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Background

Facial skin ageing is a multifactorial process influenced by intrinsic factors - such as genetic programming, hormonal changes, and natural chronological decline - as well as extrinsic stressors including ultraviolet radiation, environmental pollution, oxidative injury, and lifestyle habits. These cumulative mechanisms disrupt epidermal homeostasis and progressively degrade dermal extracellular matrix components. Clinically, this leads to dyschromia, telangiectasia, textural irregularities, enlarged pores, and reduced collagen and elastin density. Although these changes occur across all skin types and genders, they are especially prominent in chronically sun-exposed facial areas, where photoageing accelerates barrier impairment and dermal degeneration.

Despite extensive research in energy-based facial rejuvenation, most conventional technologies address only a single layer of this complex biological process. IPL devices primarily target epidermal chromophores such as melanin and hemoglobin, whereas long-pulse Nd: YAG lasers act mainly on deeper dermal structures. When applied independently, these single-modality treatments often provide partial or short-lived improvement, as they fail to correct both superficial chromophore abnormalities and deeper collagen-related degeneration simultaneously.

A significant technological gap further limits outcomes: outside of the Formatk ecosystem, no currently available platform integrates all four modalities required for comprehensive facial rejuvenation within a single system - USP IPL (430/530/590 nm cutoff filters, extending up to 1100 nm), an 808 nm diode laser, long-pulse Nd: YAG 1064 nm, and a built-in melanin meter - combined with FDA clearance, CE marking, and full EU MDR certification. This unique combination exists only in the Formatk Magma platform.

Given this gap and the limited published evidence evaluating the true in-session IPL–Nd: YAG combination therapy, a synergistic dual-modality protocol was developed to leverage the Magma system's capabilities fully. The Synergetic Skin Renaissance Protocol was designed to address both epidermal chromophore abnormalities and more profound dermal structural decline within a single treatment session by combining:

USP IPL (530–1100 nm)

Fluence selection was guided by real-time melanin-meter readings, ensuring individualized energy delivery based on epidermal melanin content. This wavelength selectively photothermolysis melanin and hemoglobin, improving pigmentation, vascular redness, and overall brightness with minimal thermal diffusion and high safety across Fitzpatrick I–V.

Defocused non-contact Nd: YAG 1064 nm delivered at 4 Hz

Enabling controlled dermal thermal accumulation and elevating the upper dermis to approximately 40–42°C without reaching coagulative thresholds. This sub-ablative temperature range activates heat-responsive pathways, stimulates fibroblast activity, increases heat-shock protein expression, and promotes neocollagenesis and extracellular matrix remodeling.

By integrating IPL-based chromophore correction with Nd: YAG-induced dermal stimulation, the Renaissance Protocol leverages the full synergistic potential of the Magma platform. This dual-layered approach aims to enhance epidermal clarity and stimulate dermal remodeling, thereby improving pigmentation, vascularity, texture, and overall facial uniformity.

Aims

This retrospective study aimed to evaluate the real-world clinical effectiveness, safety profile, and synergistic impact of a dual-modality facial rejuvenation protocol combining USP IPL (530–1100 nm) with defocused non-contact Nd: YAG 1064 nm thermal dermal stimulation delivered at 4 Hz. Specifically, the study assessed whether integrating chromophore-selective IPL photothermolysis with controlled sub-ablative Nd: YAG-induced dermal heating resulted in measurable improvements in pigmentation, vascular dyschromia, pore size, fine rhytides, and overall skin texture in patients with Fitzpatrick skin types II–V.

Primary Objective

To determine the clinical improvement in overall facial photorejuvenation - specifically pigmentation, vascular dyschromia, pore size, fine rhytides, and surface texture - following six sessions of the dual-modality USP IPL + defocused Nd: YAG protocol.

Secondary Objectives

- To evaluate the safety profile of the protocol by documenting any immediate or delayed adverse events.
- To assess patient tolerability using the Visual Analog Scale (VAS) for discomfort.
- To explore the potential synergistic contribution of combining selective epidermal photothermolysis (USP IPL) with Nd: YAG-induced sub-ablative dermal thermal stimulation.
- To generate preliminary real-world evidence supporting the theoretical mechanisms of fibroblast activation, neocollagenesis, and extracellular matrix remodeling described in the literature.

We hypothesized that this dual-modality approach would yield superior rejuvenation outcomes compared with those typically observed when either modality is used independently, due to a combined mechanism involving selective epidermal targeting by USP IPL, fibroblast activation, neocollagenesis, and extracellular matrix remodeling, all stimulated by Nd: YAG-mediated thermal accumulation. This study aimed to provide foundational real-world evidence supporting these mechanistic concepts and to establish an initial clinical basis for the synergistic rejuvenation potential of this proprietary Formatk protocol.

Methods

This retrospective preliminary case series (Level IV evidence) included two patients who had previously completed the Renaissance dual-modality facial rejuvenation protocol at the Formatk Clinical Department (Tirat Carmel, Israel). All treatments were initially performed by Veronika Yehoshua, a certified cosmetologist and Formatk clinical instructor. All pre- and post-treatment photographs were later evaluated retrospectively by Dr. Nadav Pam, Clinical Director of Medical Aesthetic Device R&D & Innovation.

Operator Information

- Treating clinician: Veronika Yehoshua, Certified Cosmetologist, Formatk Systems Ltd.
- Evaluator: Dr. Nadav Pam, MD, Clinical Director of R&D & Innovation.

Study Design

The Renaissance protocol was administered as a structured treatment series of six sessions, performed at four-week intervals. Clinical data, photographs, and treatment parameters were reviewed retrospectively after all treatments had been completed.

Before the original treatments, clinicians had conducted standard safety procedures including medical history review, screening for contraindications, informed consent, treatment-area cleansing, and standardized baseline photography. Protective eyewear was used by all individuals present during each session.

Step 1

USP IPL (530 nm) Photorejuvenation

A 1–2 mm layer of Parker Gel was applied before treatment. Fluence was selected according to Fitzpatrick skin type using real-time melanin-meter readings, following Formatk's standardized parameters (for example: Type I: 19.9 J/cm²; Type II: 18 J/cm²; Type III: 16.1 J/cm²; Type IV: 12.3 J/cm²; Type V: 8.5 J/cm²). Pulses were delivered in Single/Double mode with a 10% overlap, using F-SR, B-SR, or SR applicators.

The 530 nm IPL step targeted melanin and hemoglobin in the epidermis and superficial dermis, reducing pigmentation and erythema and improving overall brightness.

Figure 1 - Preforming Step 1 on a patient, using the Magma USP IPL 530 nm applicator.

Step 2

Defocused Nd: YAG 1064 nm Dermal Stimulation

The Nd: YAG applicator was used without a tip or gel, held 2–3 cm above the skin to deliver a deliberately defocused, non-contact beam. This broadened optical footprint allowed uniform sub-ablative dermal heating (~40–42°C) without epidermal coagulation (see image below).

Pulse numbers were adjusted according to anatomic region:

- Forehead: ~200 pulses at 4 Hz
- Cheeks: up to ~400 pulses at 4 Hz
- Typical settings included 32–40 J, 50 ms pulse duration, and non-contact delivery.

This phase was designed to induce mild collagen contraction, fibroblast activation, heat-shock protein expression, and progressive dermal remodeling.

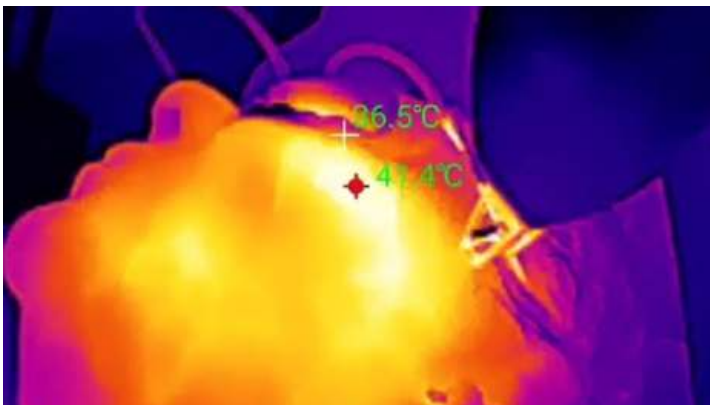

Figure 2 - Preforming Step 2 on a patient, using defocused, non-contact Nd:YAG 1064 nm delivered at 4 Hz, providing non-invasive skin surface heating up to ~42°C, maintained continuously for at least 2 minutes.

Post-Treatment Care

After each session, gel was removed and soothing products were applied as needed. Patients were instructed to avoid scratching, sun exposure, exfoliants, acids, and retinoids for 48–72 hours and to use SPF 50+ daily. Mild erythema typically resolved within hours.

Inclusion Criteria

This treatment is suitable for adults aged 18 to 70 with Fitzpatrick skin types I through V who present with clinical features such as hyperpigmentation, diffused facial redness, enlarged pores, mild to moderate fine lines, uneven skin texture, or general facial photodamage.

Exclusion Criteria

Contraindications to treatment include drug-induced photosensitivity (e.g., isotretinoin/Accutane, tretinoin/Retin-A), active skin lesions, inflammation, or infection in the treatment area, tattoos or permanent makeup within the treatment zone, excessively tanned skin, or the presence of a pacemaker. Additional contraindications include pregnancy; herpetic conditions; autoimmune disorders such as discoid lupus erythematosus; patients receiving anticoagulant therapy; epilepsy; psoriasis; thrombosis; cancer or malignant skin tumors; and varicose veins or large-diameter vessels.

Treatment should also be avoided on suspicious, raised, irregular, or otherwise uncertain pigmented lesions (e.g., spots, nevi, macules), in individuals with immunosuppressive diseases or those using immunosuppressive medications, in patients with a history of keloid scarring, and in cases of severe diabetes or any other condition deemed unsuitable at the practitioner's clinical discretion.

Results

In this retrospective preliminary observational case series, two female patients aged 62 and 64 years, both with Fitzpatrick skin types II–III, underwent six treatment sessions of the synergistic dual-technology protocol - USP IPL (530–1100 nm) combined with defocused ND: YAG 1064 nm dermal stimulation - performed at 4-week intervals. Each session lasted approximately 15–20 minutes, demonstrating the efficiency of the combined approach.

Across all treatments, no adverse events or complications were reported. Both patients exhibited high tolerability, with a mean Visual Analog Scale (VAS) discomfort score of 2/10. Patients were followed for 4 weeks after the final treatment to assess the durability of results and monitor for delayed adverse events.

Based on a standardized 4-point clinical improvement scale, the average improvement across both cases was 82%, indicating substantial rejuvenation effects.

These preliminary findings suggest that the dual-technology protocol was safe, well-tolerated, and produced notable clinical improvements without immediate or delayed side effects in this initial cohort.

Discussion

This retrospective, preliminary case series provides early, real-world evidence addressing both the primary and secondary objectives of evaluating the clinical effectiveness, safety profile, and synergistic interaction of USP IPL combined with defocused non-contact Nd: YAG 1064 nm at 4 Hz.

Primary Objective

Clinical Effectiveness Across Key Photorejuvenation Domains

In alignment with the primary objective, both patients demonstrated measurable and consistent improvements across all evaluated domains - pigmentation, vascular dyschromia, pore size, fine rhytides, and overall surface texture - following six treatment sessions. The mean 82% improvement on a standardized 4-point scale suggests that the dual-modality approach yielded meaningful photorejuvenation beyond the typical outcomes expected from either USP IPL or Nd: YAG 1064 nm monotherapy. These results support the hypothesis that simultaneously addressing epidermal chromophore abnormalities and more profound dermal structural decline can produce a compounded rejuvenation effect.

Secondary Objectives

Safety, Tolerability, and Evidence of Synergy

The secondary objectives - safety evaluation, assessment of tolerability, and exploration of synergistic mechanisms - were also supported by the findings:

- Safety. No immediate or delayed adverse events were observed across 12 cumulative treatments, fulfilling the safety objective and demonstrating a favorable profile even in older individuals with photoaged skin.
- Tolerability. Both patients reported low procedural discomfort (mean VAS 2/10), confirming the tolerability objective.
- Synergy. The combined interaction of selective epidermal photothermolysis (USP IPL) with uniform sub-ablative dermal heating (defocused Nd: YAG) appears to have contributed to improvements greater than expected from monotherapy approaches. The observed outcomes are consistent with prior data from Goldberg et al. and Lee et al., who reported enhanced rejuvenation when IPL and Nd: YAG wavelengths were used sequentially or in tandem.
- Mechanistic Plausibility. While direct histological confirmation was not feasible in this retrospective design, the clinical pattern of improvement aligns with established mechanisms - including fibroblast stimulation, upregulation of heat-shock proteins, and neocollagenesis - associated with sustained dermal heating at 40–42°C.

Discussion

An important distinction is that the Nd: YAG protocol here employed non-contact, defocused, sub-ablative thermal delivery, differing sharply from traditional long-pulse Nd: YAG parameters used for vascular photocoagulation. This gentle thermal-activation strategy represents a novel approach that may complement chromophore-targeted IPL and warrants further investigation.

Limitations

As outlined in the study aims, this case series has inherent limitations consistent with Level IV evidence:

- Small sample size (n = 2)
- Retrospective design without a control group
- Subjective clinical grading without objective imaging tools (e.g., VISIA, multispectral analysis)
- Short follow-up (4 weeks), preventing long-term durability assessment
- Inability to validate mechanistic pathways histologically

These limitations underscore the need for larger prospective studies to confirm these early findings.

Conclusion

This retrospective, preliminary case series demonstrates that the dual-modality Renaissance Protocol - combining USP IPL and defocused non-contact Nd: YAG 1064 nm thermal dermal stimulation - successfully met both its primary and secondary objectives.

Regarding the primary objective, the protocol produced substantial clinical improvements across all evaluated photorejuvenation parameters, with an average improvement of 82% after six sessions and consistent results across both patients with Fitzpatrick skin types II and III.

For the secondary objectives, the protocol demonstrated a strong safety profile, with no adverse events, excellent tolerability, and early evidence of a synergistic interaction between epidermal chromophore targeting and deeper dermal remodeling. These findings support the conceptual framework that combining selective USP IPL photothermolysis with sub-ablative Nd: YAG-induced heat-mediated stimulation may produce enhanced rejuvenation effects not achievable by either modality alone.

While limited by a small sample size and a retrospective methodology, these results highlight the potential clinical value of the Formatk Magma platform, which uniquely integrates USP IPL, an 808 nm diode, a long-pulse Nd: YAG 1064 nm, and an onboard melanin meter within a single FDA-cleared, CE-marked, and MDR-certified system.

Future studies incorporating larger cohorts, controlled comparison arms (USP IPL alone, Nd: YAG alone, and combination), objective imaging, and histologic validation are required to fully characterize the therapeutic potential, durability, and mechanistic underpinnings of this synergistic dual-modality approach.

Key Take-Home Message

- No side effects across 12 cumulative treatments
- 82% mean improvement
- Low discomfort (VAS 2/10)
- 15–20 min per session
- Zero downtime
- Strong synergy between epidermal chromophore targeting and dermal thermal remodeling

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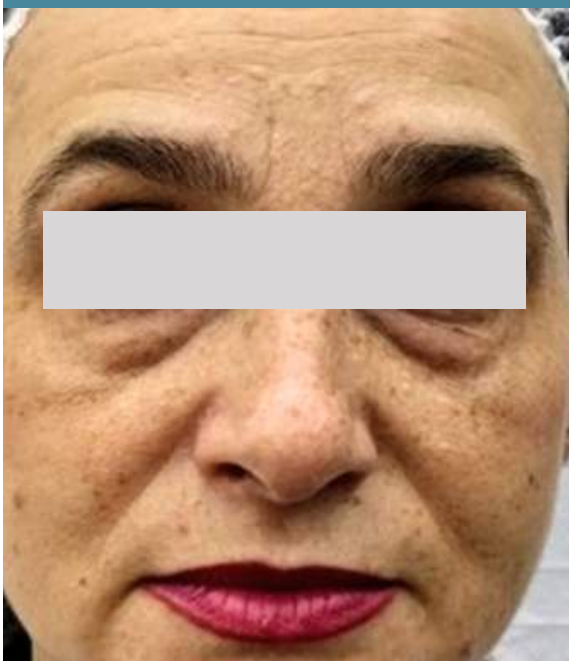
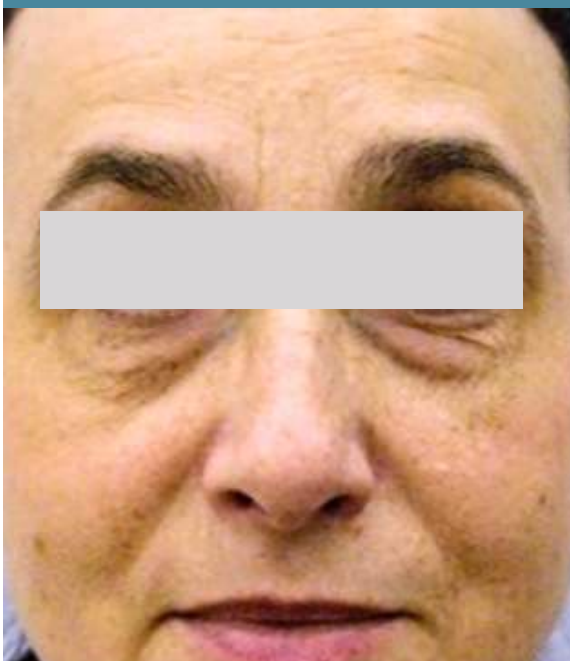
Before & After Results

Patient #1

BEFORE

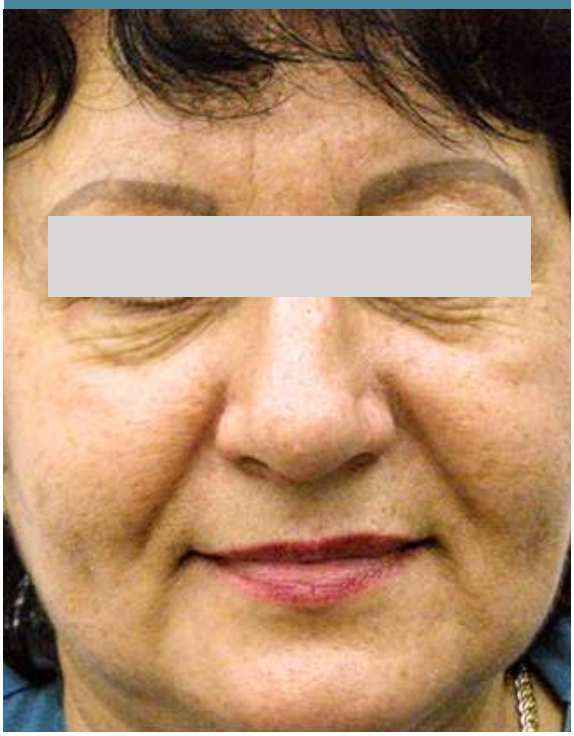


AFTER 6TX



Patient #2

BEFORE



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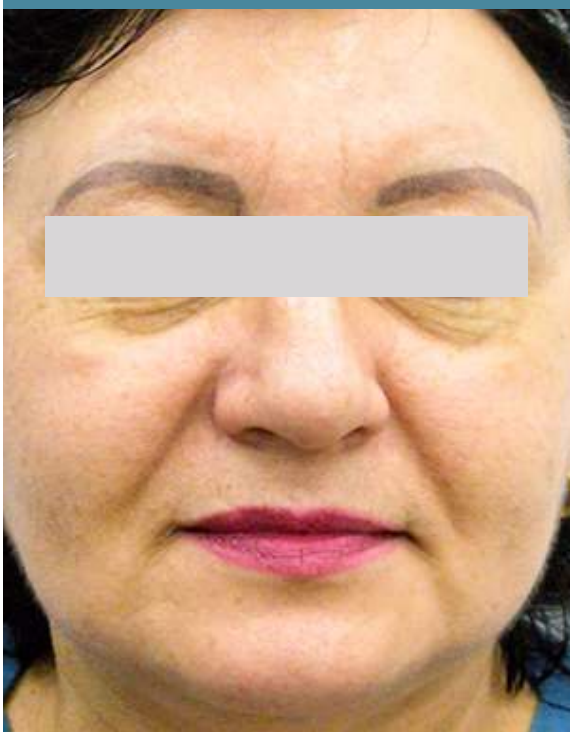

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