

# Fractional CO<sub>2</sub> laser exceeds expectations

*Treatment yields impressive results with less downtime, fewer side effects*

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**Grapevine, Texas** — A new fractional CO<sub>2</sub> laser with a nonsequential fixed-array scanning mode appears to provide noticeably better results than other fractional skin resurfacing technologies, according to a researcher.

In the pilot study, researchers gave 10 patients with superficial rhytids a single treatment with the device (ActiveFX, Lumenis). Patients were given a 30-minute application of topical anesthetic (lidocaine, tetracaine, betacaine) before treatment.

Treatment parameters included a 1.3 mm spot size delivered over square pattern for a total of 30 microthermal zones (MTZ) per cm<sup>2</sup> at a fluence of 80 mJ/cm<sup>2</sup>, says Robert A. Weiss, M.D., associate professor, department of dermatology, Johns Hopkins University School of Medicine and the study's lead researcher.

**“With ablative CO<sub>2</sub> resurfacing patients also experience weeping and oozing for two to three days,”** Dr. Weiss says, versus none with the fractional CO<sub>2</sub> device.

— Robert A. Weiss, M.D.  
Johns Hopkins University

Investigators also applied forced-air cooling during treatment and followed patients for three months thereafter, making note of side effects including pain and erythema.

To evaluate results, a blinded observer analyzed digital images (Omnia, Canfield) taken at baseline and one week, one month and three months post-treatment, applying a four-point scale.

On this quartile scale, patients' median improvement one month after treatment was three (out of four), corresponding with 50 percent to 75 percent improvement in rhytids, Dr. Weiss tells **Dermatology Times**.

While no patients scored four (75 percent to 100 percent improvement), he says, “This is still significant compared to other fractional devices that we've used, where typically the median is around two, or the average improvement score is approximately 1.75.”

While patients treated with other fractional technologies typically achieve 25 percent to 50 percent improvement, the fractional CO<sub>2</sub> laser's performance was “a noticeable notch above.”

## Comparative side effects

All patients, furthermore, rated their skin as improved after treatment, he says.

Regarding side effects, Dr. Weiss says researchers observed mild pinpoint crusting, and patients reported minimal pain.

“The nice thing with this device is that we had three to five days of downtime, or significant enough erythema that it would



## Quick READ

**A new fractional CO<sub>2</sub> laser** provides impressive results with less downtime and fewer side effects than conventional ablative resurfacing, an expert says.

inhibit normal social interaction without heavy makeup,” he says.

Conversely, he says that with ablative CO<sub>2</sub> resurfacing, this period lasts about two weeks and patients face other side effects.

“With ablative CO<sub>2</sub> resurfacing patients also experience weeping and oozing for two to three days,” Dr. Weiss says, versus none with the fractional CO<sub>2</sub> device, which is approved by the Food and Drug Administration for skin resurfacing.

Additionally, he says ablative CO<sub>2</sub> resurfacing can create immediate postinflammatory hyperpigmentation (PIH) and perhaps longer-term hypopigmentation.

However, “We've observed none of this” with the fractional CO<sub>2</sub> laser.

Though the device leaves a dot pattern visible on patients' skin immediately after treatment, says Dr. Weiss, “Once one hydrates the skin, those dots are minimized.”

The key to the fractional treatment's performance is its use of nonsequential scanning, he says.

Scanning adjacent dot patterns creates heat buildup due to the lateral spread of heat, Dr. Weiss says.

However, he says, because the device's computer control delivers energy in a fairly scattered nonsequential pattern, "That provides enough time for thermal relaxation around each fractional site."

Results include reduced pain and reduced risk of side effects, he says.

The treatment actually leaves about 1 mm of space between each 1.3 mm spot, he says.

With that spot size, Dr. Weiss says, "There is collateral damage of about 30 microns" per spot.

"So it turns out, with that scan density,

that one is actually treating 70 percent of the skin versus 100 percent," which accounts for the treatment's increased efficacy and reduced side effects compared to ablative laser resurfacing, he says.

Dr. Weiss and his colleagues have been able to follow patients for six months post-treatment, and there have been no side effects.

#### **Pre-testing beliefs**

Before the test, Dr. Weiss says, "I was pretty skeptical. I didn't think the device would work as well as it did."

While typical fractional devices treat down to a level of 700 microns, he says, "This penetrates 200 microns at the most. So, it's obviously not all about treatment depth, because we're getting more skin tightening here with one treatment than we do with the mid-range fractional devices."

"There are **new variations of this treatment** that are currently being investigated."

— Robert A. Weiss, M.D.  
Johns Hopkins University

At press time, Dr. Weiss and his colleagues were looking at fractional CO<sub>2</sub> resurfacing regimens involving two to three treatments. **DT**

**Disclosure:** Dr. Weiss received a research grant and equipment discount from Lumenis for this study. He serves on the company's medical advisory board.

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