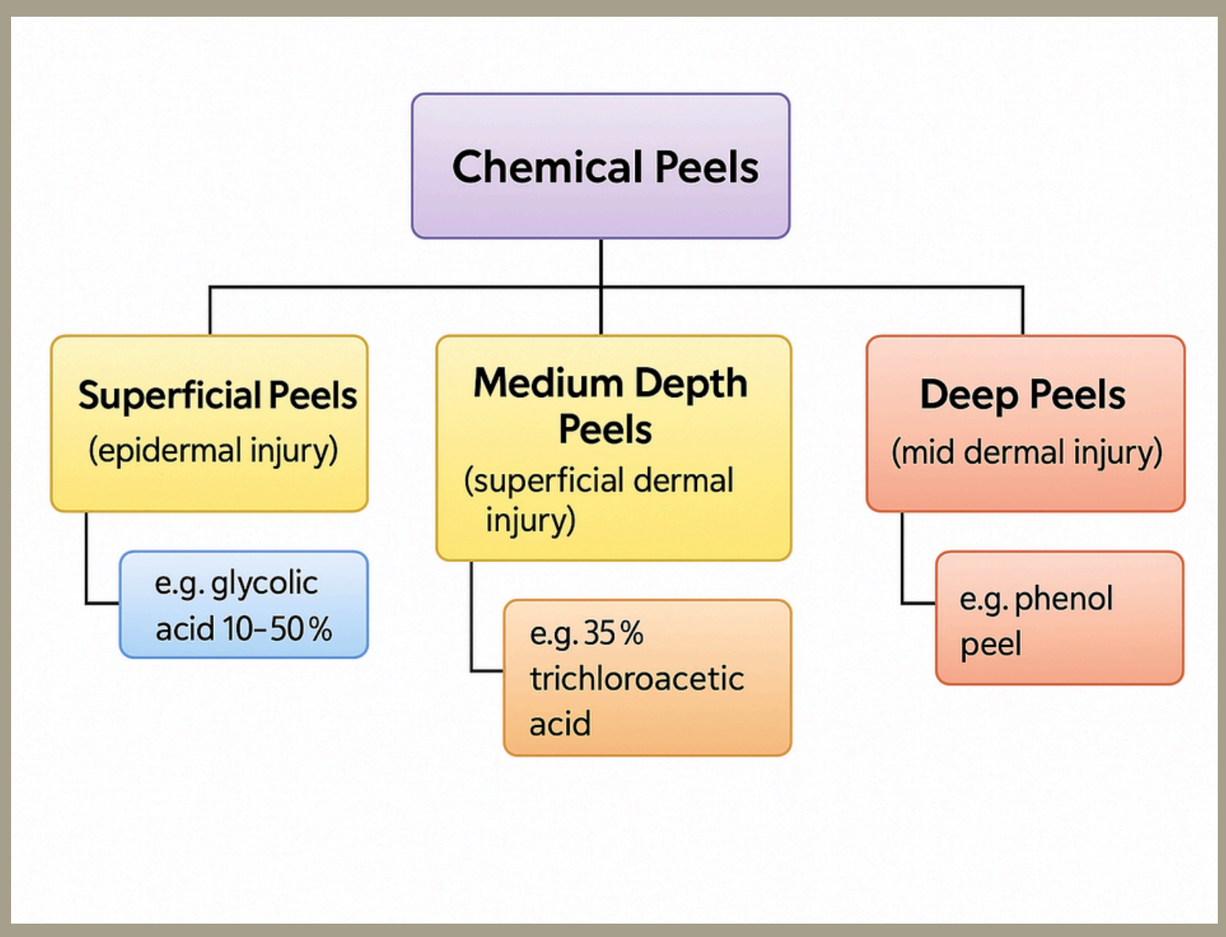


Fig I.1. Chemical peels are classified by depth of penetration

In aesthetic practice today, chemical peels remain foundational. They are scientifically grounded, clinically effective, and, when performed with expertise, offer reliable and versatile solutions for a broad spectrum of skin concerns.

Classification of Chemical Peels and Agents

The classification of chemical peels is a foundational concept in aesthetic practice, yet it remains one of the most debated and misunderstood topics in the literature. Traditionally, peels are grouped into **superficial**, **medium**, and **deep** categories based on their intended depth of penetration. However, while this simplified framework is helpful, it fails to capture the true variability and complexity of peeling behavior in real clinical settings.

The Limits of Traditional Classification

Although superficial–medium–deep classifications are widely used, they lack standardized, universally accepted definitions. What one author describes as a "superficial" peel, another may categorize as "medium," and in some cases, the same peeling agent may be referenced across multiple depth categories depending on the concentration, formulation, or application technique.

The issue becomes even more evident when considering **acid concentration**. A peel labeled as "TCA 25%" does not necessarily correspond to a consistent depth of action across brands, systems, or clinical protocols. This is because:

- The percentage may be calculated in **weight/weight (w/w)**, **weight/volume (w/v)**, **weight + volume (w+v)**, or as a **dilution** of a stock solution.
- These variations create substantial differences in molecular availability and penetration, sometimes leading to unexpected or undesirable clinical outcomes.

Furthermore, the depth reached by an acid is profoundly influenced by **patient-specific** and **procedure-specific** variables:

- Skin thickness (thin eyelids vs. thicker sebaceous areas)
- Hydration level (dry vs. oily skin)

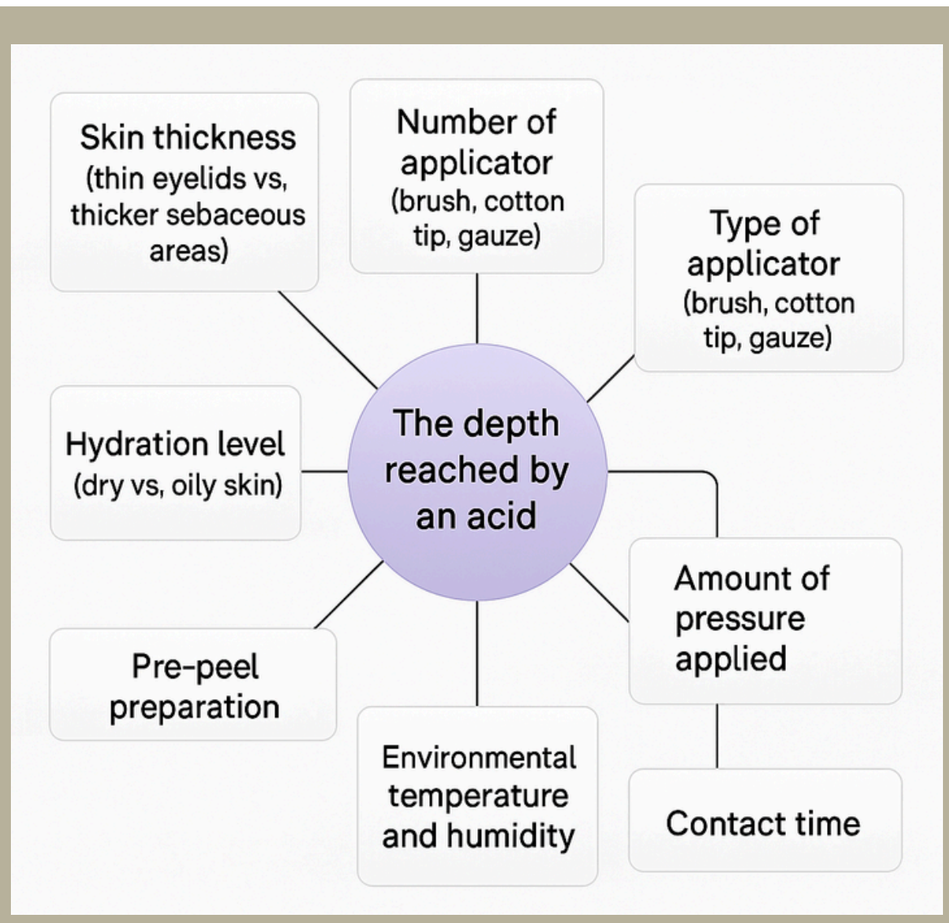


Fig I.2. The depth reached by an acid is profoundly influenced by patient-specific and procedure-specific variables.

- Pre-peel preparation
- Number of layers applied
- Type of applicator (brush, cotton tip, gauze)
- Amount of pressure applied
- Contact time
- Environmental temperature and humidity

Given the number of variables involved, relying solely on percentage concentration—or the name of the peel—to predict depth is unreliable.

A More Accurate Approach: Clinical Observation

Because formulas, concentrations, and patient factors vary widely, the most accurate way to classify and perform chemical peels is through **continuous clinical observation** during the

procedure. The practitioner should monitor the skin's biological responses —erythema, frosting patterns, textural changes, patient sensation—rather than depending on preset recipes or arbitrary time guidelines.

For example, glycolic acid peels are often described as "time-dependent." However, this does not mean strictly adhering to the clock. Instead, it requires ongoing assessment of how the skin is responding and neutralizing at the moment the desired endpoint is achieved.
This dynamic approach allows for:

- Safer control of peel depth
- Reduced risk of complications
- More customized treatment based on skin type, location, and indication

Principles of Appropriate Peel Depth

A core principle guides safe and effective peeling:

A peel should never be deeper than necessary—but also not more superficial than required.

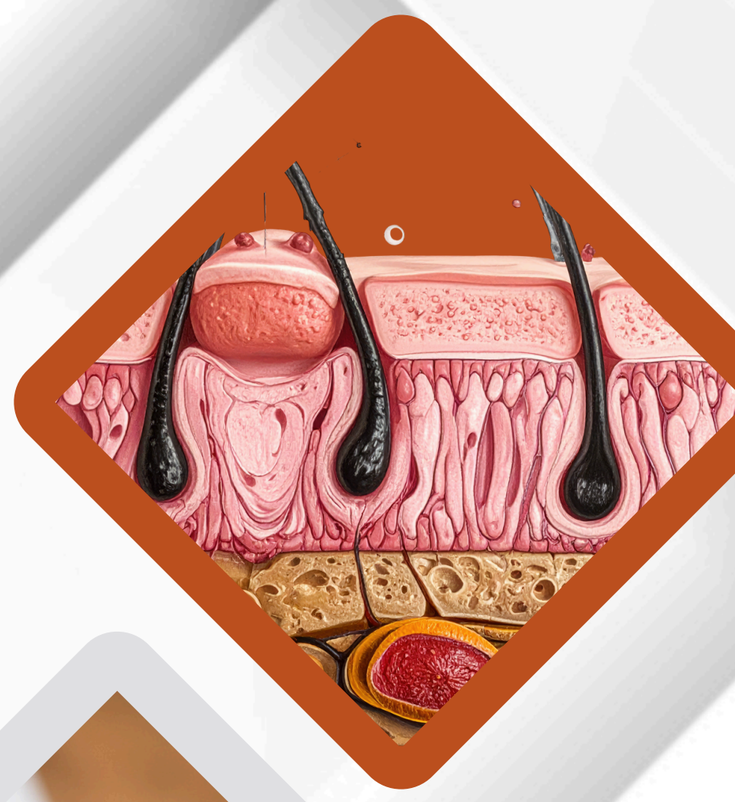
- **Over-treating** leads to avoidable complications such as scarring, prolonged erythema, and pigmentary changes.
- **Under-treating**, especially for dermal concerns, provides inadequate results even when repeated multiple times.

For example:

- Treating epidermal problems such as superficial pigmentation, fine texture irregularities, or mild acne with a deep dermal peel is unnecessary and risky.
- Conversely, attempting to treat dermal conditions such as atrophic scars or severe photoaging exclusively with mild, intraepidermal peels will be ineffective regardless of frequency.

CHAPTER 2:

SKIN ANATOMY





Chapter 2

Skin Anatomy

Relevant Skin Anatomy for Peeling

A solid understanding of skin anatomy is fundamental to performing chemical peels safely and effectively. Because each peeling agent interacts with the skin's layers according to their molecular composition, water content, pH, and structural characteristics, clinicians must be aware of the unique biological environment into which a peel is applied.

The Skin as a Complex Molecular System

The skin can be viewed as an aqueous environment containing a mixture of proteins, lipids, and carbohydrates in varying proportions. Each layer—the epidermis, dermis, and subcutaneous tissue—has its own molecular signature, which directly influences how a peeling solution penetrates and reacts.

The **epidermis** contains less water than the dermis because it is more exposed to the external environment. Its structure is dominated by **keratin**, a fibrous protective protein produced continuously by keratinocytes. Through this ongoing turnover, the epidermis is replaced approximately every 27 days, making it the primary target for superficial peels.

The **dermis**, by contrast, contains significantly more water because it is rich in blood vessels, lymphatics, and hydrophilic molecules. Key components include **collagen**, **elastin**, **glycosaminoglycans (GAGs)**, and **proteoglycans**.

- **Collagen**, the most abundant protein in the human body, provides strength and structure.
- **Elastin** contributes elasticity and resilience.
- **GAGs**, such as hyaluronic acid, dermatan sulfate, and chondroitin sulfate, consist of sugar-based chains capable of binding up to 1000 times their weight in water.

The **subcutaneous tissue (hypodermis)** is primarily composed of fat. Because chemical peels are not intended to reach this layer, its chemical characteristics have little relevance to peeling procedures.

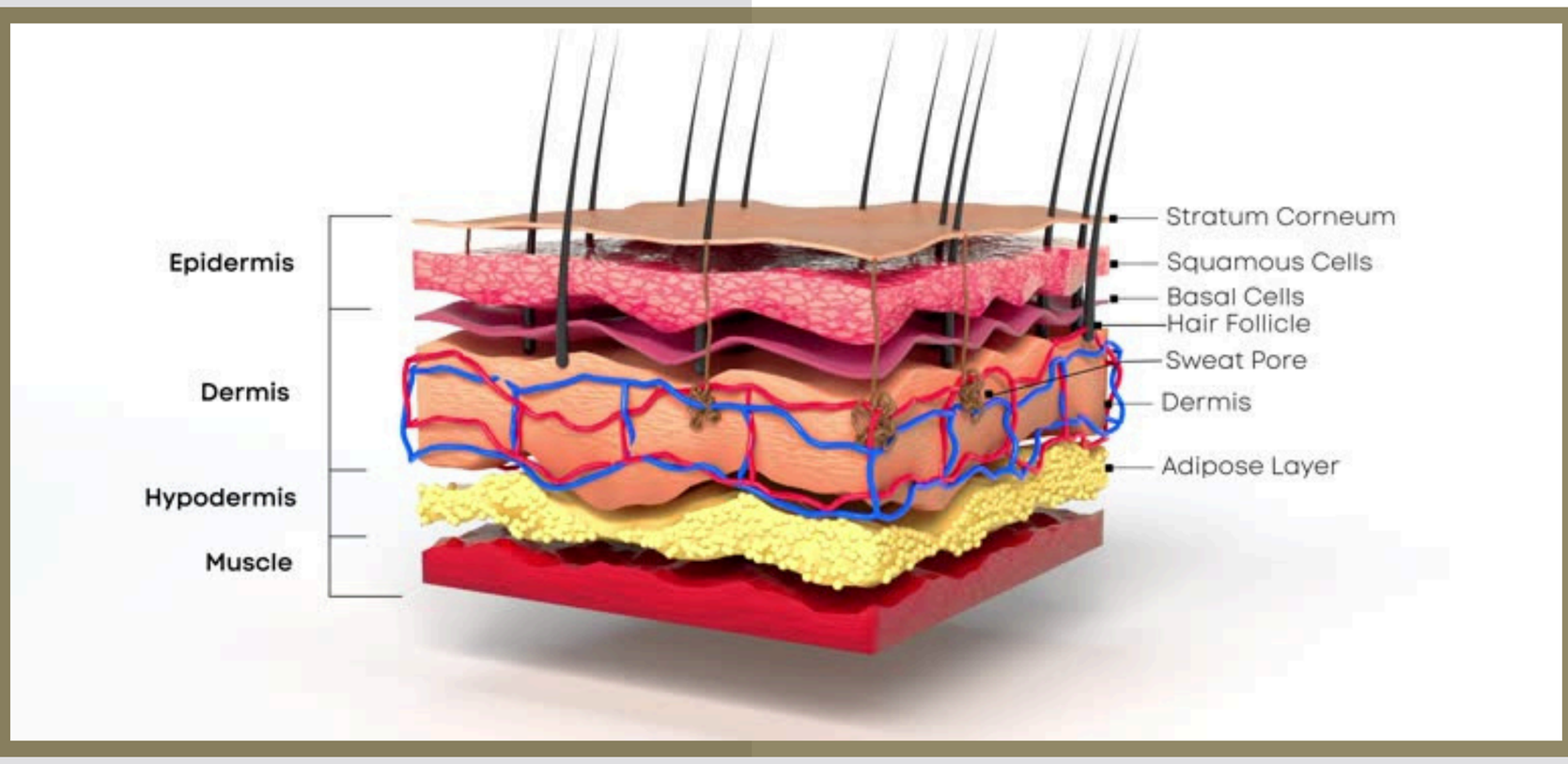


Fig 2.1. The Skin as a Complex Molecular System

Penetration and Molecular Interactions

The distinct molecular composition of each layer explains why chemical peels act differently depending on their depth. Epidermal peels primarily interact with keratin and corneocyte cohesion. Medium and deep peels extend into the dermis, where they induce controlled injury to collagen, elastin, and dermal proteins, triggering regeneration and remodeling.

This layered variability also contributes to the challenge of predicting exact peel depth. Even small changes in formulation, pH, application pressure, or skin condition can alter penetration, emphasizing the need for precise technique and thorough anatomical understanding.

pH Considerations in Peeling

pH plays a central role in determining how a peeling agent behaves on the skin. The **epidermis maintains a naturally acidic environment**, commonly referred to as the **acid mantle**, produced by sebum and sweat.

- Epidermal pH typically ranges from 4.2 to 5.6, with slight variations depending on body site, hydration status, and skin type.
- The stratum corneum is closer to pH ~5.6, while deeper epidermal layers approach pH ~4.8.
- Oily skin tends to be less acidic, sometimes approaching pH 6, whereas dry skin is more acidic.

The dermis, due to its fluid-rich composition, is less acidic and approximates the pH of blood and extracellular fluid:

- ~6.0 in the papillary dermis
- ~7.0 in the vascular reticular dermis

These pH differences influence acid penetration. Lower pH agents penetrate more readily, while buffered or higher-pH formulations penetrate more slowly and predictably.

Skin Layer	pH Range	Effect on Acid Penetration
Epidermis (Overall)	4.2 to 5.6	Slight variations depending on hydration and skin type; acidic environment.
Stratum Corneum	~5.6	Closest to neutral, affects the behavior of peeling agents.
Deeper Epidermal Layers	~4.8	Slightly more acidic, allows better penetration of lower pH acids.
Oily Skin	~6.0	Less acidic, may hinder penetration of certain acids.
Dry Skin	More acidic (~4.0)	More acidic, facilitating the penetration of certain acids.
Papillary Dermis	~6.0	Less acidic, similar to blood/ECF pH, slower penetration of acids.
Vascular Reticular Dermis	~7.0	Least acidic, less penetration of acids, requires higher concentrations.

Fig 2.2. pH variations and their effects on skin layers and peeling agents

Cell Membranes and Acid Penetration

Understanding how acids enter cells further explains peel behavior. Cell membranes are built from **phospholipid bilayers**, whose hydrophobic interior restricts passage of charged or highly polar molecules. Many peeling agents are **weak organic acids**, meaning:

- In acidic environments, they remain **uncharged (protonated)** and can cross cell membranes.
- Inside the neutral cytosol, they become **charged**, increasing their solubility in intracellular fluid and allowing them to diffuse toward target structures.

Implications for Peeling Practice

The molecular architecture of the epidermis and dermis—combined with water content, pH, and membrane behavior—explains why different peeling agents reach different depths and create different clinical outcomes. Whether a peel remains superficial or penetrates into the dermis depends not only on the agent itself but also on the biological environment into which it is applied.

A practitioner's ability to anticipate these interactions, combined with precise technique, is key to achieving predictable, safe, and effective results with chemical peels.

Fitzpatrick Skin Types: Assessment and Risk Stratification

Accurate assessment of a patient's Fitzpatrick skin type is essential before performing any chemical peel. Skin type influences not only how the skin responds to controlled chemical injury but also the risk of pigmentary complications, particularly post-inflammatory hyperpigmentation (PIH). Proper stratification allows the practitioner to select appropriate peeling agents, adjust depth, and counsel patients effectively.

Understanding Fitzpatrick Skin Types

The Fitzpatrick classification categorizes skin based on its **melanin content** and **response to ultraviolet exposure**, ranging from:

- **Type I:** very fair, always burns, never tans
- **Type II:** fair, burns easily, tans minimally
- **Type III:** medium/light brown, sometimes mild burn, gradually tans
- **Type IV:** moderate brown, rarely burns, tans easily
- **Type V:** dark brown, very rarely burns, tans deeply
- **Type VI:** deeply pigmented, never burns

While initially developed to predict sun reactivity, it remains one of the most practical tools in aesthetic practice for anticipating pigmentation risk during resurfacing procedures.

Risk Stratification and Pigmentation Concerns

All skin types can undergo chemical peeling, but the **risk of pigmentary alteration increases with melanin density**. This makes careful selection and planning essential.

Safer to peel:

Fitzpatrick I–II tend to tolerate chemical peels well, with minimal risk of PIH due to lower baseline melanin activity.

Moderate to high caution:

Fitzpatrick IV–V are more prone to pigmentation changes, both hyper- and hypopigmentation. Even minor inflammation can trigger melanocyte activity and lead to visible PIH that appears around **3–4 weeks post-procedure**.

Very dark skin:

Fitzpatrick VI can often be peeled safely with the right technique and preparation, though caution is still necessary. With proper agent selection and slow, controlled treatment plans, these patients may have outcomes comparable to lighter types.

Fitzpatrick Skin Type	Description	Response to Sun Exposure
Type I		Always burns, never tans
Type II		Burns easily, tans minimally
Type III		Sometimes mild burn, gradually tans
Type IV		Rarely burns, tans easily
Type V		Very rarely burns, tans deeply
Type VI		Never burns

Fig 2.3. Fitzpatrick Skin Types

Aging Skin vs. Photoaged Skin: How They Respond to Peels

Understanding the differences between intrinsically aged skin and photoaged skin is essential for selecting appropriate peeling agents and predicting treatment outcomes. Although both aging processes produce visible changes, their underlying mechanisms and histologic features differ significantly—resulting in distinct responses to chemical peels.

Intrinsic Aging: Slow, Biological, and Predictable

Intrinsic aging—also known as chronological aging—is driven by natural cellular and molecular changes over time. These include reduced collagen production, decreased elastin quality, slower cell turnover, and diminished hydration due to declining glycosaminoglycan (GAG) levels.

Characteristics of intrinsically aged skin include:

- Fine lines rather than deep wrinkles
- Thinning of the epidermis and dermis
- Decreased elasticity but relatively uniform texture
- Mild pigment irregularities
- Skin that may be more fragile or sensitive

Feature	Intrinsic Aging	Photoaging
Primary Cause	Natural aging	UV exposure
Texture	Thinning, fine lines	Coarse, rough, thickened
Pigmentation	Mild, even	Irregular, mottled
Elasticity	Reduced	Severely compromised
Peel Response	Gentle improvement	Often dramatic improvement
Risks	Sensitivity, thinning	PIH, uneven healing

Fig 2.4. Aging Skin vs. Photoaged Skin

Response to Peels:

Chronologically aged skin typically responds **predictably and gently** to chemical peels. Because the patterns of damage are uniform and less severe, superficial and medium-depth peels can significantly enhance radiance, smoothness, and overall quality with minimal risk. However, practitioners must consider the patient's baseline fragility: thinner skin is more susceptible to over-peeling, excessive dryness, or prolonged erythema.

Photoaged Skin: UV-Driven, Irregular, and More Damaged

Photoaging results from cumulative ultraviolet (UV) exposure, leading to profound molecular and structural changes. Unlike intrinsic aging,

photoaging produces irregular, patchy, and deeper damage due to chronic inflammation, oxidative stress, and repeated injury to collagen, elastin, and melanocytes.

Characteristics of photoaged skin include:

- Coarse wrinkles and deeper lines
- Mottled pigmentation, lentigines, and PIH
- Rough texture and enlarged pores
- Telangiectasias
- Thickened, leathery appearance in advanced cases
- Solar elastosis due to degraded and abnormal elastin fibers

Response to Peels:

Photoaged skin often **benefits more dramatically** from chemical peels because the structural damage is greater and more responsive to controlled chemical wounding. Medium-depth and combination peels can significantly improve pigmentation, texture, and fine wrinkles. However, photoaged skin may also be:

- More reactive
- More prone to uneven healing
- At higher risk of pigment instability, especially in darker skin types

In these patients, peels must be approached with deliberate agent selection, careful priming, and strict sun protection.

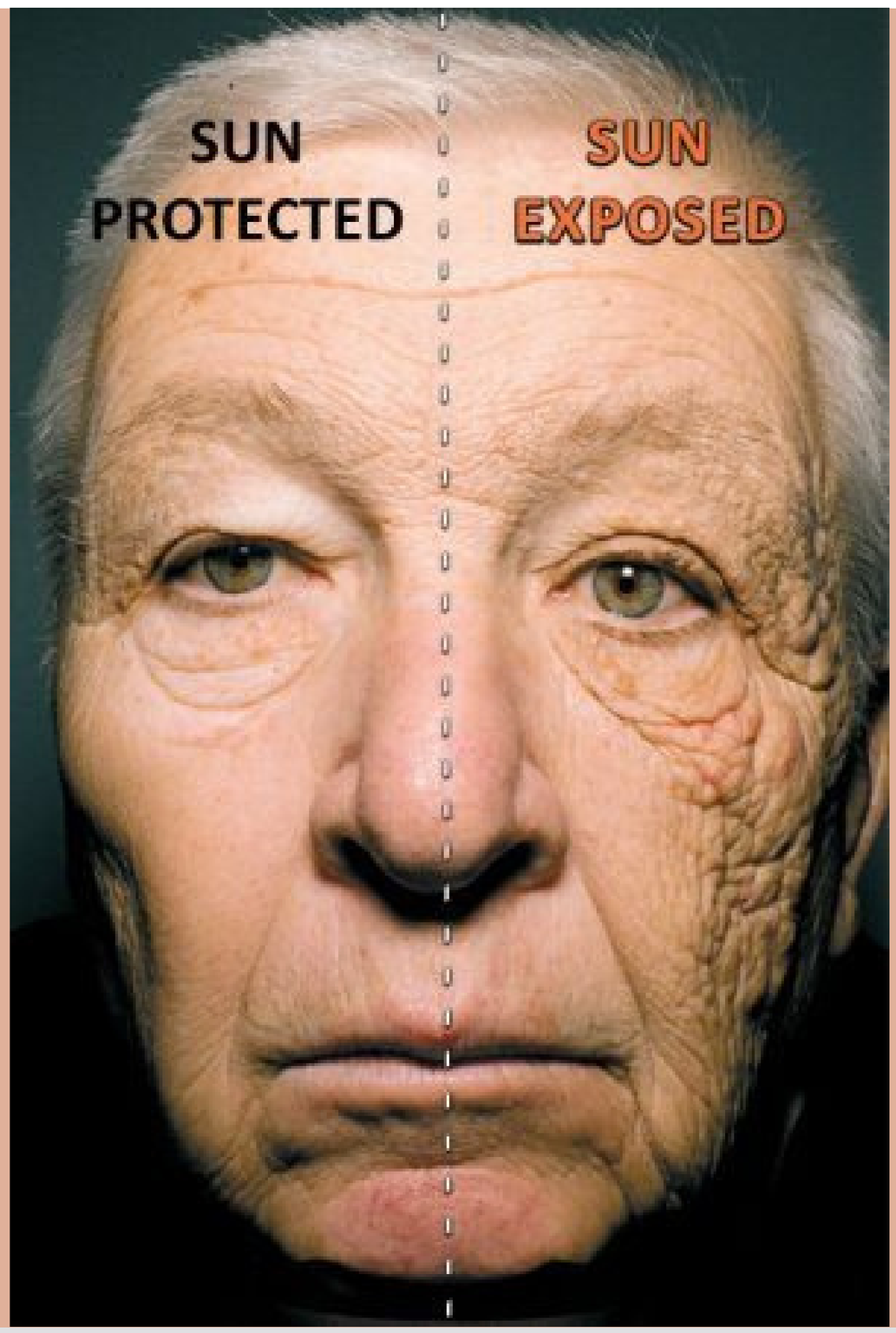


Fig 2.5. Photoaging shares many signs with chronological aging, as it accelerates the loss of elasticity and firmness

CHAPTER 3:

INDICATIONS, CONTRAINDICATIONS, AND PATIENT SELECTION



Chapter 3

Indications, Contraindications, and Patient Selection

Selecting the appropriate chemical peel for a patient is one of the most important decisions in aesthetic dermatology. The true artistry of peeling lies in understanding how each peeling agent interacts with skin tissue and using this knowledge to target the right depth, the right condition, and the right patient safely. Chemical peels work by creating a controlled wound, and this injury can be limited to the epidermis or extend into the papillary or even upper reticular dermis. The choice of peel determines not only the clinical results but also the healing time, downtime, and risk of complications.

Understanding Peel Depth and Clinical Targets

Chemical peels are traditionally categorized by the **depth of the wound** they create:

- **Very superficial peels**: Affect only the stratum corneum and upper epidermis.
- **Superficial peels**: Reach the full epidermis but do not cross the basal layer.
- **Medium-depth peels**: Penetrate the entire epidermis and extend into the papillary dermis.
- **Deep peels**: Reach the upper to mid-reticular dermis.

Each depth corresponds to specific clinical goals.

Superficial resurfacing improves fine texture, mild pigmentation, and acne. Medium-depth peels target photoaging, lentigines, dermal melasma, and mild rhytides. Deep peels achieve dramatic rejuvenation for deep wrinkles, scars, and advanced photodamage—but carry higher risks.

To maximize results while minimizing complications, practitioners must carefully match **the peel depth to the patient's skin type, clinical indication, and overall treatment goals.**

Evaluating the Patient

Choosing the correct peel begins with a **comprehensive patient evaluation**, including medical history, risk assessment, and physical examination.

1. Medical and Procedural History

Key factors to review include:

- **History of HSV infections:** Patients with frequent outbreaks (more than one every six months) require antiviral prophylaxis—especially for medium-depth or deep peels. Standard regimens include valacyclovir 500 mg twice daily for 7–14 days, increased to 1000 mg in high-risk patients.
- **HIV status and immune function:** Patients with detectable viral loads or those who are immunosuppressed (transplant patients, autoimmune patients on systemic immunosuppressants) are **poor candidates** for deep peels due to delayed healing and higher infection risk.
- **Isotretinoin history:** Traditional guidance recommended waiting 6–12 months after isotretinoin therapy. Recent evidence suggests resurfacing may be safe as early as **3 months** post-treatment—but caution remains essential for medium and deep peels.
- **Recent surgical procedures:** If a patient has had a facelift or browlift, deep resurfacing should be delayed **6–12 months** unless performed on the same day as surgery. Post-surgical lymphatic disruption can otherwise prolong edema.

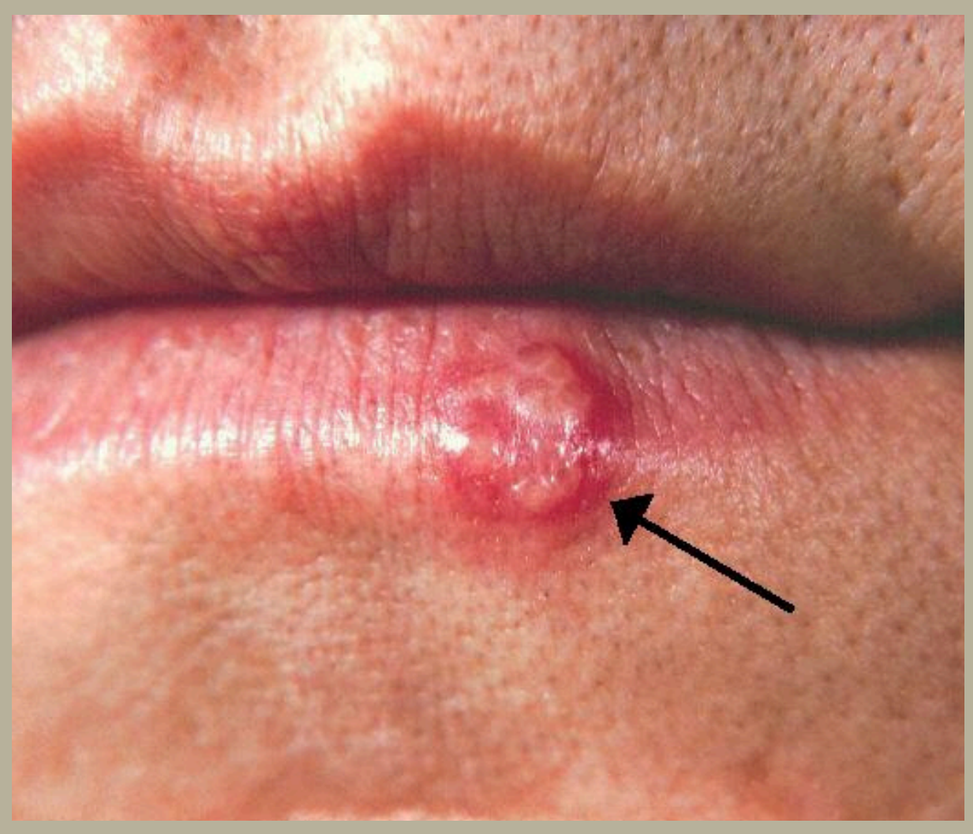


Fig 3.1. Patients with frequent HSV outbreaks (more than one every six months) require antiviral prophylaxis—especially for medium-depth or deep peels. (img: Wikipedia)

- **Past x-ray therapy or nicotine use:** Both impair healing and increase the risk of scarring. These factors must be weighed when considering peel depth.

Obagi Skin Classification: A More Comprehensive Approach

While the Fitzpatrick scale evaluates pigmentary risk, the **Obagi Skin Classification System** provides a more complete perspective for peel selection by assessing:

1. **Color**
   - Darker Caucasian skin and lighter patients of Asian or African descent are more prone to PIH.
   - Very fair patients (Fitzpatrick I–II) have stable pigment but increased fragility.

Parameter	Key Points	Clinical Relevance
Color	Darker Caucasian and lighter Asian/African skin have higher PIH risk. Very fair skin is pigment-stable but fragile.	Guides depth selection and need for pigment control protocols.
Oiliness	Excess sebum reduces penetration and increases acne flare risk.	Requires thorough degreasing; severe cases may need prolonged prep or isotretinoin.
Thickness	Thin skin is vulnerable; thick skin tolerates deeper resurfacing.	Thin skin favors conservative or repeated medium peels; thick skin often needs deeper peels.
Laxity	Peels improve skin laxity only, not muscle laxity.	Surgical intervention required for muscle-related laxity.
Fragility	Aging or compromised skin heals poorly.	Deep peels contraindicated; repeated medium peels preferred.

Fig 3.2. This five-factor Obagi classification enables safer and more precise peel planning than Fitzpatrick type alone

- **Oiliness**
  - Excess sebum interferes with acid penetration and raises the risk of post-peel acne flares.
  - These patients may require extensive degreasing or even months of systemic isotretinoin if a medium-depth or deep peel is planned.
- **Thickness**
  - Thin skin requires conservative resurfacing (often multiple medium-depth peels).
  - Thick skin tolerates more aggressive treatments and often requires deeper peels for visible improvement.
- **Laxity**
  - Only **skin laxity** improves with peels (via dermal collagen stimulation).
  - **Muscle laxity** requires surgical intervention.
- **Fragility**
  - Older patients with fragile skin or compromised healing should not undergo deep resurfacing.
  - Repeated medium-depth peels may help strengthen the dermal–epidermal junction.

This five-dimensional analysis guides treatment planning far more effectively than Fitzpatrick type alone.

Indications by Depth

Selecting the appropriate peel depth depends on the clinical condition being treated, the skin type, and the patient's tolerance for downtime. Chemical peels can target disorders confined to the **epidermis**, extend into the **papillary dermis**, or, in selected cases, reach the **upper reticular dermis**. Each depth category offers distinct benefits and limitations. Understanding these distinctions helps the practitioner choose the peel that delivers the greatest therapeutic effect with the lowest risk.

Very Superficial Peels

(Stratum corneum → upper epidermis)

Ideal for:

- **Comedonal and mild inflammatory acne:** AHAs and BHAs decrease follicular cohesion, reduce microcomedones, and improve clarity.
- **Early PIH or mild epidermal dyschromia:** Gradual, repeated exfoliation lightens pigment with minimal irritation.
- **Epidermal melasma (mild):** Useful as maintenance therapy or as part of a combination regimen.
- **Early photoaging:** Enhances brightness and texture without downtime.
- **Texture irregularities and dullness:** Improves radiance and smoothness.
- **Fine pore refinement:** Helps reduce oiliness and superficial debris.

Clinical Role:

Best performed as **a series**. Minimal inflammation → very low PIH risk, appropriate for all skin types including Fitzpatrick IV–VI when performed cautiously.

Superficial Peels

(Full epidermis; do not cross the basal layer)

Ideal for:

- **Acne**
- Salicylic acid and glycolic acid treat comedones, papules, mild pustules, and post-acne pigmentation.
- **Epidermal melasma:** Lightens pigment when combined with priming agents such as hydroquinone or retinoids.
- **PIH (post-inflammatory hyperpigmentation):** Especially effective with repeated treatments.
- **Actinic keratoses (thin lesions):** Promotes controlled epidermal turnover.
- **Solar lentigines and mild photodamage:** Helps with uneven tone and superficial pigment.
- **Texture concerns and mild roughness:** Refines surface quality and improves skin glow.

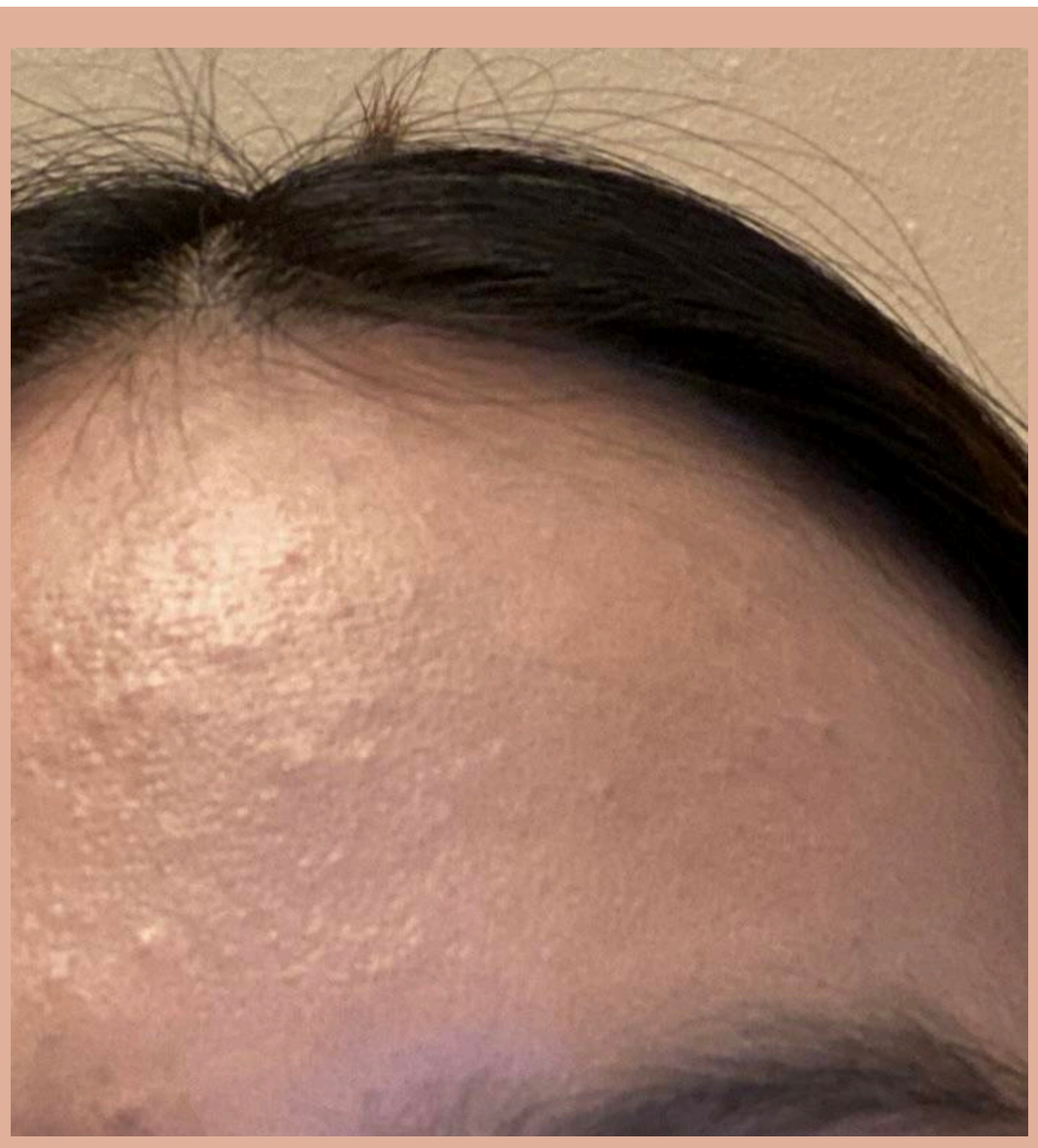


Fig 3.3. Comedonal acne is a breakout of blemishes called comedones. Comedones are small bumps that appear when pores or hair follicles clog up with sebum and dead skin cells.

- **Superficial scars (very fine atrophic changes):** Offers modest improvement.

Clinical Role:
Balances efficacy with safety. Healing occurs within 3–4 days. Still requires caution in pigment-prone patients but generally safe with proper priming

Medium-Depth Peels
(Entire epidermis + papillary dermis)
Ideal for:

- **Dermal or mixed-depth melasma:** Often used cautiously and always with strict priming due to PIH risk.
- **Moderate photoaging:** Improves fine lines, mottled pigmentation, and early elastosis.
- **More significant PIH or dyschromia:** Stronger effect on melanophages and deeper pigment.
- **Atrophic acne scars (shallow to moderate):** TCA-based medium peels improve texture by stimulating collagen.
- **Enlarged pores:** Dermal remodeling tightens pore appearance.
- **Laxity and early wrinkles:** Beneficial due to collagen remodeling in the papillary dermis.

Clinical Role:
Healing time ~7 days. Higher risk of complications (PIH, scarring) in Fitzpatrick IV–VI; patient selection and priming are essential.



Fig 3.4. Melasma is a common chronic acquired pigmentation disorder that is recognized as a type of photoaging disorder. (Zheng, Hong, Understanding Melasma: From Pathogenesis to Innovative Treatments, Dermatologic Therapy, 2024)

Deep Peels
(Upper–mid reticular dermis)
Ideal for:

- **Severe photoaging:** Dramatic improvement in deep rhytides, coarse texture, and severe elastosis.
- **Deep wrinkles (perioral, periorbital):**Phenol or phenol–croton oil peels remain gold-standard non-surgical options.
- **Deep acne scarring:** Selected scars may respond when treated focally or in combination with other techniques.
- **Severe textural roughness:** Strong remodeling leads to smoother skin.

Clinical Role:
Deep peels offer the greatest rejuvenation but come with substantial downtime (10–12 days) and the highest

Concern	Very Superficial	Superficial	Medium	Deep
Acne	✓	✓✓	✓	—
PIH	✓	✓✓	✓ (risk)	—
Melasma	✓ (mild)	✓	✓ (cautious)	—
Photoaging	✓	✓✓	✓✓✓	✓✓✓✓
Texture	✓	✓✓	✓✓✓	✓✓✓✓
Scars	—	✓ (very mild)	✓✓	✓✓✓
Pores	✓ (mild)	✓✓	✓✓✓	✓✓✓✓

Fig 3.5. Summary Table: Indications by Peel Depth: ✓ minimal effect, ✓✓ moderate effect , ✓✓✓ strong effect, ✓✓✓✓ maximal effect

complication risk. Permanent hypopigmentation is possible. Best suited for lighter skin types (Fitzpatrick I–III) or extremely carefully selected darker patients.

Absolute and Relative Contraindications

Safe chemical peeling begins with careful evaluation of factors that may impair healing, increase complication risks, or alter peel penetration. While many patients are eligible for chemical peels with appropriate modifications, certain conditions require postponement, alteration of the peel depth, or complete avoidance. Understanding both **absolute** and **relative** contraindications allows the practitioner to tailor treatments safely and prevent avoidable complications, especially scarring and pigmentary imbalance.

Absolute Contraindications

1. Active Skin Infection

Chemical peels should never be performed over:

- **Active herpes simplex (HSV)** lesions
- **Bacterial infections** (e.g., impetigo)
- **Fungal infections**
- **Viral eruptions (e.g., varicella)**

Because acid application may worsen infection, deepen tissue injury, and significantly delay healing, treatment must be deferred until resolution.

2. Known Hypersensitivity to Ingredients

A true allergy to the peeling agent or to components in the formulation (e.g., resorcinol in Jessner's solution, phenol) is an absolute contraindication.

3. Compromised Healing Ability

Patients with conditions that severely impair healing should not undergo medium or deep peels:

- **Uncontrolled diabetes**
- **Active chemotherapy / radiation therapy**
- **Severe immunosuppression**
- **Poorly controlled connective tissue diseases**

Healing unpredictability makes deep injury unsafe.

4. Pregnancy and Breastfeeding

Most medium and deep peeling agents, as well as many priming medications (retinoids, hydroquinone), are **not recommended** in pregnancy or lactation due to limited safety data.



Fig 3.6. Keloids are benign, dermal growths related to previous skin trauma or inflammation. Lesions may develop as early as 1 to 3 months or as late as one year after injury.

5. Recent Isotretinoin Use (Deep Peels)

Although evidence suggests resurfacing may be safer earlier than previously thought, **deep peels remain contraindicated** within 3–6 months of isotretinoin use. Superficial peels may still be considered with caution.

Relative Contraindications

Relative contraindications require clinical judgment, protocol modification, or enhanced patient preparation.

1. History of HSV Infection

Peels—especially medium and deep—can trigger HSV reactivation. This is not a reason to avoid peeling, but:

- **Antiviral prophylaxis is mandatory** (e.g., valacyclovir 500–1000 mg twice daily for 7–14 days).

Avoid treatment if patient refuses prophylaxis.

2. Tendency to Form Hypertrophic Scars or Keloids

Patients with a history of abnormal scarring may still undergo **superficial** peels, but medium and deep peels should generally be avoided.

3. Recent Facial Surgery

Following procedures like facelifts or browlifts, lymphatic flow is altered, increasing risk of prolonged edema and delayed healing.

Safe approach is **Waiting 6–12 months** for medium/deep peels.

4. Fitzpatrick IV–VI Skin

Not a contraindication to peeling, but:

- Requires **aggressive priming** (HQ, retinoids, pigmentation control).
- Increased PIH risk with medium/deep peels.
- Superficial peels remain safe when properly executed.

5. Compromised Skin Barrier

Conditions such as:

- Active eczema
- Psoriasis
- Severe dermatitis
- Excessive dryness or irritation from priming

may lead to unpredictable penetration and uneven frosting. The peel must be postponed until the barrier stabilizes.

6. Recent UV Exposure or Tanning

Fresh tan = elevated melanocyte activity → higher PIH risk.

Patients must avoid sun exposure for **at least 2–4 weeks** before medium-depth peels.

7. Active Acne on Areas Planned for Deep Peeling

Pustular activity increases infection risk. Treat acne before performing deeper resurfacing.

Peel Depth	Absolute Contraindications	Relative Contraindications
Very Superficial	Few	Most manageable with modifications
Superficial	Most safely treatable	Requires priming in PIH-prone patients
Medium	Multiple	Careful selection needed for ethnic skin, recent surgery, immunosuppression
Deep	Strict	Best reserved for Fitzpatrick I–III, ideal healing capacity, compliant patients

Fig 3.7. Summary: Safe Decision-Making

8. Unrealistic Expectations or Poor Compliance

Chemical peels require:

- Pre-peel priming
- Post-care adherence
- Sun avoidance: If a patient cannot commit to aftercare, medium and deep peels should be avoided.

Special Considerations

Different skin types and conditions require specific adjustments when planning a chemical peel.

Ethnic Skin (Fitzpatrick IV–VI)

Darker skin has higher melanocyte activity and a greater risk of PIH.

Key points:

- Priming is essential (hydroquinone + retinoid).
- Start with superficial peels; avoid deep peels.
- Strict sun protection before and after treatment.

Sensitive Skin

Patients with reactive skin may experience excessive irritation and unpredictable penetration.

Key points:

- Use gentler agents (lactic acid, mandelic acid).
- Shorter priming duration or lower-strength retinoids.
- Avoid medium/deep peels during flare-ups.

Acne-Prone Skin

Peels help reduce comedones and PIH, but active pustular acne increases infection risk.

Key points:

- Salicylic acid is first-line.
- Treat active infections before deeper peels.
- Expect temporary purging in some cases.

Rosacea

Rosacea skin is highly reactive and may flare with chemical agents.

Key points:

- Avoid strong AHAs and TCA.
- Use very superficial, anti-inflammatory peels only.
- Avoid during active flares.

Medication Review and Safety Screening

A focused medication and medical history review is critical to avoid delayed healing, pigment changes, or scarring.

Isotretinoin

- Deep peels: avoid for 3–6 months after use.
- Superficial peels: may be safe with caution.

Photosensitizing Medications

Examples: doxycycline, minocycline, thiazides.

Risk: exaggerated inflammation and PIH.

Recommend pausing when possible or delaying the peel.

Immunosuppressive Therapy

Includes steroids, transplant medications, and chemotherapy.

Risk: delayed healing and infection.

Medium and deep peels should be avoided.

Anticoagulants

Increase risk of bruising and prolonged erythema. Use with caution for superficial peels; avoid deeper resurfacing.

CHAPTER 4:

CONSULTATION, ASSESSMENT, AND INFORMED CONSENT





Chapter 4

Consultation, Assessment, and Informed Consent

A thorough consultation is the foundation of safe and successful chemical peeling. Because outcomes depend heavily on skin type, medical history, and patient expectations, a structured and consistent approach ensures accuracy, safety, and patient satisfaction. This chapter outlines the essential steps in evaluating candidates, documenting findings, setting expectations, and obtaining informed consent.

5.1. Structured Aesthetic Skin Consultation for Peels

An effective consultation begins with understanding the patient's goals, concerns, and motivations.

Key components include:

- **Chief concern:** pigmentation, acne, scarring, texture, aging.
- **History:** previous peels, lasers, skincare routines, reactions to products.
- **Medical background:** HSV history, medications (retinoids, antibiotics, isotretinoin), autoimmune conditions, allergies.
- **Lifestyle factors:** sun exposure, smoking, tanning habits.

A structured approach helps determine whether chemical peeling is the appropriate treatment—or if alternative modalities may be safer or more effective.

5.2. Skin Examination & Documentation

A detailed skin examination ensures appropriate peel selection and provides baseline information for comparison.

Key tools:

- **Standardized photos** (same lighting and angles).
- **Skin typing:** Fitzpatrick, Obagi classifications.
- **Evaluation of:** thickness, oiliness, laxity, fragility, pigmentation patterns, active acne, barrier integrity.
- **Documentation:** pre-peel forms, medical history sheet, peel selection rationale.

Accurate documentation also protects the practitioner medicolegally and helps track clinical progress.

Peels CAN	Peels CANNOT
Improve pigmentation irregularities	Replace surgical lifting
Enhance texture and radiance	Remove deep wrinkles
Reduce fine lines	Eliminate severe scars
Minimize mild acne scarring	Produce instant, permanent results
Support acne management	Function as a one-time cure for melasma or PIH

Fig 4.1. Managing Expectations: What Peels Can and Cannot Do

5.3. Managing Expectations: What Peels Can and Cannot Do

Chemical peels improve skin quality, but each depth has limits. Honest discussion prevents dissatisfaction.

Peels CAN:

- Improve pigmentation irregularities
- Enhance texture and radiance
- Reduce fine lines
- Minimize mild acne scarring
- Support acne management

Peels CANNOT:

- Replace surgical lifting
- Remove deep wrinkles
- Eliminate severe scars
- Produce instant, permanent results
- Function as a one-time cure for melasma or PIH

Patients should understand that results are progressive and often require a series of treatments.

5.4. Educating Patients on Process, Downtime, and Results

Clear communication reduces anxiety and improves compliance.

Patients who understand the healing process are far more likely to be satisfied with their outcomes.

5.5. Informed Consent Essentials for Chemical Peels

Informed consent ensures the patient understands risks and benefits before proceeding.

Consent should include:

- Treatment indication and chosen peel depth
- Expected results and limitations
- Possible side effects
- Potential complications
- Post-care responsibilities
- Photos used for clinical documentation and teaching, if applicable

The patient must sign the consent form before treatment.

5.6. "Red Flag" Patients and When to Decline Treatment

Certain patients are poor candidates for peeling and should be treated with caution—or declined.

Red flags include:

- Unrealistic expectations (e.g., "erase all wrinkles," "instant results")
- Poor compliance with skincare or sun protection
- Active skin infections or severe dermatitis
- Recent significant sun exposure or tanning
- Significant immunosuppression
- History of keloids (for medium/deep peels)
- Psychological instability or history of dissatisfaction with prior cosmetic treatments

In these cases, alternative treatments or postponing the peel is often safer and more appropriate.

Summary

A successful chemical peel begins with a careful consultation, thorough examination, realistic expectation setting, and a transparent consent process. Patients who fully understand the procedure, healing, and limitations are the best candidates—and the most satisfied with their results.

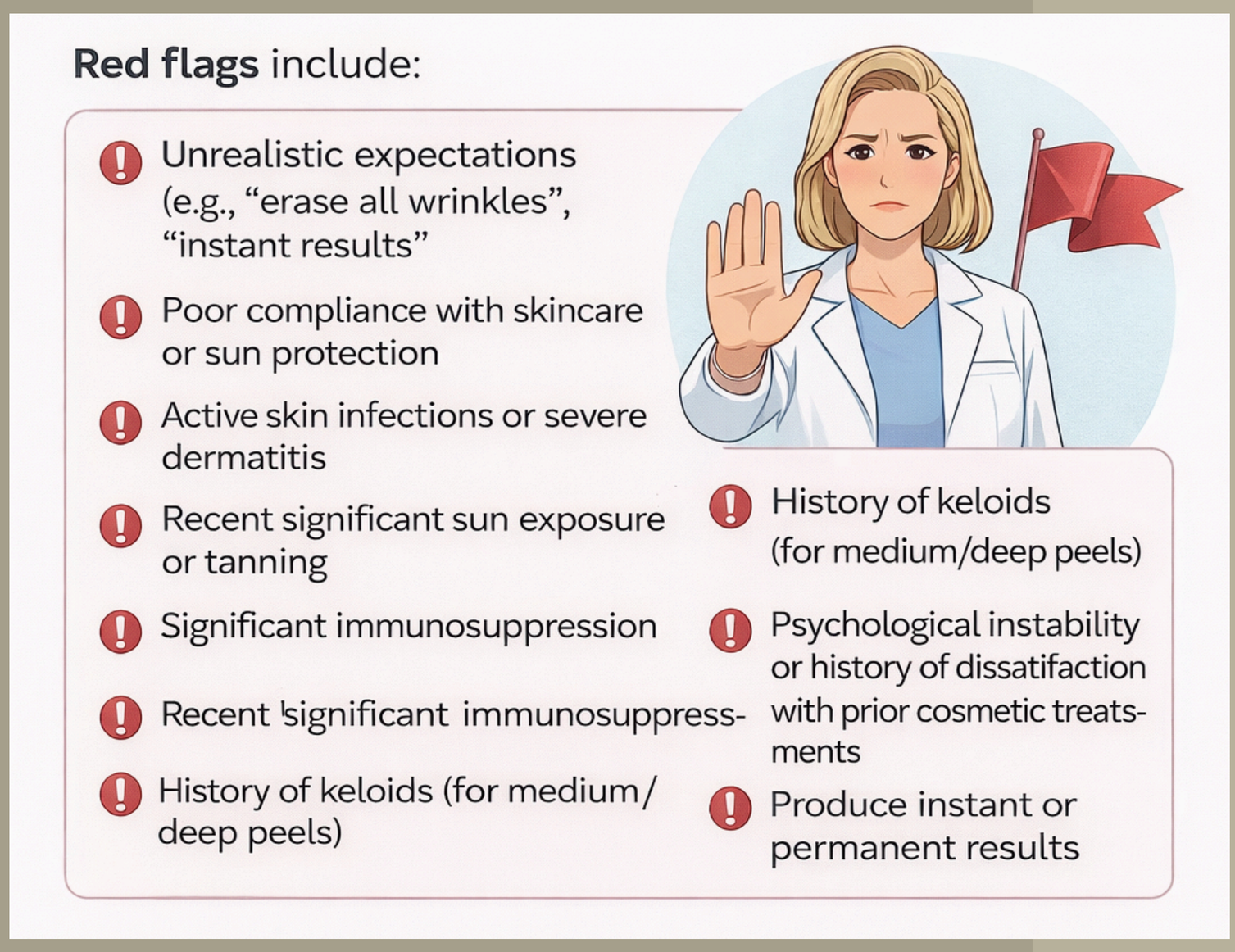


Fig 4.2. When to Decline Treatment

Chemical Peel Consent Form

Patient Name: _____

Date of Birth: _____

Address: _____

Phone Number: _____

Email: _____

CONSENT TO CHEMICAL PEEL TREATMENT

I, the undersigned, hereby consent to undergo a chemical peel for aesthetic purposes. I understand that a chemical peel involves the application of a chemical solution to my skin to exfoliate and remove damaged outer layers, improving the texture, tone, and appearance of my skin.

Treatment Explanation:

A chemical peel is a procedure in which a chemical solution is applied to the skin to exfoliate the outer layers, allowing new, healthier skin to emerge. The depth of the peel will vary, depending on the type of solution used and the desired results. Chemical peels can treat issues such as acne, hyperpigmentation, fine lines, and sun damage.

Potential Risks and Complications:

While chemical peels are generally safe, there are some risks associated with the procedure, including but not limited to:

- Redness, swelling, or irritation at the treated site
- Peeling or flaking of the skin (normal process)
- Skin infection
- Pigment changes (hypopigmentation or hyperpigmentation)
- Scarring (rare)
- Sensitivity to sunlight for a period after the treatment
- Allergic reaction to the chemicals used (rare)
- Prolonged or abnormal skin irritation

Pre-Treatment and Post-Treatment Care:

I agree to follow the pre-treatment and post-treatment instructions provided by my practitioner. Pre-treatment instructions may include avoiding sun exposure, certain medications (such as retinoids), or active skincare ingredients before the peel. Post-treatment instructions may include moisturizing, avoiding sun exposure, and using gentle skincare products until healing is complete.

Fig 4.3. Chemical Peel Consent Form sample, page 1

Medical History and Disclosure:

I have disclosed all relevant medical history, including any skin conditions (e.g., eczema, rosacea), allergies, and medications I am currently taking. I understand that failure to provide full information may increase the risk of complications.

Photographs and Media:

I consent to the use of before and after photographs of the treated area for medical documentation, educational purposes, or marketing, with my identity kept confidential unless otherwise agreed.

Acknowledgment and Consent:

By signing below, I acknowledge that I have read and understood the information provided above. I consent to the chemical peel treatment and agree to follow all pre- and post-treatment care instructions. I understand that the results of this procedure can vary, and there are no guarantees.

Patient Signature: _____

Date: _____

Practitioner Signature: _____

Date: _____

Fig 4.4. Chemical Peel Consent Form sample, page 2

CHAPTER 5:

PRE-PEEL PREPARATION (PRIMING) AND PROTOCOL DESIGN





Chapter 5

Pre-Peel Preparation (Priming) and Protocol Design

Successful chemical peeling depends not only on the choice of peeling agent or technique but also on the foundation laid in the weeks and days leading up to treatment. Proper pre-peel preparation —commonly referred to as priming— optimizes penetration, improves homogeneity of results, reduces complications, and shortens the healing period. In many cases, priming is the determining factor between an excellent outcome and an unpredictable one.

Chemical peels create controlled wounds at varying depths of the epidermis and dermis. The skin that has been well-prepared responds more uniformly, frosts more predictably, and heals more efficiently than unprimed skin. This chapter outlines an evidence-based, practical approach to priming the skin and designing a safe, effective peel protocol for aesthetic practice.

1. Principles of Pre-Peel Priming

Priming ensures four essential improvements:

- **Thinning of the stratum corneum:** Thinner epidermis allows more uniform acid penetration and reduces the risk of "skip areas."
- **Reduction of post-inflammatory hyperpigmentation (PIH):** Pigment suppression is especially important in darker skin types and melasma.
- **Acceleration of wound healing:** Pretreatment enhances re-epithelialization and reduces postoperative erythema.
- **Assessment of patient compliance:** Daily priming establishes skincare habits required for safe post-peel healing.

Priming consists of two distinct phases:

- **Pretreatment phase:** weeks before the procedure
- **Preparation phase:** immediate steps before and during the peel

Both together create a stable, predictable environment for controlled wounding.

2. Pretreatment Phase (Weeks Before the Peel)

The pretreatment phase focuses on modulating epidermal turnover, suppressing melanogenesis, and preparing the skin barrier for even penetration. Most practitioners prime for **2 weeks to 3 months**, with longer

priming recommended for melasma and PIH-prone patients. A one-month regimen is commonly preferred.

Retinoids

Retinoids (tretinoin, retinol, adapalene, tazarotene) are among the most widely used priming agents.

Benefits include:

- Accelerated wound healing
- Faster, more uniform frosting
- Enhanced epidermal turnover

Studies show that **0.05% tretinoin for as little as two weeks** can significantly speed healing at any body site.
Tazarotene is less commonly used but still effective. Retinol and adapalene offer milder alternatives for sensitive-skin patients.

Alpha-Hydroxy Acids (AHAs)

Glycolic acid is frequently used during pretreatment to reduce keratinocyte adhesion, thin hyperkeratotic lesions, and enhance penetration of the peeling agent.

- At **low concentrations**, glycolic acid simply normalizes epidermal turnover.
- At **higher concentrations**, it functions as a superficial peel itself.

A **2–3 week AHA regimen** is often sufficient for meaningful epidermal thinning.

Objective	Modulate epidermal turnover, suppress melanogenesis, and prepare skin for even penetration.
Duration	2 weeks to 3 months (1-month preferred). Longer for melasma or PIH-prone patients.
Retinoids	**Benefits:** Speeds healing, enhances turnover. **Usage:** 0.05% tretinoin for 2 weeks. Mild alternatives: Retinol, Adapalene.
Alpha-Hydroxy Acids (AHAs)	**Benefits:** Improves turnover, thins lesions. **Usage:** 2–3 weeks regimen with glycolic acid for epidermal thinning.
Hydroquinone & Pigment Modulators	**Benefits:** For PIH & melasma. **Regimen:** Modified Kligman's (Hydroquinone 5-8%, Tretinoin 0.025-0.1%, Hydrocortisone 1%) or Kojic acid if hydroquinone isn't tolerated.
Sun Protection	**Importance:** Prevents PIH. **Recommendations:** Broad-spectrum SPF 30+, antioxidants, oral photoprotective supplements.
Sample One-Month Regimen	Modified Kligman's nightly, glycolic cleanser, SPF 50+, oral supplements. Discontinue priming 1 day before the procedure.

Fig 5.1. Pretreatment Phase (Weeks Before the Peel)

Hydroquinone and Pigment Modulators

Hydroquinone (2–4% commercially, higher when compounded) remains the gold standard for PIH prevention and melasma management.
Combination regimens—often referred to as modified Kligman's formulas—may include:

- Hydroquinone 5–8%
- Tretinoin 0.025–0.1%
- Corticosteroids (e.g., hydrocortisone 1%)

These formulations are particularly effective in darker skin types or patients with a history of pigmentary instability.
Alternative: Kojic acid is used when hydroquinone is not tolerated.

Sun Protection

Aggressive sun protection is possibly the **single most important** preventive measure against PIH.

Daily use of **broad-spectrum SPF 30 or higher**, antioxidants, and oral photoprotective supplements (e.g., Polypodium leucotomos extract) is strongly recommended.

A Sample One-Month Priming Regimen

- Modified Kligman's formula nightly
- Glycolic acid foaming cleanser twice daily
- Hyaluronic acid–based moisturizer as needed
- Broad-spectrum SPF 50+ twice daily
- Oral photoprotective supplement daily

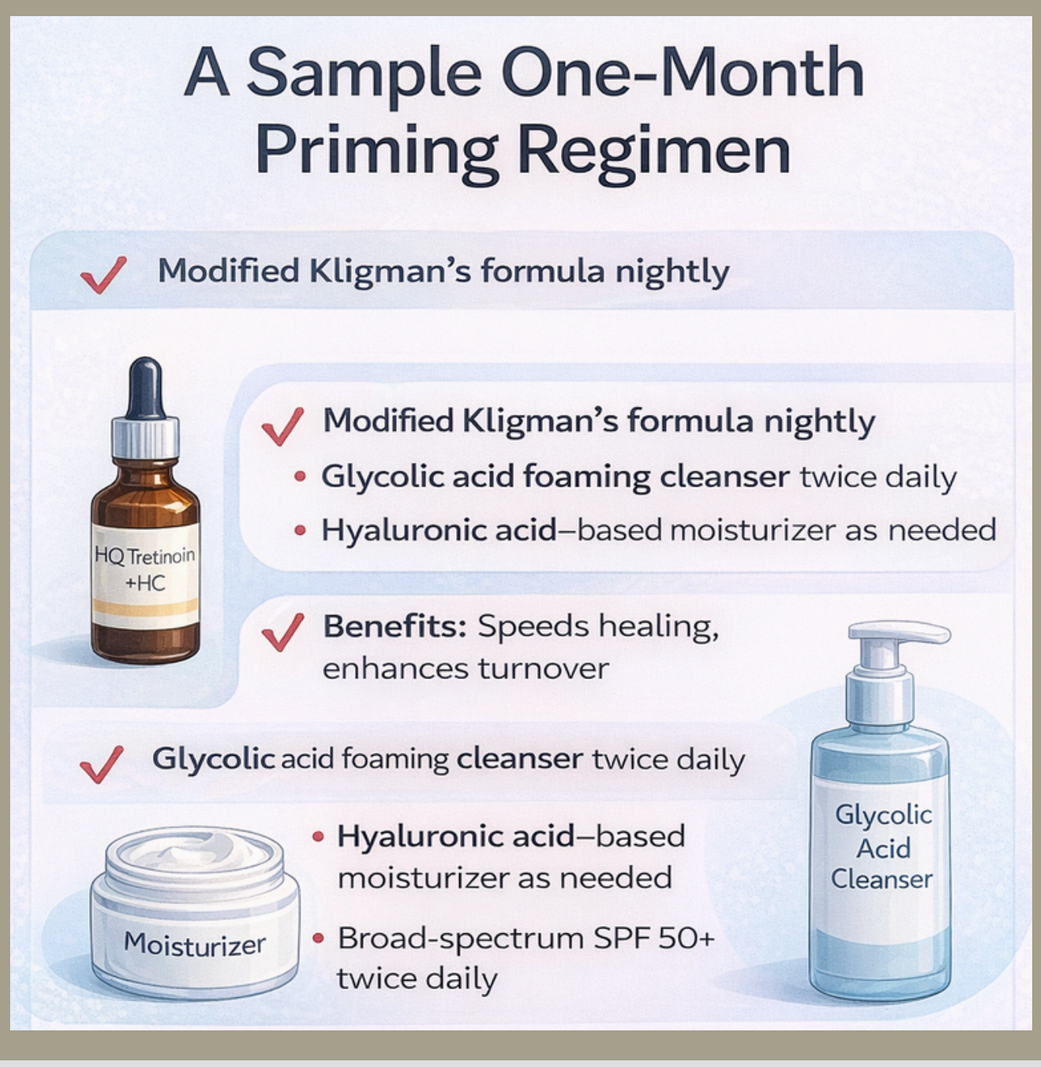


Fig 5.2. A Sample One-Month Priming Regimen

Priming is discontinued **one day before** the procedure, or earlier if irritation develops.

3. Preparation Phase (Day of the Peel)

The preparation phase ensures the peeling agent reaches the desired depth uniformly and safely.

Cleansing and Degreasing

Degreasing removes oils that impede penetration.

Common agents include:

- Alcohol
- Acetone
- Chlorhexidine (with caution due to risk of keratitis on facial use)

The **amount used, duration, and pressure of application** directly affect peel depth. Applicator choice (cotton-tip, gauze, swab) also alters penetration through variable absorption and pressure.

Depth-Enhancing Agents

Certain agents can be applied before TCA or other acids to ensure more uniform penetration:

- **Jessner's solution** (lactic acid + salicylic acid + resorcinol): Works as cleanser, degreaser, and superficial peel; often used before TCA to create a controlled medium-depth peel.
- **Glycolic acid 70%:** Enhances uniformity of penetration when applied and neutralized prior to TCA.

- **Solid CO_2:** Used similarly to Jessner's as a pre-peel modifier.

These steps improve reliability, particularly in combination peels

Topical Anesthetic Preparations

Certain compounded anesthetic gels (e.g., benzocaine, lidocaine, tetracaine mixtures) reduce discomfort and enhance hydration, contributing to more even peeling.

However, some formulations may alter penetration patterns or cause delayed stinging—requiring practitioner familiarity and caution.

4. Designing a Peel Protocol

Protocol design requires tailoring both pretreatment and in-procedure steps based on:

1. Skin Type and Color

- Darker Caucasian, Asian, and mixed-ethnicity fair patients require more aggressive priming for PIH prevention.
- Very fair patients may need gentler regimens to minimize irritation.

2. Skin Thickness and Oiliness

- Thick, oily skin requires stronger degreasing and may need longer pretreatment.
- Thin, fragile skin must avoid overly aggressive priming or deep peels.

3. Photodamage Level

- Heavily photodamaged skin benefits greatly from well-executed priming with retinoids and pigment
- modulators.

4. Expected Depth of Peel

Medium-depth and deep peels require strict adherence to priming to avoid complications.

5. Summary

1. Duration of Priming

- **Standard patients:** 2–4 weeks
- **High-risk patients (melasma, PIH-prone, Fitzpatrick IV–VI):** 4–12 weeks
- **Stop all priming agents 24–48 hours before the peel**

2. Core Priming Goals

1. **Thin the stratum corneum** → improves uniform penetration
2. **Reduce melanocyte activity** → lowers PIH risk
3. **Accelerate wound healing**
4. **Evaluate patient compliance**

3. Recommended Priming Regimen (Daily)

Night (once daily)

- Hydroquinone 4–8% *or* Kojic acid if HQ not tolerated
- Tretinoin 0.025–0.05% (or adapalene / retinol for sensitive skin)

Step	Details
1. Duration of Priming	- Standard: 2–4 weeks- High-risk (melasma, PIH, Fitzpatrick IV–VI): 4–12 weeks
2. Core Goals	- Thin stratum corneum- Reduce melanocyte activity- Accelerate wound healing
3. Daily Regimen	**Night:** Hydroquinone 4–8% or Kojic acid, Tretinoin 0.025–0.05%**Morning:** Gentle cleanser, SPF 30–50+
4. Special Considerations	- **Melasma/PIH:** Longer priming (6–12 weeks), Hydroquinone mandatory- **Oily/Thick Skin:** Glycolic acid cleanser
5. Contraindications	- Discontinue if irritation occurs- Wait 3 months after isotretinoin for medium/deep peels
6. Day-Before & Day-of-Peel Protocol	- **Day Before:** Stop actives- **Day of:** Cleanse, Degrease with alcohol/acetone

Fig 5.3. Pre-Peel Preparation (Priming)

Morning

- Gentle cleanser
- Antioxidant serum or glycolic acid 5–10% if tolerated
- Broad-spectrum SPF 30–50+ (reapply mid-day)

As Needed

- Moisturizer with hyaluronic acid
- Strict sun avoidance and protective clothing

4. Special Considerations

For Melasma / PIH-prone skin

- Longer priming (6–12 weeks)
- Hydroquinone mandatory
- Avoid irritation—reduce frequency if needed

For Oily / Thick Skin

- Add glycolic acid cleanser or lotion (5–10%)
- Consider more thorough degreasing on procedure day

For Sensitive / Thin Skin

- Use gentler retinoids (retinol/adapalene)
- Avoid aggressive exfoliants

5. Contraindications or Modifications

- Discontinue priming earlier if significant irritation occurs
- For recent isotretinoin: wait **3 months minimum** before medium/deep peels
- Always maintain daily sunscreen; PIH risk rises sharply without it

6. Day-Before and Day-of-Peel Protocol

Day Before Peel

- Stop all actives (retinoids, AHAs, HQ)
- Ensure skin is calm and non-irritated

Day of Peel

- Cleanse
- Degrease with alcohol/acetone

CHAPTER 6:

SUPERFICIAL PEELS



Chapter 6

Superficial Peels

Introduction to Superficial Peeling

Chemical peels can be categorized according to the depth of tissue injury—very superficial, superficial (light), medium-depth, and deep peels—or by their mechanism of action, such as caustic, metabolic, or toxic agents. Regardless of classification, all peels function through a controlled and predictable destruction of cutaneous layers. This controlled injury triggers exfoliation, removal of superficial lesions, and subsequent regeneration of healthier epidermal and dermal tissue.

Superficial (light) peels represent one of the most widely used categories due to their safety profile, versatility, and minimal downtime. They induce necrosis of the epidermis from the stratum corneum down to the stratum granulosum or basal lamina, depending on the agent and application technique. Very superficial peels affect only the stratum corneum, while light peels penetrate more deeply into the viable epidermis. This controlled disruption reduces corneocyte adhesion, accelerates desquamation, and stimulates dermal collagen synthesis—leading to improved radiance, texture, and luminosity.

Superficial peels are highly effective for a broad range of clinical indications, including pigmentary disorders such as solar lentigines, melasma, and post-inflammatory hyperpigmentation; inflammatory conditions such as papulopustular rosacea; and superficial acne scars and photoaging changes. They are also frequently used to refine skin tone and maintain results achieved with other modalities.

Because superficial peels induce limited injury, they offer a favorable balance between efficacy and downtime, making them appropriate for individuals seeking steady, incremental improvement. They may be combined with topical rejuvenating agents, dermal fillers, or other aesthetic procedures to enhance overall outcomes. Importantly, superficial peels require **repetition** to maintain and optimize cosmetic benefit. Treatment intervals typically range from every **1–2 weeks** for very superficial peels and **2–4 weeks** for superficial peels.

Schürer and Wiest further refine peel penetration into precise levels:

- Level A: Very superficial—limited to the stratum corneum
- Level B: Superficial—extends into mid-epidermal layers
- Level C: Deeper light peel approaching the basal layer, causing epidermolysis

This stratification clarifies the nuanced depth variability among superficial peels and underscores why identical agents can behave differently depending on skin characteristics, application method, and formulation.

Despite technological advances such as laser resurfacing, superficial chemical peels remain indispensable due to their simplicity, accessibility, low morbidity, and robust clinical utility in managing photoaging and pigmentary disorders. Their adaptability across skin types and conditions continues to make them a foundational tool in modern aesthetic practice.

Peeling Agents: Chemistry and Common Formulations for Superficial Peels

Superficial chemical peels rely on agents that target the epidermis with controlled and predictable depth. Their effectiveness depends on the molecular

Schürer & Wiest Level	Depth Category	Depth Reached	Key Clinical Effect
Level A	Very superficial	**Stratum corneum only**	Minimal exfoliation
Level B	Superficial	**Mid-epidermis**	More visible epidermal renewal
Level C	Deeper light peel	**Approaches basal layer**	**Epidermolysis** (full-epidermal separation effect)

Fig 6.1. Schürer & Wiest Peeling Levels

structure, penetration characteristics, and biochemical effects of each peeling agent. The following section outlines the most commonly used superficial peel agents, focusing on their chemistry, mechanism of action, therapeutic benefits, and practical application considerations.

Alpha-Hydroxy Acids (AHAs)

AHAs are organic acids—often called "fruit acids"—derived from natural sources but synthesized in laboratories for medical use. Common AHAs include:

- **Glycolic acid** (cane sugar)
- **Lactic acid** (milk, fermented sugars)
- **Citric acid** (citrus fruits)
- **Malic acid** (apples)
- **Mandelic acid** (bitter almonds)

Mechanism of Action

AHAs are **keratolytic agents** that exfoliate the skin by breaking the desmosomal bonds between keratinocytes in the stratum corneum and granulosum. This controlled exfoliation helps:

- Thin a thickened stratum corneum
- Increase epidermal turnover
- Stimulate dermal collagen and glycosaminoglycan synthesis
- Improve melanin distribution
- Enhance skin hydration and radiance

These effects persist for up to **14 days** after treatment and are further amplified with consistent use of topical AHA products.

Category	Key Point
Mechanism	Keratolytic: breaks **desmosomal bonds** between keratinocytes (mainly stratum corneum → upper epidermis)
Primary effects	Thins thick stratum corneum • increases epidermal turnover • supports dermal **collagen + GAG** synthesis • improves melanin distribution • boosts hydration/radiance
Duration	Benefits can persist **up to ~14 days** after treatment; amplified with consistent topical use
Ideal indications	Superficial sun damage • dyschromia • fine texture irregularities • ruddy/telangiectatic complexions

Fig 6.2. Alpha-Hydroxy Acids (AHAs)

Clinical Characteristics

- **Lactic acid** is hydrating, brightening, and excellent for sensitive skin and superficial acne scars.
- **Mandelic acid** penetrates slowly due to its large molecular size, making it a safe option for darker skin types and sensitive or rosacea-prone patients.
- AHAs are ideal for superficial sun damage, dyschromia, fine texture irregularities, and ruddy or telangiectatic complexions.

Beta-Hydroxy Acid (BHA)

Salicylic Acid (SA) and Lipohydroxy Acid (LHA)

Salicylic acid and its derivative, beta-lipohydroxy acid (LHA), provide several therapeutic benefits:

- **Antibacterial and anti-inflammatory**
- **Antifungal and anticomedogenic**
- **Sebum-regulating**
- **Lipophilic**, allowing deep penetration into the sebaceous follicle

LHA, due to its fatty chain, is even more targeted to follicular keratin and exfoliates primarily within the superficial stratum corneum.

Clinical Use

BHAs are particularly effective for:

- Acne vulgaris
- Oily or seborrheic skin
- Comedonal acne
- Post-inflammatory hyperpigmentation in acne-prone patients

Unlike many acids, LHA does **not require neutralization**, simplifying application.

Retinoic Acid (RA)

Retinoic acids—including **all-trans retinol and retinoic acid**—may be used alone or combined with AHAs.

Mechanism of Action

RAs produce:

- A thinner, compact stratum corneum
- A thicker, healthier epidermis
- Increased dermal collagen and vascularity
- Improved melanin distribution
- Reversal of atypical keratinocytes (helpful in treating actinic keratoses)

RA accelerates cell turnover dramatically—from the usual 28-day cycle to **10–12 days**—leading to faster brightening and textural refinement.

Clinical Considerations

- Enhances treatment of dyschromias
- Improves tone and superficial scarring
- Increases photosensitivity → strict sun avoidance required

RAs act primarily on the **stratum corneum**, while AHAs act deeper in the **stratum granulosum**, making combination regimens complementary.

Skin-Lightening Agents Used With Superficial Peels

Skin-brightening ingredients such as **hydroquinone, kojic acid, and other tyrosinase inhibitors** are commonly paired with superficial peels.

Mechanism

They inhibit tyrosinase, blocking the conversion of tyrosine to L-DOPA and reducing melanin synthesis.

Use Protocol

- Start **2–4 weeks before peeling**
- Continue **during the full peel series**
- Maintain **2–3 months after treatment**

Earlier initiation is recommended for darker skin or severe hyperpigmentation.

Combination Peels: Salicylic–Mandelic Acid

A popular modern formulation contains:

- **20% salicylic acid**
- **10% mandelic acid**

These combination peels are particularly effective for acne and acne scarring.

Studies show they are **better tolerated** in patients with Fitzpatrick III–V and may be preferable to glycolic acid (35%) for melasma-prone skin.

Pyruvic Acid

Pyruvic acid, an **α-ketoacid**, offers a unique set of properties:

Mechanism

- Keratolytic
- Sebostatic
- Antimicrobial
- Collagen-stimulating

Used in **40–70%** concentrations, pyruvic acid promotes controlled desquamation and remodeling.

Clinical Use

Excellent for:

- Acne
- Acne scars
- Oily skin
- Textural irregularities

May cause intense but transient stinging due to rapid penetration.

Agent	Concentration	Procedure
TCA	10%	1 coat
Glycolic acid	20–50%	1–4 minutes
Salicylic acid	10–30%	4–6 minutes
Resorcinol	20–30%	5–10 minutes
Jessner's solution	Standard recipe	1–3 coats
Retinoic acid	1–5%	Leave on 4–5 hrs

Fig 6.3. Summary Tables of Superficial Agents

Indications for Superficial Peels

Superficial chemical peels are highly versatile and well-tolerated, making them suitable for a wide range of epidermal conditions. Their controlled exfoliation improves texture, tone, and pigmentation with minimal downtime.

Primary Indications

- **Coarse skin and enlarged pores**
- Improves rough texture and reduces visible pore size.

- **Acne conditions**
- Effective for acne comedonica, papulopustular acne, and acne excoriée by normalizing follicular keratinization and reducing inflammation.

Agent	Concentration	Procedure
TCA	10–30%	1 coat
Glycolic acid	20–70%	2–20 minutes
Salicylic acid	10–30%	5–6 minutes
Mandelic acid	20–25%	—
Pyruvic acid	40–60%	Until erythema
Jessner's solution	Standard recipe	4–10 coats
Resorcinol	40–50%	30–60 minutes

Fig 6.4. Agents for Superficial (Light) Peels

- **Papulopustular rosacea**
- Gentle AHAs and mandelic acid help smooth the skin and reduce inflammatory lesions.

- **Keratosis pilaris**
- Softens keratotic papules and improves variants such as ulerythema ophryogenes. *(Fig. 4.5)*

- **Photodamaged and early photoaged skin**
- Enhances radiance, smooths fine texture, and brightens uneven tone.

- **Actinic keratoses (superficial)**
- Assists in removing thin lesions through enhanced epidermal turnover.

- **Dyschromias and pigmentation disorders**
- Helps treat ephelides, lentigines, flat seborrheic keratoses, melasma, and PIH. *(Fig. 4.6)*

- **General cosmetic enhancement**
- Improves overall brightness, clarity, and skin uniformity.

Patient Preparation (Priming)

Proper priming of the skin is essential for safe and predictable superficial peel outcomes. Priming should begin **2–4 weeks before treatment**, with longer preparation recommended for darker skin types or pronounced pigmentation.

Goals of Priming

- Improve peel penetration and uniformity
- Reduce healing time
- Lower the risk of complications (especially PIH)
- Identify product sensitivities before the procedure
- Improve patient compliance and outcomes

Core Pre-Peel Measures

- **Use of broad-spectrum sunscreen (SPF 50+)** daily and strict sun avoidance
- **Avoid:** waxing, scrubs, depilatories, bleaching creams, and facial massages during the peel series
- Continue any prescribed **tyrosinase inhibitors or retinoids** unless otherwise directed

HSV Prophylaxis

Patients with a history of herpes simplex should begin antiviral prophylaxis, such as:

- **Acyclovir 200 mg four times daily** (or 400 mg twice daily), or
- **Valacyclovir 500 mg once–twice daily**,

starting **1 day before the peel** and continuing **5–14 days**, depending on peel depth and individual risk.

Peeling Technique

A standardized and meticulous technique is essential for safe and predictable outcomes in superficial chemical peeling. Although different peeling agents have unique handling considerations, all superficial peel procedures share common preparation, application, and endpoint principles.



Fig 6.5. Exclude active infections before treatment.(viral, fungal, or bacterial), They can worsen with chemical injury. (image: example of an active infection)

1. General Pre-Procedure Requirements

Before beginning any superficial peel:

- Confirm that the patient has completed **priming**, including daily **broad-spectrum sun protection** and avoidance of tanning.
- Ensure proper **documentation** from previous sessions, including agent concentration, number of layers, exposure time, and skin response.
- Verify that a signed **chemical peel consent form** is on file.
- Exclude **active infections** (viral, fungal, or bacterial), which can worsen with chemical injury.

The patient's face is first cleansed with mild soap and water, and hair is secured with a band or cap.

2. Patient Positioning and Skin Protection

The patient is positioned **supine**, with the head elevated at **≤45°**, and is instructed to keep the eyes closed throughout the procedure.
Certain facial areas have a thinner stratum corneum and greater sensitivity —such as the:

- Nasolabial folds
- Lateral canthi
- Oral commissures
- Chin

These regions may absorb acid more rapidly and should be protected with a thin layer of **petroleum jelly**. The eyes are shielded with **moist 2×2-inch gauze pads**.



Fig 6.6. Neutralizer: An essential post-peel step that quickly balances skin pH and neutralizes the effects of acid-based peels. Formulated to calm irritation and support recovery after Glycolic, Salicylic, Lactic and other chemical exfoliants.

Degreasing is performed with alcohol-soaked gauze, followed by **acetone** to remove residual sebum and enhance uniform penetration.

3. Preparation of Solutions and Safety Measures

The peeling agent is poured into a **glass beaker**, and a separate glass cup is prepared with the **neutralizing solution** (when required). A syringe filled with **saline or water** should be readily available for immediate ocular irrigation in case of accidental splash.
Before starting:

- Re-check the **label and concentration** of the acid to prevent errors.
- Confirm the **neutralizer is ready**.
- Never pass an open bottle or soaked applicator **directly over the patient's eyes**, minimizing risk of dripping.

4. Application Technique

Using a brush, cotton-tipped applicator, or gauze, the peel is applied **evenly and swiftly** in a systematic pattern:

1. Forehead
2. Right temple and right cheek
3. Nose
4. Left temple and left cheek
5. Chin

If treating the **eyelids or perioral region**, these areas are applied **last**. Feathering strokes blend the peel into surrounding untreated skin to avoid demarcation lines.

Specific Techniques by Agent

A. Salicylic Acid Peels

Salicylic acid produces a characteristic **pseudofrost**—a crystalline precipitate—not to be confused with dermal frost.

Technique:

- Apply **1–3 layers** to achieve an even pseudofrost.
- After **3–5 minutes**, or once burning subsides, rinse thoroughly with **cool water**.
- The patient should continue rinsing until discomfort resolves.
- Gently blot dry; avoid rubbing the skin.

Tretinoin Peels:

These appear **yellow** on the skin and are left in place for **4–5 hours** before being washed off.

Repetition Intervals:

- Very superficial peels: **every 1–2 weeks**
- Superficial peels: **every 2–4 weeks**

B. Glycolic Acid Peels

Glycolic acid (20–70%) is the most widely used AHA in cosmetic dermatology.

Key Principles

- Depth of penetration depends on concentration and exposure time.
- Glycolic acid must be neutralized, typically after 3–5 minutes.
- Immediate neutralization is required if erythema, grey-white discoloration, or epidermolysis appears.

Neutralization

- Use **10–15% sodium bicarbonate solution** or a commercial neutralizer.
- Rinse with water afterward; ensure **complete neutralization**.

Clinical Notes

- Low-pH solutions cause more irritation and uneven penetration; buffered solutions are better tolerated.
- The progression from **pink → red** indicates intraepidermal injury.
- **Frost** indicates partial dermal injury and requires caution.



Fig 6.7. Pseudo-frosting is when part of the skin goes white during a chemical peel treatment. This happens when salicylic acid in the peel interact with the proteins in the skin and crystallises.

Indications

Glycolic acid peels benefit:

- Mottled pigmentation
- Fine wrinkles
- Sun-damaged skin
- Certain non-facial areas (hands, neck, chest) — must remain superficial to avoid scarring

Moderate wrinkling and dense pigmentation often respond less favorably.

C. Jessner's Solution

Jessner's solution contains:

- Salicylic acid 14 g
- Lactic acid (85%) 14 g
- Resorcinol 14 g
- Ethanol to 100 mL

Penetration Depth by Number of Coats

- **1–3 coats:** Very superficial peel
  - Slight erythema
  - Powdery white precipitate (SA crystallization)
  - Minimal exfoliation (0–2 days)

- **4–10 coats:** Superficial peel
  - Erythema + pinpoint frost
  - Burning/stinging for 15–30 minutes
  - Red-brown discoloration and tightness for 1–3 days
  - Flaking for 2–4 days

More coats produce deeper penetration and exfoliation lasting **8–10 days**.

Post-Care

- Use mild moisturizers to relieve tightness.
- A mild topical steroid may be used for persistent sensitivity.
- Makeup is permitted once irritation subsides.
- Avoid toners, scrubs, masks, and retinoids for **48 hours after healing**.

Jessner's solution is safe, predictable, and rarely penetrates deeper than intended.

D. Trichloroacetic Acid (TCA) Peels

- **10–25% TCA:** Superficial, intraepidermal peels
- **30–40% TCA:** Medium-depth peels (not covered here)

Technique

- Avoid **overlapping** layers to prevent unintended deepening.
- Extend slightly into the **hairline and eyebrow region** for uniformity.
- Light TCA application produces:
  - **Erythema**
  - **Speckled frosting** → healing in 2–4 days

A uniform white frost indicates full epidermal penetration and heals in ~5 days.

Once the endpoint is reached, rinse with **cold water** and cleanse gently.

CHAPTER 7:

MEDIUM-DEPTH PEELS





Chapter 7

Medium-Depth Peels

Introduction

Medium-depth chemical peels remain essential, highly versatile tools in aesthetic dermatology and facial rejuvenation. While advancements in laser technology have expanded resurfacing options, medium-depth peels continue to offer several unique advantages: they are cost-effective, customizable, and suitable for patients who may not tolerate certain laser modalities. Importantly, they give physicians greater flexibility to tailor treatment depth, technique, and combination approaches according to individual patient needs.

When performed correctly, medium-depth peels can address a wide range of cutaneous concerns. They can also be integrated seamlessly into multimodal treatment plans, complementing ablative and nonablative lasers, injectables, and surgical procedures to enhance overall aesthetic outcomes. Their predictable mechanism—controlled wounding to the level of the papillary dermis—makes them a reliable option for achieving meaningful rejuvenation while maintaining an acceptable safety profile.

Indications for Medium-Depth Peels

Although light and deep peel indications are covered in other chapters, the focus here is on clinical scenarios where a **medium-depth peel** is most beneficial. Selecting the appropriate peel requires understanding the anatomical location of the patient's skin concern, as resurfacing too superficially may yield minimal improvement, while peeling deeper than necessary increases risk and downtime.

Medium-depth peels are indicated for:

- **Moderate photodamage** including texture irregularities and fine-to-moderate wrinkles
- **Lentigines and epidermal pigmentation** resistant to superficial peels
- **Dermal components of melasma** (used cautiously and with proper priming)
- **Actinic keratoses** and widespread actinic damage
- **Superficial to moderate acne scarring**
- **Dyschromia from intrinsic and extrinsic aging**

These indications align with conditions located within the epidermis and papillary dermis, where medium-depth peels exert their therapeutic effect.

Understanding Aging Skin: Intrinsic and Extrinsic Components

Effective medium-depth peeling requires an appreciation of the biological processes that shape skin aging. Aging results from a combination of **intrinsic** and **extrinsic** factors, both of which alter epidermal turnover, dermal structure, and overall cutaneous resilience.

Aspect	Intrinsic aging	Extrinsic aging
Cause	Genetic/chronologic	UV + HEV/IR + pollution/lifestyle
Main changes	↓ fibroblasts → ↓ collagen/elastin, dermal thinning	Oxidative stress/inflammation → rough texture, dyschromia
Clinical look	Fine wrinkles, fragility	Mottled pigment, actinic damage, faster wrinkling
Peel relevance	Modest texture/fine-line benefit	Medium-depth peels are especially useful for dull/uneven, photodamaged skin

Fig 7.1.
Intrinsic Aging (Chronologic / Genetic) vs Extrinsic Aging (Environmental / "Photoaging")

Intrinsic Aging

Intrinsic aging is genetically programmed and begins remarkably early—around the age of **18**, fibroblast activity begins to decline steadily. This leads to:

- Reduced collagen synthesis
- Loss of elastin integrity
- Thinning of the dermis
- Gradual decline in skin elasticity and firmness

The cumulative decline is estimated at **approximately 1% per year**, contributing to fine wrinkles, increased fragility, and subtle textural changes.

Extrinsic Aging

Extrinsic aging is driven primarily by environmental factors, especially:

- **Ultraviolet radiation (UVR)**
- **High-energy visible (HEV) light**
- **Infrared radiation**
- Pollution and lifestyle factors

These triggers accelerate oxidative stress and inflammatory pathways, resulting in:

- Epidermal roughness
- Dyschromia and mottled pigmentation
- Keratinocyte atypia
- Actinic keratoses
- Accelerated wrinkle formation

In extrinsically aged skin, keratinocyte turnover slows, producing a duller, uneven texture—making medium-depth peeling particularly effective for restoring smoother, healthier epidermal architecture.

Patient Evaluation

Effective medium-depth peeling begins with a thorough and systematic evaluation of the patient. As emphasized in earlier chapters, the **success and safety** of any resurfacing procedure depend on selecting the appropriate modality, preparing the skin adequately, and identifying risk factors before treatment begins.

Proper Treatment Selection and Preparation

Medium-depth peels must be matched carefully to the patient's concerns and clinical findings. Understanding whether the pathology lies in the epidermis or papillary dermis, and assessing the level of photodamage or dyschromia, ensures the chosen depth is neither insufficient nor excessive.

Equally important is **skin priming**, addressed in early chapters, which improves uniform penetration and reduces the risk of post-procedure pigmentation issues.



Fig 7.2. The Koebner phenomenon (or isomorphic response) is the appearance of new skin lesions on previously unaffected skin following physical, chemical, or inflammatory trauma.

Assessment for Koebner-Prone Conditions

Certain skin disorders may worsen or spread in areas of trauma, including:

- Flat warts
- Vitiligo
- Psoriasis

These conditions must be recognized prior to treatment because medium-depth peels can trigger a **Koebner response**, causing lesions to appear along lines of injury.

Special Considerations for Melasma

Melasma patients require additional evaluation. Because hormonal stimulation plays a pivotal role in disease persistence, clinicians should ask specifically about:

- **Hormonal IUDs**
- **Hormonal vaginal rings**
- **Oral contraceptives**

These devices may continue to trigger melanogenesis and can reduce treatment response or even worsen pigmentation.

Key Considerations for Medium-Depth Peels

- Why they're useful: Versatile, good depth control, and can treat "hard-to-laser" areas with smoother blending when technique is correct.
- Darker skin (Fitz IV–VI): Higher PIH risk → extend priming (often up to ~3 months) and avoid overly deep peeling (reticular dermis ↑ risk of permanent pigment change).
- Systemic/immune status: Healing must be reliable—screen for nutritional deficits (e.g., post-bariatric) and use extra caution/possible prophylaxis in immunosuppressed patients.
- Isotretinoin: Evidence is evolving; many still prefer ~3–4 months washout for medium-depth peels; keep ~6 months for deep phenol/high-strength TCA.
- With surgery: Safe if conservative—keep peels superficial over undermined flaps, avoid incisions, deeper only on non-undermined zones.
- Do not perform if: Pregnant/breastfeeding, active infection, significant keloid history, poor compliance (sun care/follow-up), or unrealistic expectations.

Mechanisms of Action in Medium-Depth Skin Resurfacing

Chemical peels are often labeled "light," "medium," or "deep" based on the type or concentration of acid used. However, **peel depth cannot be determined by acid or percentage alone**. Depth is influenced by several key variables:

- Acid concentration
- Volume of solution applied
- Skin thickness and anatomical site
- Total body surface area treated
- Degree of skin preconditioning
- Contact time (for certain acids)

Key Consideration	Details
Why they're useful	Versatile, good depth control, treats "hard-to-laser" areas with smoother blending.
Darker skin (Fitz IV–VI)	Higher **PIH risk**; extend **priming (~3 months)**, avoid **deep peeling** to prevent pigment change.
Systemic/immune status	Screen for **nutritional deficits**, extra caution/prophylaxis for **immunosuppressed** patients.
Isotretinoin	Evolving evidence; **~3–4 months** washout for medium-depth peels; **~6 months** for deep phenol/TCA.
With surgery	Safe with conservative approach: keep peels **superficial over undermined flaps**, avoid incisions.
Do not perform if	**Pregnant/breastfeeding**, active infection, **keloid history**, poor **compliance** or unrealistic expectations.

Fig 7.3. Key Considerations for Medium-Depth Peels

Because of these variables, relying solely on concentration to classify depth is inaccurate and potentially unsafe. A proper understanding of **acid chemistry and tissue interaction** is essential, especially when performing combination peels.

Medium-depth peels primarily function through one of two mechanisms:

1. **Keratolysis** – exfoliation through disruption of keratinocyte adhesion
2. **Protein denaturation** – coagulation of epidermal and dermal proteins

Both mechanisms can be used individually or combined to enhance depth control and clinical outcomes.

Keratolytic Agents

Keratolytics weaken the bonds between keratinocytes, allowing controlled exfoliation within the stratum corneum and upper epidermis. Although considered superficial agents, they are also used strategically to **enhance penetration of trichloroacetic acid (TCA)** in combination peels.

Common keratolytics include:

- **Glycolic acid (50–70%)**
- **Salicylic acid (15–30%)**
- **Jessner's solution** (resorcinol 14%, salicylic acid 14%, lactic acid 14%)

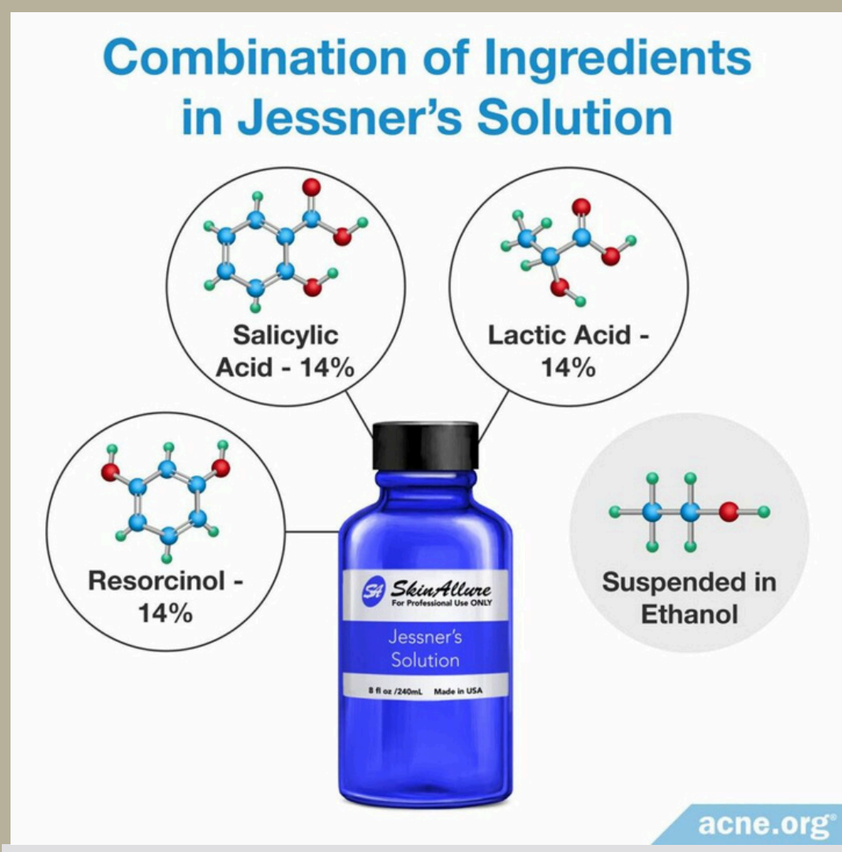


Fig 7.4. Jessner's solution is a widely used, superficial to medium-depth chemical peeling agent formulated with 14% salicylic acid, 14% lactic acid, and 14% resorcinol in an ethanol base.

Jessner's solution offers unique advantages:

- Its **lipophilic salicylic acid component** penetrates oily and acne-prone skin more effectively than hydrophilic glycolic acid.
- It does not require precise timing, unlike glycolic acid, which must be monitored closely.

As a result, Jessner's solution is widely used as a **pre-TCA keratolytic step** to break down the stratum corneum and allow more uniform, predictable penetration of TCA.

Protein-Denaturant Agents

Protein-denaturant acids create controlled coagulative necrosis in the epidermis and dermis. This mechanism allows medium and deep peels to reach the papillary or even reticular dermis.

The primary agents in this category are:

- **Trichloroacetic acid (TCA), 15–100%**
- **Phenol (60–88%; various croton oil–modified formulas)**

These acids work by:

- Coagulating structural proteins in epidermal and dermal cells
- Affecting vascular proteins, producing the characteristic **frost**
- Continuing penetration until all active acid is consumed

Key distinctions:

- **TCA** penetrates at a moderate, controllable rate. Peel depth becomes visible at ~2 minutes, allowing clinicians to determine whether further application is necessary.
- **Phenol** penetrates much more rapidly, with depth evident almost immediately.

Importantly, **neither TCA nor phenol can be neutralized** once absorbed, making technique, volume control, and skin assessment essential for safety.

Trichloroacetic Acid (TCA) Peels

Trichloroacetic acid (TCA) is one of the most versatile and widely used peeling agents in aesthetic medicine. However, describing a TCA peel as "light," "medium," or "deep" solely on the basis of concentration is inaccurate and potentially misleading. **Peel depth depends on multiple variables**, not just the percentage of TCA applied.

TCA Depth Is Not Defined by Concentration Alone

TCA concentration is only one determinant of depth. The *volume applied* has a substantial effect:

- **1 mL of 40% TCA** applied to the full face typically reaches only the **basal layer**.
- **6 mL of 40% TCA** over the same surface area can reach the **mid-dermis or deeper**.

In essence, the clinician controls peel depth much like adjusting settings on a laser. Variables such as concentration, volume, pressure of application, skin thickness, and preparation determine how deeply the TCA penetrates.

TCA as a Sole Agent

TCA concentrations ranging from **10% to 50%** may be used alone:

- Lower concentrations (10–25%) produce **superficial epidermal wounds**.
- Higher concentrations (30–50%) can reach the **papillary dermis**.

However, TCA is **hydrophilic**, which creates challenges:

- It may penetrate unevenly through a **lipid-rich, thickened stratum corneum**.

- High-concentration TCA is less predictable and more difficult to reapply without risking overpenetration.

To optimize uniformity, the skin should be **preconditioned** before treatment:

- Topical retinoids and AHAs to compact the stratum corneum
- Oil-control therapy in sebaceous patients (short-course isotretinoin, discontinued **3–6 months** before treatment)
- Rigorous **degreasing** on the day of the peel using 70% alcohol and sometimes acetone

Combination Peel	Pre-Peel "Accelerator / Modifier"	TCA Component	How It Controls Depth
Jessner's solution–TCA	Jessner's solution (keratolytic)	35% TCA (light application)	**Accelerated:** Jessner's disrupts the stratum corneum → faster TCA penetration
Glycolic acid–TCA	70% glycolic acid (keratolytic), neutralized after ~2 min	35% TCA (light application)	**Accelerated:** glycolic acid pre-peel enhances uniform penetration of TCA
TCA Blue Peel	Blue Peel base (dye + emulsifying/vehicle components) mixed with 30% TCA to yield lower effective strength	15–24% TCA (via mixing ratios)	**Decelerated**: slows and evens penetration; blue stain improves visual tracking of application

Fig 7.5. TCA combination peels.

Why Combination TCA Peels Were Developed

Higher-concentration TCA (>35–40%) has a narrow safety margin. To reduce risk while maintaining efficacy, combination techniques were introduced. These methods improve penetration by removing or weakening the stratum corneum before applying TCA, allowing clinicians to use **lower TCA concentrations** while still achieving **medium-depth results**.

Modified TCA Peels: Accelerated and Decelerated Techniques

Three combination peels are most commonly used to reach the papillary dermis safely and predictably:

- **Jessner's solution–TCA peel**
- **Glycolic acid–TCA peel**
- **TCA Blue Peel**

These peels are typically indicated for **epidermal and upper dermal pathology**, such as:

- Photodamage
- Actinic keratoses
- Lentigines and ephelides
- Fine rhytides
- Very superficial, nonfibrotic scars ("stretchable" scars)

They are *not* suitable for:

- Fibrotic or deep static wrinkles
- Nonstretchable scars
- Significant skin laxity

A useful guideline:

➡ **If a scar or wrinkle softens when the skin is stretched, a medium-depth peel may improve it.**

➡ **If not, deeper resurfacing or alternative treatments are required.**

Accelerated TCA Peels

Accelerated techniques involve applying a **keratolytic agent** before TCA to thin the stratum corneum and enhance penetration.

Jessner's–TCA Peel

- Apply **Jessner's solution**, producing a light, even frost.
- Follow with **35% TCA**.
- Jessner's facilitates **faster, deeper penetration** of TCA.

Glycolic Acid–TCA Peel

- Apply **70% glycolic acid**, then neutralize after ~2 minutes.
- Apply **35% TCA**.
- Pre-exfoliation minimizes the volume of TCA required to reach the papillary dermis.

These methods allow practitioners to use moderate TCA concentrations with **greater safety** and **more uniform depth control**.

Decelerated TCA Peel: The Blue Peel

The **Blue Peel** uses a colored base mixed with 30% TCA to produce a controlled, slower-penetrating solution:



Fig 7.6. The Blue Peel uses a blend of trichloroacetic acid (TCA) mixed with a blue base to monitor depth and uniformity of application.

Formulations include:

- 15%
- 20%
- 22.5%
- 24% TCA–Blue Peel

Key advantages:

- The **blue dye stains the stratum corneum**, allowing the clinician to see exactly where the product has been applied.
- Depth indicators such as **frosting and erythema remain visible** through the dye.
- The addition of glycerin and a saponin forms a **stable TCA-oil-water emulsion**, slowing penetration and improving evenness.

In contrast, standard TCA is colorless, requiring extreme vigilance to avoid

overlapping and deeper-than-intended penetration.
The Blue Peel provides a **slower, more controlled** approach—ideal for less experienced practitioners or when treating variable-thickness skin.

Phenol Peels
Phenol-based chemical peels represent some of the deepest and most powerful resurfacing treatments in aesthetic medicine. They are primarily reserved for **deep, static rhytides**, **selected acne scars**, and for **significant tightening** in areas such as the perioral and periorbital regions. Their clinical impact can be profound, but so are their risks—making proper patient selection and procedural precision essential.

Mechanism of Action
Similar to trichloroacetic acid (TCA), phenol induces **protein coagulation and denaturation** as it penetrates the epidermis and dermis. However, phenol penetrates **more rapidly** and often **more deeply**, which explains both its effectiveness and its higher potential for complications. Frosting appears almost immediately after application, and the clinician must closely monitor depth throughout the procedure.

Systemic Considerations and Safety
Phenol is absorbed systemically and can accumulate to toxic levels, particularly when large areas of the face are treated.

Elevated circulating phenol levels may lead to:

- **Cardiac arrhythmias**
- **Renal stress** (due to renal excretion)
- **Hepatic load** (phenol is partially metabolized in the liver)

Lower-Concentration Phenol Formulas
Modern modifications of traditional phenol-croton oil formulas—such as the **Hetter VL peel**—use **lower concentrations of phenol and croton oil**, making the procedure safer and more controlled. When applied to a **single cosmetic unit** (e.g., perioral or periorbital area) in a healthy patient, these lower-strength formulations can often be used **without IV hydration or cardiac monitoring**.

Relationship Between Toxicity and Treatment Area
Systemic phenol absorption correlates more with the **total surface area treated** than with the concentration of the solution. Therefore, to reduce toxicity risk, phenol peels are performed in **sequential sections**, allowing time for the metabolic clearance of phenol absorbed from each area.
A typical facial treatment sequence is divided into:

1. Forehead
2. Right cheek
3. Left cheek
4. Nose and perioral region
5. Periorbital region

Between each section, a **minimum of 15 minutes** is allowed before proceeding to the next area. This timing reduces cumulative phenol load and enhances procedural safety.

Clinical Role

Phenol peels remain a valuable option when deep resurfacing is required, especially for:

- Etched, rigid perioral lines
- Severe photoaging
- Deep periorbital rhytides
- Select acne scarring patterns

When performed correctly and on appropriately selected patients, phenol peels can achieve results that few other modalities can match.

Techniques: Trichloroacetic Acid (TCA) Peels

Medium-depth TCA peels aim to reach the **papillary dermis**, producing controlled epidermal and superficial dermal coagulation. Successful treatment depends not only on acid concentration, but also on **volume applied, skin preparation, technique, and real-time assessment of depth signs**.

Patient Preparation and Setup

Patients should arrive with clean skin, free of makeup, moisturizers, or sunscreen. Residual oils increase the risk of patchy penetration, so the skin is thoroughly **cleansed and degreased** using 70% alcohol and, when needed, acetone. A standard setup includes:

- TCA solution (often 30–35%)
- Alcohol/acetone for degreasing
- Sponges or gauze for application
- Cotton-tipped applicators for precise areas (eyelids, nose)
- Electrodessication tip (if treating adnexal lesions before the peel)
- Tissues to prevent runoff
- Water or saline for accidental ocular exposure

The physician must remain with the patient throughout the peel, as depth signs evolve quickly and must be carefully monitored.

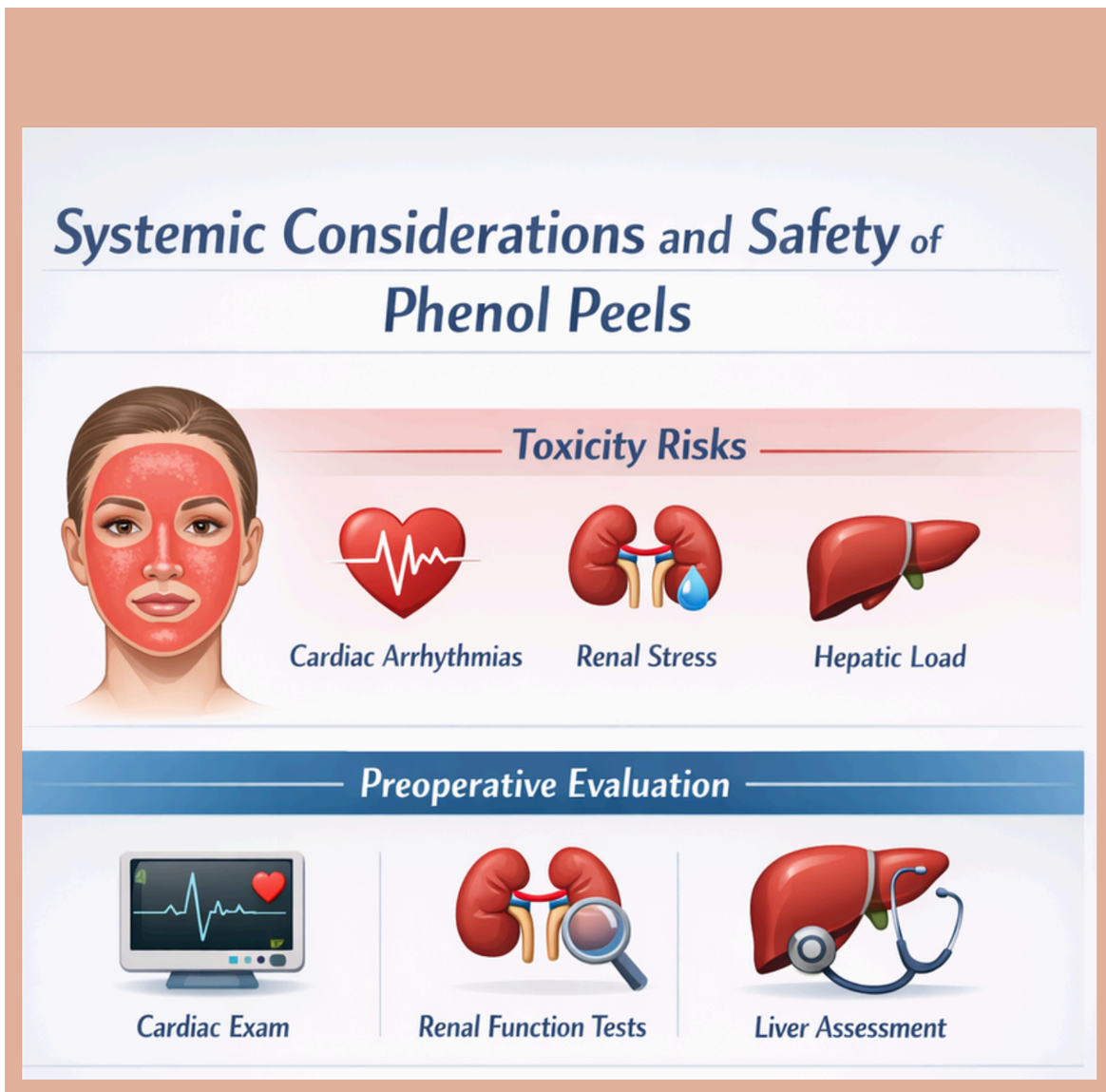


Fig 7.7. Phenol Systemic Considerations and Safety



Fig 7.8. Frosting pattern on upper lip of a middle-aged woman treated with a local combination peel of alpha hydroxy acid 70% and trichloroacetic acid 40%. (Chemical peels: A review of current practice, Alicia A O'Connor)

Patient Comfort

TCA peels produce a predictable **stinging–burning cycle** lasting several seconds. Once the endpoint is achieved, discomfort rapidly subsides. Many practitioners improve tolerance with oral sedation/analgesia, such as:

- Meperidine 50–100 mg
- Hydroxyzine 50 mg
- Diazepam 5 mg
- Ibuprofen 400–600 mg

Topical anesthetics are avoided because they alter skin hydration and may unpredictably change penetration depth. Cool air devices can further improve comfort.

Reading Peel Depth: Frosting and Clinical Signs

Correct depth assessment is essential. All TCA peels—whether accelerated (e.g., Jessner–TCA) or decelerated (Blue Peel)—produce the same depth signs, although the speed varies.

Level 1 Frost (Epidermal)

A light, speckled frost as epidermal proteins begin coagulating.

Level 2 Frost (Papillary Dermis)

A uniform white frost with a **pink background**, indicating intact superficial dermal vasculature. This is the **endpoint for medium-depth peels**.

Level 3 Frost (Superficial Reticular Dermis)

A dense white frost with **loss of the pink sign**, indicating coagulation of the superficial vascular plexus. This depth carries higher risks and is the **maximum limit for TCA peels**.

Additional Depth Indicators

- **Epidermal Sliding:** A brief phase where the epidermis wrinkles easily when pinched due to loosening from the dermis. Its disappearance indicates that proteins in both layers have coagulated and the peel has reached the superficial reticular dermis.

- **Edema:** Pinch-induced dermal edema signifies papillary dermal penetration and is another endpoint marker.

In darker skin types, the pink background may be difficult to see, making **epidermal sliding** particularly important.

Techniques for Combination Medium-Depth Peels

Medium-depth peels can be performed using TCA alone or in combination with keratolytic agents. Combination techniques improve penetration, enhance uniformity, and allow practitioners to achieve desired depth with lower TCA concentrations. This section outlines the three most commonly used combination methods: **Glycolic Acid–TCA**, **Jessner's–TCA**, and the **TCA Blue Peel**. It also provides an overview of **phenol techniques** and **combination resurfacing strategies**.

1. Glycolic Acid–Trichloroacetic Acid Peel

This accelerated technique uses a keratolytic (70% glycolic acid) to break down the stratum corneum and allow more uniform TCA penetration.

Technique:

- Thoroughly cleanse and degrease the skin with soap and water.



Fig 7.9. Unbuffered glycolic acid is a type of glycolic acid in which the pH has not been adjusted. The pH of unbuffered glycolic acid is very low, below pH 2, making the product highly aggressive and potentially harmful to the skin.

- Apply **unbuffered 70% glycolic acid** quickly and evenly.
- After **2 minutes**, neutralize with copious water.
- Apply a light, even coat of **35% TCA** using gauze or a large cotton swab.
- Wait **2–3 minutes** to assess frosting and determine whether additional TCA is required.
- Feather the solution carefully along the **hairline** and **jawline** to avoid demarcation.

This method reduces the total volume of TCA needed and provides a controlled, predictable peel depth into the papillary dermis.

2. Jessner's Solution–Trichloroacetic Acid Peel

Jessner's solution (14% resorcinol, 14% salicylic acid, 14% lactic acid in ethanol) offers enhanced penetration in oily or acne-prone skin thanks to its lipophilic salicylic acid component.

Technique:

1. Cleanse with a foaming soap.
2. Degrease thoroughly with **acetone**.
3. Apply Jessner's solution evenly with gauze or cotton-tipped applicators until a **light frost** appears.
4. After **6 minutes**, apply a light coat of **35% TCA** in smooth, even strokes.
5. Allow **2–3 minutes** for penetration and reassess whether more TCA is needed.
6. Feather edges into hairline and jawline for seamless blending.

This combination produces faster and deeper penetration compared to TCA alone while reducing the required TCA volume.

3. Trichloroacetic Acid Blue Peel

The TCA Blue Peel is a decelerated peel that allows exceptionally controlled penetration. The Blue Peel base contains a nonionic blue dye, glycerin, and a saponin emulsifier. When mixed with 30% TCA, it produces solutions ranging from **15% to 24% TCA**.

Technique:

- Cleanse with alcohol or acetone (for oily skin).
- Mix the Blue Peel base with 30% TCA immediately before use (e.g., 2 mL base + 2 mL TCA = 15% formulation).
- Apply evenly over the face, feathering into hairline, earlobes, and jawline.
- Let each coat sit for **2–3 minutes** before adding another.
- Adjust the number of coats depending on **skin thickness**—fewer for thin areas (eyelids), more for thicker regions (cheeks, perioral).
- The typical endpoint is a **Level 2 frost**.
- A **Level 3 frost** indicates penetration into the superficial reticular dermis and is the **maximum allowable depth** for facial Blue Peels.

The temporary blue staining helps visualize treated areas and prevent overlapping applications.

Special Considerations:

- Nonfacial skin (neck, chest) heals more slowly because of fewer adnexal structures.
- When feathering from face to neck, depth should gradually lighten to avoid harsh transitions.

Phenol Peels: Hetter VL Technique

Phenol peels are reserved for deeper pathology—deep rhytides, certain acne scars, or lifting effects in perioral/periorbital regions. Due to potential systemic absorption and cardiotoxicity, technique and patient selection are paramount.

Technique Summary:

- Cleanse thoroughly; degrease with 70% alcohol or acetone.
- Gently shake the Hetter VL bottle to mix components.
- Transfer a portion to a separate bowl; swirl continuously during use (the mixture separates easily).
- Apply with a moist (not dripping) cotton-tipped applicator in controlled strokes.
- Watch for a rapid **solid white frost**—the endpoint for treating deeper wrinkles or redundant skin.
- Frost clears quickly, so careful, continuous observation is essential to avoid over-penetration.



Fig 7.10. Treatment of acne scars with a phenol peeling. ("Anterior" chemabrasion for acne scars treatment, Deprez P)

Phenol peels are generally applied to **one cosmetic unit at a time** (e.g., perioral) to limit systemic absorption. More extensive peels require cardiac evaluation and possibly intraoperative monitoring.

Combination Procedures

Despite the rise of fractional lasers, chemical peels remain invaluable for treating areas unsuitable for laser resurfacing, for accommodating more diverse skin types, and for enhancing surgical outcomes.

Planning the Combined Approach

During consultation, identify:

- Areas needing vascular or pigment laser treatment
- Regions requiring electrodessication (e.g., syringomas, sebaceous hyperplasia)
- Zones best suited for medium- vs deep-depth peels
- Areas involved in surgical procedures

Preoperative markings help guide depth control and prevent accidental extension of deeper peels into vulnerable regions.

Safe Sequence for Combination Resurfacing

To avoid excessive penetration or interaction between modalities, procedures should follow a logical order:

- **Nonablative or minimally ablative lasers** (vascular/pigment)
- **Electrodessication** of adnexal lesions
- **Medium-depth peel** (e.g., Jessner–TCA, Glycolic–TCA, Blue Peel)
- **Phenol peel**, if indicated
- **Cleanse thoroughly** to remove all acid residues
- **Laser resurfacing** of targeted areas
- **Surgical procedures**, or performed first with careful avoidance of incisions during the peel

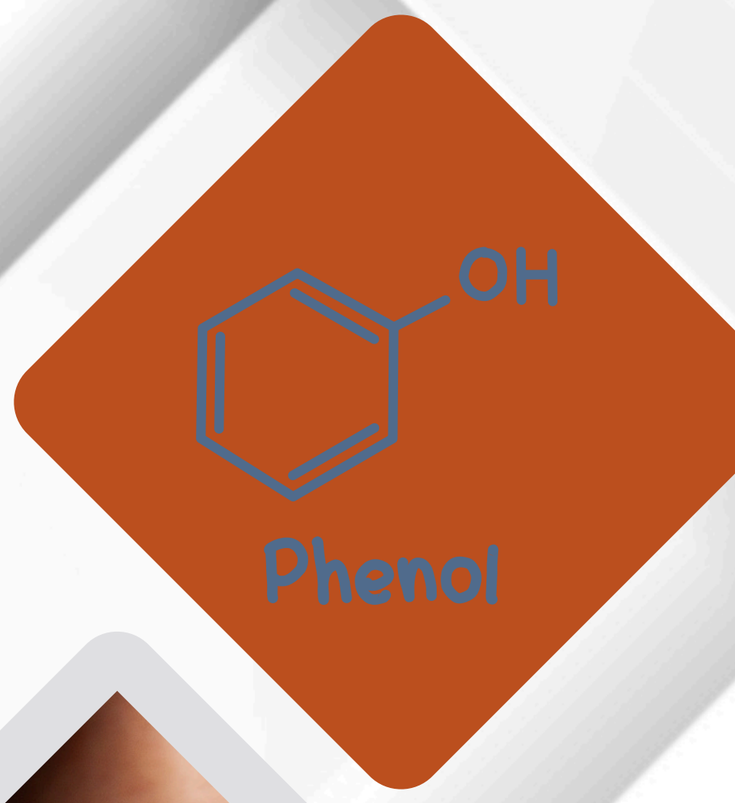
Special Situations

- **Facelift or blepharoplasty**:
  - Peel undermined skin lightly (not deeper than papillary dermis).
  - Keep solution away from surgical incisions.
- **Neck and chest rejuvenation**:
  - Prefer a series of lighter, papillary-dermis-level peels.
  - Hetter VL can be used selectively for deeper neck rhytides.

Combination approaches allow practitioners to tailor resurfacing to each patient's anatomy and concerns with exceptional precision.

CHAPTER 8:

DEEP PEELS





Chapter 8

Deep Peels

Deep chemical peels, particularly phenol–croton oil formulations, represent the most powerful non-surgical resurfacing modality in aesthetic medicine. Historically regarded as the **gold standard** for advanced facial rejuvenation, these peels offer unmatched improvement in deep wrinkles, severe photodamage, and textural aging. In the era before lasers, deep peels were essentially the only option capable of achieving radical skin renewal, and even today they remain unrivaled in their ability to transform heavily aged skin.

Their enduring value lies in three core attributes:

exceptional efficacy, **predictability**, and **longevity of results**. When performed correctly—with careful patient selection, structured preparation, and rigorous safety protocols—deep peels can produce improvements that last many years, far exceeding the durability commonly seen with medium-depth peels or energy-based devices.

Why Deep Peels Still Matter Today

Although lasers and radiofrequency platforms now dominate aesthetic practice, deep chemical peeling continues to offer several advantages:

Unmatched efficacy for deep wrinkles and severe photodamage
Phenol–croton oil peels reach the **reticular dermis**, stimulating profound collagen remodeling.

Long-lasting results
Patients often enjoy results that last **10–20 years**, surpassing most laser resurfacing outcomes.

Predictability when performed by experienced surgeons
Peel depth correlates closely with croton oil concentration and technique, allowing controlled, consistent results.

Cost-effectiveness
Unlike energy-based devices, phenol formulations require minimal equipment.

Ability to treat areas difficult for lasers
Deep peels can be modified for regions like the **perioral** and **periorbital** areas, where deep wrinkles are often most severe.

Chemical Background of Deep Phenol–Croton Oil Peels

Deep chemical peels rely primarily on the synergistic action of **phenol** and **croton oil**, a combination capable of producing controlled injury into the **reticular dermis**, making these formulations the most potent among all chemical peels.

Phenol

Phenol (C_6H_5OH), also known as **carbolic acid**, is an aromatic hydrocarbon originally extracted from coal tar but now synthesized commercially through reactions involving monochlorobenzene. Pharmaceutical-grade phenol (USP) contains approximately 88% phenol dissolved in water and exists as clear, crystalline material at room temperature.

Phenol is a **protein denaturant**, rapidly coagulating epidermal and dermal structural proteins upon contact. This swift penetration is responsible for its dramatic resurfacing effect but also necessitates careful monitoring due to potential systemic absorption.

Croton Oil

Croton oil is derived from the seeds of *Croton tiglium* and has been manufactured industrially as croton resin since the early 20th century. Its peeling activity is attributed to **free hydroxyl groups**, which act as powerful vesicants even in very low concentrations. When combined with phenol, croton oil amplifies the depth and intensity of dermal injury, providing the essential "boost" needed for deep peel penetration.



Fig 8.1. A croton oil peel — also referred to as a Hetter or modified phenol peel — is a cosmetic peel that penetrates the deeper layers of the skin.

Croton oil is the **true strength determinant** of a deep peel—not phenol concentration—and slight variations in its percentage can dramatically change peel depth. This understanding became a cornerstone of modern deep peel customization, owing largely to Gregory Hetter's contributions.

Other Components in Peel Formulations

Deep peel formulas often include additional ingredients that modulate penetration and application characteristics:

- **Septisol or Novisol** – surfactants that reduce surface tension, improving uniform skin penetration.
- **Vegetable oils (olive, sesame, glycerin)** – incorporated in some formulas, likely to slow phenol absorption and enhance application control. Clinical experience suggests that phenol-in-oil formulations behave more predictably during application.

Formulations and Concentration Ranges

Different phenol–croton oil formulations vary widely in strength, allowing practitioners to tailor depth to indication, skin type, and anatomical region. Typical ranges include:

- **Phenol:** 45%–80%
- **Croton oil:** 0.16%–2.05%

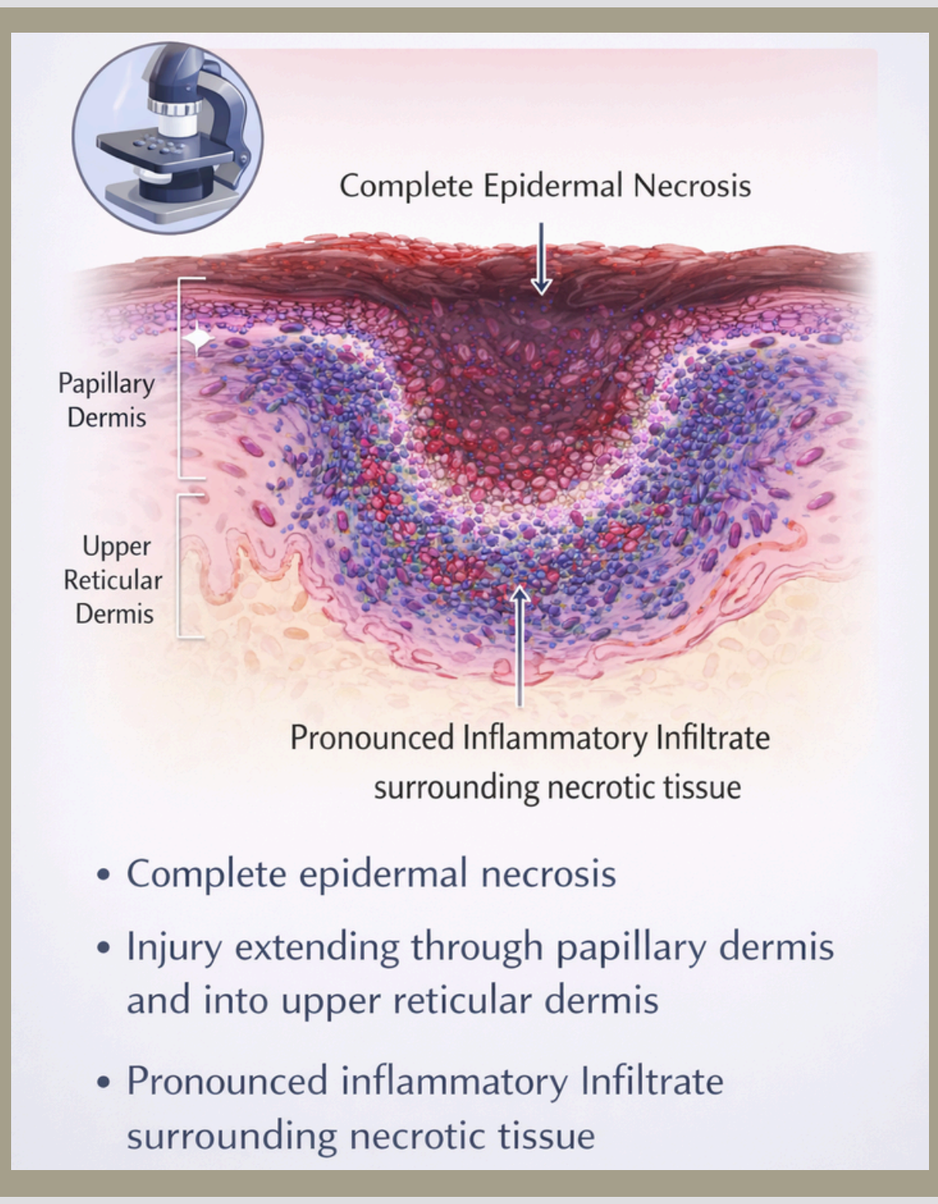


Fig 8.2. Histological Findings After Deep Peels

The variability in croton oil concentration makes it possible to design peels that range from **upper dermal resurfacing** to **full deep reticular dermal injury**.

A major paradigm shift occurred when Hetter demonstrated that peel depth is not an all-or-none phenomenon, countering the long-held belief surrounding the Baker–Gordon formulation. Instead, depth can be precisely controlled by adjusting:

- Croton oil concentration
- Volume applied
- Number of coats
- Application pressure
- Anatomical region

This brought nuance and safety to deep peeling, enabling individualized treatment planning and safer adaptation for different Fitzpatrick skin types.

Histological Findings After Deep Peels

Biopsies taken 48 hours after phenol–croton oil peeling show:

- Complete **epidermal necrosis**
- Injury extending through the **papillary dermis** and into the **upper reticular dermis**
- A pronounced **inflammatory infiltrate** surrounding the necrotic tissue

Reepithelialization typically completes within 7 days, though deeper dermal healing continues for weeks.

Long-term histologic changes include:

- Formation of a newly organized dermal layer beneath the epidermis
- Dense, horizontally arranged collagen bundles
- A rich network of fine elastic fibers
- Epidermal regeneration with evenly distributed keratinocytes
- Presence of melanocytes, though pigmentation tends to be reduced

Notably, these structural changes have been documented to persist for **up to 20 years**, explaining the exceptional longevity of clinical results.

Indications and Patient Selection

Deep phenol–croton oil peels remain one of the most powerful resurfacing modalities in aesthetic dermatology. Their predictable depth, longevity of results, and ability to dramatically improve dermal architecture make them particularly valuable for patients with advanced photoaging and significant textural concerns.

Indications

The main clinical indications for deep chemical peeling include:

- **Dyschromias**, especially solar lentigines and mottled pigmentation
- **Moderate to severe wrinkles**, including periorbital and perioral rhytides
- **Actinic keratoses** and diffuse actinic damage
- **Atrophic acne scars**
- **Periorbital melanosis**
- **Benign surface irregularities** such as xanthelasma or epidermal nevi
- **Lip rejuvenation**, where phenol–croton oil application has demonstrated noticeable enhancement and vermilion eversion

Deep peels can be performed even on **thin, delicate regions such as the eyelids**, offering improvement in dermatochalasis, fine wrinkles, and hyperpigmentation. They also serve as an effective adjunct to surgical or micropunch blepharoplasty.



Fig 8.3. Dyschromia is a change in color of the skin or nails. Although not specific to pigmentation, it is usually used to reference abnormality in pigmentation, but it can be a change in color, a loss or increase in pigmentation.

Contraindications and Cautionary Considerations

Although deep peels can achieve impressive results, careful patient selection is essential to ensure safety and satisfaction. Absolute contraindications are limited, but several conditions require heightened caution.

Absolute or Strong Relative Contraindications

- **Physical or psychological instability**
- **Pregnancy and lactation**, during which elective cosmetic procedures are discouraged
- **Uncontrolled heart disease**, given the systemic absorption of phenol
- **Prolonged QT interval**, requiring discontinuation or adjustment of QT-prolonging medications before treatment
- **History of hypertrophic scarring or keloids** (rare for deep peels but still relevant)

All patients must undergo **pre-procedural electrocardiography**, and those with cardiac, hepatic, or renal concerns should be jointly managed with their treating specialists.

Skin Type Considerations

Contrary to older beliefs that deep peels were appropriate only for light-skinned (Fitzpatrick I–II) individuals, modern clinical experience shows deep phenol–croton oil peels can be safely performed on **olive and darker skin types**, provided that:

- Preconditioning with **skin-lightening agents** is used consistently
- Patients adhere strictly to **sun avoidance and broad-spectrum sunscreen**
- Close postoperative monitoring is ensured

When these measures are followed, outcomes in darker skin have been shown to be both safe and effective.

Medication Considerations

Systemic isotretinoin was once considered an absolute contraindication for chemical peeling. Emerging evidence, however, suggests that wound healing abnormalities have been overstated. A shortened interval between isotretinoin cessation and peeling may be acceptable—particularly in patients with **thick, sebaceous skin**—though clinical judgment and informed patient counselling remain essential.

Smoking

Unlike surgical wound healing, smoking does **not appear to impair recovery or diminish results** after deep chemical peeling based on clinical experience.

Emerging Relative Contraindication: Frontal Fibrosing Alopecia (FFA)

FFA has become increasingly common and may influence wound healing on

facial skin due to underlying inflammation and fibrosis of hair follicles. Patients with active or suspected FFA should be approached cautiously, as healing patterns may be altered.



Fig 8.4. Frontal fibrosing alopecia (FFA) is a condition that causes hair loss on the front and sides of scalp. Hair loss may also occur on eyebrows, eyelashes and other body parts. An autoimmune reaction, genetics or hormones may cause FFA.

Prepeeling Preparation

Successful deep phenol–croton oil peeling begins long before the first coat of solution touches the skin. Thorough patient education, careful medical planning, and appropriate skin conditioning are essential to ensure both safety and satisfaction. Because deep peels involve significant downtime and visible healing phases, establishing realistic expectations is critical.

Skin Preparation (Priming)

The necessity of priming before deep phenol–croton oil peels remains a topic of debate. However, many clinicians find that **preconditioning the skin enhances peel uniformity**, especially in patients with thick, sebaceous, or photodamaged skin.

- **Topical retinoic acid**, applied nightly for 3–6 weeks before the procedure, may improve epidermal turnover and allow more even and predictable penetration of the peeling solution.
- Preconditioning should be adjusted based on patient tolerance, and discontinued if significant irritation occurs.

For darker skin types, priming with **skin-lightening agents** may reduce the risk of postinflammatory hyperpigmentation.

Monitoring and Pain Control

Phenol-based peels may be performed either as **full-face** or **segmental** procedures. The degree of systemic exposure to phenol dictates the level of monitoring required:

Full-Face Peels:

Continuous **cardiopulmonary monitoring** is mandatory due to the risk of phenol-induced arrhythmias. **Intravenous hydration** is administered throughout the procedure to reduce systemic phenol toxicity.

- **Segmental Peels:** Cardiopulmonary monitoring is generally *not* required. Patients should be instructed to drink at least **1 liter of water** over the course of the procedure to support metabolism and clearance of phenol.

Pain Management

The most intense discomfort occurs **during application of the peeling solution and for up to 4 hours afterward**. Pain control may include:

- Oral or intravenous sedation
- Regional nerve blocks
- Supplemental analgesics during the early postprocedure period

Topical anesthetics are generally avoided because their impact on skin hydration may unpredictably alter phenol penetration.

Preparation of the Peeling Solution

Accurate formulation of the phenol–croton oil peeling solution is essential for ensuring **efficacy, reproducibility, and patient safety**. Experienced practitioners often compound their own solutions, adjusting croton oil concentration according to **Hetter's principles**, which demonstrated that peel depth can be precisely controlled by manipulating croton oil percentage. For beginners or those less familiar with phenol peels, **commercial formulations with fixed croton oil concentrations** may be safer, allowing depth control primarily through the number of passes applied.

The first step is preparing a **stock solution**, created by mixing **1 mL of croton oil with 24 mL of 88% phenol**. Importantly, this stock solution is **not** a peeling agent and must never be applied directly to the skin.

From this stock, a range of peel strengths—light, medium, strong, or very strong—can be formulated depending on the patient's skin type, treatment area, and desired clinical outcome. For example:

Component	Strong Solution (1.2% Croton Oil)	Medium-Strength Solution
Stock Solution	3 mL	2 mL
Phenol 88%	1 mL	2 mL
Water	5.5 mL	5.5 mL
Septisol	0.5 mL	0.5 mL

Fig 8.5. Preparation of the Peeling Solution

- **Strong solution (1.2% croton oil):**
  - 3 mL stock solution
  - 1 mL phenol 88%
  - 5.5 mL water
  - 0.5 mL Septisol
- **Medium-strength solution:**
  - 2 mL stock solution
  - 2 mL phenol 88%
  - 5.5 mL water
  - 0.5 mL Septisol

Because phenol and croton oil mixtures naturally **separate into two phases**, continuous agitation—before and during application—is essential to maintain uniform concentration. Failure to remix can result in uneven depth of penetration and unpredictable results.

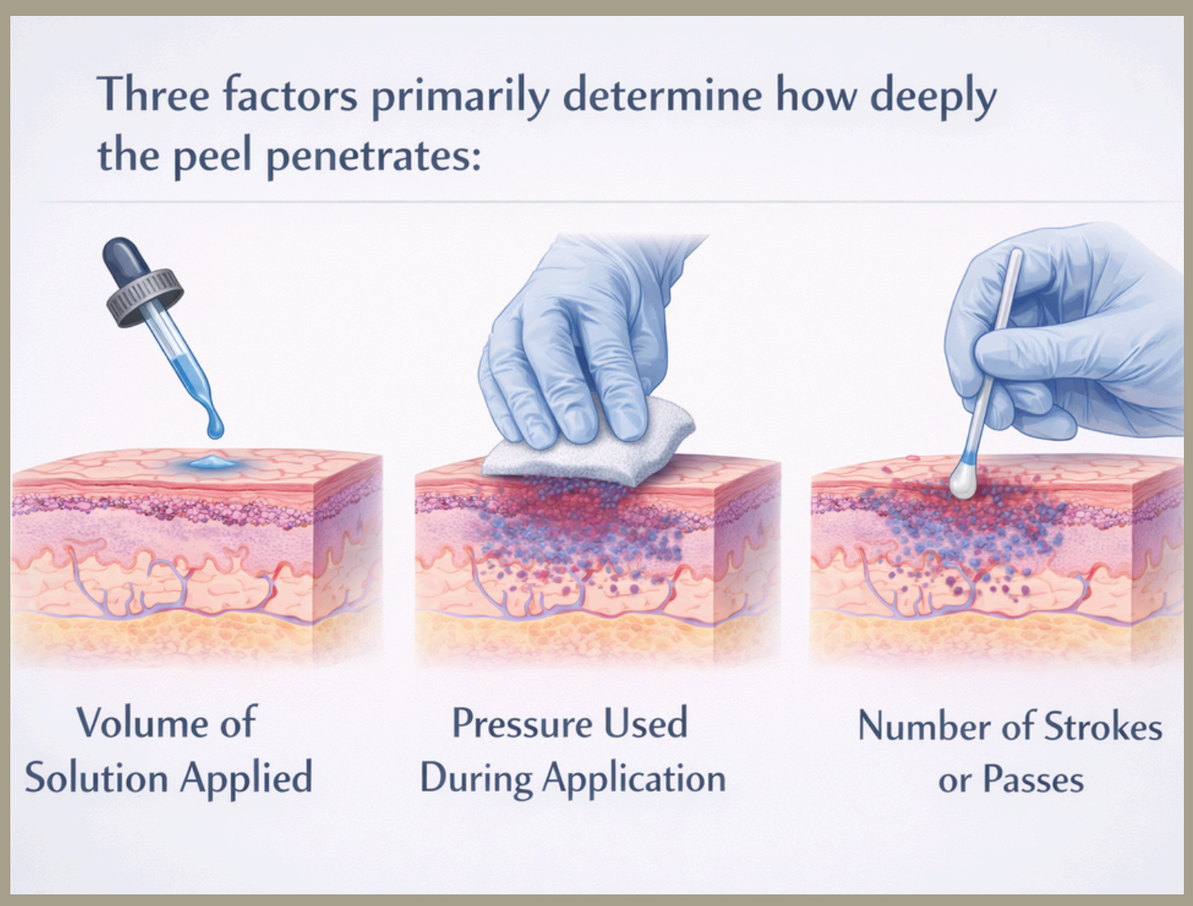


Fig 8.6. Three factors primarily determine how deeply the peel penetrates

Peeling Technique

On the day of treatment, the patient must arrive with **clean, product-free skin**. Before peel application, meticulous **cleansing and degreasing** are performed using acetone-soaked gauze pads. This step is crucial for achieving **uniform penetration** of the solution.

Application Tools

Peel application is typically performed using:

- **Cotton-tipped applicators (CTAs)**
- **4×4-inch gauze pads**

Because standard CTAs may be too dense and hold insufficient solution, many practitioners enhance absorption by **adding loose cotton fibers to soften the tip.**

Technique Variables Affecting Peel Depth

Three factors primarily determine how deeply the peel penetrates:

1. Volume of solution applied
2. Pressure used during application
3. Number of strokes or passes

To maintain control, semidry applicators are preferred. In delicate areas such as the periorbital region, only lightly moistened applicators should be used, and a single pass is recommended.

Application Pattern

The peel generally begins on the forehead and is feathered into all hair-

bearing areas, including:

- Scalp line
- Eyebrows
- Earlobes
- The “hidden triangle” above the ears

Phenol–croton oil solution does not impair hair growth and can be safely applied in these regions.

The desired clinical endpoint is an **ivory-white to gray-white frost**, indicating adequate protein coagulation (Fig. 8.5). In highly wrinkled regions, an additional pass may be applied **after the initial frost fades**. Total volume used for a full-face peel should **not exceed 5 mL**.

Monitoring and Safety

Full-face deep peels must be performed under:

- **Intravenous sedation**
- **Continuous cardiopulmonary monitoring**
- **IV hydration**, which reduces phenol-induced cardiac risk

Airflow management is essential to minimize staff exposure to phenol fumes. This may include:

- Electric fans
- Room ventilation
- Activated carbon masks
- These measures also improve comfort for the clinical team.

Postpeel Occlusion

Occlusion of the most wrinkled areas can deepen penetration. Although animal studies have shown similar necrosis depth with or without occlusion (using petrolatum, tape, or bacitracin), clinical practice often includes **zinc oxide waterproof tape** applied in overlapping strips (Fig. 8.6). The overlapping pattern allows movement during postoperative swelling while preventing tape detachment.

CHAPTER 9:

POST-PEEL CARE





Chapter 10

Post-Peel Care

Post-peel care is a crucial phase in achieving optimal results from chemical peeling procedures, especially when it comes to medium- and deep-depth peels. The healing process following a peel is as important as the procedure itself, requiring meticulous attention to detail and adherence to post-treatment instructions. Proper aftercare helps to ensure smooth healing, reduce the risk of complications, and enhance the long-term effects of the peel.

Post-Care for Light Chemical Peels

The primary objective of post-peel care following a light chemical peel is to support the skin's natural healing process while minimizing risks of side effects and complications. This is especially important for patients with darker skin tones, who are more prone to postinflammatory hyperpigmentation. A careful and consistent post-treatment routine is essential to achieve optimal results and ensure safe recovery.

Initial Post-Peel Symptoms and Skin Care

Immediately after a light chemical peel, patients may experience erythema (redness), mild edema (swelling), and desquamation (peeling). These side effects typically last for 1 to 3 days. Within 3 to 5 days, the epidermis is generally reepithelialized and healed.

To cleanse the skin, patients should use a mild soap or a gentle non-soap cleanser. In the case of crusting, the application of a topical antibacterial agent is recommended to prevent bacterial superinfection.

Moisturization and Sun Protection

Patients should be advised to use a light, non-irritating moisturizer and broad-spectrum sunscreen (SPF 50+) daily. Sun exposure should be strictly avoided, as UV rays can worsen pigmentation issues and hinder the skin’s healing process. It is important for patients to apply sunscreen even indoors, as exposure to artificial light can also cause skin damage.

Restrictions and Lifestyle Adjustments

Patients should refrain from manipulating, picking, or scratching the treated areas to avoid causing irritation or scarring. Additionally, all forms of exercise and activities that induce

sweating should be avoided until the skin has fully healed.

Early Warning Signs of Complications

Patients should be informed about potential complications, such as severe erythema, prolonged edema, burning sensations, crusting, hyperpigmentation, or the development of pustules or vesicles. These signs should be closely monitored, and patients should contact their practitioner immediately if they notice any unusual symptoms.

Follow-Up Care

Close follow-up is essential to ensure the skin is healing as expected. Patients should be encouraged to report any concerns or complications promptly. Providing patients with a contact number for emergencies and offering them a clear set of post-peel instructions will help ensure the process goes smoothly.

Post-Care for Medium-Depth Chemical Peels

Postoperative care following a medium-depth chemical peel is crucial to ensure a smooth recovery, minimize side effects, and maximize the results of the procedure. The healing process generally takes 6 to 7 days, and careful management of the post-peel period can significantly improve the skin's regenerative process and minimize complications.

Post-Peel Care	Description
Cleansing	Cleanse gently with soap and water. For Blue Peel, remove blue dye using the provided cleanser or Dawn foaming dish soap. Some blue tint will fade gradually.
Cold Compresses	Apply cold compresses (frozen peas) for 10 minutes per hour on the face during the first day. Avoid ice on nonfacial skin areas.
Elevation	Sleep at a 45-degree angle for the first couple of days to reduce facial swelling. Swelling peaks in 24-48 hours, resolving by 72 hours.
Pain and Discomfort	Mild discomfort, similar to a light sunburn, may occur. No analgesics are usually required, but oral pain relief may be given for severe discomfort.

Fig 9.1. Immediate Post-Peel Care

Immediate Post-Peel Care:

- **Cleansing:** On the day of the procedure, it is essential to cleanse the skin gently with soap and water. If a Blue Peel is performed, the blue dye should be removed using the provided cleanser or Dawn foaming dishwashing soap. Patients are advised that some of the blue tint will remain and will gradually fade during the healing process.

- **Cold Compresses:** To manage facial swelling and discomfort, patients are instructed to apply cold compresses, such as frozen peas, to the face for 10 minutes per hour, especially on the first day after the procedure. Ice should be avoided on nonfacial skin areas.

Managing Swelling and Edema:

- **Edema Management:** Facial edema, particularly with phenol peels, is common. By day 3 or 4, swelling should significantly subside, and the skin will begin to take on a "mask-like" appearance. It is important for patients to refrain from scratching, rubbing, or touching the skin during this time.
- **Exudate Management:** Areas treated with phenol or laser resurfacing may have a yellowish proteinaceous exudate. This is normal and should resolve as the skin heals. Patients should not be alarmed if the exudate looks like pus.



Fig 9.2. Exudate is fluid that leaks out of blood vessels into nearby tissues. The fluid is made of cells, proteins, and solid materials. Exudate may ooze from cuts or from areas of infection or inflammation. It is also called pus

Post-Peel Skincare Routine:

- **Cleansing and Emollients:** Patients should cleanse their skin twice a day with a gentle, non-abrasive cleanser. Astringent washes, such as those with Domeboro Astringent Solution, should be performed midday and late afternoon for about 10 minutes. After each cleansing, patients should apply a soothing emollient like Vaniply ointment or Aquaphor using a gentle patting technique to avoid disturbing the healing skin.

- **Antibiotic Application:** For patients with a history of recurrent herpes simplex, prophylactic acyclovir, valacyclovir, or famciclovir should be prescribed starting a day before the procedure and continuing until full reepithelialization is achieved. Mupirocin ointment should also be applied to the nostrils three times a day starting a week before resurfacing and continuing until the skin heals completely.

Signs of Complications:

Patients should be educated about the early warning signs of complications, including:

- Severe or prolonged erythema or edema
- Intense burning or discomfort
- Crusting, hyperpigmentation, or the formation of pustules or vesicles

Healing and Skin Care:

- **Skin Peeling:** After 4 to 5 days, the skin will begin to shed in thick sheets, especially in areas of movement such as the perioral and periorbital regions. Healing from papillary dermis-level peels typically occurs within 7 days, while deeper peels may take up to 10 days.
- **Follow-Up Appointments:** Patients should follow up at day 3 or 4 to ensure they are following care instructions correctly and to assess any early complications. Another follow-up at day 7 will help confirm complete healing and the removal of any remaining exudate.
- **Sun Protection:** Strict sun avoidance is essential during the first 4 to 6 weeks postoperatively. Patients should wear high SPF sunscreen daily to protect the healing skin.

Resuming Skin-Conditioning Programs:

After complete reepithelialization of the skin, which typically takes 1 to 2 weeks, patients can resume their skin-conditioning program. Skin firming may begin within a few weeks and continue for up to 3 months, with optimal results seen as the skin heals fully.

Deep Chemical Peel Aftercare

After a deep chemical peel, proper aftercare is crucial for a successful recovery and to achieve optimal results. The main goal is to ensure the skin heals appropriately while minimizing complications such as infections, excessive swelling, and pigmentation changes. Following the correct post-peel regimen will also help manage the discomfort that may arise after the procedure.

First 24 Hours:

- **Tape Removal:** After 24 hours, the occlusive tape used to protect the skin during the peel should be removed easily as the exudate from the peel will have separated it from the skin. This step is important to prepare the skin for further healing.



Fig 9.3. Strict sun avoidance is essential during the first 4 to 6 weeks postoperatively.

Pain Management: Analgesia is generally not required after the procedure, as most patients experience little to no pain. The procedure is typically well-tolerated, and discomfort is minimal.

Post-Tape Care:

- **Cleaning the Skin:** Once the tape mask is removed, the skin should be cleaned gently using sterile saline to remove any remaining exudate. This helps prepare the skin for the next steps of the recovery process.
- **Bismuth Subgallate:** Bismuth subgallate antiseptic powder should be applied to the treated area for the first 7 days to assist with the healing process. This powder absorbs skin exudate and helps create a firm, protective mask over the newly resurfaced skin.
- Other options include using occlusive moisturizers, antibiotic ointments, or biosynthetic occlusive dressings such as Meshed Omiderm.

Medications and Swelling Management:

- **Pain Relief:** Regular painkillers should be prescribed for the first 2 days after the procedure to manage any discomfort.
- **Corticosteroids:** Some physicians may recommend systemic corticosteroids to help reduce swelling and inflammation, especially in cases with pronounced neck swelling, which usually resolves within 4 to 6 days.
- **Swelling Management:** Swelling around the neck and face is normal after deep peels, but it should begin to subside within the first few days.



Fig 9.4. When deep peeling is over, a thick coat of post-peel mask cream is applied on the skin. Yellskreen (bismuth subgallate) powder is stacked directly on the post-peel mask exactly on the abrades areas; it will build a protective scab that stays in place during 7 days. Therefore, the patient leaves the clinic wearing the powder.

Skin Healing:

- **Mask Formation and Cracking:** The bismuth subgallate powder will gradually form a rigid, protective mask. This mask may crack in certain areas, such as around the mouth and eyes. If itching occurs, oral antihistamines can help provide relief.
- **Softening the Mask:** On the eighth day post-peel, wet soaking with tap water during a shower is recommended to soften the mask.

- This will help with the removal of the "second mask," a layer of dried exudate and bismuth powder, which can be gently removed using petroleum jelly.

Long-Term Care

- **Moisturizers and Sunscreen:** After the mask is removed and the skin begins healing, patients should switch to water-based lotions and continue applying potent sunscreens daily. It is important to protect the skin from UV exposure to prevent further damage.
- **Erythema:** Intense erythema (redness) is expected for the first 6 weeks after the peel, gradually resolving over the course of 3 to 6 months. During this time, patients are encouraged to wear makeup with a green foundation to mask the redness and continue with daily activities.

- **Special Considerations for Males and Darker Skin Types**
  - **Males:** In general, erythema tends to disappear more quickly in males compared to females.
  - **Darker Skinned Patients:** For patients with darker skin (Fitzpatrick skin type III or IV), using a retinoic acid–hydroquinone preparation is recommended to prevent reactive hyperpigmentation and speed up the healing process.

Follow-Up and Ongoing Care

- **Follow-Up Appointments:** Regular follow-up visits are necessary to ensure that the healing process is proceeding as expected and to monitor for any signs of complications such as infection or abnormal pigmentation.

- **Encouragement to Resume Activities:** Patients should resume their normal daily activities after the erythema subsides, but they should continue to protect their skin from sun exposure. Using makeup and skincare products to help manage the appearance during healing is encouraged.

CHAPTER 10:

COMPLICATIONS





Chapter 10

Complications

Skin resurfacing procedures, particularly those involving medium-depth and deep chemical peels, are elective and often performed for cosmetic purposes. As a result, the tolerance for complications is very low on the part of the patient. These procedures intentionally create controlled injuries to the skin surface, which then undergo a natural healing process. The recovery period for such peels typically lasts between 7 to 14 days, but any adverse event during this period can prolong the healing time and cause significant emotional distress for the patient. Unlike other cosmetic procedures where healing is less visible, the recovery from skin resurfacing is inherently exposed, making any complications more noticeable and distressing for the patient, their family, and the physician.

Understanding the structure and function of the skin is essential when addressing complications. The skin serves as a physiological barrier, protecting the body from fluid loss, trauma, ultraviolet radiation, infections, and toxins. It also plays a critical role in sensory perception, immune defense, and thermoregulation. The skin consists of two primary layers: the epidermis and dermis, both of which have essential functions in the healing process after resurfacing.

Given the complexity of the skin's anatomy and its vital functions, complications during or after resurfacing procedures can lead to serious concerns. In this chapter, we will discuss the potential complications that can arise during the healing process following medium-depth to deep peels, their causes, and how they can be prevented or managed effectively.

Swelling

Swelling is a common and expected side effect of chemical peeling procedures, especially those that penetrate the papillary dermis or reticular dermis. The severity of swelling can vary among patients, and it typically begins shortly after the procedure, peaks at 48 hours, and begins to resolve by 72 hours.

- **Management:**
  - Apply "crushed-ice" bags or frozen peas wrapped in small plastic bags to the cheeks and periorbital areas for 10 minutes every hour during the first 48 hours.
  - Sleep with the head elevated to at least 45 degrees to help reduce swelling.
  - If swelling is severe and the patient's eyes are nearly swollen shut, consider an oral steroid taper, provided the patient has no contraindications to systemic steroid therapy.

Contact Dermatitis

Contact dermatitis, usually of the irritant type, is commonly seen after chemical peeling due to impaired epidermal barrier function. The denuded skin is more susceptible to topical irritants, such as fragrances, propylene glycol, lanolin, and allergens found in cleansers, moisturizers, and ointments.

Symptoms: Burning, itching, increased redness, and eczematous eruptions.

- **Management:**
  - Instruct patients to stop using all topical lotions and cleansers. Cleanse the skin twice daily with plain water and apply a bland petrolatum ointment 2–3 times daily.



Fig 10.1. Any peel can cause contact dermatitis when used with excessive frequency, inappropriate high concentration, and vigorous skin preparation using acetone or another degreasing solution.

  - If the reaction is severe, prescribe a mid-potency topical steroid and oral antihistamines to alleviate pruritus and cutaneous eruptions.
  - For significant skin weeping, apply dilute vinegar compresses (1 teaspoon white vinegar in 2 cups of water) for 5 to 10 minutes per hour.
  - In severe cases, systemic steroids may be warranted to reduce the risk of post-inflammatory hyperpigmentation (PIH) and scarring.

Infection

The denuded skin after peeling is highly susceptible to infections, which can be bacterial, viral, or fungal. Early recognition and treatment of infections are essential to reduce the risk of scarring.

- **Bacterial Infection:** Signs include discomfort, pruritic papules, pustules, increased erythema, purulence, malodorous discharge, and crusting. Staphylococcus aureus is the most commonly isolated pathogen.
- **Viral Infection:** Herpes simplex virus (HSV) and varicella zoster virus (VZV) can cause deep erosions and delay wound healing, leading to scarring.
- **Management:**
  - For bacterial infections, perform skin swabs for Gram stain and culture to determine the appropriate antibiotic treatment.
  - For viral infections, initiate antiviral therapy (acyclovir, famciclovir, or valacyclovir) 1–2 days before the procedure and continue until full reepithelialization.
  - Prophylactic mupirocin ointment applied to the nares can help prevent bacterial infections.
  - In fungal infections, such as Candida albicans, use topical anti-yeast creams and oral fluconazole.



Fig 10.2. The post-peel care of deeper peeling may cause milia by occluding the upper pilosebaceous units with ointments

Milia

Milia, small keratin retention cysts, often develop between 3 to 8 weeks post-procedure, especially with deeper peels. Although they are typically not harmful, they can be bothersome to the patient.

- **Management:**
  - Milia usually resolve spontaneously as the skin heals.
  - Topical retinoids, alpha-hydroxy acids (AHAs), or poly-hydroxy acids (PHAs) can help facilitate their resolution.
  - If necessary, manual extraction may be performed by the physician.

Acne and Rosacea Flares

Post-procedure flare-ups of acne or rosacea are relatively common, particularly in patients with a history of these conditions. Peeling can trigger outbreaks in these patients.

- **Management:**
  - Prescribe topical treatments and oral antibiotics (e.g., doxycycline or tetracycline) to manage the flare-up.
  - In more severe cases, consider oral isotretinoin for significant flare-ups.

Prolonged Erythema

Erythema is a normal part of the healing process after chemical peeling. However, if erythema persists beyond 3 weeks, it can indicate underlying issues, such as incomplete healing or scarring.

- **Management:**
  - Avoid topical corticosteroids unless absolutely necessary, as they can contribute to prolonged erythema.
  - Use retinoids, ascorbic acid, and broad-spectrum sunscreens to reduce erythema.
  - Pulsed dye laser (PDL) treatments can help target redness and assist in collagen remodeling.

- **Treatment Schedule:** A typical protocol involves 3-4 initial sessions spaced 4-6 weeks apart, followed by maintenance sessions every 3-6 months.

- **Results:** Patients often see reduced hair shedding within a few weeks, with new hair growth and increased thickness becoming visible after 3-6 months.

Scarring

Scarring is one of the most serious complications of chemical peeling. It can be caused by excessive peeling, infection, or delayed wound healing. Scarring can manifest as hypertrophic, keloidal, or reticular atrophy.



Fig 10.3. Rarely, a chemical peel can cause scarring — typically on the lower part of the face. Antibiotics and steroid medications can be used to soften the appearance of these scars.

- **Prevention:**
  - Careful monitoring of the healing process is necessary to avoid excessive wound depth and minimize scarring risk.
  - Topical application of corticosteroids, silicone sheets, or low-level laser therapy (LLLT) can help prevent or treat scarring.

- **Management:**
  - For hypertrophic scars, consider intralesional steroid injections or a combination of steroids with 5-fluorouracil (5-FU).
  - For keloidal scars, intralesional steroid injections are the most effective, sometimes in combination with other treatments like silicone gel sheets.

Delayed Wound Healing

Rarely, some patients may experience delayed wound healing without an identifiable cause. In such cases, the patient may develop erosions, pustules, or wounds that fail to heal promptly.

- **Management:**
  - Treatment involves systemic steroids or isotretinoin to promote healing and prevent further complications.
  - Close monitoring is essential to ensure proper healing and prevent scarring.



Fig 10.4. PIH occurs when inflammation triggers pigment production, resulting in darkened spots or patches on the skin.

Pigmentary Alterations

- **Hyperpigmentation (PIH):** Post-inflammatory hyperpigmentation is a common complication, particularly in patients with darker skin. It usually resolves on its own but can take several months.
- **Management:** Use broad-spectrum sunscreen and topical treatments such as hydroquinone, glycolic acid, and retinoic acid to treat PIH.
- **Hypopigmentation:** Hypopigmentation is less common but can occur with deeper peels that reach the reticular dermis. It may appear as lighter skin compared to surrounding areas.
- **Management:** Topical agents or lighter peels can be used to blend the skin tones, and peeling may be used to treat different areas with varying degrees of damage.

Ocular Injury

Accidental exposure of the eyes to the peeling solution can cause corneal damage and significant discomfort.

- **Prevention:** Extreme caution is necessary when performing peels around the eyes, especially with sedated patients. Use cotton-tipped applicators for eyelid treatment and avoid direct contact of acid with the eyes.
- **Management:** Immediate ocular irrigation with saline and consultation with an ophthalmologist is required in the event of ocular injury.



Fig 10.5. Intraoperative view of the patient after the trichloroacetic acid (TCA) peel. The opacity resulting from chemical injury to the eye is evident. (Ocular Complication After Trichloroacetic Acid Peeling: A Case Report, Muhammed Besir Ozturk)

Uneven Peel Penetration

Uneven penetration can occur, especially during early practice with peels, leading to "hot spots" where the acid concentration is higher, resulting in uneven healing.

- **Management:**

Ensure even application of the peel with firm strokes and adequate time between passes to monitor the frosting and adjust as necessary. Proper skin preparation and avoiding areas of excessive acid accumulation are crucial for even penetration. The key to even acid penetration is to prepare the skin so that the stratum corneum is smooth and compact; the acid should be applied in firm even strokes without leaving “hot spots,” and care should be taken to wait long enough between passes to see the extent of frosting and to see where more solution is needed

Complications from Deep Phenol Peels

Cardiac Arrhythmias

Phenol, as an active ingredient in deep peels, is absorbed through the skin and metabolized by the liver before being excreted through the kidneys. Patients with impaired liver or kidney function are at an increased risk of phenol toxicity. Additionally, the degree of phenol absorption is more closely related to the total area of exposed skin than the concentration of phenol used. This makes full-face treatments especially concerning in terms of systemic absorption.

Cardiac arrhythmias are a significant complication seen with phenol-based peels, particularly with rapid application during full-face treatments. The most commonly observed arrhythmias include tachycardia, premature ventricular contractions, bigeminy, paroxysmal atrial tachycardia, ventricular tachycardia, and atrial fibrillation. These arrhythmias can be life-threatening if not addressed promptly.

To mitigate the risk of cardiac complications, it is crucial to perform cardiac monitoring throughout the procedure and during the recovery period. This allows for immediate detection and management of any cardiac irregularities. Additionally, intravenous hydration before and during the peel helps reduce the risk of phenol-related cardiac complications.

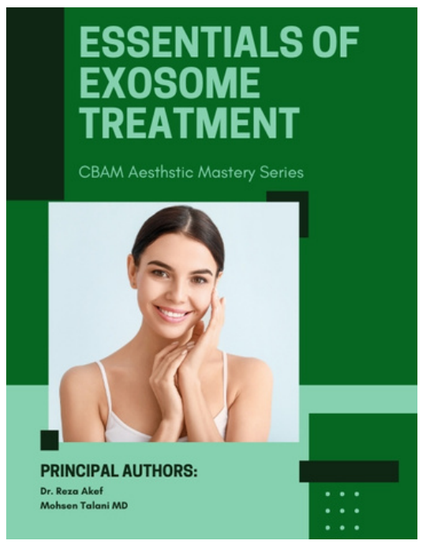
A critical approach to reducing cardiac risk is to treat the face in smaller, segmented cosmetic units, with a 15- to 20-minute pause between each area. This method extends the procedure duration to 90-120 minutes, providing sufficient time for the phenol to be metabolized and minimizing systemic toxicity. Maintaining patient comfort is also essential to reduce any adrenergic surges that could contribute to complications, and the use of epinephrine in local anesthetics or nerve blocks should be avoided.

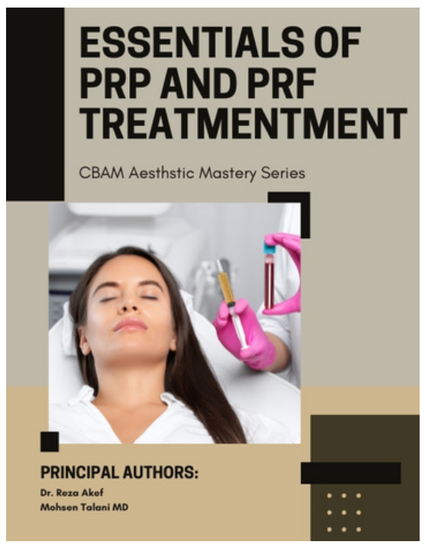
Laryngeal Edema

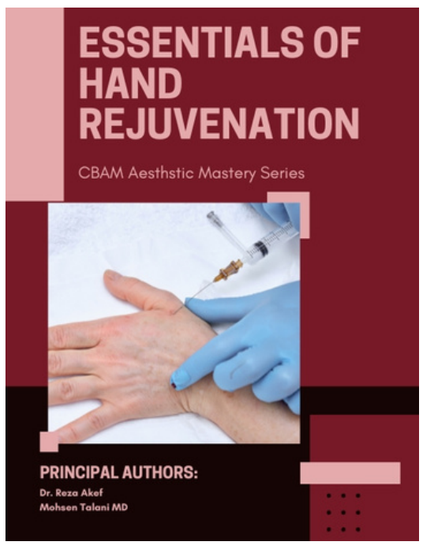
Laryngeal edema is a rare but serious complication that has been reported in patients undergoing phenol peels. In one case series, three patients, all heavy smokers, developed laryngeal edema with symptoms including stridor, hoarseness, and tachypnea within 24 hours after the phenol peel. These symptoms resolved within another 24 hours with the use of heated mist inhalation therapy.

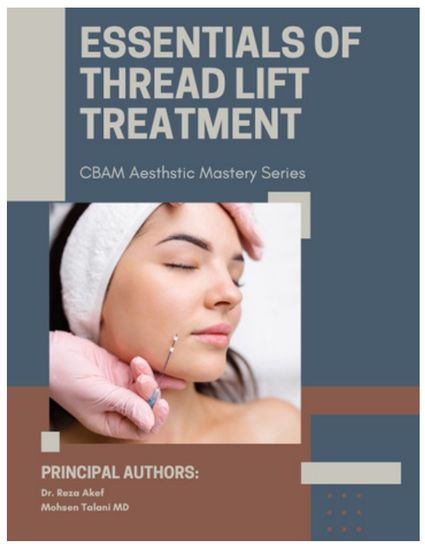
The proposed cause of this complication is an additive effect of irritation to the larynx caused by ether fumes from the phenol peel and pre-existing irritation from cigarette smoke. Alternatively, it may be a hypersensitivity reaction to phenol itself. While this complication is rare, it underscores the need for vigilant monitoring, especially in patients with a history of smoking or respiratory issues.

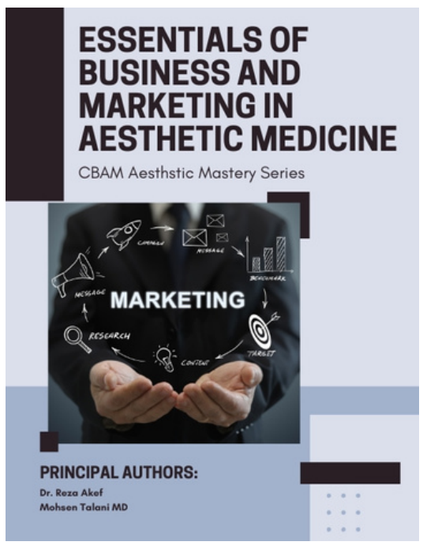
CBAM Aesthstic Mastery Series

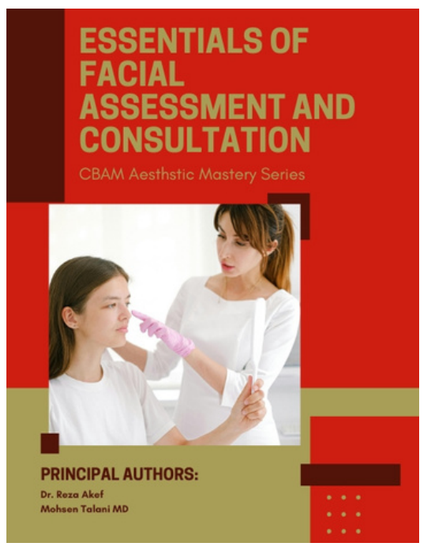


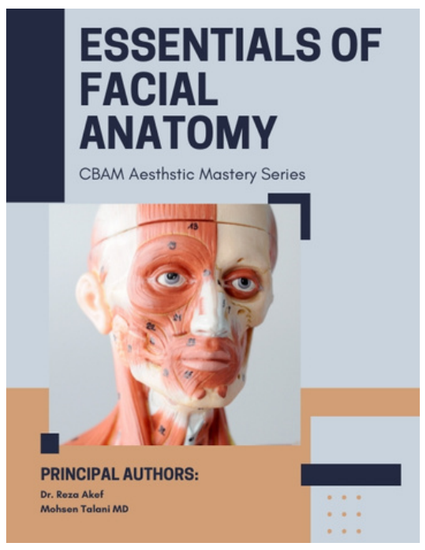






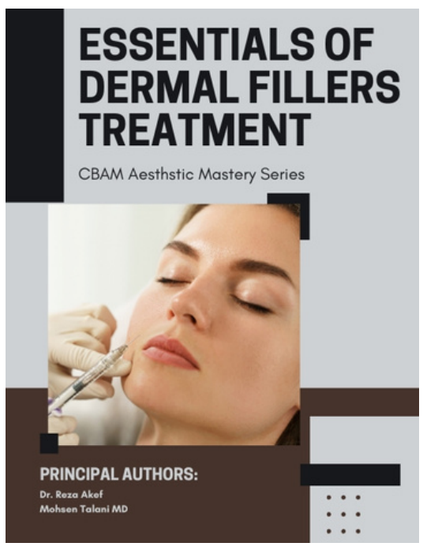












Principal Authors:



Dr. Reza Akef

MD, CCFP-EM

Dr. Reza Akef is a highly experienced and respected cosmetic physician, with over 15 years of experience in teaching and practicing cosmetic medicine. He is currently the Assistant Professor at McMaster University and the Chairman of the Canadian Board of Aesthetic Medicine (CBAM), where he shares his knowledge and expertise with other healthcare professionals to provide the best care for their patients. Dr. Akef is board certified by the College of Family Physicians of Canada in both Family and Emergency Medicine. Additionally, he is deeply involved in interventional pain practice cooperation for the treatment of Migraines, chronic pain, TMJ, Myofascial pain, and Fibromyalgia.



Mohsen Talani

MD, Anatomist

Mohsen Talani is the Director of CBAM. He has over 18 years of experience teaching anatomy in Canada and internationally to students and healthcare practitioners in different fields of medicine such as physicians, dentists, nurses, chiropractors, and physiotherapists.
After graduating from medical school at a young age, he became a medical doctor in his home country, Iran, and practiced in the field of emergency medicine. While pursuing his Master's thesis in neuroscience at McGill University, he discovered his passion for teaching. Since then, he has been working in the field of medical science education, with a focus on anatomy.

CBAM Publications
www.CBAMedicine.com