

# Multi-Center Clinical and Technical Perspectives on LimeLight 3-in-1 Programmable Device

Christine Lee, M.D.<sup>a</sup>, Kei Negishi, M.D.<sup>b</sup>, E. Victor Ross, M.D.<sup>c</sup>

<sup>a</sup> The East Bay Laser & Skin Care Center, Walnut Creek, CA

<sup>b</sup> Tokyo Women's Medical University, Aoyama Institute of Women's Medicine, Tokyo, Japan

<sup>c</sup> Dermatology Division, Scripps Clinic, San Diego, CA

## Background

Three top dermatologists with extensive backgrounds in laser and light based procedures describe their unique experiences with the Cutera LimeLight programmable wavelength device.

LimeLight was introduced in the Fall of 2006 and represents the first light based device for skin rejuvenation with the ability to shift the wavelength spectrum depending on the application. Three distinct programs not only adjust the wavelengths to accommodate the melanin and hemoglobin absorption but also the pulse width and cooling depending on the needs of the patient. Although each of

the three physicians describe three distinct experiences with the LimeLight device, they all report a high level of patient satisfaction and a positive overall experience both from a clinical and user's perspective.

## Methods and Materials

Patients were treated with the LimeLight, a pulsed light device with an adjustable wavelength range of 520 to 1100 nm. The table below describes the three distinct programs A, B, and C which control the wavelength distribution, pulse duration and epidermal cooling.

Program	Application	Wavelength Distribution	Pulse Width	Cooling
A	Fine Telangiectasia & Diffuse Redness	Shortest	1-12ms	5°C
B	Telangiectasia, Diffuse Redness & Solar Lentigines	Mid-Range	12-30ms	5°C
C	Telangiectasia, Diffuse Redness & Solar Lentigines	Longest	30-60ms	10°C

Program A is the most aggressive program (shortest wavelength distribution and shortest pulse duration) and is intended for patients with light skin and fine vascular targets.

Program B is the most commonly used program and is intended for patients with both vascular and pigmented targets

Program C is the least aggressive program (longest wavelength distribution and longest pulse duration) and is intended for patients with darker skin or actinic bronzing.

*Dr. Christine Lee is a board-certified Diplomat of the American Board of Dermatology and a fellow of the American Academy of Dermatology with a private practice in Walnut Creek, CA. She is also on the clinical faculty at the University of California, San Francisco, Department of Dermatologic Surgery. Dr. Lee's specialties include laser therapy for wrinkles, age spots, broken blood vessels, tattoos, birthmarks, vascular lesions, rosacea, and hair removal.*

One of my biggest challenges with traditional IPL skin rejuvenation procedures is that over the course of treatments, the patient's skin also changes. It is necessary to change the therapy in order to accommodate for these changes. The density of the chromophore decreases as the remaining melanin and oxyhemoglobin decreases with subsequent treatments. Consequently, there is less concentration of the target. This requires frequent adjustment of fluence for the IPL handpiece and often a completely new handpiece to adjust the wavelength.

The LimeLight device is unique in its design because it makes pulsed light much more specific for the condition it's treating and is able to shift between modes/wavelengths for different skin types and severity of conditions. It's similar to having three different wavelengths in one box using the shorter wavelengths in the 500-600 nm range for vascular type procedures and longer wavelengths for pigment.

The LimeLight is able to overcome the challenges of traditional IPLs because of its ability to customize the treatment over consecutive treatments targeting specific imperfections. The operator can decrease fluences and shorten wavelengths as competing surrounding pigment (actinic damage) decreases.

I use program C when starting treatments, eventually moving down to program B and A as the LimeLight starts to clear up poikiloderma, bronzing, diffuse pigmentation and vascular lesions.

I've used the LimeLight device prior to its introduction in October 2006. A typical LimeLight protocol is a series of treatments done every 2-4 weeks. Treatment time for a face takes approximately 30 minutes while treatment time for a neck/chest is around 45 minutes. Two passes are done on each treatment area.



Female with red and brown dyschromia

**1<sup>st</sup> treatment**  
Program C  
Fluence: 16-18 J/cm<sup>2</sup>  
**2<sup>nd</sup> treatment**  
Program B  
Fluence: 18 J/cm<sup>2</sup>

*At Tokyo Women's Medical University, Dr. Kei Negishi has developed one of the world's leading research-based laser surgery centers. Dr. Negishi has done pioneering work in developing successful protocols for treating Asian skin with IPLs and other non-ablative devices. She has written several peer-reviewed clinical papers for forums including the American Society of Laser Medicine and Surgery.*

The majority of my patient population is Asian female with skin types III and IV. The difficulty I have found with conventional IPL treatments is their lack of effective results in treating low contrast pigmented spots on darker skin.

In order to perform safe, effective IPL treatments, the operator must consider all of the important parameters, not just fluence. An operator must choose the proper combination of fluence, treatment wavelength, pulse width and tip temperature.

Using the LimeLight device, I am able to choose the optimal combination to treat low contrast pigmented spots that are difficult to treat with conventional IPLs. Prior to the LimeLight's introduction, the only method to treat these types of spots was to use Q-switched lasers, despite the risk of post inflammatory hyper-pigmentation. Now, I can effectively treat low contrast pigmented lesions safely at a low fluence and short pulse width.

Another attractive feature of the LimeLight is program C. This program has extremely long pulse widths which allows for safe treatment of darker skin. A longer pulse width helps to heat the desired target while

minimizing the effect on the surrounding tissue.

Treating telangiectasia with LimeLight also results in a significantly better outcome than conventional IPLs. We can stimulate different degrees of response with IPL irradiation; by not only adjusting the fluence, but also by using the three unique programs. Selecting one of the three programs makes our treatments easier and safer.

We have used the LimeLight device over 1000 times in more than 300 cases with each case consisting of 3 treatments. I conduct the LimeLight facial procedure for patients who want to improve their overall skin condition, not necessarily for strictly spot removal.

Compared to other IPLs, I find that LimeLight offers excellent results in a smaller number of treatments. In addition, its efficacy allows me to expand the range of cases I can treat with an IPL. Overall LimeLight offers superior treatment results while delivering a high level of satisfaction to my patients.

We typically schedule a series of 3 to 5 treatments at intervals of 3 to 4 weeks.



**Before**

**Post 1 treatment**

Female cheek with low contrast pigmented spots, Skin Type 4  
LimeLight Program B  
Fluence: 12 J/cm<sup>2</sup>  
Cooling 5°C



**Before**

**Post 1 treatment**

Female face with brown dyschromia, Skin Type 3  
LimeLight Program A + topical cream 5% HQ+0.05% Tretinoin  
Fluence: 11 J/cm<sup>2</sup>  
Cooling 20°C sun mode

*Dr. Ross is presently on the staff in the Division of Dermatology (Skin and Cosmetic Center) at Scripps Clinic. He is also on the teaching staff at the University of California at San Diego. His special interests are laser skin resurfacing, photodynamic therapy, and mechanisms of laser tattoo removal and laser hair reduction. He frequently lectures at national laser meetings and is the author of more than 40 publications.*

We currently have several lasers and light based systems in my practice in San Diego. With other competitive systems, skin rejuvenation procedures require changing handpieces to choose the appropriate wavelength ranges. The multiple handpieces require extra storage space and extra time to switch in and out for various applications.

The LimeLight's ability to "shift on the fly" offers a unique advantage; adjusting the peak wavelength to treat different types of lesions and different skin types with maximum efficacy. The ability to have three handpieces in one device can significantly save procedure time and minimize the need for multiple handpieces.

In addition, the LimeLight's contact cooling is a plus making the procedure more comfortable for the patient as well as safer with less risk of complication.

**Treatment Protocol**

We use program B for 70 – 80% of our applications and use program A for fine vessels. Program C is well suited for patients with darker skin types or actinic bronzing.

A typical patient requires up to 3 treatments with the LimeLight. Treatments are spaced 4 weeks apart. We start with program B at 26 J/cm<sup>2</sup> in a typical untanned type II patient and adjust according to clinical response.



**Before**

**Immediately Post**

Female Chin with  
Fine Telangiectasia  
LimeLight Program B  
Fluence: 28 J/cm<sup>2</sup>  
Cooling 5°C

Photograph on the  
right shows normal  
post treatment  
erythema