

# Anti-aging Procedures in Skin of Color

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# Disclosures

- Galderma, Sun Pharma, Avita, Proctor & Gamble, Regeneron, Aerolase, Benev, L'Oreal, LaMer, Avène, Kenvue, Bristol Myers Squibb, Nutrafol, Acclaro, Beiersdorf, Primus, Johnson & Johnson, Crown Aesthetics, Abbvie, UCB, Incyte, Xtressé, Novartis, Reframe Beauty, Revance

# Objectives

1

Differentiate the biological and structural mechanisms of cutaneous aging in skin of color.

2

Identify the predominant clinical manifestations of aging in skin of color.

3

Analyze the pathophysiology and risk factors for post-inflammatory hyperpigmentation (PIH).

4

Critically evaluate the safety and efficacy of chemical peel modalities in skin of color.

5

Compare energy-based device technologies for antiaging in skin of color.

6

Develop phenotype-driven procedural algorithms for antiaging in skin of color.

# Why Skin of Color Demands a Different Approach

01

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## **Tone-First Aging**

In skin of color, dyschromia and uneven pigmentation typically precede rhytid formation as the primary aging concern.

02

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## **Defining Our Population**

Fitzpatrick IV–VI phototypes, acknowledging heterogeneity across ancestry and underlying pigment biology.

03

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## **Three Core Goals**

Master aging biology and phenotype in SOC, understand safety science and PIH prevention, implement evidence-based peels and energy-based device algorithms.

# Why Aging Looks Different



## Epidermal Melanin Architecture

Larger, more dispersed melanosomes provide superior UV attenuation but dramatically increase post-inflammatory hyperpigmentation (PIH) susceptibility following any inflammatory insult.

## Photoaging Pattern Shift

Relatively fewer coarse rhytids and solar elastosis. Instead, dyschromia, uneven tone, and volume changes dominate the clinical presentation.

# UV Damage, Inflammation, and Melanocyte Cross-Talk

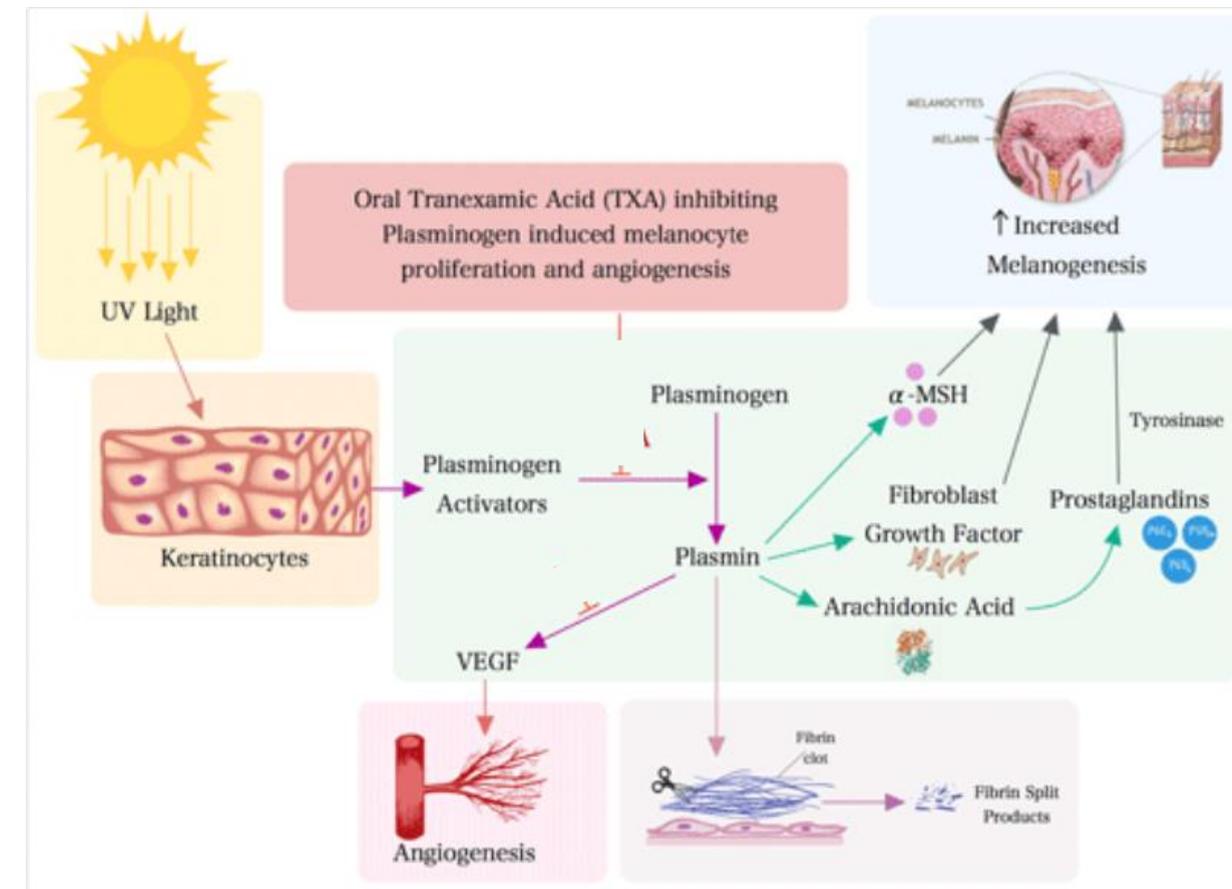


## UV-Induced Cascade

UV radiation triggers ROS generation, activating AP-1 and MMP pathways that fragment collagen. Clinical expression differs by phototype.

## Cellular Signaling Network

Melanocyte–keratinocyte–fibroblast communication drives coordinated pigment production, cytokine release, and ECM remodeling in photoaged skin.



Jia, X., & He, L. Pharmacological research. (2025).

# Early Signs of Aging in Skin of Color

1

## Early Manifestations

Mottled dyspigmentation, lentigines, and periorbital darkening, Texture changes subtle.

2

## Later Onset

Skin laxity, prominent NSL folds, jowling. Deep wrinkles emerge later compared to lighter phototypes.

3

## Volume and Shape Changes

Aging often manifests as facial volume loss and laxity rather than etched rhytids.



**Clinical Pearl:** Define the patient's primary phenotype—tone versus texture versus laxity—before selecting devices or chemical peels.

# Post-Inflammatory Hyperpigmentation

## PIH Predilection

SOC demonstrates heightened PIH risk driven by inflammatory mediators and melanogenic responsiveness.

## Prevention Evidence

Structured pre- and post-intervention protocols—photoprotection, anti-inflammatory measures, and regimen control—are important.



**Reframe consent discussions:** In skin of color, PIH risk may outweigh downtime as the primary perceived burden. Address this explicitly with patients.

# Pre-Procedure Optimization: Prime and Protect



## Visible Light Protection

UV protection alone is insufficient. High-energy visible (HEV) light contributes to pigmentation. Tinted, iron-oxide-containing formulations reduce visible light transmission and improve pigment outcomes in melasma and hyperpigmentation contexts.



## Regimen Simplification

One to two weeks before procedures, reduce irritants (retinoids, acids) that amplify baseline inflammation and compromise barrier function.



## Pigment Stabilization

In dyschromia-dominant patients, consider pigment-stabilizing topical adjuncts as part of pre-treatment optimization.

# Peel Fundamentals:

## **SOC Guiding Principle**

Favor superficial peels with incremental improvement and lower complication risk.

Aggressive depth increases PIH probability exponentially.

## **Injury-Inflammation-Melanogenesis Cascade**

Peel depth and post-peel erythema duration directly correlate with PIH risk.

## **Match Phenotype to Modality**

Peels address pigment and texture. They do not correct volume loss or significant laxity—set expectations accordingly.



# Agent Selection

## Glycolic Acid and Salicylic Acid

Consensus positions these as generally safe and well-tolerated when properly selected and depth-controlled. They remain first-line agents for SOC.

### Matching Agent to Phenotype

- **Dyschromia/melasma-prone:** Superficial AHA approaches with strict photoprotection protocols
- **Acne with PIH overlap:** Salicylic acid-based strategies leverage anti-inflammatory and comedolytic effects

Sharad J. Clin Cosmet Investig Dermatol (2013).



8 weeks following 2 Sal Acids peels + tretinoin 0.025% cream nightly + spironolactone

📄 **Clinical Protocol:** Consider test spots and employ conservative escalation strategies. Never advance depth without assessing individual response.

# Agent Selection



Before and After 50% Glycolic Acid Peel

Sharad J. Clin Cosmet Investig Dermatol (2013).



1 month following Cosmelan Peel 1 and 2

Courtesy of Ann Marie Freeman McNeil

# Energy Based Devices

## SOC Hazard

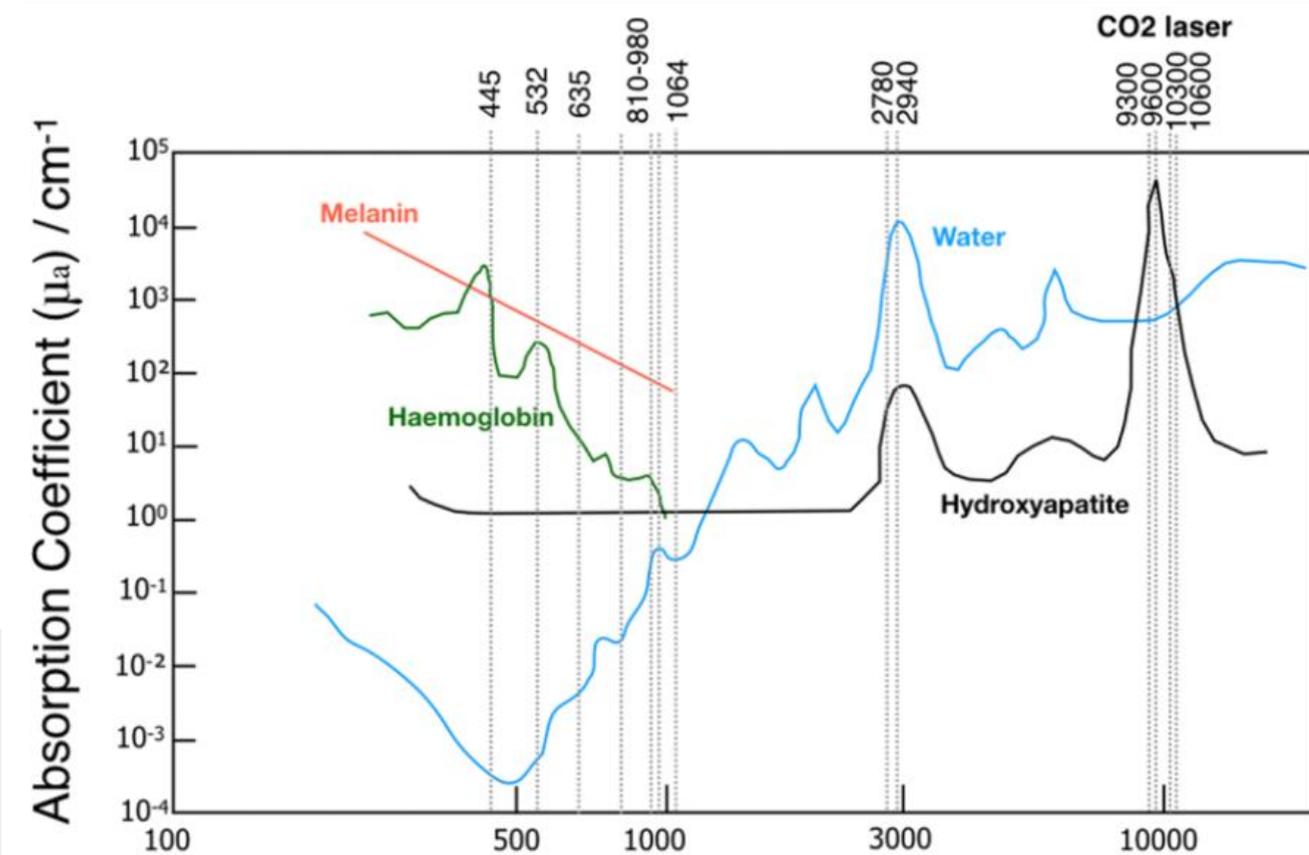
Epidermal melanin competes as a chromophore, increasing burn and PIH risk with inappropriate device settings.

## Safety

Longer wavelengths, lower fluence, longer pulse durations, epidermal cooling, and fractionation all reduce risk.

## Goal Separation

Pigment modulation (high caution), texture/pore/scar improvement, and dermal tightening require distinct approaches.



# Fractional Radiofrequency Microneedling

## Mechanism of Action

Radiofrequency energy creates dermal coagulation columns with minimal melanin dependence, triggering controlled collagen remodeling without relying on chromophore targeting.

## SOC Performance Profile

Effective across texture, pore, and scar indications with typically transient PIH. Comparative safety advantage versus many laser modalities is well-documented in SOC-focused reviews.

## Practical Parameters

- Needle depth titration by anatomic site
- Energy titration guided by erythema and edema endpoints
- Strategic interval spacing between sessions



# Fractional Radiofrequency Microneedling



# Non-Ablative Fractional Lasers: 1550/1540 nm



## Mechanism

Fractional photothermolysis delivers dermal remodeling through controlled microscopic treatment zones with intact surrounding tissue.



## SOC Use Cases

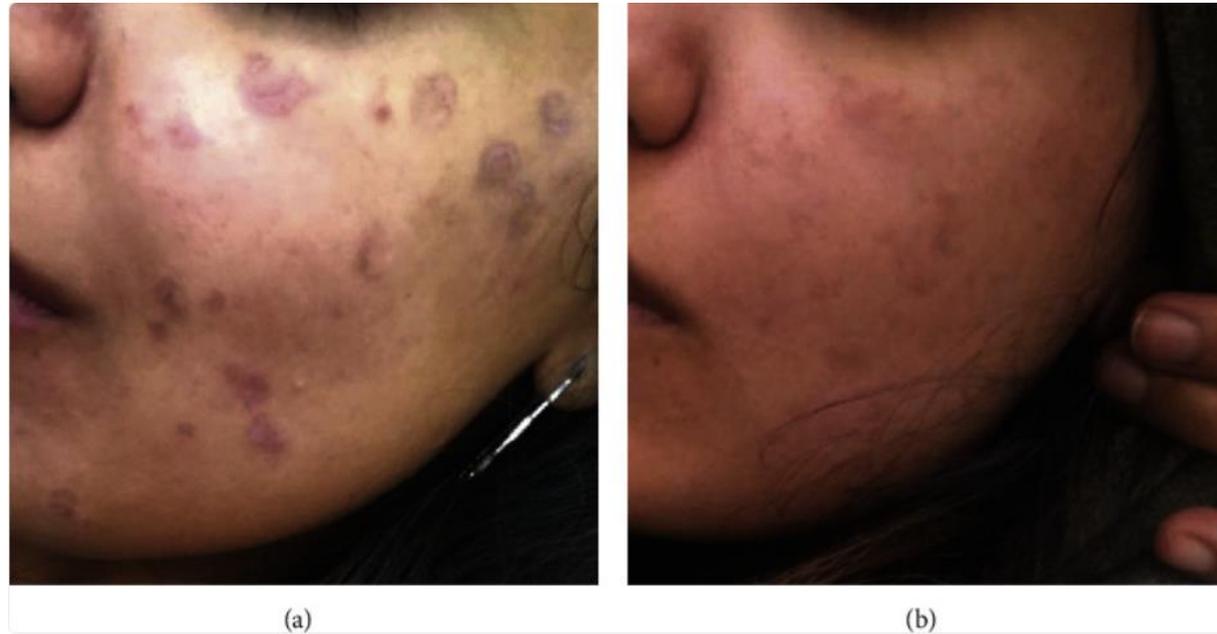
Texture refinement, fine lines, and scar improvement. Pigment risk management protocols are essential.



## Melasma Caution

NAFL can benefit selected patients but demands conservative settings plus rigorous pigment stabilization strategies.

# 1927 nm Thulium



one session of 1927 nm wavelength laser treatment combined with topical hydroquinone 4% cream for 6 weeks  
Alharbi, M. Dermatol Res Pract. 2021.

## Targeting Rationale

More superficial water absorption compared to 1550 nm wavelengths. Often positioned for dyschromia and actinic field change in carefully selected candidates.

## SOC Selection Criteria

Success hinges on pigment history, conservative density and energy parameters, and meticulous aftercare protocols.

**Research Spotlight:** Active clinical trials are evaluating combination strategies, including cysteamine plus 1927 nm thulium for enhanced outcomes.

# Picosecond Fractional Technologies: Less Heat, More Photoacoustic

## **Mechanistic Rationale**

Ultra-short pulse durations minimize bulk thermal diffusion. Fractional and diffractive delivery patterns target texture and dyschromia with reduced collateral damage.

## **Current Evidence Position**

High interest in SOC applications, particularly for melasma and pigment disorders. Device-specific and parameter-dependent—avoid overgeneralization.

## **Safety Profile**

Reviews of fractional picosecond Nd:YAG devices demonstrate promising safety and efficacy in pigment contexts when appropriately applied.

# Picosecond Fractional Technologies



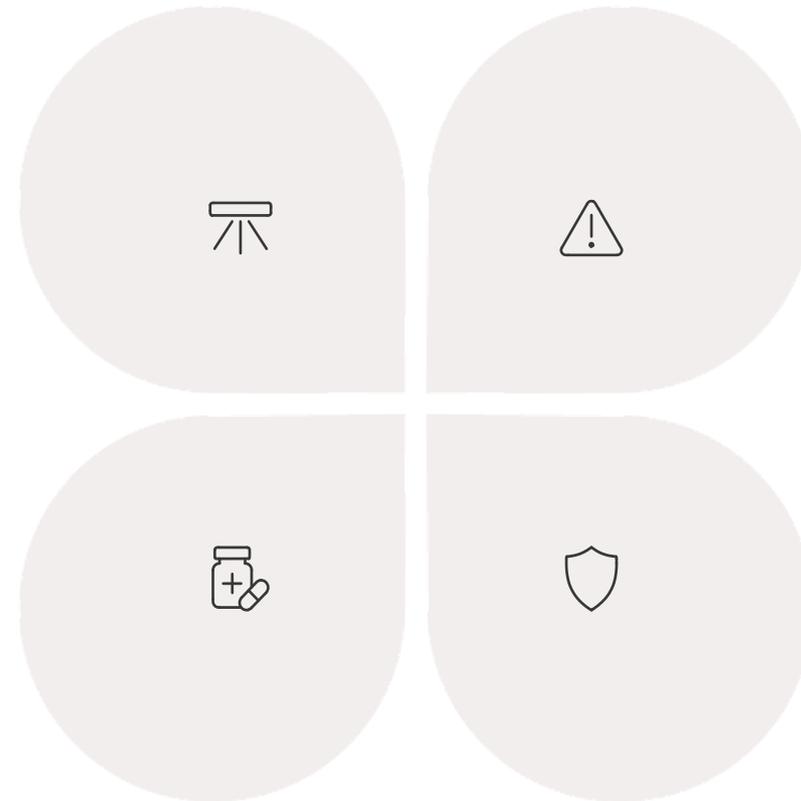
# Ablative Fractional Lasers: Balancing Efficacy and Risk in SOC

## Mechanism & Efficacy

Precisely vaporize microscopic columns of tissue, stimulating robust collagen remodeling for severe textural irregularities and deep scarring.

## Current Clinical Role

Generally approached with extreme caution in SOC. Non-ablative alternatives or fractional RF microneedling are often preferred due to superior safety profiles.



## Significant SOC Risks

High potential for post-inflammatory hyperpigmentation (PIH), hypopigmentation, and scarring due to aggressive epidermal ablation and melanocyte stimulation.

## Patient Selection & Protocols

Reserved for carefully selected patients with severe indications, requiring extensive pre-conditioning and meticulous post-procedure pigment-stabilizing care.

# Ablative Fractional Lasers- Era

2940nm Er:YAG laser

**300-microsecond pulse technology**—designed to deliver full-field and hybrid fractional ablative resurfacing without the heat, pain, or prolonged recovery of traditional systems.



# Ablative Fractional Lasers- 2910 Cold Fiber

Before

4 Months Post 2 Treatments



Before

6 Weeks Post 1 Treatment



# Biological Differences in the SOC Dermis



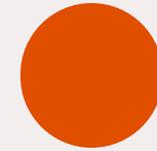
## Denser Collagen & Elastin

The dermis in Skin of Color typically exhibits a greater density of compactly arranged collagen bundles and elastic fibers, contributing to enhanced structural integrity and slower development of fine lines and wrinkles.



## More Active Fibroblasts

Fibroblasts are often more numerous and metabolically active, leading to robust extracellular matrix production and wound healing. This also correlates with a heightened propensity for hypertrophic scarring and keloid formation.



## Unique ECM Composition

Variations in glycosaminoglycan (GAG) content and proteoglycan distribution within the extracellular matrix may contribute to increased intrinsic dermal hydration and resilience, impacting overall skin viscoelasticity and aging patterns.

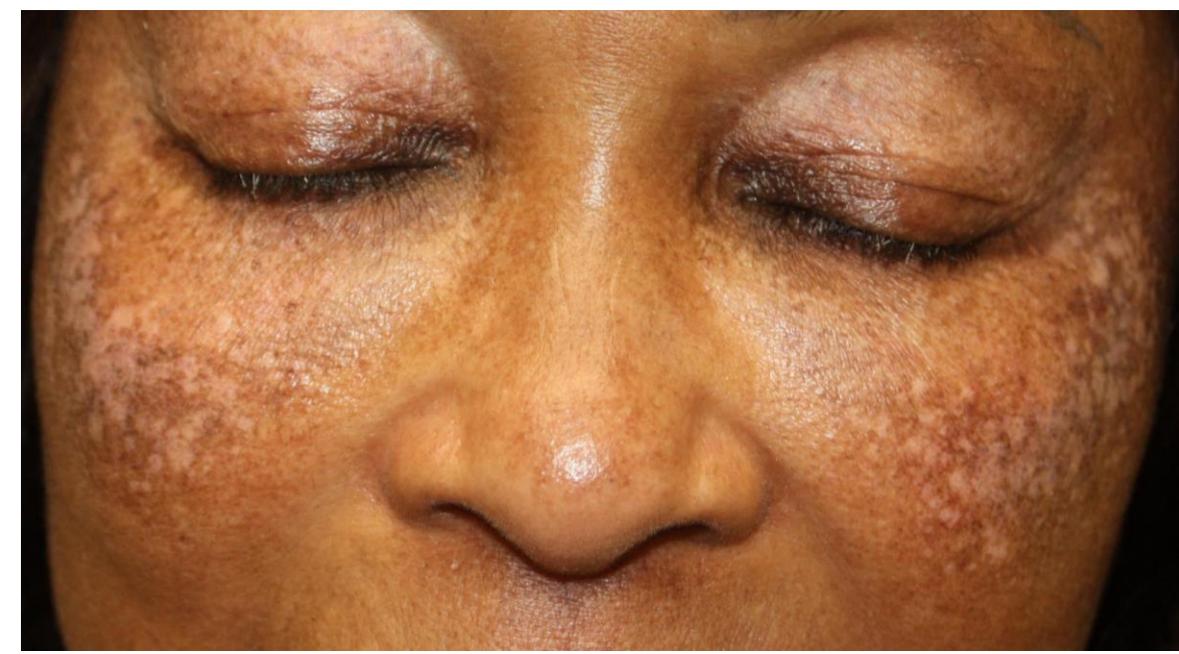
# Biostimulators



1 session PLLA

*Courtesy of Rawn Bosley, MD FAAD FASDS*

# Protocol Engineering: Minimizing PIPA and Scarring



*Courtesy of Ginette Okoye, MD*

01

## **Pre-Peel Checklist**

Recent retinoid or irritant use, active dermatitis, recent sun exposure, history of PIH, keloid tendency. Each is a risk modifier.

02

## **Intra-Procedure Discipline**

Strict timing, uniform application technique, adherence to neutralization protocols. Avoid "hot spots" that create focal thermal injury.

03

## **Post-Peel Care**

Barrier repair and iron-oxide tinted photoprotection are non-negotiable. Avoid stacking inflammatory insults during the healing window.

# Minimizing PIPA and Scarring

A 4-point visual scale based on palmar crease pigment was proposed as a predictive tool for risk of PIH.

Each point is determined by the level of contrast between palmar crease pigment and the pigment of the surrounding skin.

“0” = no difference in pigments

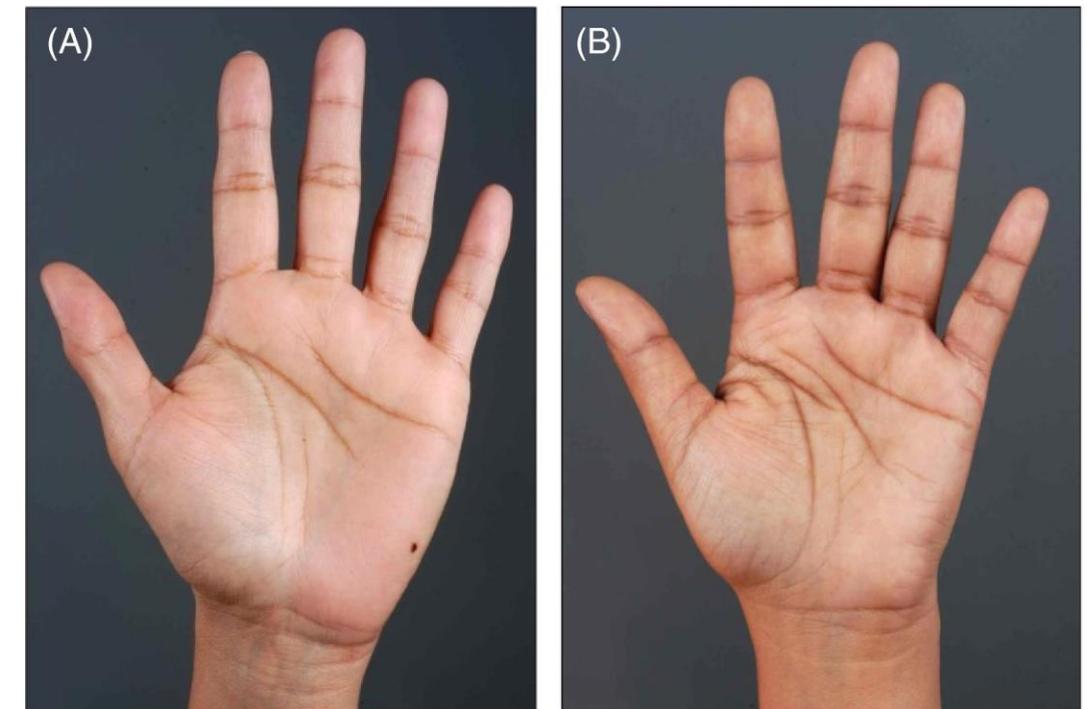
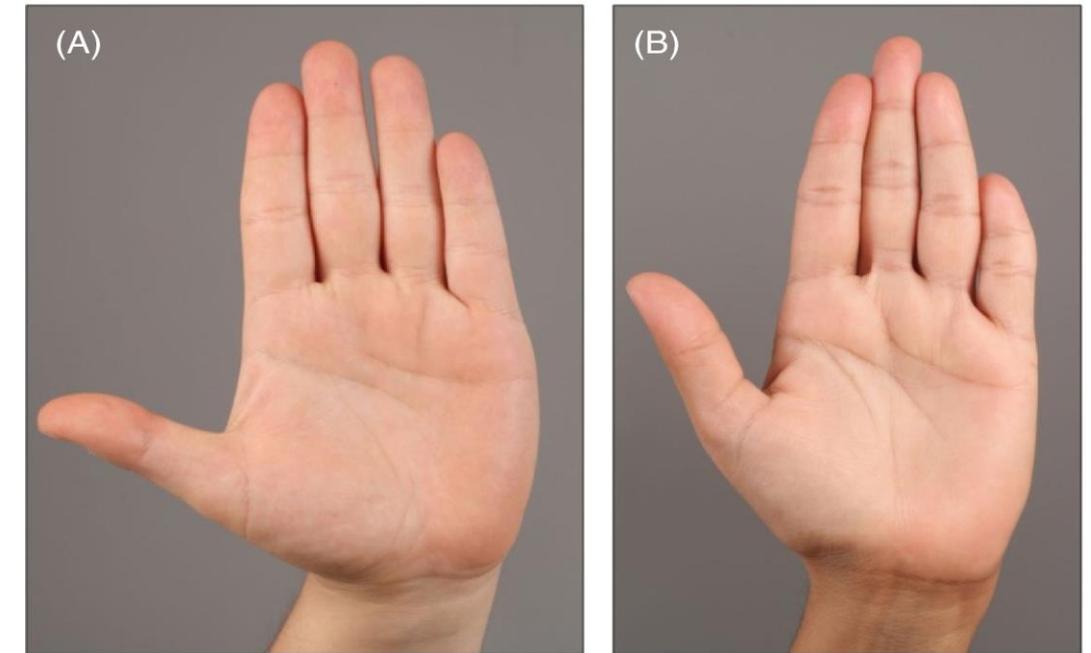
“1”= low level of difference

“2”= moderate level of difference

“3”= high level of difference

Scores of 0 or 1 are low risk of developing PIH

Scores of 2 or 3 are high risk of developing PIH



# Post-Procedure Care: Prevent Rebound Pigmentation

## Visible Light Protection

HEV protection is essential in pigment-prone SOC. Iron-oxide tinted formulations are repeatedly should be emphasized.

## Gentle Barrier Repair

Avoid stacking irritants such as retinoids and acids until complete re-epithelialization occurs. Reinforce barrier function with appropriate emollients.

## Protocolized Follow-Up

Early intervention for excessive inflammation. Establish clear protocols for urgent evaluation.

# Key Takeaways



## **Dyschromia-First Aging**

SOC aging prioritizes tone over rhytids. Procedures must be PIH-first in safety design. This is the foundational principle.



## **Incremental, Low-Inflammatory Protocols**

Favor staged approaches with controlled inflammation. Standardize pre- and post-procedure care to reduce variability and risk.



## **Visible Light-Aware Photoprotection**

Pair all procedural interventions with visible light protection strategies to ensure outcome durability and prevent pigment rebound.

# THANK YOU!



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