The approach to aesthetic medicine treatments, aimed at improving signs of chrono- and photoaging or other blemishes, such as acne scars and pigment changes, involves diverse methodologies. Mechanisms of action of such methodologies, techniques, protocols and effects on the tissues are not superimposable. Hence, in clinical practice, a combination approach can be beneficial as long as it is backed by a solid clinical and scientific rationale, documented clinical experience and a safety profile assessment.

Chrono- and photoaging treatments aim to improve firmness, elasticity, texture, pigmentation and wrinkles through actions targeting the epidermis and dermis. Specifically, the treatments target alterations of the dermal extracellular matrix and the collagen network, caused by metalloproteinases in sun-damaged skin, which induce collagen degradation and fragmentation1.

In the treatment of acne scarring the methodological approach must include an accurate assessment of scar type (rolling, ice pick, boxcar) and predictive criteria of success, in particular scar severity. The goal of this treatment is the detachment of fibrous tissue adhesions, collagen stimulation and remodelling, and improvement of tissue elasticity and “lifting” of scars2.

Overall, many methods are developed to achieve these goals at the dermal and epidermal level, such as fractional ablative and non-ablative lasers, intense pulsed light (IPL), radiofrequency, mesotherapy, skinboosters, fillers, needling, and chemical peeling.

Of these, skinboosters and fractional lasers are associated with an efficacy and safety profile that has been well documented in various clinical studies3-12.

Skinboosters (Restylane Vital® and Restylane Vital Light®, Q-Med AB-Uppsala, Sweden) employ the patented NASHA™ (Non-Animal Stabilized Hyaluronic Acid) technology, a hyaluronic acid in modified form. Injected as micro-droplets in the mid to deep dermal layer (protocol of 3 sessions per month3-6), it has been found to have a lasting presence in the skin, providing long-term hydration and improving skin elasticity and reducing surface skin roughness. In addition to skin rejuvenation, the efficacy of Skinboosters has been found to improve acne scars7-8.

The hypothesis is that these effects are the result of collagen production, stimulated by NASHA gels’ mechanical stretching of skin fibroblasts9.

In the case of laser treatments, especially with the widespread use of fractional technology, efficacy is a result of the effect of coagulation (or vaporization) of tissues and stimulation of the underlying collagen2.

The CO2 Laser (AcuPulse™, Lumenis® Ltd), used in fractional mode, creates microablative columns to the skin tissue, promoting the healing process through heat damage and mechanical formation of new tropocollagen and its remodelling. Biological processes activate the renewal of vaporised tissue treated for sun-induced dyschromia, resulting in overall skin tightening and tissue rejuvenation10-11.

The 1565 nm Erbium-glass Laser (ResurFX™, Lumenis® Ltd.) acts solely in a non-ablative fractional mode, generating microcolumns of coagulated tissue. The heating effect into the mid-reticular dermis stimulates the release of inflammatory mediators, activating fibroblasts, neocollagenesis, and consequent skin remodelling.

The favourable clinical effects, derived from the combined use of non-ablative fractional lasers and Skinboosters, were reported for treating signs of aging in the neck in 9 subjects12. The study documented the overall clinical improvement of the skin, in terms of surface roughness, firmness and texture. This is supported by histological assessments, that demonstrated improved skin cellularity, collagen and elastic fibres in the treated areas. The hypothesis, formulated by the authors, supports the efficacy of the combined method, considering both techniques to be complementary one to the other. The laser acts on the epidermis and superficial dermis through heat stimulation. The Skinboosters act on the deep dermal level through mechanical stimulation (stretching) and provide a deep dermal hydration effect that creates a favourable micro-environment for fibroblast activation12.

Below is a description of the clinical experience, acquired with combined Laser and Skinboosters protocols by two plastic surgeons, Dr. Francesca De Angelis (fractional ablative CO2 laser AcuPulse™ and Skinboosters) and Dr. Matteo Tretti Clementoni (fractional non-ablative Erbium-glass laser ResurFX™ and Skinboosters). This approach stems from analysis of the available literature12-16 and from the hypothesis that combining both treatments, based on their respective mechanisms of action and targets, optimises their effects and patient satisfaction.

Clinical experience with SkinBoosters and ablative and non-ablative laser combination treatments:
Rationale for use, opportunities and protocols for acne scar and skin rejuvenation
Francesca De Angelis, MD | Matteo Tretti Clementoni, MD
Below described physician-preference study commenced in April 2012, designed to treat acne scarring and skin rejuvenation of about 50 patients, between 18 to 65 years old. A combined approach of Skinboosters and Laser was employed. The rationale for the use of Skinboosters prior to the Laser treatment is based on the NASHA gels’ ability to improve skin physiology by stimulating fibroblasts. This ensures that the laser acts on fibroblasts which are more responsive to heat stimulation, with an overall optimising effect.

In the case of acne scarring, [this study] all types of acne scarring were included, taking into consideration that the level of response in “ice-pick” scars is lower. Excluded from the study were patients suffering from active acne; patients not yet in stable remission; and patients who had suspended retinoid therapy less than 6 months prior to the study’s onset.

The laser used was the AcuPulse™, a CO₂ Laser, which offers two fractional ablation modes: superficial and deep. Overall, 1 to 3 sessions, once yearly, were performed, with the recommendation to abstain from sun exposure for at least 6 months, and, to use a high SPF sunscreen starting at day 7 following the treatment. Patient management called for the administration of an antibiotic and antiviral prophylaxis and the topical application of an emollient cream (Vaseline) with an antibiotic and antifungal cream for 7–10 days post-treatment until the crusts detached spontaneously. In terms of skin phototype, phototypes IV-VI were excluded.

The personal experience with combined Skinboosters and Laser treatments is based on a protocol of 3 sessions of Restylane Vital, one every 20 days, with deep dermal hydration effect, followed by one AcuPulse ablative CO₂ laser treatment, 30 days after the last Skinboosters session.

To maintain the results, 2 additional maintenance sessions with Restylane Skinboosters at 3 months and at 6 months are required. (Table 1)

| Table 1. Combined Skinboosters and Ablative Laser Protocol (acne scars and skin rejuvenation) |
|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|
| Baseline Visit (Time 0)                         | Visit 1 (after 21 days)                         | Visit 2 (after 21 days)                         | Visit 3 (after 30 days)                         | Visit 4 (after 90 days)                         | Visit 5 (after 90 days)                         | Visit 6 (after 90 days)                         |
| Prescription of depigmenting agents for 6 months |                                                  |                                                  |                                                  | Deep: 10mJ/15%                                 |                                                  |                                                  |
|                                                  |                                                  |                                                  |                                                  | Sup.: 120mJ/40%                                |                                                  |                                                  |

Results and conclusions:
Based on clinical and photographic observations of this evaluation, the combined approach demonstrated its advantage with the optimized results. In cases where the starting (baseline) skin condition showed alterations (e.g. dehydration, elastosis, fibrosis) due to anti-acne treatments, the preparation of the skin with Restylane Skinboosters before the laser treatment, showed the greatest improvement.
Combined Skinboosters and Fractional Non-Ablative Erbium-Glass Laser ResurFX™:
Protocol for the treatment of acne scars and skin rejuvenation
Matteo Tretti Clementoni, MD

The results described here, for the combined approach with Restylane Skinboosters and Laser, involve 30 patients, aged between 17 and 54 years. Of these, 20 were treated for acne scars and 10 for moderate to severe photoaging. Exclusion criteria for both indications were: serious systemic disease, pregnancy, breastfeeding, weakened patients, and concomitant sun exposure (summer time). The laser treatment for both indications involved the use of the ResurFX™, a fractional non-ablative 1565 nm Erbium-glass laser; 4-5 sessions were performed, at 1-month intervals. Recovery time was 3-4 days. The Skinboosters treatment called for the use of Restylane Vital Light (NASHA gel 12 mg/ml), the formulation of preference on account of its boosting hydrating power. The NASHA gel was injected as micro-droplets (approximately 10µl per injection, at a distance of approximately 1 cm from each other), for a total of approximately 1 ml distributed across the face. In the case of acne scarring, subcision of the fibrous adhesions with a needle preceded the infiltration.

Patients with acne scarring, included in the treatment presented with Grade 3B and 4B Goodman classification scars, phototype II and III, resolved acne for at least 6 months, without any acne medication treatment. Specific exclusion criteria for the treatment were: boxcar scars, rolling scars and retinoid treatment in the last 6-9 months.

Patients treated for skin rejuvenation were over 35 years of age, with grade I to IV signs of aging.

In the combined approach, for both clinical indications, 2 or 3 sessions of Restylane Vital Light preceded the laser treatment. Subsequently, once the erythema had subsided and the post-laser recovery time had passed, a new session of Skinboosters was performed, based on 2 sessions at 1-month interval (Table 2).

<table>
<thead>
<tr>
<th>Baseline Visit (Time 0)</th>
<th>Visit 1 (after 15 days)</th>
<th>Visit 2 (after 15 days)</th>
<th>Visit 3-5 (20 days after the last Laser session)</th>
<th>Visit 6 (after 20 days)</th>
<th>Visit 7 (after 15 days)</th>
<th>Visit 8 (after 20 days)</th>
<th>Visit 9 (after 15 days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical evaluation/ history/ Informed Consent/ Treatment Plan</td>
<td>Restylane Vital Light</td>
<td>Restylane Vital Light</td>
<td>ResurFX (3 sessions, 1 per month)</td>
<td>Restylane Vital Light</td>
<td>ResurFX</td>
<td>Restylane Vital Light</td>
<td>ResurFX (An additional Skinbooster session is permissible after 20 days)</td>
</tr>
</tbody>
</table>

Results and conclusions:
The photographic clinical assessment showed noticeable evidence of acne scar reduction by at least 1 grade, based on the Goodman classification. In the skin rejuvenation group, overall improvement of skin quality, particularly in terms of skin texture, colour, and firmness, was observed. The side effects observed were those commonly associated with single (not combined) procedures. The benefits observed, despite longer treatment periods and significantly greater costs than for mono-therapy, promoted patient loyalty. Indeed, all the patients expressed a higher level of satisfaction and returned to the clinic for the additional procedures. Acne scarring patients expressed a significant improvement in their psychological state following the procedure.
Bibliographic references

8. Landau M. Hyaluronic Acid "Skinboosters" and Use of blunt injection microcannulas". J Drugs Dermatol 2012; 11 (suppl 3); s41-43

For safety use, indications and contraindications, refer to the operator manuals and instructions for use of Lumenis laser system and accessories and other cosmeceuticals or drugs used.