

Candela Laser Researchers Reveal New Treatment Techniques

Editor's Note: This Clinical Roundtable article resulted from a meeting of key clinical investigators and users of Candela laser systems, held during the EADV annual congress in Florence. The purpose of this Roundtable is to educate readers regarding the most important new clinical developments and treatment approaches using Candela's laser technologies.

One of the advantages of the Vbeam pulsed dye laser is a choice between purpura and non-purpura doses. How does this play out clinically?

Jeffrey S. Dover, M.D., FRCPC – Selective photothermolysis is the backbone of all Candela technology. The Vbeam allows you to treat vascular conditions without purpura; this in fact distinguishes Candela's pulsed dye laser from many others currently available on the market. So really, purpura-free treatments represent the essence of advances in vascular treatment.

An example of a purpura-free setting is 7.5 J/cm² at 10 ms with a 10 mm spot size. Even with this setting, though, a patient may occasionally develop purpura;

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however, it is very infrequent. But you need to warn the patient in advance that he may end up with a bit of purpura the size of your baby finger. If the patient is overly concerned, don't do the procedure. Or if you do, reduce the fluence to around 7 J/cm². Or don't stack the pulses as much or execute as many pulses.

Purpura is caused by a short pulse that explodes the blood vessel, resulting in leakage of red cells. It is a delayed phenomenon. Even when using new cryogen cooling and a slightly longer pulse duration, purpura still lasts on average about one week. And you cannot cover facial purpura with makeup.

Yet, isn't it true that many dermatologists still feel that for a treatment to be effective, purpura must occur?

Well yes. Especially in Europe it is still a common perception. Until fairly recently, we all believed that to get real efficacy, purpura needed to occur. But now we can see that while there is a subtle difference in the degree of improvement between purpura and purpura-free treatment, and results do slightly favor purpura treatment, the truth is with pulse-stacking and multiple passes, we can now achieve results that nearly rival purpura treatment. But just as importantly as the medical results, we need to consider the emotional impact that purpura has on patients.

Three published studies polled patients around the world. When offered the choice between purpura and non-purpura treatment, 70% of patients selected purpura-free treatments. In my practice, it's about 99.5%. We rarely do purpura treatments anymore.

The cost for each treatment session is the same, whether we induce purpura or not. I explain that purpura-free treatment may require a couple of more sessions than purpura treatments, and I make sure



Jeffrey S. Dover, M.D.

they understand that. So patients have a choice. “Would you like to be purple for up to ten days, or would you rather have no purpura and return to work tomorrow and not miss any events for the next seven to ten days?”

A great majority of patients, no matter what study you look at, state they do not want purpura. And frankly, you have a vested interest in patients choosing three treatment sessions for purpura-free results versus one or two with purpura. You will do better financially, which of course should not be the reason to

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suggest such therapy, but you will also achieve better results and patients will be happier. Referrals will increase. If the patient selects purpura treatment, all their friends will go elsewhere once they see the immediate result.

The Smoothbeam is a 1450 nm diode laser that has shown good results for treating acne. Why is that and what has been your experience?

Christine Dierickx, M.D. – This particular wavelength is highly absorbed by water, so the laser pulse is absorbed by the water content in the dermis. Smoothbeam’s unique pulse structure alternates milliseconds of cryogen cooling with laser pulses, thus enabling a cumulative heating of the dermis while avoiding overheating of the epidermis. The epidermis is saved from being damaged while deep thermal heating occurs.

Sebaceous glands residing at a depth between 200 and 300 microns are damaged by the heat. This is why the Smoothbeam has been FDA approved for the treatment of acne. After treatment, the sebaceous

Photos courtesy of Jean-Michel Mazer, M.D.



Before Tx



One month after fourth Tx

glands are still present. However, you injure them and they shrink. It is like hair removal: you injure a hair and it recovers, growing back as a smaller, finer hair. Similarly, the enlarged sebaceous gland returns to its original shape.

Jean-Michel Mazer, M.D. – Candela does not claim that the Smoothbeam is the only or even the best solution for acne. It simply provides physicians and patients with another option, especially patients who need to avoid the negative side effects of Accutane. One U.S. study treated the back with the Smoothbeam. It found a 98% reduction in lesion count at six months. This is very impressive.



Jean-Michel Mazer, M.D.

Here in France, we evaluated the effectiveness of the Smoothbeam for facial acne. Compared to baseline, there was a 60% to 70% reduction in total lesion count among the 45 patients who completed the study. A full 83% of patients responded to treatment.

Dr. Dierickx – Yes, the published study mentioned by Dr. Mazer is very significant. The investigator was Victor Ross, M.D., of San Diego, California. It involved treating acne on the back of 27 males with the Smoothbeam. Patients scheduled four sessions at three week intervals. There was a controlled site and a laser treated site. Dr. Ross followed these patients up to six months after the four sessions and conducted lesion

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counts. The controlled site, with the dynamic cooling device (DCD) alone, did not respond at all. But by combining the DCD and the Smoothbeam, there was further reduction of lesion counts with each treatment. At six months following final treatment, there was almost 100% reduction. That is quite impressive.

Dr. Dover – Right now we're involved with several ongoing acne studies in the U.S. For one of these studies, we conducted sebumeter measurements of sebum production after infrared laser treatments for acne. Every single patient felt his skin was less oily, and in each case, the sebum measurements increased when the patient said he was less oily. So we discarded the

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sebumeter and listened to the patients. Interestingly, perception is different than reality.

Now, in our clinical practice outside of the study, we have not seen great immediate results. But we have had some very delayed results after six Smoothbeam treatments for sebaceous hyperplasia of the whole face. Patients come back months later, commenting that their skin suddenly is 50% drier. These are unbelievably oily patients, two in particular. I know of another physician who has had a similar experience. I don't understand why we are observing this delayed improvement, but it is certainly fascinating, and it seems to be occurring in many different studies.

There is also the concept that if you treat parts of a face and the acne improves, the rest of the face may improve as well. What are your clinical observations?

Dr. Mazer – Yes, we treat the entire area, not just the lesions, and we do see a general improvement overall.

Photos courtesy of Jean-Michel Mazer, M.D.



Before Tx



One month after fourth Tx

Dr. Dierickx – Yes, that's why I treat the whole affected area, so I'm not treating only the noticeable acne lesions or the active acne lesions. If acne is on the cheek, I'll treat the entire cheek. Likewise, if it's on the chin, I'll treat the whole chin. My typical parameters for nearly all indications are a 6 mm spot size, a setting of 40 on Candela's proprietary DCD and 14 J/cm².

The number of sessions range between five and eight, spaced one month apart. Because I have a laser clinic, most of my patients have already tried all the other conventional treatment modalities for acne. The subset of patients I treat are usually female with resistant low-grade inflammatory acne that does not go away. It usually flares up every month. After four sessions, we often achieve a very nice result. For the first time in years, the patient can walk around lesion free. Side effects are minimal. There may be some slight redness and a little bit of edema.



Christine Dierickx, M.D.

What about pain management for the Smoothbeam?

Dr. Dierickx – When using the Smoothbeam for acne, I normally apply topical anesthesia to minimize patient discomfort.

Dr. Mazer – Yes, despite the encouraging results, we do need to address the issue of pain associated with the Smoothbeam. Generously applying a topical anesthetic one hour before treatment appears to reduce the pain to an acceptable level. I have a colleague here in France who uses two complete tubes of topical anesthetic on the face per treatment, with very good results. Patients do not complain, and they

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are coming back for three, four and five sessions for wrinkle reduction. For reduced pain for acne treatment, I avoid overlapping pulses.

The good news is that some patients have not required any additional treatment nearly two years out. And while the Smoothbeam may not achieve better results than other treatments for acne, it does provide similar results, with the added benefit of fewer side effects and longer-term effectiveness. The Smoothbeam also achieves reduction in wrinkles and scars.

What about the versatility of the GentleYAG, a 1064 nm Nd:YAG laser?

Dick Van Gerwen, M.D. – I’ve had success treating varicose veins, including the greater saphenous vein and its branches. The 1064 nm wavelength provides good, deep penetration. This laser achieves very high energy levels and can be used for an extremely long procedure. Spot sizes range from 1.5 to 18 mm, which provides tremendous versatility. Most important, though, is Candela’s DCD, which can give you perfectly controlled cooling of



Dick Van Gerwen, M.D.

the skin. This is necessary to prevent blistering. The problem with contact cooling is that you don’t achieve standardized cooling. With DCD, on the other hand, you can completely control the cooling of the epidermis. You can also use higher energy levels than with a contact cooling machine. The higher the energy levels, the better results.

I prefer the 1.5 mm spot size, along with a short pulse and shorter cooling. In most cases, after only one week, we achieve great results. In my first patient, hypopigmentation disappeared and the varicose vein completely resolved within four months. I was very encouraged. Most patients can be successfully treated in one session. Reticular veins, especially those in the back of the knee, can also be effectively treated with laser therapy. However, it would be useful to have more specific information on how well the YAG laser treats red veins versus blue veins.

While treatment can be painful for some patients, topical anesthetic would probably be a good solution. For even better results, we should investigate the possibility of combining laser with sclerotherapy, or perhaps use compression bandages with the laser treatment.

Dr. Dover – There is no question that the GentleYAG is a very exciting new device. The DCD



Before Tx



One month after fourth Tx



One year later, without any new Tx

Photos courtesy of Jean-Michel Mazer, M.D.

feature allows for better visibility during treatment. The laser is very high-powered and extremely nimble. There is a wide-range of applications, including hair removal, which has to be better than electrolysis. The GentleYAG is beautiful for treating dark skinned people and light skinned people with dark hair. Because it has a long wavelength, which is poorly absorbed by melanin, you can treat up to Fitzpatrick skin type IV. Among the indications are

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pseudofolliculitis barbae, pseudofolliculitis of the posterior neck, women who develop folliculitis in their groin area, and folliculitis on the buttock.

Although the GentleYAG is highly effective, it is important to inform patients that they will end up with fewer hairs that are finer and less coarse. Hair will also be lighter in color, but that they won't be 100% hair-free. By telling them these realities up front, you will have happier patients. We write these things in their chart every time.

The GentleYAG also shows promise for skin rejuvenation, perhaps in combination with the pulsed dye laser. For example, if someone is red, perform the Vbeam first, followed by the GentleYAG. But if they have no redness at all – just photo-aging in general without lentigines – the GentleYAG can be used alone. However, if a patient has lentigines, first use the GentleLASE, followed by the GentleYAG.

Speaking of pigmented lesions, what laser would you recommend for treating this condition?

Giuseppe Scarcella, M.D. – The Q-switched AlexLAZR alexandrite laser is a good option for pigmented lesions and tattoos. Although the Q-switched laser has very, very short pulse durations, we do have power. The 755 nm wavelength has a 50 ns pulse duration, along with a spot size up to 4 mm and fluences up to 18 J/cm². The AlexLAZR also has an optical fiber delivery system. This laser can treat a wide variety of tattoo colors, plus lesions like nevus of Ota. And the short pulse duration renders less patient pain and minimizes purpura.



For nevus of Ota, good results can be achieved in five sessions. Freckles are also easy to treat, normally in three sessions. I have also had success with

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café-au-lait spots. You want to protect the upper area with eye shields, of course. Patients should also be told that a lesion or age spots may recur about two years after treatment.

Before starting to treat a tattoo, it is important to identify the exact kind of tattoo: pigment, concentration and depth of pigment. Tattoo artists regularly introduce new colors. Professional tattoos are more difficult to treat and usually require more treatment sessions than amateur, cosmetic, traumatic and

medicinal tattoos. We see good results for the colors black, green, red, yellow and blue. I prefer using a 552 nm wavelength for the red, 1064 for the black, and 755 for the green.

You may be able to clear a tattoo by inducing an optical chemical change of the color following laser radiation. Another method is transepidermal elimination of the color following laser radiation.

Treating with a combination of lasers has been mentioned several times. What approaches do you use?

Dr. Dierickx – For non-ablative skin rejuvenation, I combine the Smoothbeam with the Vbeam. I first apply the Smoothbeam and do some flushing because there is more chromophore. This is followed by the Vbeam at very low fluences – 2 to 3 J/cm², non-purpura doses.

I recently read in *Dermatologic Surgery* that another physician, Mario Trelles, M.D., Ph.D., of Spain, is also combining these two lasers for skin rejuvenation. However, he uses the Vbeam first, then the Smoothbeam. Dr. Trelles compared three treatment groups: combination therapy, Vbeam alone and

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Smoothbeam alone. Each patient received five treatments every two weeks. Patients were followed for up to six months following the final treatment session. In the combination group, there was about a 40%

wrinkle reduction observed right after the fifth session. But by six months, wrinkle reduction had increased to about 80%. Conversely, at six months, improvement with the Smoothbeam alone was about

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60% and with the Vbeam alone, about 40%. Hence, combination therapy with the two Candela lasers provides faster and better results overall.

I'm having a lot of fun with the Smoothbeam, both as stand-alone and combination therapy. We continue to seek new indications.

Dr. Mazer – Yes, and we have good indications that combining Vbeam and Smoothbeam in the treatment of acne has good results: Smoothbeam for lesions and Vbeam for redness.

Dr. Dierickx – We have also treated two cases of nevus sebaceous with the Smoothbeam, after first debulking the mass by erbium laser. In one woman, a biopsy after the sixth treatment revealed no presence of nevus sebaceous. She still maintained a very nice cosmetic result after one year of completing therapy. The alternative would have been for a plastic surgeon to excise the mass first, which would have resulted in a scar. So this is another example of combination laser therapy with good results.

I firmly believe Candela continues to be at the forefront of laser technology for multiple indications. Candela lasers often have more than one application, and that provides the needed flexibility for treating patients. Add the real possibility of using the lasers in combination, and it opens up treatment for a wide-range of indications. ■