INNOVATIVE SOLUTIONS

Optimizing New Laser Technologies in Aesthetic Practices
Cutera gathered top laser experts for a roundtable discussion and case presentation symposium during the American Society for Laser Medicine and Surgery Annual meeting in San Diego this spring. Jeffrey S. Dover, MD, FRCPC, moderated the program, which featured a practically-focused discussion of some of Cutera’s top laser systems: enlighten, laser genesis, and excel V.

Welcome to Innovative Solutions: Optimizing New Laser Technologies in Aesthetic Practices, which presents readers of Modern Aesthetics® magazine a taste of some of the lively and informative discussion that I and my colleagues had the pleasure to share, at the invitation of Cutera, during the ASLMS 2017 meeting in San Diego.

The large crowd in attendance for the event was a testament to Cutera and to our faculty, who are true experts. Each of us has accumulated a good deal of experience with Cutera devices over the years, and our goal was to share our perspectives in order to help our peers optimize their experience using these devices.

As the aesthetic market continues to grow and change, cosmetic surgeons are faced with new technologies—and new opportunities to meet patients’ needs. But there may also be uncertainty about which devices and manufacturers offer the best products for the practice’s and the patients’ needs.

A company like a Cutera with an established track record of innovation and customer support certainly is at the forefront of the market. Programs like the live event and this print supplement are examples of the company’s focus on education and its commitment to meaningful outcomes.

I hope you enjoy reading the proceedings of the symposium as much as I enjoyed chairing it. I learned a lot, and I trust you will, too.

—Jeffrey S. Dover, MD, FRCPC

Participants

Jeffrey S. Dover, MD, FRCPC Co-Director, SkinCare Physicians of Chestnut Hill, MA; Associate Professor of Clinical Dermatology, Yale University School of Medicine; Associate Professor of Dermatology, Brown Medical School.

Macrene Alexiades, MD, PhD Private practice, New York City; Associate Clinical Professor, Yale University; Adjunct Professor, Sigros Hospital, University of Athens.

Jeffrey Hsu, MD The Dermatology Institute, DuPage Medical Group, Naperville, IL.

Omar Ibrahimi, MD, PhD Founding (Current) Medical Director, Connecticut Skin Institute, Stamford, CT.

Woraphong Manuskiatti, MD Bumrungrad International Hospital, Bangkok, Thailand.

Vic Ross, MD Director, Scripps Clinic Laser and Cosmetic Dermatology Center, San Diego, CA.
ENLIGHTEN

Dr. Dover: Picosecond technology has revolutionized the approach to tattoo removal and pigmentary concerns, and increasingly, we are identifying other applications for picosecond devices, including skin revitalization.

The enlighten laser is an Nd:YAG picosecond laser system that treats tattoos and pigmented lesions at wavelengths of 532nm, 670nm and 1064nm.

Dr. Ross: In addition to the three wavelengths, the enlighten device offers both picosecond and nanosecond pulse durations to treat almost every color of tattoo, as well as benign pigmented lesions (BPLs) and skin revitalization.

Dr. Ibrahimi: We’ve known for over 20 years from studies performed by Dr. Ross and Dr. Dover’s group, that picosecond pulse durations are better for tattoo removal. We just haven’t been able to bring the technology about in a commercially viable device until just recently. The enlighten device, with its nanosecond and picosecond pulses, has changed my level of excitement when treating someone with a tattoo.

Before I had the enlighten, I was not excited, and it was a difficult conversation to have with patients: “You’re going to need 10 to 20 treatments. I don’t know exactly how many we’re going need to do to get this tattoo cleared.”

With the enlighten (Fig. 1), it’s a much more rewarding interaction. I’m much more confident. We’re getting great results in about half as many treatments.

Dr. Dover: In a nutshell: 532nm for the red; 1064nm for the black; 670nm for the green and blue inks.

The 1064nm picosecond pulse in the enlighten is the best laser for black ink, bar none. And 532nm is the best for red, so you actually have the best-in-class for both red and black tattoos.

Dr. Ross: For black tattoos, I start at 2 nanoseconds, 2 to 3J/cm² with a 3 or 4mm spot. If the tattoo was resistant to other technologies, I might switch over to the 750 picosecond (Fig. 2).

Dr. Ibrahimi: Multi-colored tattoos spotlight the strength of this system. Green has been difficult to treat in the past. (Fig. 3). The results are quite impressive. The enlighten is equipped to treat all tattoo ink colors from start to finish.

Dr. Dover: The PICO Genesis™ procedure uses dual wavelengths and the picosecond pulse duration for skin revitalization. We are seeing that the procedure is safe for use in darker skin tones, and many laser surgeons are reporting good results treating low-contrast pigmented lesions. Treatment can be aimed at full facial revitalization to improve tone and texture with spot treatment for specific pigmented lesions, all in a relatively short treatment time.

Dr. Hsu: Treating lentigines on Caucasian skin with the enlighten procedure (532nm) is like shooting fish in a barrel. It is one of the easiest things you can do with the enlighten. Usually with one or two treatments you can clear these lentigines very effectively. Hands, chest, and certainly the face can be treated. It is a very satisfying treatment with this laser.

My colleague Kelly Stankiewicz, MD completed a case series with 10 female patients with Fitzpatrick skin types (FST) II-IV who had visible evidence of BPLs, dyschromia, photo-damage, or photo-aged skin.

Patients received up to three treatments at four to six week intervals with the PICO Genesis procedure using the enlighten laser, specifically the 670nm and 1064nm wavelengths. The two-part procedure included treatment of individual lesions.
using 670nm with no overlap to address dyschromia and BPLs, followed by global treatment of the face using 1064nm with low fluence and four to five passes.

Patients tolerated the treatment well and had only minimal, transient side effects and minimal downtime of two to three days.

Minimal side effects were noted and no cases of hypo- or hyperpigmentation were noted as a result of the treatment. Patients reported improvement in both pigmentation and skin quality with minimal downtime.

Dr. Manuskiatti: In Asia, the market for device-based treatment of pigmented lesions is large and continues to grow. Market estimates suggest that the US will continue to grow demand and follow in our footsteps. I like that I can use enlighten safely in patients with darker skin tones. We don’t worry about post-inflammatory pigmentary changes. I have had excellent results treating lentigines (Fig. 4) with enlighten. I do a full-face treatment and then go back to target specific lesions, with very good lightening effects.

Many of my patients appreciate not only a reduction in the appearance of lentigines, but also an overall aesthetic improvement in texture and tone. (Fig. 5)

LASER GENESIS

Dr. Dover: The xeo system was introduced by Cutera with the intention of being a workhorse for the aesthetics practice. It offers three laser and light-based modules that are highly customizable, in order to allow treatment of all skin types.

truPulse™ Nd:YAG Laser is optimized for hair removal and treatment of vascular lesions and offers unique and popular treatment. The Laser Genesis procedure for skin revitalization uses the 1064nm, Nd:YAG wavelength and is available on the xeo, excel V and excel HR systems.

Dr. Hsu: Laser Genesis is the procedure for skin revitalization that uses the 1064nm laser. I use the 0.3 millisecond pulse duration with a rapid repetition rate and multiple pulses for a whole face, five or six thousand pulses to paint the entire area.

Laser Genesis does two things. First, because it’s targeting the vasculature, you can decrease erythema and diffuse redness. Second, you’re causing bulk heating of the dermis, which leads to dermal remodeling and revitalization effect. I had a patient who developed a patterned PIH that seems to have developed secondary to a laser procedure performed elsewhere (Fig. 6). By using Laser Genesis in a very gentle manner, I decreased the vascularity and improved the discoloration.

Dr. Alexiades: When I did the original FDA trial for this device, I was using it for acne scars. And what I have since learned is that Laser Genesis is phenomenal not just for acne scars but also for active acne (Fig. 7). We see really nice results following a series of treatments.

EXCEL V

Dr. Dover: For years, laser specialists desired a set of specific—but previously unavailable—parameters within a “perfect” vascular laser.

In fact, the engineers at Cutera asked top laser experts what we wanted in a “perfect” vascular laser and we weighed in with a wish list: It should be small, versatile, solid state, 110 volts, with a big sapphire window that stays clear all the time and doesn’t fog up. It should have controls on the hand piece and on the device. It should
theoretically be able to treat both superficial and deep vessels on and off the face. And it should turn on in a few seconds, be quiet and non-disruptive to your patients. That’s what the engineers at Cutera have delivered in the excel V. They listened to us and developed a device that is truly beneficial clinically and practically. Let’s explore the clinical efficacy of this laser by reviewing some cases.

Dr. Ross: I see patients every day with red and brown dyschromia; this is my bread and butter case (Fig. 8). For light-skinned patients with a lot of red dyschromia, my go-to settings are 532nm, 10-12mm, 8J/cm², 12ms, 10°C. I tend to favor the 12mm spot instead of the 10mm spot, because you get about 1.5 times the coverage per pulse.

Typically in about eight to nine minutes or less, you can cover the entire face. That includes changing spot sizes. For the concavities around the nose I’ll switch to a 5mm spot and normally increase the fluence to 8.5J/cm², but the other settings normally remain the same.

The beautiful thing about this case is it’s all so easy. This is a laser built from the ground up with input from people who treat every day.

Dr. Hsu: I use similar settings: 10mm spot size, 10ms, but sometimes I will adjust to 10°C if treating brown dyschromia. By increasing the temperature slightly we decrease epidermal protection, allowing the laser to target epidermal lesions.

Dr. Ross: When treating vessels, you can see the vessels change in my experience with an 8-12mm spot, usually about 6.2-6.4J/cm². That’s just where you can treat type III skin and very light type IV skin without any concern.

Dr. Alexiades: When we first adopted this laser, we used settings similar to what we used for pulsed dye laser (PDL) patients. The nice thing about the excel V is that you basically don’t need the PDL anymore. It’s so versatile that you can transfer over parameters that you used with the pulsed dye.

Usually, I first address the distinct telangiectasias using a small spot size and relatively high fluence, then I go back to treat with broader settings, larger spot size and more conservative fluence to target the background erythema. I tell my patients to expect hive-like swelling for approximately 24 to 48 hours and provide them with post-treatment instructions. What I like about Dr. Ross’ parameters: He’s covering two bases at once—the background redness and the pigment in one pass and set of settings. But I wonder, what is the downtime with these settings?

Dr. Ross: I do just one pass, unless a vessel is resistant. The downtime is variable and based on the edema; Patients who are more red tend to have more swelling.

Dr. Hsu: Regarding edema, I always make a point of calling patients the evening of the treatment. I do it for two reasons. The first is to assess their recovery, and to reassure them that swelling is expected. I don’t anticipate any side effects with excel V, but by calling I ensure nothing unexpected is developing. The second is that patients love to learn that their doctor is so dedicated that he is still working hard late into the evening.

Dr. Ibrahimii: I had a patient who was just really bothered by his rosacea (Fig. 9). With him I did a series of four treatments with the 532nm wavelength on the excel V. His rosacea is now in remission.

Dr. Hsu: Dr. Ibrahimii, would you consider this to be maybe a case of keratosis pilaris rubra facei? Very typical of a young
man who walks in with bright redness on the cheek and lower cheek, as well. And to me that’s actually very challenging to treat. Even with a series of treatments I have a very hard time getting this any better. So this is a fantastic result.

It’s worth noting, with excel V, not only do you treat the facial erythema and diffuse redness, but the active inflammatory papules of rosacea improve as well.

**Dr. Dover:** Dr. Hsu, one of the questions I get a lot is how would you contrast the results of the excel V to the pulsed dye laser?

**Dr. Hsu:** Two things come immediately to mind. Number one it takes fewer treatments to get the results. And number two it’s more comfortable. Split face studies of 532nm vs 595nm have proved that in every single case the excel V performed as well, if not better, than the pulsed dye laser.

**Dr. Ross:** I use my Syris lamp on every excel V case. Even when you’re treating diffuse redness, you can see tiny vessels when they are getting better. You see a little bluing of the tiny vessels and then you know you’re at a good end point.

**Dr. Dover:** These treatments that were just described should be totally purpura-free. At 10ms the chance of getting purpura is incredibly low, and you only get it if there’s a confluence of many vessels. If you pulse too many times over that area, you can induce purpura. I’ve seen it but it’s almost always preventable.

**Dr. Alexiades:** I assess with my naked eye to watch for transient methemoglobinemia, or transient purpura, as the clinical end point. What’s so interesting is when we talk about the other modalities—Laser Genesis and PICO Genesis—one can visualize in the window of the handpiece the transient blanching of the vessels. There’s no evident methemoglobinemia in that case. The vessels go from red to flesh tone. I find that immediate clinical endpoint very helpful and informative during the treatment session.

**Dr. Manuskiatti:** When I use a device I always try to use the largest spot size so I can go a little deeper. One criticism of 532nm has always been it’s depth of penetration, but if you’re using a 10mm or 12mm spot, you’re going to go significantly deeper. Since we’re treating both diffuse redness and pigment, I think it makes a much better case for using a larger spot size.

**Dr. Dover:** If swelling is a concern, you may want to first trace the bigger vessels then go back and paint the whole face. In that case, if you’re using a 5mm spot, you’re still getting a lot of forward penetration of light. I think using a 4-5mm, you can see the vessels disappear in front of your eyes, and they don’t come back. Then we go back and paint over the area. It’s just a way to decrease your total pulse count and decrease the total amount of energy delivered.

**Dr. Ross:** We treat tan skin every day in San Diego; we have to do it. These are common cases of chronic bronzing, not an acute tan after a week in Maui. For the chronic bronzing, I would just lower the settings to around 6.4, 6.3J/cm². Unless someone is really acutely tanned, that works pretty well.

And we also use the Zimmer sometimes as ancillary cooling. We find that it makes the patient a little more comfortable, and also provides a little bit more epidermal protection.

**Dr. Alexiades:** I prepare my patients extremely well. In pre-op I inform my patients, “With excel V, I’ll get you done in two treatments, if we do pulsed dye, we’re looking at three to five.” I have them ice when I’m done treating for several minutes and they head home with a post-pack if needed and continue an antihistamine and fluocinolone cream prescription if swelling occurs. Treatment results speak for themselves (Fig. 10). And they’re durable results. I tell my patients, once I’ve treated with the excel V, if I maintain them on topical therapy for their rosacea and their flushing, they won’t need to be retreated for about five years.

**Dr. Hsu:** Another one of my favorite treatments of the excel V is to trace out each individual telangiectasia one by one, using a small spot size. (Fig. 11)
The sapphire window gives you great visibility. With one treatment you see a big difference. The one caveat with this is that you have to be very careful not to double pulse or stack the pulses.

**Dr. Dover:** Two crucial points: The first is to ensure that you do not stack one pulse right after the other. The second point is to put enough gel on the treatment area to bridge the crease in the nasal fold so that there’s no air between the sapphire and the vessel. Otherwise, it will go unchilled and you can end up with necrosis.

**Dr. Ibrahimi:** I treated an individual with hereditary hemorrhagic telangiectasias (Fig. 12), a condition where patients get these telangiectasias all over the body. These skin lesions sometimes bleed with the slightest trauma and it is not just a cosmetic issue. Patients can also get them viscerally in the liver. He’s got something genetically that drives angiogenesis, which is driving these vessels to form. And you can see a very good result here.

**Dr. Hsu:** With the 1064nm, one of my favorite things to do is treat the periorbital veins, around the temples or under the eyes (Fig. 13). Usually with one, at most two, treatments you’ll get good results. Patients are very satisfied. It can cause a bit of discomfort and swelling, and sometimes bruising, so I warn patients prior to the treatment.

One big caveat around the eyes is that the 1064nm can damage the retina. So I make it a point to remain outside the orbital rim during the treatment.

**Dr. Alexiades:** My experience treating leg veins has been positive. I had a case of reticular leg veins where the patient had a point of comparison on two different sets of vessels.

On one occasion, I treated her vessels with the excel V. In another instance, the patient had been treated by a vascular surgeon to have them stripped, but she preferred the excel V treatment. It took a very long time for the clotted vessel to resolve, but the result was superb, and there was no scarring.

In the end, where she had a comparative, she would choose to do this again over surgery.

**Dr. Ross:** I have a case of a typical person who comes in just with diffuse telangiectasias around the ankle (Fig. 14). I usually use a combination of 532nm and 1064nm. It can be uncomfortable so I recommend using a numbing cream and the Zimmer chiller. We bring all weapons to bare to make it more comfortable.

Another great application of excel V is the treatment of venous lakes (Fig. 15). The patient had one venous lake and one mole. We treated the large venous lake twice. She came in once and it was about 80 percent better, and after the second time I treated it was resolved completely.

For my parameters, I will typically use a little bigger spot or lower fluence.

**Dr. Manuskiatti:** When treating venous malformations or big venous lakes like this, you have a lot of target. I always start with the 532nm, because I want to avoid bleeding. I’ve had ones this size and bigger, and I can’t remember the last time I needed two treatments. One treatment, 532nm followed by 1064nm. They’re flat and slightly gray on the surface for an endpoint. Works every time like a charm. This is a fantastic treatment.
Dr. Ross: This laser is also great for port wine stain. You can treat somewhat darker skin (Fig. 16). It is important to use cooling and take your time.

Dr. Alexiades: I had a case with a very longstanding port wine stain with overlapping melasma. We’ve learned recently that there is a relationship between vascularity and melasma and by treating the vascularity with excel V, it has improved melasma cases in my practice. (Fig. 17). I have incorporated this laser for my resistant melasma cases.

CONCLUSION

Anecdotal reports from the field, and statistics from specialty societies all show that patients are increasingly interested in aesthetic treatments. Interestingly, as tattoos become ever more popular in American society, demand for removal is also on the upswing. Patient concerns about the cosmetic appearance of pigmented lesions and vessels has been consistent over time, but as better and more accessible device-based interventions emerge, demand for treatment may grow.

The American Society for Dermatologic Surgery reported in 2017 that seven out of 10 consumers are considering a cosmetic procedure. With effective, reliable tools like enlighten, laser genesis, and excel V from Cutera, aesthetic physicians can be prepared to effectively meet patients’ needs using proven technologies with low risk of adverse events and little to no downtime.