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Lux1540 Fractional Handpiece Refines Skin Resurfacing

The patented fractional resurfacing capability of the Lux1540 Fractional™ laser handpiece from Palomar Medical Technologies, Inc. (Burlington, Mass.) has greatly improved skin resurfacing, according to clinical researchers. This new handpiece, which is an attachment to the Palomar StarLux® pulsed light and laser system, delivers light in an array of high precision microbeams. These microbeams create narrow, deep columns of tissue coagulation that penetrate through the epidermis and into the dermis, while sparing the tissue surrounding the columns from damage.

“In my opinion, fractional resurfacing has proven to be the gold standard for the treatment of many skin conditions. This includes fine rhytides, acne scars and melasma,” said Vic Narurkar, M.D., a dermatologist in private practice in San Francisco, Calif. “In fact, in my practice, fractional resurfacing has virtually replaced ablative resurfacing because we are achieving consistent results, without all the risks associated with ablative procedures, assuming there is proper patient selection.”

The Lux1540 handpiece easily integrates with the other elements of the StarLux platform. “This includes the LuxG™ green light handpiece, which has been my workhorse for performing photorejuvenation,” noted Dr. Narurkar, who often schedules blending treatments. For instance, he may use the green handpiece on telangiectasis or lentigines, then use the Lux1540 handpiece for rhytides.

Dr. Narurkar is currently involved in clinical trials assessing the efficacy of the Lux1540 handpiece in combination with the LuxG handpiece. “If someone has more superficial damage, such as telangiectasis or lentigines, we address that with the LuxG handpiece. But when you need to go deeper for resurfacing or for rhytides or acne scars, you can use the 1540 nm handpiece. We now have a platform that allows us to change handpieces to address the different etiologies.”



Forehead before Tx



Forehead after two Lux1540 Fractional treatments

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When using the Lux1540 handpiece, Dr. Narurkar typically overlaps pulses and performs two to three passes. "I usually do about a 2 cm x 2 cm area, then go on to the next 2 cm x 2 cm area, with a 50% overlap. This is more comfortable to the patient because multiple passes build up heat and discomfort increases. By overlapping, you give the skin a chance to relax before moving on to the other element of the skin."

"I'm most impressed with the ease of application to the patient's skin compared to other fractional devices," said Robert Weiss, M.D., an associate professor of dermatology at Johns Hopkins University School of Medicine in Baltimore, Md. "There is no messy blue dye and most patients can be treated without topical anesthetic. There is also no cost of disposables."

The predictability of an array of microthermal zones rather than an irregular scan is another advantage of the Lux1540 handpiece. "This leads to much less patient discomfort because heat is distributed more evenly," Dr. Weiss said. "There should also be increased efficacy compared to other mid 1500 nm devices."



Robert Weiss, M.D.

Associate Professor of Dermatology
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Dr. Weiss and his associates are conducting a clinical trial for Palomar for treating acne scars and wrinkles with the Lux1540 handpiece. The treatment protocol is the same for both indications: three sessions, one month apart. "For acne scars, we are seeing significant improvement. The improvement in wrinkling has also been significant. Patients are very pleased. The handpiece allows you to treat right up to the lower eyelid for wrinkles under the eye. This is very difficult to accomplish with scanning fractional technology." Dr. Weiss also finds it very easy to do complete coverage of the skin. "You can readily see the treated areas because of the slight redness, so there are no skipped areas."

The Lux1540 handpiece protects the skin by delivering microbeams in individual short pulses, with active contact cooling.

Furthermore, the handpiece features two heads for different treatment approaches. The 10 mm spot size head delivers fluences up to 100 mJ per microbeam (mB) and creates a 100 mB/cm² array of columns for deep coagulation. In contrast, the 15 mm spot size head delivers fluences up to 15 mJ/mB and creates a 320



mB/cm² array of narrow columns for relatively shallow coagulation.

"In the study, we are only using the 10 mm spot," Dr. Weiss explained. "However, we anticipate treatment with the 15 mm spot for patients with more superficial wrinkles or scars. Overall, I think it is remarkable that one platform can offer so many choices. You should be able to treat virtually any cosmetic skin problem. Fractional technology also allows you to treat all skin types, even up to Fitzpatrick skin type VI, and patient discomfort is minimal."

"It's wonderful to be able to treat some cosmetic indications that traditionally I've had to treat with ablative technology," added E. Victor Ross, M.D., director of the Laser and Cosmetic Dermatology Center at Scripps Clinic in San Diego, Calif. "For example, with acne scarring, I previously needed to use an ablative technology or something invasive to end up with any real improvement. There was nothing available that would return the patient back to normal within one or



E. Victor Ross, M.D.

Director of the Laser and Cosmetic Dermatology Center at
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two days." Similarly, when treating wrinkles, "with older technology, the patient might have been down for 5, 7 or 12 days. With the Lux1540 handpiece, the patient is swollen for only one or two days and has minimal downtime."

As of the middle of August, Dr. Ross had treated about 25 patients with the handpiece. "Acne scarring is my primary indication. I schedule four sessions about three to four weeks apart. Patients can expect 30% to 50% improvement in particular types of scars, such as subtle boxcar scars and some small rolling type scars.

Modest scarring responds reasonably well. Results are also fairly predictable in the patients I've treated, which was not the case with other non-ablative technologies like the 1450 nm laser." A full face takes about 45 minutes.

Dr. Ross has also had success in restoring some normal tone and smoothness of the face, as well as the neck, chest and arms. "When you treat off-face, ablative technologies are not very effective. In the past, we've been limited to intense pulsed light (IPL), which is very nice for pigment. But the Lux1540 handpiece can also improve some of the fine textural changes and that crepe paper change on the damaged neck, chest and arms." Treatment for off-face may consist of up to six sessions, spaced about two to three weeks apart. "Most patients require a numbing cream one hour before, which makes treatment much more tolerable. I also think that when using this handpiece for any indication, you should lay down as many pulses as the patient can tolerate. The more aggressive you are, the more robust the results."

On the other hand, the rate of coverage with the 10 mm spot size head is slightly slower than with the 15 mm spot. "But you can actually move faster with the 10 mm spot, so the rate of coverage is not that dissimilar between the two," Dr. Ross said. "The 15 mm

spot penetrates less and is more geared for superficial pigmentation problems, whereas the smaller 10 mm spot penetrates deeper and is probably better for acne scars and wrinkles."

Stanley Kovak, M.D., who practices cosmetic medicine in the Chicago area, noted that the 1540 nm wavelength "has been shown to allow good penetration and heats up water well, so you can create an injury pattern in the dermis, thereby causing collagen to build up in the area that has been injured." Dr. Kovak has recently switched from an older fractional technology, since the Lux1540 allows him to denature deeper tissue with higher fluence for wrinkles and acne scars.

As with Dr. Ross, acne scarring is Dr. Kovak's most popular indication to treat with the Lux1540 handpiece. "We typically schedule four to six sessions, depending on the severity of the acne scars, at about two week intervals. Often, we see at least 50% improvement at three to four months after completion of a series." For any indication, Dr. Kovak prefers to treat with a 40% to 50% overlap. "I treat small sections at a time, such as a 5 - 6 cm² area. By doing a small section at a time, we're able to sort of circumvent the fact that edema causes less penetration of the wavelength."

The StarLux pulsed light and laser system also offers pulsed light and laser handpieces for such applications as permanent hair reduction, photofacials for pigmented and vascular lesions, skin tightening through soft tissue coagulation, leg vein treatment and acne clearance. "We combine treatments," Dr. Kovak said. "For instance, we'll first treat telangiectasis or erythema or even lentiginos with IPL, followed by the Lux1540 handpiece for wrinkles."

"There is a lot of confusion about what fractional resurfacing really involves," concluded Dr. Narurkar, an assistant clinical professor of dermatology at the University of California, Davis. "You really need to be in the mid-infrared wavelength range – between about 1500 nm and 1800 nm – to truly perform fractional resurfacing. Wavelengths of the CO₂ or the erbium 2940 laser are too superficial and do not address what we are trying to achieve, which is dermal remodeling of collagen. These other lasers do not penetrate deep enough. The 1540 nm wavelength is ideal for fractional resurfacing because it penetrates to the appropriate depth." ■

Editor's Note: *The Palomar Lux1540 Fractional Handpiece is FDA cleared for soft tissue coagulation. A 510k application has been submitted to the FDA for skin resurfacing.*



Lux1540
Fractional
treatment