

# EVOLUTION OF SCAR TREATMENTS

The emotional impact of scarring continues to drive innovators to find safer, more effective treatments to smooth damaged skin.

*By Judy Kirkwood*

**In 2016**, Bio-Oil commissioned a survey on the impact of scars. One in 10 of the 1,000 respondents said that they feel isolated as a result of their scars, and 42 percent said that their scars affect their everyday mental health. The psychological impact of scarring is not new, as evidenced by the long history of scar treatments.





"Treatment for reducing scars has been around since Cleopatra," says Mitchel P. Goldman, MD, medical director of Cosmetic Laser Dermatology and West Dermatology in San Diego, and clinical volunteer professor of dermatology at the University of California, San Diego. Egyptians used different types of acids as well as sandpaper to resurface skin and smooth scars. Fortunately, we now have more effective treatment options, but they still rely on the same basic principal of resurfacing the skin to stimulate new collagen.

### FROM PEELS TO LASERS

The first "modern" advances in scar treatment came about as a result of World War I when a German-American dermatologist named Max Jessner invented a chemical peel to soften soldiers' gunpowder burn scars. Jessner peels are still used to smooth skin 100 years later, but not everyone is a candidate for a Jessner peel, which can create post-inflammatory hyperpigmentation (PIH), particularly in darker skin types.

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In the 1950s, dermabrasion became popular in the treatment of acne scars. "Dermabrasion for acne consisted of a diamond-studded wire brush that would scrape off skin," says Dr. Goldman. "It was a bloody, painful procedure with a number of potential complications, such as loss of skin pigment and the creation of new scars."

Today, lasers have become the go-to treatment tools for acne, surgical and traumatic scars. "Laser technology offers a better range of treatments," says Dr. Goldman. "I can't totally remove a scar, but I can make it 50 to 75 percent better."





Combination laser treatments can reduce discoloration, remove scar tissue and stimulate new collagen production for dramatic improvement in scarring.

### SOFTENING BURN SCARS

"We are so lucky here in the U.S. to have the equipment that we do," says Jill Waibel, MD, medical director of the Miami Dermatology and Laser Institute, and clinical volunteer assistant professor at the University of Miami. "Laser treatment of scars has been a huge innovation since fractional lasers came out. In 2004, I was the first person that I know of to use the Deep FX fractional ablative CO<sub>2</sub> laser by Lumenis on a burn patient. The more times you treat the skin, the better it gets. You can see 70 to 80 percent improvement, which is life-changing."

of the Dermatology and Laser Surgery Center in Houston and clinical assistant professor at the department of dermatology, University of Texas Medical School and Weill Cornell Medical College.

Newer technologies can transform the lives of patients with old burn scars as well. One of Dr. Waibel's most memorable patients is Kim Phuc, "the napalm girl" from the iconic Pulitzer Prize-winning photo that shocked the world during the Vietnam War era. Phuc came to Dr. Waibel's practice in October 2015 for the first of nine pro-bono treatments. At age 52, she was still in constant pain from her wounds, which had melted her flesh and muscles to her bones. She also had itching, as well as some impaired mobility.

Over the course of two years, Dr. Waibel used a combination of ablative and vascular lasers to treat Phuc. "Her pain intensity went from a level 10 to a 3," says Dr. Waibel. "The itching abated, and she recovered more motion in her arm. In addition, sensitive nerves near the surface of her skin that had been damaged regenerated so she is now more receptive to touch in those areas."

Because scars vary from patient to patient and, in some cases, from one centimeter to the next, Dr. Waibel advocates for a customized approach broken up into what she describes as "courses." "I have an IPL and vascular lasers to take away the red or brown color of a scar—that's the appetizer; fractional ablative CO<sub>2</sub> lasers or Er:YAG lasers for

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Today Dr. Waibel has more than 60 lasers in her practice. "They have changed the world of scars and given hope to patients whose skin has been disfigured," she says. "In addition to smoothing out the skin, we can improve range of motion, pain, burning and itching."

In the past, the standard of care for burn scars was to wait a year for the scar to "mature." Based on research led by Dr. Waibel, it is now recommended to begin treatment as soon as skin grafts and donor sites are healed, which is usually about three months post-injury. "There has been a paradigm shift to initiating earlier treatment of scars than in years past," says Paul M. Friedman, MD, medical director

the main course of removing scar columns and generating collagen; and laser-assisted delivery of drugs to minimize and control scarring from continuing to grow for dessert," she says.

The drugs she delivers with the help of her ablative lasers vary based on the type of scar. "Some of these drugs include Triamcinolone Acetonide and 5-Fluorouracil used for hypertrophic scars; Poly-L-Lactic Acid which can be used for atrophic scars; Bimatoprost 0.03% topical solution for hypopigmented scars; and botulinumtoxinA, which is an emerging laser-assisted drug for contracture scars," says Dr. Waibel.





Deep ice-pick scars may require excision, filling and resurfacing.

Fractional CO<sub>2</sub> lasers that offer deep penetration, such as the Lumenis Active and Deep FX, have become the go-to devices for removing scar tissue and stimulating new collagen. Fractional microneedle radiofrequency devices are also finding a place in scar treatment. Dr. Goldman uses Lutronic's Infini to stimulate collagen growth and smooth areas of scarring. "Both acne and trauma scars respond to it well," he says.

### SMOOTHING ACNE SCARS

Treatment for acne scars depends on the type of scar: ice pick (deep, narrow pitting), boxcar (shallow round or oval depressions) or rolling (wide and shallow undulation). Fractional ablative and nonablative lasers as well as fractional RF microneedle devices can help smooth rolling and boxcar scars so they are less noticeable, but deep ice-pick scars typically need to be excised and/or filled to achieve an acceptable outcome. Plastic surgeon Rod Rohrich, MD, of the Dallas Plastic Surgery Institute in Dallas excises the pit of the ice pick scar with a punch, fills the area with the patient's own fat and then resurfaces the area with a fractional laser—all in one appointment.

Because acne is such a common skin disease in the U.S., acne scar prevention is a significant area of research. "Retin-A and Accutane have been amazing treatments for acne prevention," Dr. Goldman says, "but one of the biggest advances may be changing the bacteria population on the skin without drying or irritating the skin. Instead it would

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prevent the big red pimples that destroy the collagen, leading to scarring."

Dr. Waibel is hopeful that new treatments, such as gold nanoparticles (Sebacia), will help clear acne before scarring has a chance to take hold. "These tunable gold nanoparticles absorb light. Once they are applied to the skin and transverse down the hair follicle/sebaceous gland, we use a laser to activate the particle," she says. "Initial data out of Poland showed a 70 percent reduction of inflammatory lesions."

Another on-the-horizon technology that may offer relief to scar patients is Rotational Fractional Resection (RFR, Recros Medica). "This company has the technology for rotational fractional resection and lipectomy that removes both fat and skin via tiny excisions," says Dr. Waibel. "These tiny excisions create a dense fractional field with minimal downtime. The technology can remove up to 25 percent of skin in one treatment with no visible scarring."

What is the best tool to help patients struggling with depression and anxiety over their scars? The internet, says Dr. Friedman. "Websites that allow consumers to learn how laser technology can safely and effectively improve the appearance of scars are key to helping them find treatment," he says. The results of the 2016 Bio-Oil study support his view. In that survey, 67 percent of those with scars said they had never sought medical advice largely because they did not know healthcare professionals could help with scarring. **ME**

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