



PUSHING THE SPECTRUM

OPTIMIZING TREATMENT
OF VASCULAR AND PIGMENTED LESIONS

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OPTIMIZING TREATMENT OF VASCULAR AND PIGMENTED LESIONS

Is the aesthetic challenge presented by vascular and pigmented lesions adequately addressed by current laser and light-based technologies? Might clinicians benefit from a review of innovations in their clearance—using optimized IPL technology in particular? Are there condition-specific tools and techniques that can leverage treatment—even foster skin rejuvenation? Recently, an expert panel convened to explore these multifactorial dermatological conditions, to assess the science that may optimize outcomes, and to share how they've approached some of their most challenging patient cases.

Mechanism of Action of IPLs on Pigmented and Vascular Lesions

DRILLING DOWN ON SELECTIVE DAMAGE

DR. ROSS: What is the best mechanism of action (MOA) for clearance of vascular lesions particularly on the face—and maybe the legs as well—and how does that relate to the IPL technologies?

DR. ARNDT: For a long time, we have known how to induce some selective damage to vascular targets, and for some time, we have settled on 585, 595 nanometers as being selective. As intense pulse light has evolved over time, it has become clear that it is close to the equal of—or perhaps better than—the sort of classical therapy, which has been the pulsed dye laser. The MaxG™ (Palomar Medical Technologies, Inc., Burlington, MA) is very exciting because it takes us to another level in which we are able to either damage vessels so they slowly go away or destroy

them entirely immediately.

DR. ROSS: I think there are two mechanisms that are active here. One is the coagulation of the vessel and the associated thrombus, and the second is the actual collagen shrinkage of the vessel as the wall is heated from the heat conduction from the blood. I think both are operative (Figure 1).

FACULTY



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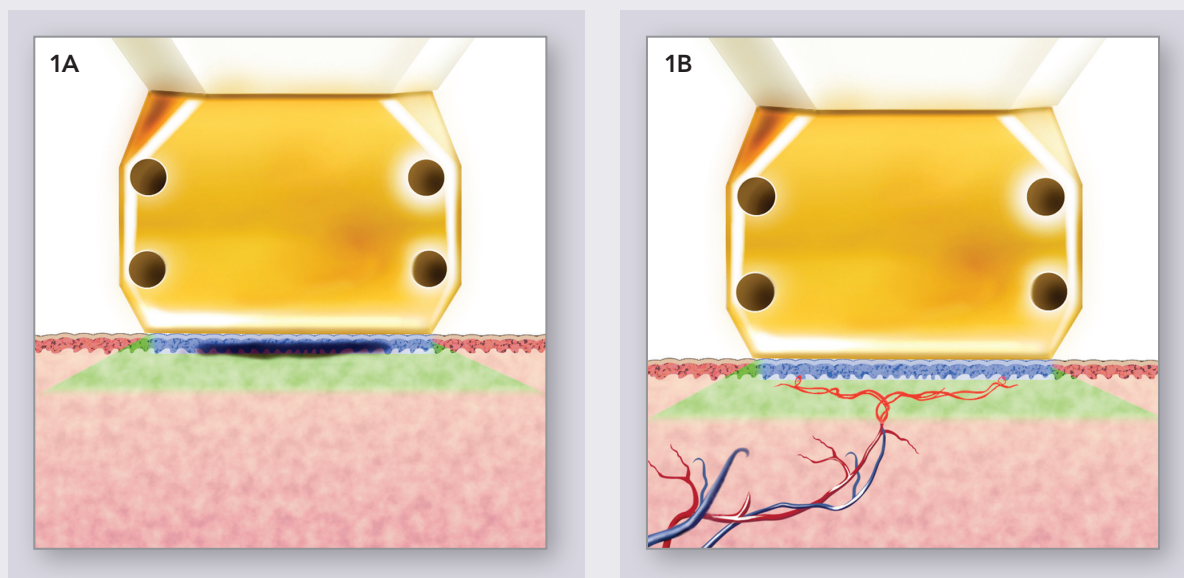


Robert A. Weiss, MD

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FIGURE 1. IPL MOA on Pigmented and Vascular Lesions



The MaxG's optimized range of light waves is targeted at melanin pigment (1A) or hemoglobin in the blood vessels (1B). The light is absorbed by either melanin or hemoglobin, resulting in fragmentation of melanin pigment or damage to the vessel wall. The melanin pigment and these tiny vessels are then absorbed by the body, making them less visible.

DR. DOVER: I think you described it well. It looks like there are three end events that occur after we deliver light that converts to heat in the vessel wall and within the lumen. Either you can get spasm of the vessel, which is often very temporary, and those vessels reopen literally while the patient is still in the room—usually within a minute to 10 minutes. Or the red cells “sludge” and become thermally damaged and you stop blood flow—but very temporarily—and then it restarts over a period of hours to weeks to even a month or so.

Finally, every once in a while, you get what I described before, thermal damage to the red cells and collapse of the vessel wall; the vessel wall lining sticks to itself and it stays shut and then you get some resorption of that vessel and it never recurs. That is the ideal situation, but I don't know what percentage of the vessels do this versus those that respond with the other two mechanisms.

The real question is how do you make those vessel walls stick—one to another—to stay closed forever, and I'm not sure we know the answer. You wonder if repeat treatments, a week later, as opposed to four to six weeks later before the vessel reopens, might seal the deal.

DR. ROSS: Jennifer Barton has done some beautiful

studies looking at hamster blood vessels and showing that there was definitely both coagulation and thrombosis, but, like you said, some of the vessels would reappear within minutes even after you saw the clot through a microscope.

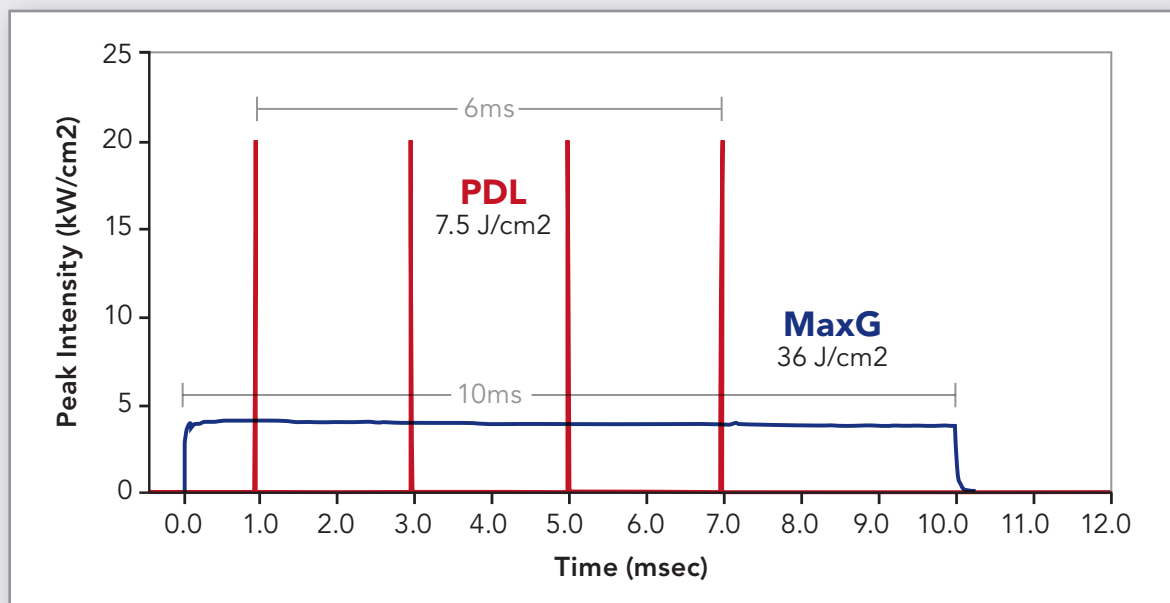
Some “micro-thrombi” would sit there in the vessel and then it would move along and then the blood vessel would be reperfused. I think that is part of what we are seeing with these nasal vessels that are so persistent. Probably the other action, too, is you get the spasm, but then the spasm relaxes and you come back five minutes later and the vessel is back. So, those are tough vessels.

DR. DOVER: The other vessels this happens to are the tiny ones. You see them disappear and they either go into spasm or, if you are wearing loupes, you can actually see the blood boiling. You see it change color. You can actually see the clot and then, before you know it, the vessel is back, open with blood flowing again.

DR. TANGHETTI: That is why the pulse duration is extremely important in how the energy is delivered. If it is delivered in little spikes, as you see with a pulsed dye laser (Figure 2), you often have a tendency not to see the whole vessel wall [become] coagulated and the adjacent areas thermally damaged.

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FIGURE 2. **Pulsewidth Structure of a PDL compared to the MaxG**



Peak powers should be limited to the minimum necessary to avoid temperatures in excess of coagulation temperatures. Otherwise, vaporization or ablation can occur, which are not ideal mechanisms of injury to vascular components. For these reasons, the MaxG output power is highly controlled and uniform, free from high peak power spikes. Note the PDL pulse actually consists of four 100-microsecond pulses during the 6 ms, each with peak intensity of 18.75 kW/cm². In contrast, the MaxG peak intensity is 3.6 kW/cm².

The longer 532 devices generally have the entire pulse on for the 10 or 40 milliseconds or whatever you use. You are not having these little spikes, so it heats differently and you can see this in the vessels—especially with the MaxG at 100 milliseconds on the large nasal vessels. You can actually see a zone of thermal injury around the vessel.

DR. ROSS: Yes, in that case, clearly you are beyond a thermal relaxation time with the vessel—or certainly near it. You are getting full trans-vessel coagulation and actually damaging the wall directly during the pulse and relying on the heat conduction. That may be optimal for larger vessels, [but] smaller vessels, unfortunately, are cooling off during that 100-millisecond pulse, particularly the really tiny .1-millimeter vessels. One needs a shorter pulse or higher fluence to damage those vessels.

DR. TANGHETTI: Right. Even with the shorter pulse, they still see the pulse on for the whole 10 milliseconds. It is not spiking; you are not having any of these little mini-pulses in there, so there is a difference in heating those two ways. The advantage of an IPL device [is] it can give you many different wavelengths that work with blood vessels that you

cannot deliver with a laser device. With lasers, you are stuck in a 532, 585, 595, 940 wavelength. But with the IPL device, you have a broad spectrum of light that can absorb in the whole hemoglobin range—even the red range—which a lot of us think is useful for treating blood vessels.

DR. DOVER: Actually, Emil, I think that the point you just made is an important one which has been lost on the majority of treating physicians—including me. We were so set on looking for the ideal wavelength say, 577 or 585 or 595, when, in fact, the IPL was in front of us for well over a decade. We sort of almost ignored it, thinking, “Well, white light is not as good.” But, in fact, the way you describe it, frankly, it gives us more potential hits on that vessel; more absorption peaks and the theoretical possibility of getting an even better result than you would with a targeted wavelength at one nanometer.

DR. ROSS: Right. One of the myths is that hemoglobin has these very sharp peaks. But the peaks are somewhat broad, so having the output spectrum of the IPL mirror the hemoglobin spectrum really makes more sense than finding one wavelength, like 532 or 577, and saying we are going to put all our eggs in that basket and see what we get. The

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laser purists, on the other hand, would say that at least you are locked into one characteristic when you fire the device—that you are locked into wavelength [and] you can alter the other parameters.

Strictly speaking, when we use this IPL, we are varying the spectral structure as we are varying the pulse duration in the peak power. So, in a sense, we are varying many parameters simultaneously when we pick different settings off the touchscreen with the IPL. Therefore, the tough thing would [seem to] be achieving reproducibility, but once you establish good outcomes with certain parameters, you can rely on these settings.

DR. WEISS: I'd say that the primary mechanism is the heating of hemoglobin which then transfers heat to the collagen wall of the vein. This leads to immediate visual photodarkening, or, when the vessel is large enough, a clearly visible shrinkage. It is advantageous with IPLs to

adjust the pulse duration to match the vessel size. The great feature about MaxG is that there is enough fluence—even at the shortest pulse durations—to be able to treat even small red telangiectasias.

I've seen that, when vessels contract at the time of treatment, or if they have an immediate photodarkening, then the chance of resolution is 85% to 90%. When treating over an area—not stacking—but repeat pulsing several minutes later, it is possible to increase the chance of resolution.

For deeper vessels, extending the pulse duration with adequate fluence is very useful, especially since the MaxG puts out a second broadband peak in infrared. For more superficial vessels, there is a peak at green which is perfect for small telangiectasias. Combine that with the sapphire cooling for skin protection, along with a superior beam profile tuned to both large and small vessels, and this is the most effective IPL for vascular lesions that I have used.

POINT OF LIGHT

A PORT WINE STAIN CASE STUDY

MaxG Effective—After 'Maxing Out' with Pulsed Dye Laser

DR. ROSS: So, Vic Narurkar, you have this port wine stain. One treatment looks like you got about 50% clearance. What were your parameters for this?

DR. NARURKAR: I treated this patient with 10 milliseconds at 36 to 38 J/cm². Two passes. And I actually have a second treatment for him where he is about 80% clear after two treatments. So, it was actually more than

50% clearance with one treatment.

DR. ROSS: That is a nice result. Absolutely. And that is a pretty fair-skinned patient. I have a Philippino lady I am treating right now—a calf port wine stain and she is about 52. It has never been treated. You might choose, what—26 J/cm² and 10 ms—or 24 J/cm² and 10 ms?

DR. NARURKAR: I would probably use 20 milliseconds on the first pass

and do about 24 to 26 J/cm². I have treated extremity port wine stains with the MaxG that have maxed out with pulsed dye laser. The MaxG actually treats resistant port wine stains.

DR. WEISS: We've also seen some PWS respond to the MaxG when all else has failed. I am impressed with the immediate photodarkening and subsequent response with resistant PWS. Patient comfort is impressive as well.



A single treatment using the MaxG's optimized light achieved approximately 50% clearance of this facial port wine stain. One subsequent treatment has diminished the PWS an additional 30%. (Photos courtesy of Vic A. Narurkar, MD, FAAD)

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The Physics of Clearance

WIEN'S DISPLACEMENT LAW, SPECTRAL SHIFT AND ITS TREATMENT IMPLICATIONS

DR. ROSS: Wien's displacement law is a classical physics law about blackbody thermal radiators—how, with any blackbody, as you go to a higher and higher temperature, the emission spectrum shifts to the left or shifts toward the blue (Figure 3). That is really the principle behind the xenon flashlamp and all light devices including the Palomar IPLs. So, a xenon flashlamp, for all practical purposes in this configuration, is a blackbody, and as you shift the temperature and pump it harder, as you pump it to a shorter pulse duration, the spectrum shifts. So, from 10 milliseconds to five milliseconds, maybe 10% or 15% or more of the light goes to the visible.

Likewise, if you go out to 100 milliseconds and lower the peak temperature of the lamp, you are going to shift the spectrum out to the infrared. So, that is all that law really is—it comes from Plank's original radiation law.

DR. DOVER: Help me to understand how this would impact my results clinically.

DR. ROSS: Well, it's not so much clinical as it is just an understanding of how the flashlamp works. If you look at

FIGURE 3. The Equation for Wien's Displacement Law

$$\lambda T = \text{Const}$$

This equation states that the product of temperature (T) and wavelength (λ) is constant. Although an arc lamp is much more complex than a blackbody in equilibrium, a spectral shift to longer wavelengths is observed with decrease in power.

all the xenon flashlamps, including the one in your flash camera, they work based on this principle. When you pump with the capacitors, you drive up a voltage and that drives the lamp to a certain temperature. The temperature is going to determine the output spectrum, unfiltered. So, if you took an unfiltered xenon flashlamp, the spectral output is really dependent on the temperature, which, in turn, is dependent on the peak power.

DR. DOVER: As the pulse duration is shortened, it shifts more towards the visible portion of the spectrum?

DR. ROSS: It does. I did some little experiments with the MaxG and, clearly, as you go to shorter pulses with the same fluence, you have two reasons that you might compromise the epidermis more. The first is that you are simply putting the energy [out] faster so the melanosomes get hotter, but the second thing is there is a spectral shift anywhere from 10% to 30%—say, 10 milliseconds to five milliseconds—so more of the light gets shifted into the visible.

One of the upsides of IPL is that you have this flexibility, but if you have an understanding of the way the lamp works, and the way it is pumped, you will have more of a feel for how to stay out of trouble and maybe also how to optimize. In other words, if you're treating a light pink vessel, or a tiny vessel, or a light pink port wine stain in a light-skinned patient, you might want to pump hard, high fluence, short-pulse duration to maximize the lamp temperature to push the spectrum to the left. On the other hand, if you have a darker-skinned patient, you want to shift the spectrum to the right, so you use a longer pulse and a lower fluence (Figure 4).

DR. DOVER: Well, just today I saw a female Asian patient, whom I hadn't seen in years, who has lentigines. We decided to use the Palomar MaxG instead of the previously used pulsed dye for the red component and the Q-switched for her brown component. I spoke to Dr. Arndt who, luckily, had corresponded with someone at Palomar

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DARKER SKIN CHALLENGES

Effective Vascular Clearance in Ethnic Skin

DR. ROSS: Has anybody treated a [photo]type IV patient with this device for vessels?

DR. NARURKAR: Yes. There have been no issues, but what I usually do is reduce the fluence by about 20% and then I do try to use the longer pulse durations.

DR. ROSS: So, Vic, if a darker-skinned patient comes in, who has used steroids for melasma, and she has the telangiectasias around the nose—not the huge ones. What would be a typical setting you use with the MaxG?

DR. NARURKAR: In that patient, I like the 20 millisecond pulse duration as my first pulse and I will typically treat them at 24 to 26 J/cm² and then, gingerly, on the second pulse, use a 10 millisecond pulse duration at around 24 to 26 J/cm². For the majority of my vascular patients with alar vessels, if they can come in at a week to 10 days for a second treatment, we offer that to them as a courtesy treatment because I do think that sequential coagulation of the vessels gives better clearance if you shut them down again a second time.

[Manufacturer's note: The MaxG is FDA-cleared for skin types I through IV.]

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and they had suggested the parameters to use.

I had not treated a lot of Asian patients with lentigines of late, and so I shifted to 30 milliseconds and, in fact, what it does is what you just described. We are getting more towards infrared and less visible. So, trying to get away from her maximum absorption in the spectrum of pigment takes advantage of that law.

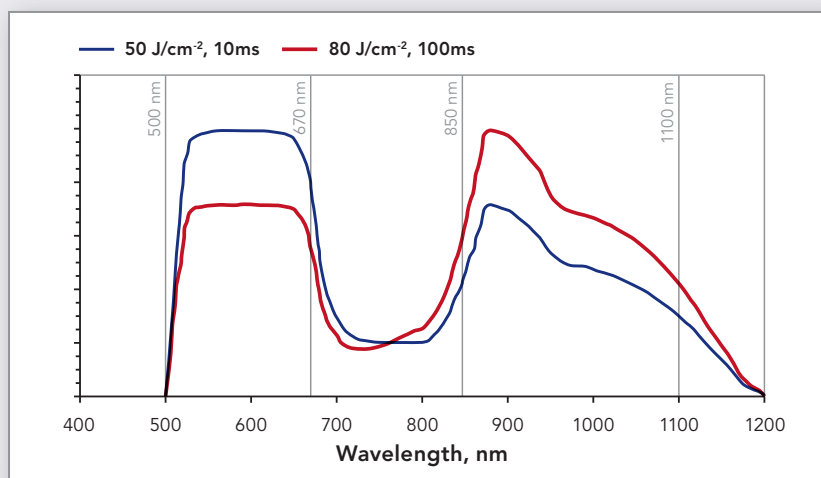
DR. ARNDT: Dr. Dover brings up a good point which is that I do not think that most clinicians understand the spectral shift and certainly no one has quantified it like the Palomar folks have. They actually give us a percentage and some understanding of these principles. This has given us a better understanding about the IPL light source and how we can use spectral shifting to our advantage when we treat our patients.

DR. ROSS: Oh, absolutely. I mean, it has been talked about before, but never to the degree Palomar has. It is something that, if you want to learn how to use the device the best you can, it's good to understand, because you can do a lot of neat things—or you can do harm with it if you push too hard with the lamp. Turn the lamp up high, and by putting the pulse duration low and the fluences high, you can just as easily damage an Asian patient with the same fluence that you might not have damage at 30 milliseconds [with another phototype].

So, it is a trick, but if you use it more—again the flexibility is very, very high with it—you can do a lot more things, but you have to use the handpiece a lot, like any device, to get the best results. It does take a lot of practice to get the best results. You get good results with little practice but, like with any other device, [you get] better results with a lot of practice.

DR. VASILY: One of the significant benefits of the longer pulse duration with the MaxG is spectral shifting to the infrared region. Spectral shifting allows the delivery of more infrared energy at long pulses which, consequently, allows

FIGURE 4. Spectral Shift



A spectral shift to longer wavelengths is observed when power density is decreased. For example, a 30% increase in the percentage of energy in the Near Infrared (NIR) band of the spectrum occurs when the settings are changed from a fluence of 50 J/cm² at 10 ms (a power density of 5 kW/cm²) to 80 J/cm² at 100 ms (a power density of 0.8 kW/cm²) (spectrum changes from the blue curve to the red curve). At the same fluence, as the pulsewidth is increased to optimize treatment of larger diameter vessels with longer thermal relaxation times, the amount of energy emitted in the longer wavelengths of the NIR band increases at the expense of the visible band. This puts more energy into the bands responsible for more uniform heating of deeper lying vessels.

targeting of larger and deeper blood vessels which are often resistant to treatment with lower energy, shorter pulsed-duration IPLs.

DR. WEISS: The MaxG has been designed to take advantage of this law. It's very useful to have spectral shift with a flashlamp design to produce more visible light with shorter pulse durations and more infrared with longer pulse durations. The science has been well documented by the engineering team at Palomar. This helps explain why the MaxG is so effective on red telangiectasias and for pigmentation with shorter pulses.

Game-changing Tech Specs

BEYOND IPL LIES 'OPTIMIZED LIGHT'

DR. ROSS: We just discussed extended selective photothermolysis and basic selective photothermolysis and we are actually using a combination of both of these, whether we are in the short mode or the long mode, and depending on the vessel size, but does anybody have any comments that would suggest [in what ways] this MaxG device is unique? (Figure 5)

What is unique about this, say, if we just had a pulsed

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dye that went out to 40 milliseconds, say, versus 40 milliseconds with the new MaxG. What would you say is an advantage of that, looking at selectivity? I mean, is it the wavelength, the pulse duration, the pulse structure?

DR. NARURKAR: I think that Emil made a very good point about having the ability to have more than just a single wavelength so, even though you may be treating at similar pulse durations, you are capitalizing on “cooking” the vessel better—even at these extended pulse durations. I also think that’s why we were not that excited about the older IPL for vessels. [It] was the contact cooling.

So, being able to deliver these higher fluences more

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MaxG MIX

Leverage Results by Multi-Platform Sequencing

DR. ROSS: Are there other cases where you are using multiple technologies or a cascade of technologies to get the best results?

DR. NARURKAR: I actually have used the MaxG and the Lux1540™ (Palomar Medical Technologies, Inc., Burlington, MA) in the treatment of scars and striae. So, for scars, I will also do nonablative [treatment] and then hit them with the vascular in the same session.

DR. WEISS: A combination of nonablative fractional Lux1540nm and MaxG can be synergistic—particularly with erythematous scars or resistant, pigmented lesions. These treatments are done, not on the same day, but sequentially—at least one week apart. My leading application is the treatment of scars with the combined treatment. This includes acne scars or surgical scars. One can perform MaxG first and then, immediately after, perform Lux1540nm.

DR. NARURKAR: We routinely will use fractional resurfacing and a vascular device for more extensive neck and chest photodamage where it is much easier to get better textural change and pigment clearance.

DR. ROSS: Do you ever do those at the same session?

DR. NARURKAR: No, I think you get quite a bit of erythema, so I usually stage them. If you are using nonablative or even ablative fractional resurfacing to treat the face, and then you have some residual telangiectasias, then you can clear the telangiectasias with your vascular device.

DR. ROSS: Would you tend to use, say, [the] 1540? Let’s say you have a patient who has tone and texture changes as well as red and brown dyschromias.

DR. NARURKAR: I do the fractional resurfacing first.

FIGURE 5. The Palomar MaxG Handpiece

The MaxG rivals single-wavelength lasers in performance, with the comfort of pulsed light. MaxG offers superior closure of the larger, deeper facial vessels with Palomar’s unique combination of Dynamic Spectrum ShiftingSM and dual-band filters which provide more uniform heating across the entire diameter of larger vessels.



safely without causing epidermal compromise—those are two advantages. Also, the ability to stack pulses more effectively, possibly the larger spot size with the IPL, getting better clearance. Those are things that I’m noticing. I think, Emil, you actually did the hard work, which was the comparative [study] on the same patient, comparing pulsed dye with similar parameters to the MaxG and showing either superior or equivalent clearance.

DR. TANGHETTI: I’ve done a number of patients and they are pretty equivalent. So, I think the pulse structure is very different between those two devices—whether it’s 40 milliseconds or 10 milliseconds. The problem we have had with the IPLs in the past is that they have been inadequately powered, and I think that is where the MaxG is different. It has way more power.

DR. ROSS: And the power is in the right place.

DR. TANGHETTI: Right.

DR. ROSS: You can burn patients with a lot of IPLs.

DR. TANGHETTI: That is right.

DR. ROSS: But the ratio of vascular to melanocytic damage has always been woefully inadequate for most of the IPLs. The problem is you can take any IPL—even a bad IPL—and you can treat pigmented lesions on the hands. Just find the sweet spot and, eventually, you will find some contrast. The challenge is to find somebody with slightly pigmented skin [on whom] you can treat the vessel and the pigment—particularly the vessel—and still preserve the epidermis. I haven’t found too many IPLs that do that very well.

DR. ARNDT: I think that is one of the reasons it has been slow to evolve from the broadband white light source, that had relatively little selectivity, to current sources that give you much more in the vascular and pigmented range and take out some of the wavelengths you do not need.

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A SPLIT-FACE COMPARATIVE CASE STUDY

MaxG vs. Vbeam®—One Treatment, Comparable Outcomes

DR. ROSS: This is Ken Arndt's case. Treating these matte-like telangiectasias is challenging. You see a lot of them with connective tissue disease. Ken, what exactly did you do to treat this patient?

DR. ARNDT: Well, in the first place, I did not know quite what it was. It is not your usual actinic telangiectasias; it is not rosacea. It is really this striking, matted telangiectasia. I treated her on the right cheek with the Vbeam (Candela Corporation, Wayland, MA) using 3 milliseconds at 7 or 8 J/cm², and on the left using the MaxG, 10 milliseconds primarily at 42, some pulses at 44 J/cm². I was aiming for purpura on both sides—and there was a little less purpura produced on the MaxG side. I saw her about four or six weeks later and both sides did well. The MaxG side is lighter, but I think it was a little bit less to begin with. It shows the quite striking effectiveness of both. It is hard to make a definitive opinion about which is the best, but it is clearly at least equal.

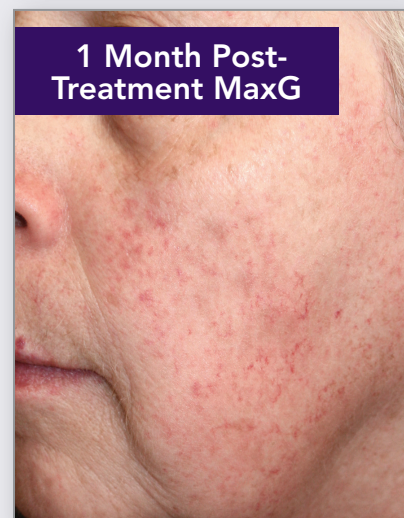
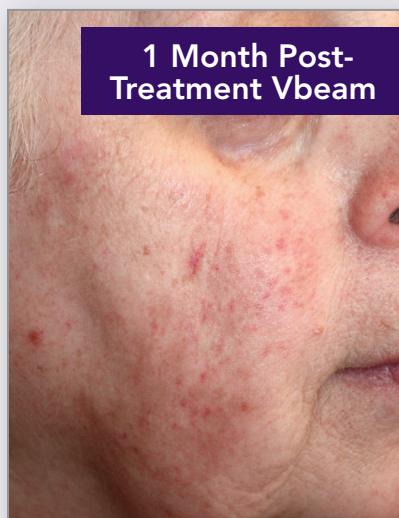
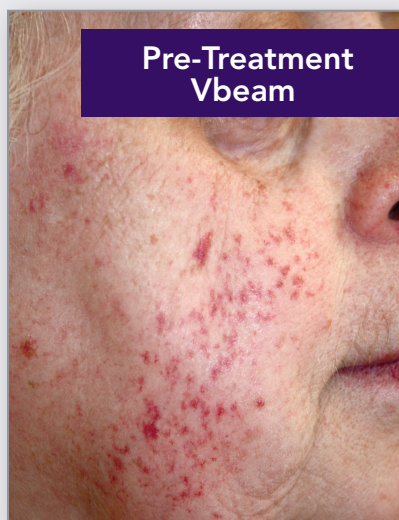
DR. ROSS: Yes, it is interesting. You look at the purpura and there is clearly more purpura on the Vbeam side—and the purpura is more "spot-sized" on the PDL side as well. Obviously, the purpura thresholds will go higher than the MaxG because, with the MaxG, you are only seeing the purpura where the vessels are—which is pretty classic, because the purpura threshold is inversely proportional to the dermal blood fraction. That has been shown over and over. You are really only seeing the purpura where the vessels are.

DR. WEISS: I have seen similar

results with MaxG at higher energy levels—over 40 J/cm². Slight purpura is the trade-off, but well worth the result. I agree with Vic Ross that purpura is more limited with MaxG. This is an intense case of

telangiectasias and the results are outstanding with better improvement on the MaxG side.

DR. ROSS: I applaud you, Ken. These are really good results for one treatment.



This particularly challenging case of facial telangiectasias was administered a single treatment on one side with Vbeam and on the other with MaxG's optimized light with comparable results. (Photos courtesy of Kenneth A. Arndt, MD)

POINT OF LIGHT ●●●●●

A POIKILODERMA CASE STUDY

The Honeycomb Conundrum

DR. WEISS: This is a patient who had one treatment with dramatic improvement. IPL is my favorite for poikiloderma, and this [case] was reported in 2001. PDL treatments typically result in a honeycombing effect as Dr. Arndt has experienced. I agree that this honeycombing is very difficult to blend with PDL. As I said, IPL is one of my favorite treatments for poikiloderma of the neck and chest. The settings in this case were 10 milliseconds pulse and relatively low fluence of 30 J/cm². Very impressive—and the patient was thrilled with the results. He had previous PDL treatments without much response since a large component of his poikiloderma is pigmentation.

DR. ROSS: Panel, what is your treatment or device of choice for poikiloderma? I know pulsed dye is a good choice for most people. IPL is also a good choice. Anybody have any other favorites they use for poikiloderma?

DR. ARNDT: With the pulsed dye, you often get a honeycomb appearance.

DR. ROSS: Right.

DR. ARNDT: And then, when you go back the second or third time, I have found it very difficult to erase that entirely, even using the IPL. The IPL is probably a better choice. Sometimes, I have used fractional resurfacing with mixed response, but I think poikiloderma, in my mind, is still a therapeutic challenge.

DR. ROSS: I agree. I have used a KTP laser, IPL and pulsed dye—all three on some patients and some patients, regardless of what I have done, they have not cleared as much as they should. And I agree with Dr. Arndt, if you do the pulsed dye the first time and they get this honeycombing, it is difficult to homogenize it after that.

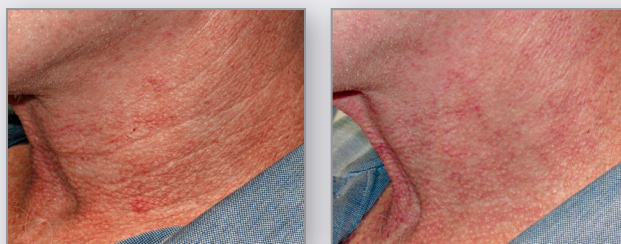
It's like it is almost set like epoxy; you cannot get it to unset. You can redo it multiple times, but that very first imprinting is really hard to unravel. The biggest problem we have in San Diego is that, of most of our patients who have poikiloderma, at least 50% are bronzed poikiloderma and quite dark. That is a real challenge, even with the best IPLs, to get enough cooling to really preserve the epidermis.

That is when we are sort of stuck with the pulsed dye with the DCD on which, I have to admit, the cooling is probably still the best, efficiency-wise. But, outside of that, I think the IPL is probably a better choice for the fair skin or [photo]type II patient who has some poikiloderma.

IPL is still probably the best choice right now.

DR. ROSS: What would you use here, David?

DR. VASILY: If the patient appears to have significant actinic bronzing, I have more recently been pretreating them by, in effect, cutting a “window” in the pigment first by performing a treatment with a StarLux® (Palomar Medical Technologies, Inc., Burlington, MA) fractional 1540 laser handpiece. This treatment has a significant affect on the spectrophotometric pigment ratios that allow safe use of higher energies with the MaxG handpiece to address vessels and pigment in the photo damaged areas of concern.



Following unsuccessful treatments using pulsed dye laser, this patient's poikiloderma was treated in a single session with the MaxG optimized IPL. (Photos courtesy of Robert A. Weiss, MD)

DR. ROSS: Are you doing this in the same session or are you waiting?

DR. VASILY: I usually wait about two or three weeks and it really is remarkably safer. I have not had any honeycombing, which is a nightmare—or blistering or dyschromia.

DR. DOVER: Would this be one fractional nonablative [treatment] and then two, three weeks later, one IPL [treatment]—or a series of IPL treatments?

DR. VASILY: Usually, it will take one or two [sessions]. To me, this is comparable to melasma, but even more difficult to treat because of the pigment and vascular issues. The advantage of the using the fractional 1540 first is that these patients often have a significant amount of solar elastotic sun damage and you can achieve some additional dermal remodeling. This remodeling does not happen quickly, but I think, in the long run, it may help prevent these people from re-pigmenting.

DR. NARURKAR: And we have [also] been able to correct some of the honeycombing with nonablative fractional resurfacing.

Contact Palomar to learn more about the MaxG handpiece.

DR. ROSS: Exactly. And that is why a lot of the IPLs, I think, have been just woefully unsatisfactory. I mean, you can treat a [photo]type I patient and turn it up real high and you will do fine. You take a type II or III and, the next thing you know, you have crusting. We used to use the old MediLux® (Palomar Medical Technologies, Inc., Burlington, MA) and we actually did a trial comparing the old Palomar MediLux (which had no cooling or you had to use external cooling) with the long-pulse KTP with cooling and we did fine as long as the patients were very light. But when the patients got even slightly dark, we started getting crusting on the IPL side at any fluence that was sufficient to damage the vessels.

So, there was no sweet spot. This MaxG device, with the better cooling, the spectral shifting and the spectral filtering, gives us an opportunity to treat some patients with at least a slight tan or [who are] slightly dark. It is not going to allow you to treat a dark type IV for vessels for the most part, but at least [for] type III skin which is slightly bronzed, you have a fighting chance—with good cooling and pulse stacking—to have a shot at getting the vessels.

DR. VASILY: I think the most notable aspect of the MaxG is the fact that we can deliver more energy safely at short pulse durations because of the smooth pulse configuration of the energy output. This is a significant difference compared to even the older generation StarLux G-handpieces. The clinical significance of the evolution of the smooth pulse technology is the fact that you can optimize treatment parameters and deliver higher energies with less risk of epidermal damage in some phototypes that would otherwise be risky to treat without smooth pulse delivery, photon recycling and enhanced cooling. It allows me to push the spectrum—to put the energy up cautiously for great results.

The Experts' Take

OPINIONS ACROSS THE SPECTRUM

The Service Advantage

DR. VASILY: One nice thing about the MaxG is that when a handpiece goes down or there's a problem, you can put it in a box and send it back and have a new handpiece very quickly—as opposed to the pulsed dyes where you have to call the service rep and have them come to your office. If you don't have a service contract, which a lot of us don't, or you can't afford these expensive contracts, you could pay a fortune to have that pulsed dye laser serviced.

Limited Devices, Unlimited Flexibility

DR. ROSS: We have three or four IPLs, KTP, two pulsed dyes, and they all have a role. But this IPL is clearly the IPL

I use the most because I just like to see a vessel disappear right when I hit it—and that's what I'm seeing with the MaxG. And I think, Emil, you talked earlier about the fact that a lot of people don't have multiple devices, so if you had to get one device, it certainly would be a reasonable option.

DR. TANGHETTI: Yes. We're all talking about [being] blessed with a plethora of devices. Most people have one device, and this [MaxG] device seems to fill a lot of those gaps—whether it's pigment, whether it's vascular and even some degree of photorejuvenation, I think the utility of this device, across the lines, makes it nice for the doc [who] can't afford everything.

DR. VASILY: I now tend to use the MaxG on a more regular basis for clinical applications previously treated with the Vbeam in the past.

The Cool Key to Safety

DR. VASILY: I think it really is remarkable that, compared to the older [Palomar] handpieces, with the MaxG, we can probably accomplish as much with one session as we could with one to three sessions in the past—and with more complete clearing than we could previously achieve due to the advanced engineering and optics of this handpiece.

DR. DOVER: But what I have noticed with the new devices—the predecessor to MaxG, and now especially with MaxG—we're getting way more clearing in one pass than we used to. I think it's because the ratio of energy to cooling has been optimized, and I think that's one of the big advantages of the new device.

DR. NARURKAR: The thing that made me go from more of a laser purist to an IPL was the contact cooling. The fact [is] that this has the most powerful cooling I've used—which doesn't ice up somehow. I'm not sure why the competition frosts and ices up and this does not. I think we really underestimate the safety and how this has changed, and also the way the pulses are delivered as opposed to these old IPLs with the spiked pulses. With the MaxG, being able to deliver these higher fluences more safely and more effectively—that's what's made me more of a convert to using this, in lieu of a lot of my lasers, for vascular and pigmented lesions.

You also don't get the intense amount of purpura. If somebody is covered with extensive pigmented lesions, even though you can use a Q-switch, a lot of my more cosmetic patients would prefer not to have that kind of purpura as well as the vascular lesions. So, the extended pulse durations that support the higher fluences make this a better aesthetic device. It shouldn't be understated [that] the spectral emission of this specific device is so far superior to all the

Contact Palomar to learn more about the MaxG handpiece.

other IPLs on the market. But I think one of the most important variables is the emission spectrum of the device.

Spectrum Shift Prompts Paradigm Shift

DR. TANGHETTI: In the past, I must say, I could not compare treating a facial vessel with a pulsed dye laser

versus an IPL. There was no comparison whatsoever. Now, there's a comparison, and the comparison is equally good and, in some cases, better. I think that that changes the paradigm—and when you look at the maintenance costs of a dye laser, they're substantial. And this IPL is much simpler. It's a cost-effective device that most practitioners could afford to put in their practice.

DR. ARNDT: Yes, I think it's a slow, philosophic shift. When the IPLs were evolving for the use of vascular and pigmented lesions, they were somewhat complex in terms of multiple pulses and spacing between the pulses. At this point, they're equally or perhaps more effective [than PDL] and easy to use. Perhaps a newer generation will accept that, but I think it takes time to conceive of these instruments differently. And I think that this instrument, because it's so easy to use and effective, will help this sort of change come about.

DR. DOVER: I couldn't imagine anyone describing it better than Dr. Arndt just did. It's taken me a long time to convert, but this is by far the best IPL I've ever used. All you need to do is treat a series of patients over a period of six months to a year. They come back and they're pleased. It doesn't hurt very much, it's relatively fast and it's pretty quiet, and you can turn it on and off in-between treatments when you're conversing with patients. You can use an anesthetic if you want, and if you don't need it, you don't. You get very nice results. It works very well for vascular lesions, very well for pigment, helps texture a bit—it's very impressive, I have to say.

Towards 'Optimized Light'

DR. ROSS: I agree. It's doing the job we hoped IPLs were going to do 10 years ago. I think, for the first time, we have an IPL that can reproducibly destroy vessels or at least temporarily cause them to spasm, which is why Palomar calls it Optimized Pulsed Light™ (OPL).

And the advantage of this technology is it's platform-based, so you have the opportunity to use other handpieces. Its spectral filtering allows for this dynamic change, and good cooling. It's a nice unit with a lot of flexibility. Older IPLs have been cast as “jacks of all trades,” but this new OPL device from Palomar, I think, is the “queen of all trades.”

DISCLOSURES

Drs. Ross, Dover and Vasily are consultants for Palomar Medical Technologies, Inc. and receive research support. **Dr. Weiss** receives research support and serves on Palomar's speakers' bureau.

Drs. Narurkar and Tanghetti have performed clinical trials for Palomar. **Dr. Arndt** reports no relevant disclosures.

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POINT OF LIGHT

GREAT EXPECTATIONS

MaxG—Minimize 'Results Wait Time,' Maximize Patient Comfort

DR. ROSS: I find I have to do something really robust for the first treatment or people do not want to come back. That has always been the problem with these fractional nonablative technologies [since it takes a while to see the improvement]. I like to “hook them” with something that is really tangible at first so they experience some immediate benefit, [so] I will use the MaxG first to clear the vessels and pigment and then come back with the [Lux]1540.

DR. VASILY: If they have very light alabaster skin mixed with unwanted photo damage, then I might tend to use the MaxG first, because, as you said, they like to see that immediate improvement.

DR. ROSS: Anything you can do that makes a visible difference on the initial treatment affects, not only their lesions, but their psyche, so they are more likely to come back later.

DR. DOVER: I saw a patient this afternoon who has had her third treatment with MaxG, followed by fractional nonablative resurfacing. She had a red face and acne scarring, and [now] she is absolutely thrilled and has seen dramatic improvement of her redness [from the MaxG]. She was planning for today to be her last treatment of the red component, but [now] plans to do a full series of six nonablative treatments. She [has] very limited down-time, so we do them back-to-back same day: MaxG first, immediately followed by nonablative fractional resurfacing which she tolerates very well.

DR. ROSS: Do you find you have to use topical anesthesia with the MaxG at all?

DR. DOVER: I've not put topical anesthetic on a MaxG patient for months. They tolerate it incredibly well. I find the MaxG is so comfortable [that] patients say it barely hurts.

DR. NARURKAR: I use ELA-Max® (Cream [lidocaine 4%] [Ferndale Laboratories, Inc., Ferndale, MI]) and it's more than adequate for the MaxG.