

## **New Picosecond Alexandrite Laser with 50% Increased Energy, Independently Adjustable Fluence and Spotsizes for Skin Rejuvenation, Skin Pigmentation, and Acne Scars**

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### **Background/Objective:**

The Picosecond Alexandrite with the flat optic and the diffractive lens array has become an important tool for skin rejuvenation, abnormal pigmentation, and treatment of tattoos. It is a particularly important device with the fractional optic in Asian skin types. To address these demands, an adjustable fluence picosecond laser with an increased energy output was developed.

### **Methods:**

We will discuss the pathophysiology of using picosecond lasers in targeting melanin. This will focus on the thermal confinement of the energy delivered with the flat optic and the development of LIOBs with the fractional optic.

We will highlight the use of the flat optic with larger spotsizes and energy to treat nevus of Ota and tattoos. We will also demonstrate using this optic at lower fluence settings to target melanin for treatment of abnormal pigmentation, including melasma.

Using the fractional optic with the increased energy available permits the use of larger spots and the ability to fine-tune the fluence settings

### **Results:**

This presentation will provide examples of many skin types utilizing the settings that are now available with this device. Histologies highlighting the selective and localized injury created by this laser will be presented and correlated with the clinical outcomes observed with this patients. Guidance will be given about proper pulsing and energy delivery techniques.

### **Conclusion:**

Over the last 10 years the original version of this laser has proved to be an important tool for the treatment of abnormal pigmentation and rejuvenation in Asian patients. This enhanced device delivers better performance and enhancements which will permit practitioners to better serve their patients individual needs

=====previous versions=====

23 subjects were enrolled and had 2-4 treatments with diffractive lens array with the original 200mJ/pulse picosecond device settings, as a baseline, on one half of their face with average fluence of 0.51 J/cm<sup>2</sup> and the new 300mJ/pulse picosecond alexandrite laser on the other half of their face with average fluence of 0.58 J/cm<sup>2</sup>. A subset of 3 subjects with melanin index MI between 21 and 36, Fitzpatrick skin type III to V, were treated with 8mm spot, 0.4J/cm<sup>2</sup> on one half of their face and with 10mm spot, 0.38J/cm<sup>2</sup> on the other half of the face. Evaluation for satisfaction (on a 6-point Likert scale) and improvement (graded with the GAIS Questionnaire) were evaluated by the subjects and the physicians. Subjects were also evaluated after each treatment, comparing the baseline vs the adjustable settings.

At the 30 day follow up, all subjects who attended were satisfied and noticed improvement; blinded graders rated 75% of the patients as 3- improved and 25% as 2- much improved on the GAIS scale. All subjects who filled questionnaires were also satisfied immediately after treatment on both sides of their faces. When asked about how the skin feels after treatments, subjects responded “tighter” in 41%, “smoother” in 23% and “firmer” in 17%. Both sets of laser settings received similar responses from all subjects. Throughout this study, no serious adverse events occurred. The average pain scores were 5.1/10 and 5.3/10 for the baseline and the adjustable settings, respectively. Split-face patients where the 8 and 10mm handpieces were compared at similar settings were treated on average with 12% smaller number of pulses on the 10mm side,  $p < 0.05$ . When all treatments for 8 and 10mm spotsizes were analyzed, the 10mm treatments were completed with 36% smaller number of pulses,  $p < 0.01$ . We will also present mathematical model and data on the importance of cadence and pulsing stacking with fractionated picosecond lasers.

In this split-face study, both the baseline and the adjustable laser settings were safe and tolerable with no analgesic and provided excellent efficacy results for the treatment of pigmentation, acne scars and skin rejuvenation. The increased energy output and the independently adjustable fluence and spotsizes settings allowed these excellent results to be achieved with a statistically significant smaller number of pulses. Our experience and modeling data suggests that the treatment is safe for all skin types with appropriate cadence and avoidance of pulse stacking.