

Practical Applications for Medical and Aesthetic Treatment of Skin of Color With a New 650-Microsecond Laser

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INTRODUCTION

The following roundtable is edited from discussion between the authors concerning treatment with the 650-microsecond 1064nm Nd:YAG laser. These dermatologist experts share their expertise, experience, and treatment pearls regarding the device for medical and aesthetic use, and in treatment of skin of color (SOC).

CASE REVIEW

Melasma in Skin of Color

Dr. Roberts: *The 650-microsecond 1064nm Nd:YAG laser is ideal for six out of the top ten indications for SOC, including melasma. Prior to this device, was there one specific laser you used on your SOC patients? Did you alternate between devices? How has this changed and why?*

Dr. Henry: I used multiple devices, but with this we have a go-to device for SOC that my patients are very comfortable with because of the safety level.

Dr. Burgess: Distinguishing factors like pulse duration make a difference between Nd:YAG lasers. The 650-microsecond 1064nm Nd:YAG is my go-to laser device. For melasma, I begin the treatment with non-laser or light devices due to the exacerbation of melasma with heat. The 650-microsecond laser device seems to generate the least amount of heat to provoke a rebound effect. Additionally, we recommend wearing physical sun protection, avoiding sun exposure and extreme heat. I typically treat with hydroquinone (not higher than 6%) several times a week with alternating non-hydroquinone blending products. After several weeks of home therapy, I chemically peel the skin with Jessner and salicylic acid peels to mitigate inflammation. I may alternate with microdermabrasion. For stubborn areas, I go to my 650 microsecond 1064nm Nd:YAG laser device every 3-4 weeks because you need time for phagocytosis of pigment.

Dr. Roberts: *And you've noticed decrease in rebound pigmentation?*

Dr. Burgess: Yes, I see less rebound pigmentation with the 650-microsecond 1064nm Nd:YAG device when I compare it to my Q-switched short pulse and long pulse Nd:YAG devices.

Dr. Roberts: *In my experience it's great for those islands of darker skin within patches of melasma. Comments?*

Dr. Chilukuri: We use a similar protocol involving topicals and peels. I use the device mostly for refractory melasma. With melasma, we're targeting different aspects: epidermal pigment, dermal pigment, and upper dermal pigment as well as the vasculature. Peels treat epidermal melanin but not so much deeper. The laser will break up some epidermal pigment, but with the microsecond technology we're more specific to that deeper dermal melanin and vasculature that peels cannot treat.

Dr. Roberts: *Do you go for rejuvenation at the same time or just target hyperpigmentation?*

Dr. Chilukuri: I consider the rejuvenation effect anytime we have an opportunity to heat collagen and improve the skin texture and quality. I'll do full-face, two or three passes, maybe four, focusing on darker areas with a few more passes. I've trained our staff to feel the skin with the back of the hand as you would a child with a fever, to make sure we're not getting too much heat. As Dr. Burgess said, if we cause too much heat, we're inducing rebound hyperpigmentation.

Dr. Henry: I do it the same way, picturing the treatment area as gradients with more passes on darker areas feathering out to normal skin.

Dr. Saedi: We go over the whole face with two passes and then back to the areas of melasma, do one to two more passes making sure that it's not too hot.

Dr. Burgess: For my conservative treatments of chemical peels and microdermabrasion, I will treat the entire face; however, I will spot treat with the laser device for the deep dermal pigmentation. To determine the depth of pigmentation, I will perform a Wood's lamp examination and meximeter/colorimeter readings for quantitative measurements to baseline pigment. I can always determine if therapy is ineffective or there is increased sun exposure.

Dr. Roberts: At first, I just treated areas of melasma but was eventually treating the whole face because I began to see it as pigmentation in the past, present, and future, especially in the mature patient here in the sun belt. For melasma this isn't a monotherapy. Now I recommend full face rejuvenation for melasma cases, I think they turn out better, and the whole result is very even.

Dr. Chilukuri: I don't want to say it's a drug delivery system, but what I do is pre-treat with the laser, and if there's a small break in the skin that expands just a little bit, I apply a skin peel and get better results with fewer application passes. I use that combination quite often, but this is not my go-to laser, I may be the lone dissenter on that. I would go with a picosecond laser, especially for somebody who may not be as skilled because you can use very, very low fluences and no downtime. Some would argue that the pico might be even safer for melasma because it's a photomechanical effect, rather than photothermal. If you have to pick one device that does a lot of things with no consumables, however, 100% I would.

Dr. Roberts: *What about rebound pigmentation?*

Dr. Chilukuri: Typically, we use low fluences with the pico, but again, that's not the primary thing that I treat in my office, I usually refer out melasma patients. But you can paint it seven, eight, ten times, you're using such a low fluence, usually 0.6-0.7 J/cm2, doing a generalized photomechanical disruption.

Dr. Saedi: I totally agree about the safety of the pico, we use often for melasma, but one issue is that with the pico you still unmask the vasculature that's there. And with the 650-microsecond 1064nm Nd:YAG you're treating the pigmentation and vascular components.

Dr. Campbell-Chambers: I also use the combination treatment approach to melasma that Dr. Burgess and Dr. Chilukuri discussed. I use a peel with hydroquinone plus salicylic acid and lactic acid, after the laser. I tend to reserve it for refractory cases.

Dr. Roberts: *So not everyone is going right to the 650-microsecond 1064nm Nd:YAG laser for melasma but we're using it often in combination. Any other tips for melasma?*

Dr. Henry: I also use topical tranexamic acid after the laser, that's been one of my favorite treatments. If I'm using hydroquinone, there is a non-irritating hydroquinone gel that I'll use immediately after as well.

Dr. Burgess: I use the lowest setting possible, usually at level four or five in order not to expose the skin to a lot of heat.

Dr. Chilukuri: I agree with the low heat and fluence. Like Dr. Burgess I use the laser in a paintbrush fashion across the skin, no double passes, breaking up the pigment. I usually follow with a hydroquinone peel. Another tip, if melasma patients have a special event I break protocol and treat weekly at very low fluence, just to break up that pigment. Then I'll use a triamcinolone or other mid-potency steroid to calm down the inflammatory response of the skin. We're often seeing good improvement as early as three to four weeks in all skin types, use a painting technique and then apply the triamcinolone and your hydroquinone or other at home treatment as normal.

Acne and Pseudofolliculitis Barbae (PFB)

Dr. Roberts: *How does the device address the multifactorial nature of inflammatory and non-inflammatory acne?*

Dr. Burgess: I have a patient with chronic nodulocystic acne with an urticarial response who was not a candidate for isotretinoin because of pseudotumor cerebri. I treat her full face every two to three weeks to control her acne and improve the scarring; therefore, I would definitely recommend the 650-microsecond 1064nm Nd:YAG laser treatment for patients who are not isotretinoin candidates. Because she is Caucasian, I treat her at level 8. Within two to three days, the nodules diminish. She has home therapy of Vitamin 25,000 IU and topical prescription acne products to control her acne.

Dr. Chilukuri: I've got somebody very similar who took an antibiotic, but it caused pseudotumor cerebri type symptoms, so she's gun-shy about orals. Her topical regimen was terrible, she had extra-dry skin and mostly nodular acne with some cysts (really a prime Accutane candidate), skin type V. We've cleared her active acne and continue maintenance treatments. I was treating her at the beginning every week to handle the cystic component. After three sessions we weren't seeing new breakouts, so we went to treatments every two weeks, and now she's at monthly to improve scarring. Like everyone else I used combination topicals, plus a hyaluronic acid that will hopefully help repair the skin, and a non-comedogenic moisturizer with sun-

screen. And she's finally able to tolerate topical retinol because her skin is healthier. The interesting part from her perspective is how quickly she started seeing a result, almost after every session, which really helped establish trust with her, so I was able to guide her during the ups and downs of therapy. So, for the dermatologist reader: Use your expertise and customize it to the patient. She's had maybe four or five treatments to be completely clear from active lesions and I think next week is her sixth or seventh treatment to help with scarring and any hyperpigmentation.

Dr. Saedi: I've talked to patients about using this laser with Accutane, oral antibiotics, or by itself. It contributes so nicely to any phase of acne or treatment, whether they want to speed the onset of result if you're clearing up deeper lesions with a topical and oral regimen, or if they're just using topicals. And some of my Accutane patients also see clearer results, we improve PIH or erythema. Rapid clearance makes a big difference psychologically.

Dr. Henry: I treat acne patients every two weeks and tell them they should see improvement by about two to four treatments. Once they're happy I also transition to monthly. I am quite impressed by how quickly they see improvement, especially with the nodules.

Dr. Roberts: *What might be causing this early onset result?*

Dr. Chilukuri: I presume it's the anti-inflammatory component or that we're shrinking, almost vaporizing, some of the sebaceous glands.

Dr. Burgess: I really don't know why, but it really works, almost like intralesional injection of triamcinolone acetonide.

Dr. Roberts: *Are the nodules less red?*

Dr. Henry: Yes, definitely.

Dr. Burgess: Less inflamed, yes. The size, inflammatory response, everything is diminished.

Dr. Chilukuri: Also, the laser is very gentle over the nodules, which can otherwise be very painful. Many people don't want or can't afford Accutane or are afraid of needles, so they avoid lab draws.

Dr. Saedi: I've switched many patients from intralesional injection to just the 650-microsecond 1064nm Nd:YAG laser, and they've been very happy. There is an inherent risk with intralesional injections.

Dr. Roberts: I don't like to do them because while it usually goes well, if not, it's right in the middle of the face. I'd be happy to put down my syringe for the laser.

Dr. Chilukuri: We actually had a patient so upset with us for not going for the injections that she walked out of the office. We got her back in, did the laser, and she called up apologetic the next morning, asking to continue treatment with the laser because it worked better.

Dr. Chilukuri: We had another patient, a woman in her late forties with several children and acne, maybe better categorized as folliculitis, covering her back and chest. She was frustrated and was very non-compliant with topicals. She had amazing improvement over the entire back and chest with one laser treatment, only needed three sessions for complete clearance and she's been clear more than a year, without topicals. Compliance with topicals is so important, so this may be a great alternative for difficult compliance cases, such as with men.

Dr. Campbell-Chambers: The key points with acne treatment are how quickly we see results, and versatility, because a lot of these acne patients also have hirsutism and/or scarring, so it's ideal to treat multiple indications at the same time. I tend toward combination treatment. We must stress that when we're using retinoids, advise patients to stop for at least three days before and after the laser. Patients get excited about how quickly they see results compared to traditional medical treatments.

Dr. Roberts: *What about treating PIH secondary to acne with this device?*

Dr. Saedi: I love it for that indication, it works well for residual active acne or residual PIH. We see reduced pigmentation and erythema after one treatment, which keeps patients coming back. For the most part I don't stop tretinoin before or after the laser treatments, I haven't really had problems with irritation or PIH unless someone has very sensitive skin.

Dr. Campbell-Chambers: I think the 650-microsecond 1064nm Nd:YAG laser is revolutionary for PFB. For many PFB patients—ironically, more females than males in my practice come for that—it has changed their lives. Patients with traditional long pulse Nd:YAG experience are thrilled about the treatment experience and results with this device. I recommend the standard monthly treatment protocols, but the settings seem to be a bit conservative. I've been able to go a bit higher in SOC patients, with better efficacy on hair removal as well. Sometimes I do a few extra pulses on the actual PFB lesion, but I tend to use just one pass for the hair removal itself.

Dr. Roberts: *What do you do for the standard PFB patient?*

Dr. Campbell-Chambers: We include a retinoid, and in the morning either a benzyl peroxide cleanser or clindamycin product. Also, we have a steroid combination with fucidin cream as well, to calm down the bumps, then monthly treatments. I recommend breaking off medications for about three days and then resuming a few days after the laser. I did a small study a few years ago and we found that quality of life improved after laser treatments.

Dr. Henry: I often use it for PFB, even right after injecting, and I don't stop the tretinoin except in the darkest of skin. I haven't had much difficulty. You get improvement without using energies strong enough to remove hair. Patients like being able to regrow hair. I haven't had any side effects from this.

Dr. Roberts: *For PFB, what percentage are women versus men?*

Dr. Campbell-Chambers: Probably about 70% women. I treat men for PFB, but for those that go with the laser, more women for some reason.

Dr. Burgess: Probably 95% of my patients with facial hair are female. Men usually want to keep their hair, so I always ask first. Some men want to shave every morning, ingrown hairs or not, others will never grow a beard because of their career.

Dr. Roberts: I see about 50-50. Men tend to want the option of growing hair, so I use lower settings for PFB, level two to three oftentimes decreases the keratinization, gets PFB to a level of acceptability in their eyes.

Dr. Roberts: *On a related note, the number one litigated and number one cause of laser complications nationally, usually with scars and hypopigmentation resulting from treatments, is laser hair removal, so let's discuss the safety profile techniques and why the 650-microsecond 1064nm Nd:YAG laser is great for this.*

Dr. Burgess: I've seen many of the hair removal disasters in our community, so I've used this device for PIH due to trauma or laser burns from hair removal. This device works very well in combination with chemical peels. If patients are gun shy because of a previous bad experience, we do a test spot, and when they see the difference or correction, it builds trust, which is so important in correction of the skin.

Dr. Chilukuri: I do very little laser hair removal patients but in my experience the device is powerful and safe to use on all skin types but takes a lot longer than our diode laser.

Dr. Campbell-Chambers: It's my go-to SOC for hair removal. Safety can make or break your practice. The safety profile and efficacy with this laser, especially with ancillary staff users, has positioned it well. For patients who've had traditional lasers versus this, they attest to the higher comfort level. Expectations management is important because patients want to see no hair. We advise an average of six treatments, approximately once a month, plus maintenance afterward. With hair, heat can build up so we must be conservative with the number of passes, and so forth, but we know that rapid pulses limit the time for energy to diffuse into surrounding areas and damage the epidermis.

Dr. Burgess: I also find it very helpful with fine vellus hair on the face in post-menopausal women.

Dr. Roberts: I love this laser for facial hair. In post-menopausal woman, all skin types, it's a hit. In my type IIIs and IVs, just one treatment and they notice a big change. And I see a lot of teenage girls with hairiness based on ethnicity, so I am very enthusiastic about this laser for that group.

Skin Rejuvenation and Photodamage

Dr. Roberts: *What about photodamage and skin rejuvenation?*

Dr. Chilukuri: We're using the device in combinations as well as a last-minute fine tuning for events. But we're also using it long term to heat skin with multiple passes for skin types I through III, especially on the anterior neck. The lateral neck I can tighten with a variety of things, whether we're putting in PLLA or PDO threads, or building along the jaw line using PLLA, calcium hydroxlapatite, or HA fillers, but the anterior portion of the neck has been a challenge. I've learned to be patient. We'll do three treatments at two-week intervals, wait three months, then do that again. When I combine it with something where I can penetrate even deeper, like fractional 1540 XD handpiece, we're starting to hit some home runs there. I'll use the 1540 nm Erbium Glass and then follow it with the Aerolase, and where I'm seeing even better results is with RF-plus-ultrasound to deeply penetrate with heat, and then utilize the Aerolase laser immediately after in the same treatment session, with the goal of raising temperature in the superficial skin to the neighborhood of 40°C, with good long-term results.

Dr. Burgess: I have gotten great results, in fact one patient with a lot of photodamage on her neck and décolleté saw what a great job this laser was doing on her face and wanted to try neck and chest. In two treatments you could see a difference, same frequency as for the face, which was about every three weeks. I'm not combining treatments; therefore, I'm excited to try some of the things Dr. Chilukuri is doing.

Dr. Roberts: It does such a great job on the anterior neck. Sometimes on the face, people aren't as excited, but always on the neck, first treatment, everyone notices a difference. I combine it with RF and I'm getting amazing results. Because people ask

for it I'm doing the laser plus RF on the front and the back of the neck. I've also been treating the hands which is a total home run. One woman had sclerotherapy and then I did her hands with the laser, it was like night and day. In one session, a 20-year difference.

Dr. Burgess: I'm doing a case, skin type V, where the elbows were very dark and somewhat keratinized. What a difference. I used level five or six.

Dr. Saedi: I'm considering this for knees as well.

Dr. Roberts: *So, would you have the elbow bent, to stretch everything out?*

Dr. Burgess: I do the laser treatment with elbow bent. I like to stretch the skin. My assistant holds it taut so that we cover more surface area.

Dr. Roberts: That's a very good point.

Dr. Saedi: I do that for the neck to maximize the surface area and get into all the creases.

Dr. Roberts: *What about positioning?*

Dr. Burgess: I have my patients lying down that–will extend their neck backwards over a covered pillow.

Dr. Campbell-Chambers: I've had fantastic results combining the laser in an alternated regimen with dermal needling and PRP for skin rejuvenation.

Dr. Roberts: This laser seems to have real synergy with other modalities. For photorejuvenation in general, I recommend the 650-microsecond 1064nm laser to promote collagenesis and to improve pigmentation and vascularity; this provides greater power and less discomfort compared to fractional lasers. To replenish the epidermis, I suggest a full-field 300-microsecond 2940nm Er:YAG laser.

Other Indications

Dr. Saedi: I've had really good experience with plaque psoriasis patients who have either failed topical therapy, have hard-to-treat areas, or been sick or non-compliant with topicals. We see improvement shortly after initial treatment. For example, I had a woman, skin type II, with it on the ear. I used the 6mm spot at level six, four passes. A week after her first treatment there's barely anything left.

Dr. Chilukuri: I like the laser for bruising. I generally use IPL with a cutoff filter between 650 and 710nm for skin types I through IV, but with SOC you have to turn down the fluence so low we don't get good results. I saw Dr. Michael Gold using the laser at one of the live injection courses. It does take two to three treatment sessions rather than one or two for other devices, but it's not just for bruising from toxins or fillers, but from running into something or falling down. We can use it all over the body. My treatment pearl is to go ahead and heat it up, do anywhere from three to eight passes, and massage the area in between to improve blood flow and break up hemosiderin.

Dr. Roberts: *The table below summarizes the treatments we recommend for skin of color patients.*

TABLE 1.

Suggested Treatments in Combination With 650-Microsecond 1064nm Laser for Skin of Color Patients

Condition	Treatment Combinations
Melasma	Start hydroquinone (≤6%) and non-hydroquinone blending products at home, follow with Jessner and salicylic acid peels and microdermabrasion, several treatments with 650-microsecond laser (low setting) for stubborn areas (3-4 weeks apart), sun protection.
Acne vulgaris	Start with 650-microsecond laser weekly to clear cystic acne, then biweekly, monthly; patient happy with rapid clearance, then combination topicals; later treatment with 650-microsecond laser for PIH and scarring.
PIH (secondary to acne)	650-microsecond laser for quick clearance, tretinoin before and after 650-microsecond laser.
PIH (secondary to trauma)	650-microsecond laser in combination with chemical peels, test spot to win trust of patient.
PFB	Monthly 650-microsecond laser treatments, lower settings (2-3) if patient wants to keep hair; some passes directly on lesion, one additional pass for hair removal if desired.
Hair removal	Three to six 650-microsecond laser treatments, one month apart; skin of color may require only 3 treatments due to high concentration of melanin in hair.
Skin rejuvenation	Full face with 650-microsecond laser (2-4 passes, more passes for darker areas).
Photodamage (skin types I-III)	For photorejuvenation, use the 650-microsecond laser to promote collagenesis and to improve pigmentation and vascularity; this provides greater power and less discomfort compared to fractional lasers; to replenish epidermis, use a full-field 300-microsecond 2940-nm Er:YAG laser; this combined approach is recommended over the use of a fractional laser alone.

PIH – postinflammatory hyperpigmentation; PFB = pseudofolliculitis barbae.

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CLOSING COMMENTS

Dr. Roberts: *So who should invest in 650-microsecond 1064nm Nd:YAG laser?*

Dr. Burgess: Start with patient population. Those in urban settings or with a very international patient base, as I have, would obviously benefit though I don't think this should be pigeonholed for SOC. It's a laser for all skin types. But if you have a multiethnic demographic, it's definitely the laser for you.

Dr. Campbell-Chambers: Anybody can benefit from this device, but especially for a young doctor just building a practice, you want to use your money wisely. This is an obvious choice. It's versatile, with hardly any maintenance to speak of. It's portable, it's safe, it's effective, it's a no brainer.

Dr. Chilukuri: What this is, essentially, is the power of a larger device in a compact application, with a lot of science behind it. Also, it's important to partner with the laser company. In this case I enjoy the passion these people have, and they respond rapidly to my questions and needs.

Dr. Roberts: *What about user- and patient-friendliness, having safety built into a device or treatment, and not having to depend on numbing or cooling?*

Dr. Saedi: It is important to note that in general, cooling and numbing increase the risk of complications, because we do depend on patient feedback and numbing or cooling allows us to treat beyond patient tolerance, causing injury that may advance beyond the therapeutic level. With cooling we need enough to facilitate treatment but not so much that skin is damaged. With many devices you need full contact in order to have adequate cooling.

Dr. Campbell-Chambers: With lasers, patients are always concerned about the pain, so the confidence of a safe, gentler treatment improves compliance. Needing no consumables reduces the hassle as well as cost of treatment.

Dr. Henry: I notice that patients appreciate the time savings, especially those with treatment experience where they've had to sit with numbing for 15 to 20 minutes, they really enjoy the ease of coming in and out of the office, having the procedure, and getting out in under 20 minutes. That's a strong selling point.

Photo courtesy of Laserderm Clinics, Lagos, Nigeria.

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