

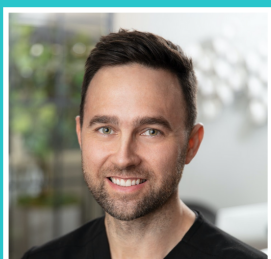
A NOVEL LAYERED APPROACH FOR TISSUE REJUVENATION ON A SINGLE SYSTEM UTILIZING 4 WAVELENGTHS: 1064NM, 755NM, 532NM, AND 2940NM



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The following report was featured in Laser in Surgery and Medicine Supplement: ASLMS 2022 Abstracts. The findings show the results from the **Elluminate** treatment – a novel, layered approach that employs four wavelengths in a single treatment from one device, the EVO Light 4V. The EVO Light 4V, manufactured by Quanta System Aesthetic Division, is available in the US and Canada from Cartessa Aesthetics. Cartessa led the development of this abstract to measure the improvement in overall photo rejuvenation and patient and provider satisfaction of the layered protocol, marketed as the Elluminate treatment.

BACKGROUND

When closely examining the skin, different layers are evident and have been well documented.¹ The Epidermis, Dermis, and Subcutaneous (hypodermal) layers contain different levels of the chromophores: oxyhemoglobin, melanin, and water. These chromophores are targeted with specific wavelengths of the electromagnetic spectrum to allow for absorption of the laser energy thereby creating a clinical effect.² Full spectrum skin rejuvenation requires absorption and subsequent thermal effects by these chromophores at multiple skin levels in order to reach the proper denaturation and stimulation of the different components of the tissue. As different wavelengths can be tailored to target specific chromophores in variable skin layers,² multiple standalone or platform laser technologies would typically be required to achieve full spectrum skin rejuvenation.

This paper explores the novel, multi wavelength laser system (Evo Light 4V from Quanta, Italy) which incorporates 532 nm, 755 nm, 1064 nm, and 2940 nm on a single platform system and the advantages of layering wavelengths in one treatment, in a single layered treatment approach.

METHOD

Ten patients, skin photo types I-III, from three centers were treated in a layered treatment approach using one system (EVO Light 4V) containing four lasers: 532nm KTP, 755nm Alexandrite, 1064nm Nd:Yag, and 2940nm Er:Yag. Treatment proceeded from deepest penetrating wavelength to the most superficial wavelength.³ Patients were treated first with 1064nm, followed by 755nm, then by 532nm, and concluded with the 2940nm.

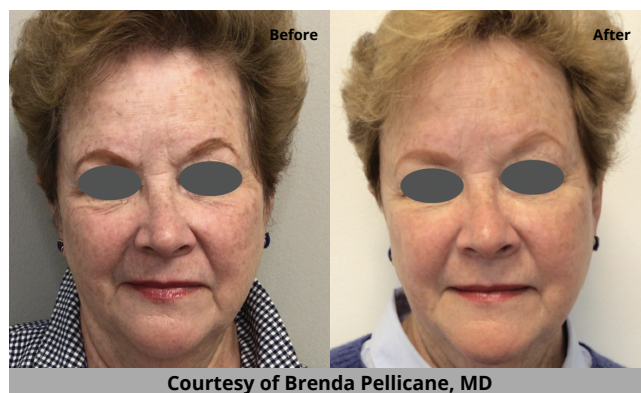
These lasers targeted the following chromophores, respectively: water, melanin, oxyhemoglobin,² and again water thereby affecting dermal collagen, pigmentation, superficial vasculature and epidermal keratinocytes.⁴ Treatment with the above lasers occurred sequentially in a single session in under 45 minutes. Topical anesthesia (lidocaine 30% ointment) was applied 45 minutes prior to treatment. Patients were photographed pretreatment, at each subsequent treatment, and at 1 and 3 month follow ups. Expert observers graded the images using the Global Aesthetic Improvement Scale and were asked to identify the pretreatment and post treatment photos.

RESULTS

Patients noted reduction in pigmentation, improvement in tone and texture, and reduction in fine lines. A decrease in active acne and rosacea as well as diffuse redness was also noted. Patients reported mild-moderate erythema lasting 24-48 hours post treatment followed by mild flaking/exfoliation of the skin for up to 7 days. Pain was not a factor, as patients experienced little to no discomfort during the procedure (with the aid of topical lidocaine).

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When reviewed by two expert physician graders, the before and after images averaged a score of “Much Improved” on the Global Aesthetic Improvement Scale (GAIS). This is a 5 point scale ranging from “Worse” to “Very Much Improved”. Both graders were also able to correctly identify the pre and post treatment images 100% of the time. Patient and physician satisfaction was 100% “satisfied” or higher. Patients described the treatment as very comfortable with little to no downtime.



DISCUSSION

It has been established that photoaging is due to intrinsic and extrinsic factors which affect varying layers and components of the skin.⁵ In order to adequately address the effects of photoaging, it is important to effectively treat multiple chromophores in both the dermis and epidermis.⁶ While individual lasers have been used for many years to address separate concerns, the use of these four wavelengths sequentially in one treatment session offers a unique approach to photorejuvenation.

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The wavelengths used in this layered treatment were selected for their well-established efficacy. The 1064nm wavelength is highly absorbed by the chromophore water. This high absorption generates heat in the dermis thereby stimulating neocollagenesis.⁷ The 755nm wavelength is absorbed primarily by melanin leading to a reduction in pigmentation.^{2,8} The 532nm component targets the superficial vasculature and low contrast pigmentation which is ideal given the high absorption coefficients for oxyhemoglobin and melanin at that wavelength.^{2,9} The 2940nm, being situated at the peak of water absorption on the electromagnetic spectrum, is effective at superficially ablating the top layers of the epidermis in order to complete the full spectrum of facial rejuvenation.¹⁰

Treatment parameters for each laser were moderate in intensity. This allowed for a comfortable yet effective treatment which safely incorporated four laser treatments one immediately followed by the next. This resulted in significant improvement in pigmentation, erythema, texture, tone and fine lines with relatively little down time which contributed greatly to both provider and patient satisfaction.

Use of a single platform system containing all four of these lasers allows for a more efficient treatment session – for both the provider and patient – and eliminates the need for multiple devices which might require patients to move rooms, booking conflicts and footprint constraints.

The device being used (Evo Light 4V from Quanta, Italy) uses the option of integrated parallel contact cooling or Zimmer air cooling during the procedure. The system uses the same fiber delivery system to deliver each laser wavelength with an option of different spot sizes from 2 mm - 16 mm. There are a large range of pulse duration options from 0.3 milliseconds to 300 milliseconds and there is also the ability to use a burst mode, or pulse train delivery based on the desired laser-tissue interaction. As the system only needs 90 seconds for start up time, it can be turned on and off throughout the day, keeping energy usage and noise pollution to a minimum.

CONCLUSION

Based on our results, this layered treatment approach provides patients with a high degree of improvement in overall photorejuvenation. Elevated levels of satisfaction were seen in both patients and providers alike. More research is necessary to further this approach, however, our findings have shown that the layered treatment approach is a safe and effective method for treating multiple factors of photoaging in skin rejuvenation treatments in skin types I-III.

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