

# Fractional CO<sub>2</sub> Therapy Combats Aging Skin With Minimal Risk and Downtime

By Kevin A. Wilson

Reducing the aged appearance, especially in the face, is perhaps the most sought-after cosmetic treatment. "Aging skin is characterized by stretching, sagging and loss of elasticity, pigmentary alterations, and disorganization of collagen bundles which causes wrinkling," says Thomas T. Jeneby, M.D., board-certified plastic surgeon and Medical Director of The Plastic & Cosmetic Center of South Texas. "Smoking and exposure to solar radiation exacerbate these processes."

Noticeable and even dramatic results are possible with modern procedures, the most effective and well-known of which is facelift surgery. For skin tightening, the gold standard has long been ablative CO<sub>2</sub> laser resurfacing, in which a thin layer of epithelial tissue is vaporized with a CO<sub>2</sub> laser, causing collateral thermal damage to deeper tissues. The natural healing process creates healthier, younger-looking skin.

Simply put, the downside of cold steel surgical and ablative laser techniques is that they ask a lot of the patient. Post-procedure care is extensive, discomfort during recovery is unavoidable, and downtime is lengthy. Risk of complications such as infection or scarring is significant. A 2005 survey by the American Society for Aesthetic Plastic Surgery<sup>1</sup> documented reductions in some surgical aesthetic procedures, with concurrent increases in the number of patients undergoing nonsurgical procedures. "The patient is always looking for miracles with no pain or downtime," says Deborah S. Sarnoff, M.D., Associate Clinical Professor of Dermatology at New York University Medical School. Dr. Sarnoff is in private practice in Manhattan and Long Island.

Also, the past decade has seen aesthetic medicine become more accessible to the average person, which has positively influenced public perception. "Now more than ever, we see women from two income families coming in," Dr. Sarnoff con-



tinued. "For someone who works, taking three or more weeks off isn't appealing, even if they expect remarkable results."

In response, the number of safer, less invasive modalities with low risk and downtime has skyrocketed, but at the expense of efficacy. "Nothing replaces a facelift," explained Dr. Jeneby. "And deep thermal damage is required to promote sufficient reorganization of collagen to create the tightening seen with ablative techniques."

The development of fractional photothermolysis,<sup>2</sup> which uses proprietary scanner technology to create patterns of microscopic subsurface wounds with an erbium-doped glass fiber laser, was a landmark in aesthetic medicine. By preserving barrier function as well as surrounding tissue, re-epithelialization is rapid and downtime is minimal. "The downside of using the erbium laser is that it causes less thermal damage than the CO<sub>2</sub>," said Dr. Jeneby. "This was a plus because it speeds healing, but it limits efficacy."

Fractional CO<sub>2</sub> resurfacing, a new modality, combines the safety and low downtime of fractional techniques with

the efficacy of ablative methods. Optical scanner technology creates patterns of microscopic ablative wounds over the treatment area with a CO<sub>2</sub> laser at a depth and power sufficient to cause visible skin tightening during the natural healing process. Because the surrounding tissue is spared, re-epithelialization is rapid and downtime is minimal. Fractional CO<sub>2</sub> resurfacing has been shown to stimulate the wound healing response, promote neocollagenesis and create a tightening effect.<sup>3</sup>

The SmartXide DOT™ Laser (DEKA), a fractional CO<sub>2</sub> device, allows practitioners to perform fractional CO<sub>2</sub> resurfacing safely, easily and quickly. Treatment with the SmartXide DOT™ is called Dermal Optical Thermalolysis, or DOT Therapy.™ "People love the results, even on lower settings," said Dr. Sarnoff. "In a week, temporary edema gives the skin a glow that attracts compliments. Collagen reorganization takes a few more weeks. It doesn't completely erase wrinkles or replace a facelift, but it does a great job quickly and safely, even with a single

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treatment. For the usual mix of wrinkles, fine lines, crêpe-like neck, loose skin, and mottled pigmentation, it's my treatment of choice."

According to Dr. Sarnoff, patients receive topical anesthetic for 30 minutes, without occlusion, followed by a thorough cleansing. During treatment, patients will wear goggles or, if the eyelids are to be treated, orbital shields. Treatment typically requires only a single pass but more can be layered, or "stacked," on tougher areas. "Average treatment time with the device itself is less than 15 minutes, and downtime will be anywhere from three to seven days, depending on the treatment settings, which are quite flexible," she said.

Flexibility is a key feature of the SmartXide DOT.<sup>™</sup> "You can adjust DOT pattern density to treat at differing degrees of aggressiveness," said Dr. Sarnoff. "Adjusting the energy level (up to 30 watts) would help you treat dyschromia, for example. Changing dwell time controls the depth of the wounds. This lets you treat other areas of the body such as the décolletage or the back of the hand, which typically don't heal as well. You can even flip a switch and go fully ablative." Aggressive parameters enhance efficacy. Conservative settings reduce downtime. "You may also switch to a pen-shaped handpiece to do work freehand," she added.

The shape and depth of the wounds created by the laser set the SmartXide DOT<sup>™</sup> apart from competitors. Optimal ablative thermal damage is created in a deep, rounded cone 350 µm wide. Competing systems may create deeper wounds that cause unnecessary pain and edema, and are too narrow to effectively stimulate neocollagenesis; or saucer-shaped wounds that are too shallow and wide, leaving little undamaged tissue and increasing healing times (Figure 1).

DOT Therapy<sup>™</sup> is also useful for other indications, such as acne scars, for which the pen-like handpiece is especially handy. "I'll go freehand to sculpt the periphery of the scar before using the scanner handpiece for the full face," Dr. Sarnoff said. "It's a dynamite combination. I also like to

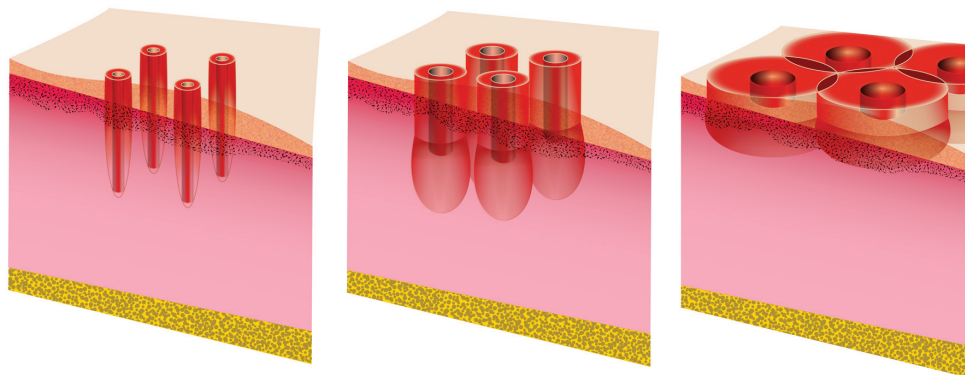


Figure 1: Wound shapes from fractional CO<sub>2</sub> resurfacing devices. Some devices create deep wounds that cause unnecessary pain and edema but not enough collateral damage (left), and some lay down patterns of shallower, wider wounds that leave less undamaged epithelium and increase healing times (right). The SmartXide DOT<sup>™</sup> creates wounds deep enough to promote neocollagenesis and narrow enough to allow rapid healing (center).

combine treatment with other things such as dermal fillers."

"Whether it's aging skin, acne scars, melasma from birth control pills, or sun damage, anyone from their late thirties to sixties with wrinkles, spots, or acne is an ideal candidate for DOT Therapy<sup>™</sup> as long as their skin isn't too dark and they don't smoke," said Dr. Jeneby. Because smoking inhibits healing, Dr. Jeneby performs a urine dip test before and one week after treatment.

The SmartXide DOT<sup>™</sup> laser device is distributed by EclipseMed, Ltd. in the U.S. Learn more at [www.dottherapy.com](http://www.dottherapy.com). ♦

#### REFERENCES

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