

White Paper

Facial Rejuvenation with the use of the Elite MPX™ IPL Laser

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For the baby boomer generation, there was minimal education on the long term effects of sun exposure caused by UV rays produced by the sun. In fact, in the period from 1970 to 1985, exposure to sun for this generation was considered a synonym for “healthy-looking.” Now as 10,000 to 15,000 baby boomers turn 50 each year, patients are searching for methods to reverse sun damage with a safe and non-invasive treatment method.

IPL Technology, also referred to as PhotoFacial, or FotoFacial, improves the appearance of photo-aged skin, including age spots (sun induced freckles), most benign brown pigments, and erythema caused by broken capillaries, through a process called Photo Rejuvenation. IPL treatments are considered “non ablative” and typically require five to six treatments separated by three to four week intervals. Published studies have shown improvements in pigmentation, telangiectasias, fine wrinkles, and skin texture.¹⁻⁴

These studies have reported significant improvement for the specific treatment of photoaging. Weiss and colleagues reported that at four years following initial treatment using filtered flash lamp intense pulsed light (IPL) improvements in skin texture in 82% of subjects, telangiectasias improvement in 82% of patients, and pigmentation improvement in 70% of patients. Weiss also reported that the face responded slightly better than the chest or neck.¹ Several published studies showed excellent results on Asian skin with appropriate parameters as well.²⁻³

For Asian skin, Negishi and colleagues reported that after the fifth treatment, a combined rating of greater than 60% improvement was given to more than 80% of patients for pigmentation improvement, telangiectasias reduction or removal, smoother skin texture, and overall improvement. Histological evaluations showed strong staining of Type I and Type III collagen. Complications were minor and transitory.²

Huang et al reported in their study that for the treatment of facial freckles (ephelides) in Asian skin, 86% of the patients assessed by two attending physicians reported results as excellent to good, with 92% of the patients reporting that they were extremely or very satisfied.³

Bitter reported all aspects of the treatment of photodamage, including wrinkling, skin coarseness, irregular pigmentation, pore size, and telangiectasias, showed visible improvement in more than 90% of subjects with minimal downtime and no scarring. Eighty-eight percent of the subjects (Skin Types I-III) were satisfied with the overall results of their treatments after a series of four or more full-face treatments at three-week intervals, using a nonablative intense pulsed light source.⁴

This paper will review our experience with the Elite MPX IPL for the treatment of photoaging.

Mechanism of Action

Photodamage is the result of UV light exposure from the sun. The visible signs of photodamage are characterized by thinning of the epidermis and dermis, coarse skin texture, wrinkling, pigmentation alterations such as lentiginos and erythema, telangiectasias, and in some cases actinic keratoses and epidermal malignancies.⁴

Treatment of photoaging is attributed to the ability to apply light energy to a specially targeted chromophore (selective photothermolysis). In the case of pigmentation, melanin serves as the intended chromophore for the removal of freckles and liver spots while hemoglobin is the intended chromophore for telangiectasia.



Subject 1

In a published study by Negishi and colleagues, they reported the presence of Type I and Typed III collagen three weeks after five treatments at intervals of three weeks. All stains revealed significant collagen production, mainly in the superficial layer of the dermis within 300µm of the skin's surface.²

Following treatment, patients can experience a crusting and darkening of lentigines and freckles, as well as some purpura for treatment of small vessels, which demonstrates the effect of the light source.

IPL comes from a broadband light source (non-coherent) which emits a continuous spectrum in the range of 515nm to 1200nm. Low end cut-off filters are used to eliminate shorter wavelengths, depending on the skin type and application. In this study, filters of 530, 560, and 590nm were used.

Materials and Method

A total of five patients with Fitzpatrick skin types II-IV and ranging in age from 34 to 67 years old were evaluated and treated.

An assessment was performed by the physician noting any skin problems, patient expectations, and Fitzpatrick skin type. Wavelength filters were selected based on the patient's Fitzpatrick skin type as noted in Table 1.

All tanned skin Type III and all Type IV-V were pre-treated for six weeks with a bleaching regime, stopping two days before treatment and two days post treatment.

Prior to treatment, a two to three mm layer of ultrasound gel was applied. Test spots of three to four pulses were performed on each side of the face prior to treatment. Test spots were evaluated by the physician for signs of erythema, edema, pain, or blisters. If the test spots showed little response, the fluence was increased one to two J/cm² and another area was tested. The immediate post treatment endpoint is a mild and even erythema over the entire treated area.

Treatments were started on the lateral side of the face with direct contact with the thin layer of ultrasound gel. The direct air cooling was set at level nine. An overlap was performed on 20% of the previous spot. In all patients, the entire face (excluding upper eyelids) was irradiated with one pass.

Treatments were performed every three weeks for a total of four sessions. The device used in this study was the Elite MPX which provides an IPL light source, in addition to the Alexandrite and Nd:YAG lasers, in one system. The IPL is a non-coherent light source and allows the selection of the main wavelengths according to the treatment application through cut-off filters attached to the treatment head. The system is equipped with 530, 560, and 590 cut-off filters. The pulse width and fluence are selectable and the system is equipped with an integrated cooling system which provides cool air to the treatment area. The Elite MPX design allows customized treatments to be developed for unwanted hair, pigmented and vascular lesions, and veins, as well as aging/photodamaged skin in all skin types

Table 1 outlines the filters and parameters used for initial test spot treatment in the study.

Skin Type	Filter	Test Spot Fluence	Pulse Structure	Hz
1	530nm	16J/cm ²	10ms	2
2	530nm	16J/cm ²	10ms	2
3	530nm	14J/cm ²	20ms	2
4	560nm	12J/cm ²	30ms	2
5	590nm	12J/cm ²	30ms	2

Table 1: Elite MPX IPL Parameters



Subject 2

Results

All patients tolerated the treatment well. There were no major complications or adverse events. Pigmentation improvement, telangiectasia reduction or removal, diminishment of fine wrinkles, smoother skin texture, and overall improvement were noted in the five patients that were treated.

Case Reports

Subject 1

A 34-year-old female, skin type IV, was evaluated for signs of photoaging for the study. Upon examination, she presented with dyschromia, which was comprised of hyperpigmentation manifested as facial pigmentary lesions (solar lentiginos). The following treatment protocol was used at three week intervals.

Treatment	Filter	Pulse Width	Fluence
1	560	30ms	12/Jcm ²
2	560	30ms	13/Jcm ²
3	560	30ms	14/Jcm ²
4	560	30ms	16/Jcm ²

Subject 2

A 54-year-old male, skin type III, was evaluated for signs of photoaging for the study. Upon examination, he presented with rosacea (facial erythema) which was comprised of mild telangiectasias with mild edema (erythematotelangiectatic). The following treatment plan was used at three week intervals.

Treatment	Filter	Pulse Width	Fluence
1	530	20ms	16/Jcm ²
2	530	20ms	17/Jcm ²
3	530	20ms	18/Jcm ²
4	530	20ms	19/Jcm ²

Conclusion

The results of the five patients that were treated with the Elite MPX demonstrated that photorejuvenation is a safe and effective treatment with the benefit of minimal downtime. IPL is our treatment of choice for those patients that request rejuvenation of the full face. We use this in conjunction with the other two wavelengths, the 755nm Alexandrite and the 1064nm Nd:YAG, offered by this technology, to treat specific and more chronic lesions that may fail to be reduced with the IPL, and to provide additional tightening effects over and above what IPL can deliver.

References

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