POST-PROCEDURE SKIN RECOVERY:

MDPEN COPPER + HA MIST FOR TEWL MANAGEMENT AND REGENERATION

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MICRODERMAL NEEDLING

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Microneedling, radiofrequency microneedling (RFMN), and fractional laser resurfacing are cornerstone treatments in modern aesthetic practice. They deliver reliable dermal remodeling and skin rejuvenation by inducing controlled micro-injury, which triggers fibroblast activity and neocollagenesis. Yet these procedures also cause temporary epidermal barrier dysfunction, most notably reflected in increased transepidermal water loss (TEWL).

Gordon Sasaki, MD, demonstrated that TEWL rises sharply within 24 hours and peaks at 24–48 hours post-microneedling or RFMN, underscoring the importance of early and sustained barrier support.

MDPen Copper + Hyaluronic Acid Mist has been formulated to meet this clinical need. Combining hyaluronic acid, GHK-Cu (copper tripeptide-1), Saccharomyces-derived mineral ferments (copper, manganese, zinc), caprylhydroxamic acid, and caprylyl glycol, the mist provides hydration, antioxidant defense, anti-inflammatory benefits, and antimicrobial protection. Its use post-procedure aligns closely with the biologic needs of barrier-compromised skin, supporting re-epithelialization, reducing downtime, and optimizing treatment outcomes.

THIS EBOOK SHOWS HOW MDPEN COPPER + HA MIST RESTORES THE SKIN BARRIER AFTER MICRONEEDLING AND LASER TREATMENTS TO SPEED HEALING AND IMPROVE RESULTS.

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Microneedling and its fractional energy-based variations continue to gain ground in aesthetic medicine due to their efficacy in improving scars, texture, and fine lines with relatively low downtime. The therapeutic principle is straightforward: controlled micro-injury initiates a wound-healing cascade that enhances dermal structure.

However, this process also leaves the skin vulnerable. The stratum corneum is disrupted, TEWL increases, and patients frequently report dryness, redness, and sensitivity. While these are expected sequelae, the quality of aftercare has a direct influence on both patient comfort and treatment outcomes.

Dr. Gordon Sasaki and colleagues quantified TEWL changes after microneedling and RFMN, confirming that barrier compromise peaks within 48 hours and gradually normalizes over 5–7 days. This research reinforces the clinical imperative: support barrier repair early and consistently.

TEWL AND BARRIER DYSFUNCTION POST-MICRONEEDLING

TEWL measures the diffusion of water vapor through the epidermis. It is a reliable indicator of barrier function and has long been used in dermatology research to evaluate skin integrity.

- Within 24 hours: Sasaki observed a significant spike in TEWL following microneedling.
- At 24–48 hours: Barrier compromise reaches its maximum, with patient symptoms (tightness, heat, irritation) correlating with these values.
- At 5–7 days: TEWL gradually declines as re-epithelialization proceeds.

This period of elevated TEWL is more than a discomfort issue; it reflects vulnerability to dehydration, oxidative stress, and infection. Therefore, practitioners must integrate post-treatment products that hydrate, calm, and protect without occluding the skin.

INGREDIENT-SPECIFIC CONTRIBUTIONS OF MDPEN COPPER + HYALURONIC ACID MIST

Deionized Water

Provides a pure, non-irritating delivery base with a cooling effect — particularly useful in the first hours post-treatment when surface heat is highest.

Hyaluronic Acid (HA)

- Binds up to 1,000 times its weight in water.
- Immediately counteracts TEWL, restoring hydration and reducing tightness.
- Improves skin elasticity and supports keratinocyte migration during re-epithelialization.

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GHK-Cu (Copper Tripeptide-1)

GHK-Cu (Copper Tripeptide-1) stimulates fibroblasts to produce collagen, elastin, and glycosaminoglycans. It also functions as both an antioxidant and an anti-inflammatory agent.

Saccharomyces/Copper Ferment

Delivers copper in a bioavailable form, supporting collagen cross-linking and angiogenesis while reinforcing antioxidant defenses.

Saccharomyces/Manganese Ferment

Provides manganese, a cofactor for mitochondrial MnSOD, reducing oxidative stress and protecting fibroblasts during healing.

Saccharomyces/Zinc Ferment

Saccharomyces/zinc ferment is essential for DNA synthesis and keratinocyte proliferation. It accelerates wound closure and re-epithelialization while also providing antimicrobial and anti-inflammatory support.

Caprylhydroxamic Acid

A gentle antimicrobial agent derived from coconut, protecting skin when microchannels remain open.

Caprylyl Glycol

A multifunctional humectant that works with HA to maintain hydration while contributing additional antimicrobial protection.

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Ingredient	Mechanism of Action	Relevance to TEWL & Healing
Deionized Water	Vehicle, cooling	Immediate soothing post-procedure
Hyaluronic Acid	Humectant, binds water	Restores hydration during peak TEWL
GHK-Cu	Fibroblast activation, collagen synthesis, antioxidant	Accelerates re-epithelialization; reduces erythema
Copper Ferment	Bioavailable copper	Enhances collagen stabilization, antioxidant defense
Manganese Ferment	MnSOD cofactor	Protects against oxidative stress during healing
Zinc Ferment	DNA synthesis, keratinocyte proliferation, antimicrobial	Accelerates wound closure, antimicrobial defense
Caprylhydroxamic Acid	Antimicrobial	Protects against infection during barrier compromise
Caprylyl Glycol	Humectant, antimicrobial	Sustains hydration, enhances antimicrobial defense

TEWL RESPONSE AND POST-PROCEDURAL INTERVENTION

- 0–48h: Hydration (HA, caprylyl glycol), cooling (deionized water), anti-inflammatory (GHK-Cu), antimicrobial protection.
- 2–7d: Collagen stimulation (GHK-Cu, copper ferment), oxidative stress reduction (Mn ferment), epidermal closure (Zn ferment).
- 1–4w: ECM stabilization (GHK-Cu, copper ferment), hydration and elasticity support (HA).

CLINICAL APPLICATION TIMELINE

- Immediate (0–48h): Hydration peaks in importance. Mist use alleviates tightness, redness, and microbial risk.
- Early Healing (2–7d): Cellular activity accelerates. Ingredients support fibroblasts, keratinocytes, and antioxidant pathways.
- Remodeling (1–4w): Collagen and elastin synthesis intensify; mist sustains hydration and supports ECM stabilization.
- Extended Use (Up to 90 days): Collagen maturation continues for months post-microneedling. Continued use of MDPen Mist supports dermal strength and elasticity while maintaining hydration.

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TEWL is a critical clinical marker of skin barrier compromise following microneedling and RFMN. Sasaki's research underscores the vulnerability of the first 48 hours, but ongoing remodeling for up to 90 days demonstrates the need for long-term supportive care.

MDPen Copper + Hyaluronic Acid Mist offers a non-occlusive, biologically active adjunct that meets these needs through hydration, antioxidant defense, collagen stimulation, and antimicrobial protection. For practitioners, integrating this product into post-microneedling protocols not only reduces downtime and improves patient comfort but also enhances long-term treatment outcomes.

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