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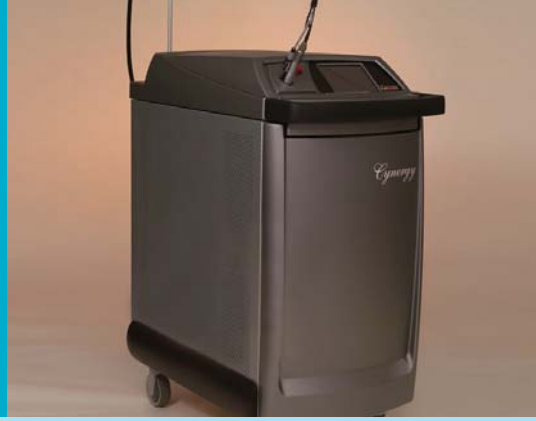


Clinical Roundtable Supplement

Cynergy with MultiPlex Provides Double Effect for Vascular Lesions

Combining a pulsed dye laser (PDL) with a 1064 nm Nd:YAG, Cynergy with MultiPlex™ from Cynosure, Inc. (Westford, Massachusetts, U.S.) appears poised to become the new gold standard for treating vascular lesions.

The novelty, however, is in the way these two proven technologies are put to use, according to Emil Tanghetti, M.D. The technique, termed MultiPlex, fires the two lasers not quite simultaneously but very close together. "We're synchronizing the delivery of two different wavelengths out of one handpiece, through the same fiber. That's not only novel, it's very difficult to do technically." Dr. Tanghetti, a dermatologist practicing privately in Sacramento, California, U.S., was heavily involved in the development of Cynergy and was among the very first to put the device into practice.

Emil Tanghetti, M.D.
Associate Professor UC Davis Medical Center
Center for Dermatology and Laser Surgery
Sacramento, CA, USA

"We did some work with their V-Star PDL unit and their Nd:YAG, and thought it would be interesting to use these devices in tandem. Each of these devices alone has limitations." According to Dr. Tanghetti, the Nd:YAG has a very narrow therapeutic window. "You can go from doing something very beautiful to something very ugly within a few joules. This makes it a very unreliable device for a lot of patients. We wondered if using them together might maximize their capabilities for vascular lesions."

After some success experimenting with two standalone units, it was thought that delivering the two wavelengths a few milliseconds apart might further improve results. All that was needed was a company with the wherewithal to develop the technology. "Few companies out there had the requisite scientific knowledge, background and muscle to make it happen. Cynosure was the only one who could do it right away," Dr. Tanghetti continued.

Leg before Tx

Leg after one Cynergy Tx

Photos courtesy of Martine Darchy-Gilliard, M.D.

Delivering the different wavelengths synchronized with MultiPlex technology is safer and more effective than either wavelength alone. "Pre-treatment with the PDL sort of paves the way for the Nd:YAG. The first pulse (PDL) generates a different chromophore, methemoglobin, that diffuses more deeply, and this changed chromophore more readily absorbs light from the second pulse (Nd:YAG). That not only increases efficacy, it allows us to use lower fluences, which increases the safety factor." Dr. Tanghetti added that Cynergy users may employ either of the two lasers singly as well as in tandem.

Although further investigation is required to uncover the full mechanisms and capabilities of Cynergy with MultiPlex, so far the technology is proving superior for vascular malformations on the face and legs, according to Dr. Tanghetti. "Multiplex is very effective for the larger, deeper vascular lesions on and off the face, and this also includes port-wine stains (PWS) with blebs, as well as large hemangiomas that are difficult to treat with conventional PDL or any other lasers for that matter," he explained.

Editor's Note: In the following Clinical Roundtable, moderated by Emil Tanghetti, M.D., world renowned dermatologists and plastic surgeons share insight into their experience with Cynergy/MultiPlex technology.

Why do you prefer the Cynergy with MultiPlex over conventional single wavelength lasers?

Mitchel Goldman, M.D. – Better efficacy and less purpura. To get the best efficacy with PDL, for example, you need to treat to purpura. If you want to minimize purpura with PDL you have to use long pulse mode and efficacy is reduced. You usually get purpura with single wavelength lasers, but with the Cynergy you no longer need purpura to have efficacy.

Mitchel Goldman, M.D.
Associate Clinical Professor of Dermatology
University of California, San Diego
La Jolla, CA, USA

Maurice Adatto, M.D. – Cynergy fascinates me because it's so novel, but in a practical sense the results I'm seeing are superb — better and with lower fluences than single wavelength lasers. With less fluence per wavelength, you diminish the risk of potential complications such as hypo- or hyperpigmentation, or if you push the envelope too far, scarring.

Elizabeth Tanzi, M.D. – I prefer the Cynergy because of its versatility. It's able to treat a wider spectrum of conditions than either single wavelength laser alone. It has the ability to treat not only telangiectasis and PWS, but leg veins and unwanted hair as well.

Martine Darchy-Gilliard, M.D. – Cynergy is a new concept in treating vascular lesions, using two wavelengths with different absorption and penetration. I can use the two wavelengths separately without changing machines, which is very practical. I also use it for hair removal and rejuvenation, and I've had promising first results for scar treatment. And there are fewer side effects.

David Goldberg, M.D. – When we treat photo-aging, involved issues include telangiectasis, collagen, skin toning and some larger blue venules of the face. Cynergy's PDL component treats red vascular lesions. The Nd:YAG treats both the blue venules as well as some of the collagen changes. Sequencing them with MultiPlex allows optimal treatment of blood vessels because the PDL converts hemoglobin into methemoglobin which preferentially absorbs the Nd:YAG energy.

Mark Taylor, M.D. – I love the greater versatility, especially in treating vascular lesions that have different vessels at different depths.

What conditions do you predominantly treat with Cynergy/MultiPlex: facial and leg telangiectasis, PWS, hemangiomas, spider veins? Are some of these more difficult to treat by single wavelength lasers? Different anatomical locations?

Dr. Goldman – I treat just about all vascular lesions with Cynergy. Understand that most of us have only had the laser for a few months, so this is preliminary, but even so, Cynergy has virtually replaced my pulsed dye laser.

"Cynergy has virtually replaced my pulsed dye laser."

Tina Alster, M.D. – I find the Cynergy/MultiPlex helpful for leg veins, perinasal telangiectasis, and PWSs unresponsive to PDL alone. After several PDL treatments, many superficial vessels of the PWS have been eradicated, but deeper vessels may have developed thicker walls that resist the PDL. This is when I use the Cynergy/MultiPlex. The PDL targets superficial vessels

and Nd:YAG laser reaches the deeper vessels to amplify the response.

Dr. Tanzi – Cynergy is now my first line treatment for PWS and telangiectasis. The MultiPlex feature is particularly helpful when a patient with a refractory PWS has had ten to fifteen treatments with a traditional PDL and shown little improvement. The Multiplex allows deeper penetration into the lesion, which is essential for hypertrophic PWS.

Dr. Goldberg – Cynergy is our first line treatment for PWS in adults because of the methemoglobin conversion factor, a sort of double whammy where the PDL component clears the way for and optimizes the effect of the Nd:YAG. We're also studying Cynergy with MultiPlex for photo-aging.

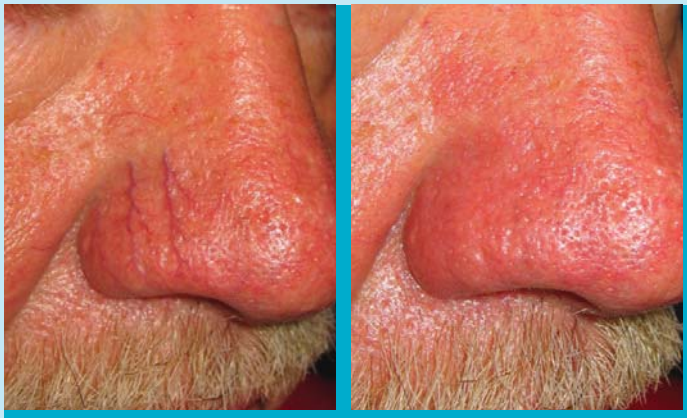
David J. Goldberg, M.D.
Clinical Professor of Dermatology
Mount Sinai School of Medicine
New York, NY, USA

Dr. Taylor – I'm predominantly treating difficult vascular lesions, keloid scars, some routine treatments such as telangiectasis, angiomas, spider veins and facial redness, plus a little skin tightening. It's great for tough PWS because of the depth of treatment. Conventional modalities really only get the surface, and there are deeper underlying vessels still feeding the surface, causing the lesion to recur. So in that sense Cynergy might cut down on the number of required treatments as well.

Dr. Adatto – Facial telangiectasis, leg veins, PWS, cherry angiomas, all sorts of vascular lesions. I also started treating hypertrophic scars. I think that the sequential wavelengths gives us more of a chance to get better improvement than single wavelengths.

Dr. Darchy-Gilliard – I mostly treat leg veins, first reticular veins, then telangiectasis in the same session. I also treat all the facial telangiectasis, rosacea and all the vascular lesions such as angiomas. I am also trying it for scars.

Dr. Geronemus – Most of my work is done with PWS. We've also used it effectively on facial telangiectasis.



Photos courtesy of Mitchel Goldman, M.D.
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Before Tx | After one Cynergy Tx

How have your Cynergy/MultiPlex results compared to those obtained when using single wavelength devices? Why the difference?

Dr. Adatto – Better results and less potential for side effects, and less immediate side effects. It's more comfortable for the patient. For example, when I treat the face with the single wavelength Nd:YAG, patients are quite swollen and uncomfortable for two days. With Cynergy's dual wavelengths, I can use less energy with better results and patients are happier.

"With Cynergy's dual wavelengths, I can use less energy with better results and patients are happier."

Dr. Tanzi – In my experience, the results obtained using the Cynergy Multiplex compare favorably with single wavelength devices. I've been impressed with the Cynergy's ability to deliver comparable clinical improvement with fewer necessary treatment sessions as compared to a long pulsed PDL when treating rosacea and telangiectasia.

Dr. Alster – I initially used the Cynergy/MultiPlex for conditions difficult to treat with single wavelength

devices alone and obtained superior results. Difficult to treat lesions were either becoming more resistant to treatment or were never amenable to treatment. With the dual-wavelength combination, I use lower fluences and fewer treatments. With single wavelength lasers, I would have to increase fluences to the maximum to increase their effectiveness.

"The dual wavelength allows for the ability to treat thicker lesions, particularly PWS with blebs, nodules that occur as patients age."

Dr. Darchy-Gilliard – It has fewer side effects, no dyspigmentation and so far no scarring. Reduced purpura is very important in my practice. The patients can return to their normal life and activities with no trouble. On the leg veins, the results are better and more extensive, but we have to treat the deep veins first. And we must also be careful with the Nd:YAG fluence.

Dr. Geronemus – The dual wavelength allows for the ability to treat thicker lesions, particularly PWS with blebs, nodules that occur as patients age. They're difficult to treat with single wavelength lasers but do quite well with Cynergy. The MultiPlex allows the use of lower energies because the PDL component generates the methemoglobin which is more susceptible to the Nd:YAG. When used independently, Nd:YAG is a bit more risky to use.

Roy Geronemus, M.D.
New York University Medical Center
New York, NY, USA

Dr. Taylor – Without having done specific head-to-head studies it's more of a gut feeling, but my experience has Cynergy producing equal or better results more rapidly and with less purpura, which people really appreciate. More studies are needed there.

What treatment parameters (including delay [short, medium, long, or extended]) do you typically use with the Cynergy/MultiPlex?

Dr. Alster – Treatment parameters change from individual to individual on the basis of the lesion and the location being treated. When using the Cynergy/MultiPlex, I generally use the extended delay setting between the two pulses in order to give the skin a chance to recover between pulses. Overall, it's a matter of milliseconds which is long in laser-related terms (but not long in treatment terms).

Dr. Darchy-Gilliard – For rosacea: PDL 6 ms pulse width, fluence 7 to 8 J/cm^2; YAG 15 ms at 30 to 35 J/cm^2; delay short or medium. I often finish by passing the PDL laser in defocalized mode over the treatment area. For large (reticular) leg veins: PDL 20 to 40 ms pulse width at fluence 8 to 9 J/cm^2; YAG 40 ms at 40 to 60 J/cm^2, delay long or extended. For small leg (blue) veins: PDL 20 ms pulse width at fluence of 8 to 8.5 J/cm^2; YAG 20 ms at 30 to 40 J/cm^2, delay medium or long. For facial (red) veins PDL 10 to 20 ms pulse width at fluence 8 J/cm^2; YAG 15 ms at 35 to 40 J/cm^2, delay short or medium.

Martine Darchy-Gilliard, M.D.
Dermatologist
Orléans, France

Dr. Goldberg – In treating facial veins, the PDL parameters are 5 to 6 J/cm^2, 7 mm spot size, 10 ms pulses with about a medium delay followed by the Nd:YAG laser at about 20 J/cm^2 with 15 ms pulses. Then we're using a Zimmer cooler between three and four. We've been doing this on a regular basis so we've got it down now.

Dr. Taylor – I use a lot of different settings for different things. The beauty of this laser is that an experienced operator can marshal all their knowledge to choose the best parameters for an individual with a challenging malformation. Sure there are average lesions and we'll certainly develop parameters for common things, but for complicated lesions it's going to require some thinking on the part of the practitioner.

How have treatment side effects been improved when using Cynergy with MultiPlex? What are the principles by which the Cynergy/MultiPlex removes vascular lesions without causing purpura? How important is the absence of laser-associated purpura to you and to your patients?

Dr. Geronemus – Our work with PWS has shown Cynergy to be equal or better than PDL, without the bruising you expect with single wavelength lasers. During some of the original work I did with Cynergy we saw some crusting, but we were able idealize the parameters to limit side effects. Purpura affects patients socially and in business. Many people who would not have sought treatment in the past are now seeing good results with minimal negative impact on their lives.

"Our work with PWS has shown Cynergy to be equal or better than PDL, without the bruising you expect with single wavelength lasers."

Dr. Tanzi – I've seen reduced potential for edema with MultiPlex compared to PDL because I do not pulse-stack with the MultiPlex. For the best improvement with a single wavelength PDL, often I pulse-stack to obtain the best response, which can lead to significant post treatment edema. Pulse-stacking is completely unnecessary (and not advised) using the MultiPlex feature of the Cynergy. As for purpura, any vascular specific laser can cause bruising. However, the Cynergy parameters can be modified to deliver an effective treatment with minimal purpura, if desired.

Elizabeth Tanzi, M.D.
Co-Director
Washington Institute of Dermatologic Laser Surgery
Washington, D.C., USA

Dr. Goldman – I haven't seen any side effects yet. Basically, the conversion of hemoglobin into methemoglobin by the PDL, then having the Nd:YAG which is more specific for methemoglobin, is the key to the increased efficacy and reduced side effects.

Dr. Alster – I don't find that the Cynergy/MultiPlex increases the risk of treatment side effects when the correct fluences/pulse delays are used. Patients typically experience transient erythema and swelling. If, however, the operator applies the same (high) fluences that are used in single wavelength treatment, the risk of purpura (and patient inconvenience) increases. Most of my patients return to their regular activities within a day of treatment.

Tina Alster, M.D.
Director
Washington Institute of Dermatologic Laser Surgery
Washington, D.C., USA

Dr. Darchy-Gilliard – I have not yet seen any important side effects. I want to have the best results with the least side effects. So if I have purpura or edema it depends on the subject, therefore I test under the level of purpura and then treat. The most difficult treatments are very light rosacea or people who complain of flushes. Often I have to use short time delay and short pulse time and it's difficult to avoid side effects such as edema.

Dr. Taylor – I think the general discomfort is similar, and pain level will depend on the intensity of the treatment no matter what sort of device is used. People seem to really enjoy Cynergy's cold air blower. Purpura is the main concern, though. A week or two with a purple face is annoying if you have to do it multiple times. It upsets people's lives. Cynergy can achieve results with purpura that is less intense and doesn't last as long.

Dr. Adatto – Because you can use lower fluences to get results, you're less likely to get purpura. But sometimes I look for purpura, as with PWS. That's your end point. If you have no purpura, it means the energy is too low. Usually when you use the sequential wavelengths, the purpura lasts about half as long as it would if you use PDL only, which is more comfortable for the patient. Patients today do not tolerate a lot of downtime. The same goes for number of sessions. If they can get the results in fewer sessions, they'll choose that option.

Photos courtesy of Mark Taylor, M.D.

Before Tx

After one Cynergy Tx

Dr. Goldberg – You rarely get purpura. It's not very painful because the energy levels are lower than we tend to use with single wavelength lasers. And with the 10 mm spot size you can go quite fast. With the conventional PDL you don't have to treat to purpura, but generally results are better if you do. Here you don't have to have purpura and you're going to achieve similarly good results. It's not rocket science, it's simply that second wavelength back to back, and people like knowing they can come in for treatment and go back to work. Lack of purpura is a major advantage.

Has the Cynergy with MultiPlex transformed the way you treat vascular lesions? What role does downtime and number of treatments to achieve results play in your choice of lasers?

Dr. Taylor – In the past, I've used the PDL and on the same visit treated with long pulse 1064 nm right on top of that. If I can dial in both of them in a single treatment, it's more convenient for me. Downtime and number of treatments are both very important. Less downtime and fewer sessions to achieve a similar result with less purpura means the patient is happier.

Mark B. Taylor, M.D.
Medical Director
Gateway Aesthetic Institute and Laser Center
Salt Lake City, UT, USA

Dr. Goldman – Cynergy has transformed the way we treat vascular lesions because we get better results with fewer treatments. That's attributable to greater efficacy per treatment.

Dr. Alster – Absolutely. I'm thrilled to have an option for people with recalcitrant lesions. The system is quick, efficient, reliable and effective. I use it more often than my single wavelength laser systems. My patients require fewer treatment sessions. The easy post treatment recovery and downtime quotients are important too.

Dr. Tanzi – Yes, because you need fewer treatments to see similar results when treating many of the most common vascular lesions. Reduced recovery time is also appreciated by patients. The majority of my patients are working full time and they really appreciate the ease of a procedure without prolonged side effects. It's one reason patients would eschew treatment in the past, they wouldn't tolerate the purpura. Cynergy is bringing some of these patients back to the office.

"Cynergy has transformed the way we treat vascular lesions because we get better results with fewer treatments."

Dr. Goldberg – This is the next generation for treating vascular lesions. Downtime is a big issue. Our patient base will essentially not be treated unless there is no downtime. And because we've optimized the parameters, we now need less treatments than before, so people don't have to come in as often, which also makes it easier for patients.

Dr. Adatto – Transformed, yes. I can treat more vascular lesions and with better hope of improvement than before.

Maurice Adatto, M.D.
Medical Director
Skinpulse Dermatology & Laser Center
Geneva, Switzerland

Dr. Geronemus – Cynergy has given us a very unique option, which has expanded our patient base and increased patient acceptability. Downtime plays a big role because most people just can't afford to take any more time out of their lives.

How do you compare Cynergy with pulsed dye lasers (PDL), Nd:YAG lasers and intense pulsed light (IPL)? Please consider efficacy, side effects, throughput, speed of treatment, ease of use, patient convenience and other factors.

Dr. Goldman – Cynergy is generally better and easier to use. I can get better results in fewer treatments, and like I said, my PDL is sitting in a corner right now. Cynergy is also much easier and quicker to calibrate and warm up than the PDL. I still use the Nd:YAG for blue veins, and the IPL if the patient has a lot of cherry angiomas or I'm doing full face rejuvenation. We're doing a clinical study on full face rejuvenation with Cynergy right now.

Dr. Adatto – Cynergy will treat just about any vascular lesions, and with IPL you are limited. It also treats PWS beyond the plateau of improvement I've seen when using PDL. And I did a split face study treating facial telangiectasis with the MultiPlex versus Nd:YAG alone, and not only was the improvement superior with Cynergy, the swelling was visibly greatly reduced.

Dr. Alster – When the operator has become familiar with the dual combination treatment parameters, the MultiPlex is easier to use, more versatile and reliable, and less expensive to operate than single wavelength laser or intense pulsed light systems. Everything the user needs is included in the system, including the air cooling device, so disposable expenses, a big cost factor for physicians in the long haul, are reduced.

Dr. Tanzi – Using the combination of PDL and 1064 nm Nd:YAG reduces the amount of Nd:YAG energy that is required for an effective treatment thereby making the procedure safer than if the Nd:YAG was used alone.

"Cynergy has given us a very unique option, which has expanded our patient base and increased patient acceptability."

Dr. Taylor – PDL alone doesn't penetrate more than a millimeter or so, but if you add the Nd:YAG you can treat deeper to the medium or larger vessels at the same time, so that's an advantage over either of them alone. IPL is a different story. In my opinion the newer generation IPL units are inferior to the older ones which had shorter high energy pulse options. But for serious reticular veins a millimeter or greater in size, Cynergy is better. Cynergy also offers more control and is less cumbersome than IPL.

Dr. Geronemus – We see good results with the PDL for PWS, but it requires bruising to get the same result, and it doesn't work as well as Cynergy for thicker lesions. The Nd:YAG has limited indications and is not as safe in the treatment of deeper lesions as the Cynergy/MultiPlex system.

Dr. Darchy-Gilliard – Compared to PDL, Cynergy is more efficient on the face, PWS and leg telangiectasis with less purpura. The patient gets results faster with few or no side effects. The same holds true versus Nd:YAG. It does better than the Nd:YAG for scars. Comparison with IPL is not as easy because they don't really treat the same vascular lesions, but if you compare small telangiectasis or rosacea, Cynergy looks promising.

Before Tx

After one Cynergy Tx

Photos courtesy of Mark Taylor, M.D.

Dr. Goldberg – PDL is the gold standard and I think the one thing we don't know yet is how this will compare to the PDL in treating children's PWS. What can be said equivocally at this point is that nothing comes close to MultiPlex for treating vascular lesions in adults. Nd:YAG lasers are very helpful for blue vessels, but you generally have to use painfully high fluences to achieve results. And I like IPLs, I think they are very good, but in my experience they are totally ineffective for treating blue vessels. Cynergy combines so many options into one unit. Nothing really does what this unit does.

What treatment advice can you offer?

Dr. Goldman – Cynergy is a welcome advance for the treatment of vascular lesions in general, but it's best for discrete lesions.

Dr. Adatto – First, get a good base of knowledge with the system. And especially with this machine you need to use a skin cooling system. This is crucial. Don't use the laser without cooling the skin.

Dr. Alster – Be conservative at first. Don't use the same fluences you'd use with either laser alone. Treat more forgiving areas (cheeks, trunk, thighs). Avoid thin skinned or delicate areas (neck and chest) until you are proficient. Prepare patients for the initial gust of wind of the air cooling device.

Dr. Geronemus – I avoid double pulsing for safety reasons. You can get significant energy when you're double pulsing a vascular lesion.

Dr. Taylor – You can actually remove hair with it, and there might be some advantages in terms of some of the lighter colored hairs. A lot of this is still theoretical, but Cynergy may have much untapped potential.

Dr. Tanzi – When treating vascular lesions in hair bearing areas, care must be taken to reduce the risk of long-term hair reduction from the Nd:YAG component of the Multiplex. When treating a facial PWS in the beard area, there is significant absorption of the Nd:YAG wavelength in the hair follicle. To reduce the risk of hair removal, lower fluences with the Multiplex, or the use of the PDL wavelength alone is warranted. ■

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