

Elite MPX Combines Clinically Proven Wavelengths to Increase Tx Options

By Kevin A. Wilson, Contributing Editor

The dual wavelength Elite MPX aesthetic workstation from Cynosure (Westford, Mass.) combines two clinically proven wavelengths – 755 nm alexandrite and 1064 nm Nd:YAG – using the company's proprietary MultiPlex™ sequencing technology. Offering the next-generation XPL2 intense pulsed light handpiece, integrated air cooling and larger spot sizes, this workstation delivers effective, customizable treatment of unwanted hair, pigmented or vascular lesions and aging skin, with the potential to successfully treat the full range of skin types.

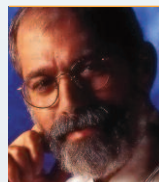
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“Blending the wavelengths will enable us to deliver more energy safely, efficiently and effectively by allowing us to optimize the delivery of thermal energy based on the individual skin type.”

According to Eric F. Bernstein, M.D., medical director of the Center for Cosmetic Laser Surgery in Ardmore, Penn., the marriage of these two workhorse wavelengths has been a long time coming. “We’ve been using 755 nm alexandrite and 1064 nm Nd:YAG for these indications for quite some time now. The alexandrite is powerful. It is well-absorbed by melanin, which translates into potential side effects in darker skinned patients. Therefore, we use the longer Nd:YAG wavelength for that subset. By blending these wavelengths we may achieve fine tuning of laser treatments for various skin types.”



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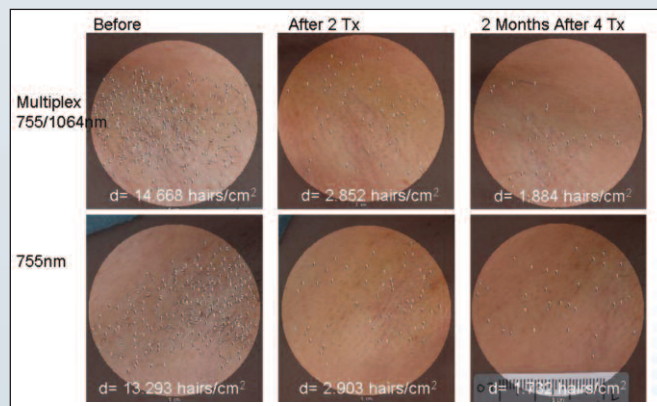
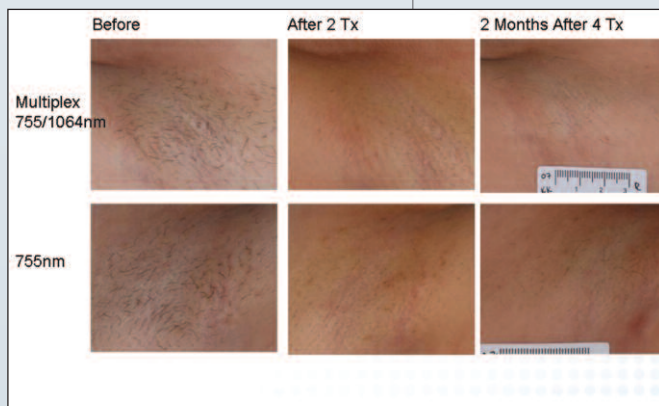


Emil A. Tanghetti, M.D.
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Emil A. Tanghetti, M.D., clinical professor of dermatology at the University of California, Davis (Davis, Calif.) and director of The Center for Dermatology and Laser Surgery (Sacramento, Calif.) agreed with Dr. Bernstein. “The alexandrite laser is the hair removal powerhouse,” he said.

“When we use Nd:YAG on darker skinned patients we avoid the associated problems, but the increased penetration can be very painful. Blending the wavelengths will enable us to deliver more energy safely, efficiently and effectively by allowing us to optimize the delivery of thermal energy based on the individual skin type. This makes the treatment more tolerable.”

The variety of parameters one can adjust to tailor treatment to the patient’s unique skin profile is fairly extensive, Dr. Bernstein further explained. “With Elite MPX you can titrate the maximum fluences you wish to use, adjust the pulse durations and choose continuous pulse or single pulse repetition rates. You can also decide which wavelength to deliver first, or you can use either wavelength by itself.” Seven spot sizes are available on the included handpieces, ranging from 3 mm to 18 mm in diameter and an optional 1.5 mm spot handpiece is available for finesse work.



Photos courtesy of Eric F. Bernstein, M.D.

“This technology has already proven useful for veins where the shorter wavelength changes the chromophore to optimize treatment by the longer wavelength, with cooling between multiplexed pulses.”

Elite MPX also features SmartCool, Cynosure’s integrated air cooling system. “In my experience, integrated cooling just works better,” Dr. Bernstein said. “In addition to saving space, which is always at a premium, the cooling turns itself on and off, so it’s one less thing to deal with.”

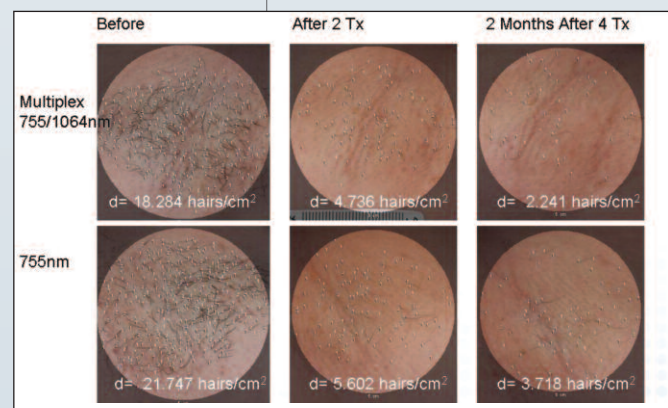
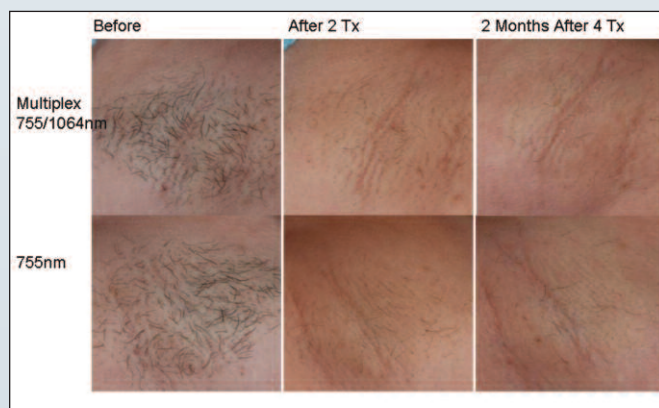
While the experts agree that removal of unwanted hair is among the most popular and lucrative indications to treat with Elite MPX, the benefits of MultiPlex technology go far beyond hair removal. When treating vascular lesions, the 755 nm alexandrite laser converts oxy-hemoglobin to methemoglobin in the targeted blood vessel to increase the absorption of the 1064 nm Nd:YAG wavelength by 300% to 500%, for optimized results. The wavelengths can also be combined to treat pigmented lesions and photo-aged skin. The MultiPlex technology enhances treatment to provide powerful rejuvenation effects with less total fluence due to the combined delivery system.

Editor’s Note: In the following clinical roundtable, four top physicians share their knowledge, clinical expertise and insight with alexandrite and Nd:YAG wavelengths while discussing treatment with Elite MPX from Cynosure. Collectively, these physicians have dozens of years of experience using laser and light-based therapies for the full spectrum of aesthetic medical applications.

[Please explain the concept of MultiPlex technology. What is it, how does it work and what advantages does it bring?](#)

Eric F. Bernstein, M.D. – MultiPlex technology is Cynosure’s wavelength blending system which fires one wavelength then the other, in sequence. It offers a substantial range of settings to manage delivery of energy from the 755 nm and 1064 nm wavelengths and control over which wavelength fires first. This technology has already proven useful for veins where the shorter wavelength changes the chromophore to optimize treatment by the longer wavelength, with cooling between multiplexed pulses.

Emil A. Tanghetti, M.D. – MultiPlex technology is going to be especially important in hair removal. Epidermal absorption of energy from the alexandrite laser is a problem for darker skin types, but it is an ideal wavelength for hair removal. By blending



Photos courtesy of Eric F. Bernstein, M.D.

“Alexandrite and Nd:YAG are workhorse wavelengths that we depend on and use all the time to remove hair, treat pigmented and vascular lesions and provide skin rejuvenation.”

alexandrite with Nd:YAG in a darker skinned patient, you can use portions of each of these wavelengths to maximize energy delivery, in effect allowing us to deliver more of the appropriate energy in a proportion the patient can tolerate.

Jay M. Kulkin, M.D. – For melanin, the absorption co-efficient of the alexandrite laser is eight to nine times greater than that of the Nd:YAG laser. From another perspective, we can say that every joule of energy from the 755 nm laser is equal to about three joules of energy from the 1064 nm laser in terms of the effective heat that is delivered. Used properly, MultiPlex technology allows us to take advantage of the physics of the alexandrite wavelength at safe levels. We are able to distribute more energy in a shorter time frame, while still delivering energy with the Nd:YAG, to destroy the hair follicle and protect the skin. The challenge is that we need to figure out how to best achieve this.



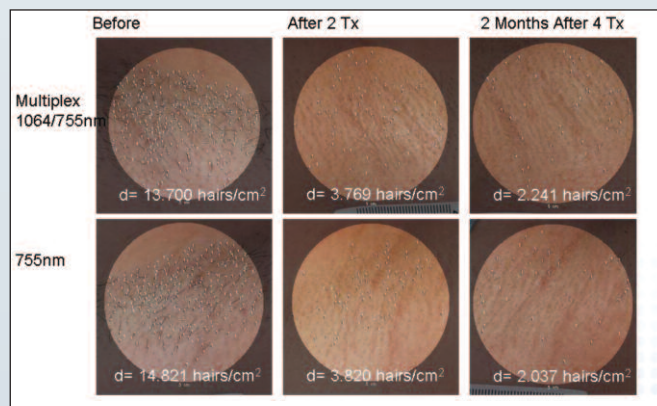
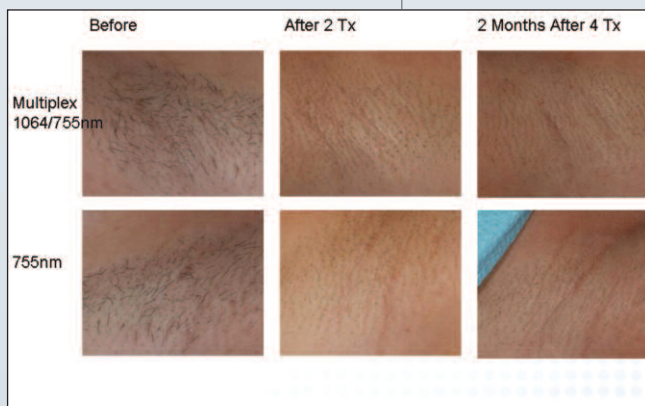
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Eliot F. Battle, Jr., M.D.
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Eliot F. Battle, Jr., M.D. – Any clinician with a research background should be very eager to explore the possibilities with this device. Both alexandrite and Nd:YAG are workhorse wavelengths that we depend on and use all the time to remove hair, treat pigmented and vascular lesions and provide skin rejuvenation.

Having a device that allows us to couple and blend these wavelengths is exciting. The possibilities are endless; you can change the order of delivery and the percentage of energy between them. Furthermore, you can independently control each wavelength's fluence and pulse duration. Since each wavelength offers a different depth of penetration and different chromophore absorption co-efficient there is a lot of experimenting to be done, but one can easily observe the potential and why this device is so exciting, with or without the MPX mode.



Photos courtesy of Eric F. Bernstein, M.D.

“We’ve come a long way with being able to safely and effectively treat skin of color. Color is just one factor to consider. Ethnicity and genetic factors play a big role as well.”

Briefly explain what the Elite MPX enables physicians to achieve.

Dr. Tanghetti – Ultimately, it is very practical. Elite MPX gives us two important wavelengths in a single platform; that alone is a value. Moreover, the 755 nm alexandrite and 1064 nm Nd:YAG wavelengths represent the extremes; you have alexandrite for lighter skinned patients and Nd:YAG for darker skin. These wavelengths aren’t ideally suited for too many people. However, most patients could use a combination of the two, depending on their unique skin profile. Elite MPX allows us to do that in a very useful way.

Dr. Kulkin – Elite MPX should allow us to blend a little alexandrite into the mix of laser energy when treating patients, regardless of skin or hair color. We have to stay theoretical with that sort of statement because there is so much unexplored ground right now, so much to learn. The blending of alexandrite and Nd:YAG lasers for different skin and hair types should maximize safety for a more successful treatment.

Dr. Battle – Being able to combine the wavelengths in MPX mode is going to give us even more options when treating the more difficult cases. For example, hair stimulation has always been a concern when performing laser hair removal, particularly in patients with Mediterranean skin types in the range of III to V. We can observe hair stimulation not just at the treatment site but peripherally and outside the treatment site. In attempting to eliminate hair stimulation we’ve tried a variety of options including utilizing different wavelengths, pulse durations and other treatment parameters, but we haven’t come up with a consistent solution yet. The MPX mode of coupling alexandrite with Nd:YAG might be the “holy grail” we are looking for in treating this difficult condition.

What skin types do you see / treat on a regular basis in your practice?

Dr. Battle – In Washington D.C. we see all skin types, a full range of ethnicities and skin colors, people of various backgrounds from all over the world. In my practice about 75% of my patient base is skin of color. We perform a wide variety of cosmetic and laser treatments for various indications in these patients with great success. The more ammunition I have, the more options I have to choose from. I feel I have a distinct advantage with this technology at my disposal.

Dr. Kulkin – In my Georgia-based practice we see a lot of ethnic skin types, but I treat patients from all over the world, so I see a very broad spectrum of skin colors and ethnicity blends. It’s interesting to see how differently various people respond to treatment based on their lineage. With Elite MPX we have the advantage of MultiPlex mode.

Dr. Bernstein – Being in a suburb of Philadelphia, I have a very mixed demographic so I treat all skin types. It’s fairly evenly distributed.

Dr. Tanghetti – I’m in California so I see all skin types in my practice. I treat a wide spectrum of black, Hispanic, East Indian and many mixed-race individuals.

What, if any, are the special challenges involved when treating skin types IV to VI for hair removal, skin rejuvenation, vascular or pigmented lesions, or any other indication Elite MPX might treat? How might MPX address these issues?

Dr. Battle – We’ve come a long way with being able to safely and effectively treat skin of color. Color is just one factor to consider. Ethnicity and genetic factors play a big role as well. Some patients with darker skin seem to tolerate shorter wavelengths better than others, for example. For hair removal, the tools we currently have are effective at treating



Pseudofolliculitis Barbae before Tx



After eight Elite MPX treatments

Photos courtesy of Jay M. Kulkin, M.D., M.B.A., F.A.C.O.G.

“There’s no denying that expanding your patient base is a great way to survive bad times. You want the ability to treat as many different people as possible, and Elite MPX gives you that, no question about it. ”

coarse, dark hair in patients with skin of color. We still need better tools to effectively treat thinner and lighter hair, but by the fourth or fifth treatment all hair, regardless of how coarse it was originally, has become thinner and lighter. The Nd:YAG laser needs a pigmented, coarse target to be most effective; when hair is lighter or thinner we lose efficacy. By blending in a little alexandrite we may be able to attack that target more effectively and improve efficacy over an individual’s treatment series.

Also, recent studies have shown that by safely preheating the skin we may be able to treat more effectively, so adding the alexandrite laser before might also promote these results and allow use of less energy. We must be protective and conservative as we investigate this device and perform research in treating skin of color with the alexandrite. The alexandrite wavelength loves pigment, and if we use too high of fluence we can create unwanted side effects. There is a fluence level at which skin of color can safely tolerate the alexandrite wavelength. If we can find the proper dosages, Elite MPX will make it possible to add low fluence alexandrite to the gold standard Nd:YAG wavelength. Jump starting with the alexandrite and following up with traditional Nd:YAG might create some very effective results.

For skin rejuvenation the microsecond Nd:YAG mode is a very safe and effective way to perform treatments on darker skin. The Elite MPX allows us to treat with these parameters. I don’t treat vascular lesions with lasers in skin of color. For pigmented lesions I use microsecond Nd:YAG, fractional and KTP lasers with spot sizes smaller than the actual lesion to minimize the chance of affecting the surrounding skin. In the microsecond Nd:YAG mode I can gradually lighten dark spots, post-inflammatory hyperpigmentation, melasma and dark patches.

Dr. Bernstein – When you’re talking hair removal, the melanin in the skin is the same melanin as is in the hair, which begs the question: if you turn to the 1064 nm wavelength to treat darker skin and avoid melanin, how is the melanin in the hair going to be targeted while at the same time avoiding melanin in the epidermis? This seems like a paradox on the surface, but in hair, melanin is packaged differently than it is in skin; it’s arranged differently and more densely packed in the hair shaft than in the epidermis. The 1064 nm wavelength targets melanin in hair while melanin in skin is less affected. Seemingly there’s a paradoxical benefit of using 1064 for hair in darker skin types because the laser energy will still be absorbed sufficiently by the hair shaft.

Dr. Kulkin – I’ve done more than 30,000 procedures on ethnic skin types without problems. We see mixed ethnicities every day, and we might be able to tell a lot about a person’s ethnic background by watching how their hair on a particular body part responds to the Nd:YAG laser, for example. Skin is different between individuals and body parts at different times of the year. The YAG is safer for darker skin. In lighter skin the Nd:YAG doesn’t get the job done, despite being FDA approved for lighter skin. Since the alexandrite is so good at destroying hair, it’s advantageous to harness that power for everyone in some way.

[What does the ability to treat darker skin types bring to the table in the current landscape of aesthetic medicine, especially in the face of the recent economic downturn?](#)

Dr. Bernstein – There’s no denying that expanding your patient base is a great way to survive bad times. You want the ability to treat as many different people as possible, and Elite MPX gives you that, no question about it.

"I am impressed by the science and engineering that went into this device. Cynosure did a great job of integrating the air cooling and making a fairly complex device easy-to-use."

Dr. Tanghetti – If you look at the demographics of many urban populations in the U.S., maybe 30% to 35% are Caucasian and the rest are other ethnicities. Darker skinned people have hair issues, too, and it can only benefit us to be able to treat them successfully. Economic downturn or not, hair removal remains a popular indication. Unwanted hair is important to a lot of people, especially women. For many it's a convenience issue as well as an aesthetic issue. Now, we have one device that allows us to treat darker skin, as well as lighter skin, which was not easily achievable before.

Dr. Battle – I recently came across a survey that showed that during the recession, the only segment of the patient population in aesthetic medicine that actually grew was patients with skin of color. Focusing primarily on this segment in ways some other practices may not have been able to, has made my practice recession-proof. This population sees the same commercials, reads the same magazines, and wants the same treatment opportunities. Patients of color who seek out these services are either turned away because the practice cannot treat them, or they receive substandard or even unsafe treatment. In almost every major city in the U.S., the skin of color population is the majority and will only become more so.

Dr. Kulkin – We definitely have to realize that the landscape has certainly changed in the country over the past fifteen to twenty years. We are clearly a global population and the demand for laser procedures for people with ethnic or darker skin continues to escalate. Having a laser that allows us to meet the needs of this varied population and developing expertise with the wavelengths to meet the unique demands of this diverse patient base is critical and serves us well every day.

[What other advantages do you feel the Elite MPX brings to a practice? How might the other features of the device make Elite MPX more attractive to physicians?](#)

Dr. Bernstein – I am impressed by the science and engineering that went into this device. They had to answer some difficult questions to make this work. Cynosure did a great job of integrating the air cooling and making a fairly complex device easy-to-use. It's the kind of thing one might not appreciate if they haven't had experience with older generation laser technology.

Dr. Kulkin – Overall I think you can treat more rapidly with Elite MPX, which is a huge advantage. By combining a variety of spot sizes, integrated air cooling, and a variety of pulse widths at great speed, especially with single-wavelength use, I can do a back in 30 minutes or legs in 30 to 45 minutes. The device is very efficient. From a design point of view, it's critical to have the cooling unit built in. Air cooling is consistent and persistent throughout treatment, not just before the pulse as with contact cooling. I also like the Windows XP interface which will allow for even better service from remote locations.

Dr. Tanghetti – The graphical user interface is very sophisticated and allows us to control a wide variety of parameters, but is in fact very easy-to-use. Also, it's Windows-based, so there's a lot of room for expansion as Cynosure continues to develop new and interesting add-ons for the platform. It would be premature of me to speculate about that further, of course, but it's definitely a plus. Cooling is essential to many laser treatments, so having the integrated air cooling is helpful as well.



Pseudofolliculitis Barbae before Tx



After eight Elite MPX treatments

Photos courtesy of Jay M. Kulkin, M.D., M.B.A., F.A.C.O.G.

“Elite MPX offers the most versatility, effectiveness and potential of any of the laser systems out there.”

What do you see in the future for Elite MPX?

Dr. Bernstein – I think that in the future we’ll see just how many ways MultiPlex technology can be used. This technology is obviously very useful but it really hasn’t been around long, so as we move forward more of its capabilities will become apparent.

Dr. Kulkin – To me the future is in exploring the additional capabilities of this extraordinary device. We need more experience and we’re going to get it. We’re going to learn how to blend for better hair removal but also for vascular lesions and possibly even things like rosacea. For a laser facial, we are able to deliver 10 Hz, which is very fast. Some physicians use that for skin rejuvenation, but in my experience and based on patient feedback, it’s a top treatment for rosacea when compared to anything else out there. The sky’s the limit.

Dr. Battle – We must learn how to tailor each treatment to the uniqueness of the patient. Variety among skin types is extensive; this is true amongst patients of color as well as Caucasians. We are finding that ethnic and genetic background plays a much larger role in the way skin reacts to treatment than just the skin color we see. In the future, we as a community will be taking into account skin type, ethnicity, scar and tanning history, as well as a variety of other genetic and physical factors. We’re going to have to learn how to customize treatment based on these factors at some point, and having a device like Elite MPX at our disposal will help us do that.

Dr. Tanghetti – I don’t want to over speculate, but I think there is still a lot of room to expand the capabilities of Elite MPX because of the Windows-based software package. I’d like to see some sort of temperature sensor which might tell me when I’m overheating skin or something that might help judge skin color for safer and more effective management of treatment parameters.

What final thoughts do you have for physicians considering the Elite MPX laser?

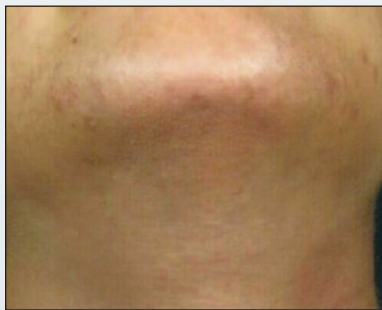
Dr. Kulkin – I think that for the money, Elite MPX offers the most versatility, effectiveness and potential of any of the laser systems out there. Its safety profile is extraordinary because of the air cooling and wavelength blending capabilities. Being able to use the individual wavelengths is crucial because that’s the starting point for any beginner. I can treat any patient, of any skin type with this laser platform, whether they’ve come in for hair removal, pigmented lesions, or veins, and it’s very user-friendly on top of that.

Dr. Tanghetti – I think it’s important to note that the simple combination of two wavelengths in a single platform is in itself a nice advantage that shouldn’t be overlooked. When you add in the benefit of combining the wavelengths in a single treatment session with MultiPlex technology, it is an entirely new ballgame. I love being able to choose; to tailor treatments to my own skill set and comfort level, as well as to patient needs. As such, this device will appeal to both the novice and the seasoned laser physician.

Dr. Battle – It’s no secret among experts that combining wavelengths and different cosmetic modalities often achieves better results than using any single modality. The Elite MPX does exactly that, and with the various, adjustable parameters, there are a lot of nuances we can eventually harness as we learn more. Even if we don’t use the MPX mode we can still perform the old-fashioned, tried-and-true techniques we all love with the wavelengths we know and trust. Most of us know these lasers well, and now they’re combined in a way that’s never been done before. There’s a tremendous amount of opportunity here to do something very special and I’m excited about its potential.



Pseudofolliculitis Barbae before Tx



After eight Elite MPX treatments

Photos courtesy of Jay M. Kulkin, M.D., M.B.A., F.A.C.O.G.