





Erasing the Past

Choosing the right tools and treatment protocols to clear unwanted tattoos.

By Virginia Pelley

Tattoos are often deeply personal expressions of an individual's life experiences or a snapshot in a moment of time—the reasons for seeking tattoo removal are similarly varied. A new parent may feel uncomfortable about an old racy forearm tattoo, a former gang member may seek to be free of any inked reminders of a painful past or a new vegan might want to erase a now embarrassing “Bacon forever” tattoo.



Picosecond lasers and multipass methods have contributed to better and faster removal of tattoos, but patients should still understand it can take eight or more sessions to get satisfactory clearance.

This technology remained more or less the same until around five years ago when picosecond lasers emerged as the next-generation laser for tattoo removal, offering ultra-short pulses relative to the Q-switched nanosecond lasers. Fundamentally, they work the same way: The laser energy fragments the tattoo ink particles and macrophages remove them from the body.

Although he also uses both Q-switched and picosecond lasers to remove tattoos in his practice, picosecond technology “offers fewer treatment sessions with significantly better clearance and allows safer treatment of all skin types given the lower fluence required,” says Paul M. Friedman, MD, director of the Dermatology & Laser Surgery Center in Houston, clinical assistant professor of dermatology at the University of Texas Medical School and vice president of the American Society for Laser Medicine and Surgery (ASLMS).

“Furthermore, picosecond lasers are effective in treating all colors of tattoo ink, including stubborn greens and blues and more recently were shown to be effective for orange and yellow tattoos,” Dr. Friedman says.

“There is absolutely a level of unpredictability associated with all laser tattoo removal treatments.”

Whatever your patients’ reasons for seeking tattoo removal, you can best serve them by understanding the tools and training that you will need to provide an acceptable level of clearance and educating them on the time commitment involved.

Advancements in the past few decades have made tattoo removal a less painful and arduous process than in the past, when the only available methods for removal were mechanical, chemical or surgical.

The first time a Q-switched laser was used in tattoo removal dates to the 1960s, although the modern era of laser tattoo removal didn’t blossom until the 1990s, says Douglas C. Wu, MD, PhD, a dermatologist and director of research at Cosmetic Laser Dermatology in San Diego.

Still, picosecond lasers are not the silver bullet some had hoped, and experienced practitioners have learned that getting effective clearance, particularly for multi-colored tattoos, requires multiple modalities.

Choosing Your Device

“Originally, they were saying you could knock a tattoo out in two to three sessions with picosecond lasers compared to Q-switched, but it turned out that was a little exaggerated,” says Edward Glassberg, MD, senior partner and co-founder of Laser Skin Care Center & Dermatology Associates in Long Beach, California. “But they are, perhaps, twice as fast as the Q-switched.



"Picoseconds are really good lasers but also very expensive; they can be two to three times the cost of a Q-switched. Most people don't have the volume of tattoo patients to justify the expense," he adds.

Bryna Kane, MD, a dermatologist at Laser Skin Care Center & Dermatology Associates in Long Beach, California, who, with Dr. Glassberg, co-founded the Erase the Past gang tattoo removal program, typically starts with a Q-switched laser. "I might start with a Q-switched and get 95% of the tattoo out, then switch to a picosecond technology to remove the remainder. But some tattoos do better with one device over another."

Dr. Friedman's choices for removing blue and black inks are the Q-switched ruby 694 nm and Q-switched Nd:YAG 1,064 nm lasers. For red, orange and yellow, he uses a 532 nm picosecond laser.

"Color matters when treating tattoos," Dr. Friedman says. "Black and dark blue clear well. Green and light blue in the nanosecond domain clear less well, and red clears more slowly with nanosecond technology."

Color Stories

While choosing your wavelength based on color is key, the lack of industry standards combined with the creativity of tattoo artists can make color and treatment determinations much more difficult.

"Because the tattoo ink industry is not regulated, there are many different types of pigments on the market," says Alexis L. Parcels, MD, board-certified plastic surgeon, owner of Parcels Plastic Surgery and founder of SUNNIE Wrinkle Reducing Studio in New Jersey. "Each responds differently. Additionally, the amount and complexity of pigments can compound this variability. Yellow is incredibly frustrating and almost impossible to remove, and designs with white pigment can shift to a brownish-black due to titanium dioxide."

Practitioners must be aware of the potential for color mixing as well. "While it's absolutely true that specific wavelengths of light work best on specific tattoo ink colors, we often find that tattoo artists and even ink manufacturers purposely mix different colors together," says Will Kirby, DO, chief medical officer at LaserAway, Hermosa Beach, California. "When pure black ink is tattooed into the skin, it often appears gray. As such, tattoo artists will occasionally use a black ink that is premixed with a blue ink to make a tattoo that appears black in the skin."

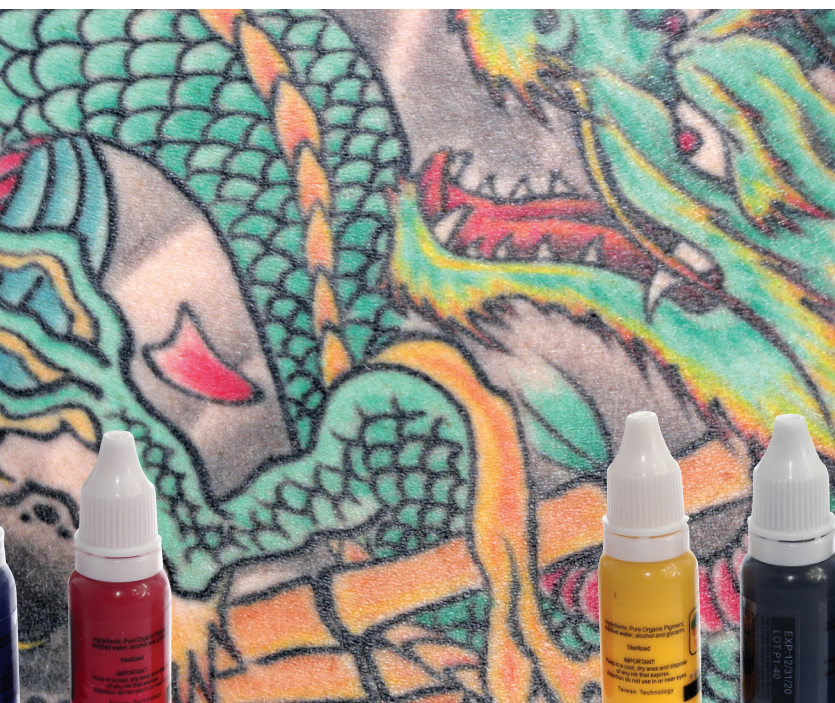
"Point being, don't be surprised if you use a specific laser wavelength on a tattoo only to find that you need to move to a different wavelength as treatments progress," he says.

For example, because purple is a mix of red and blue inks, both a 532 nm and 694 nm wavelength may be required, says Dr. Kirby.

Cosmetic tattoos present their own challenges. Similar to the white ink in professional tattoos that can turn black due to the interaction of the laser with the titanium dioxide, the types of inks used in cosmetic tattoos may contain metal particles that don't react well with lasers.

Therefore, it is important to test a small spot first because "a red or white cosmetic tattoo can turn black," says Dr. Glassberg.

For white tattoos that have the potential to turn black, Dr. Kirby uses a Q-switched Nd:YAG 1,064 nm laser.



Color mixing, combined with a lack of industry standards, adds to the challenge of removing multi-colored tattoos.

In the six patients with cosmetic tattoos, four had satisfactory clearance with no retreatment needed.

A Protocol for Cosmetic Tattoos

In a poster presented at the ASLMS 2021 conference, Magdalena Atta-Motte, MD, noted that “Cosmetic tattoos may turn black after Q-switched (QS) laser treatment... Such paradoxical darkening has been successfully treated with further QS laser treatments, sometimes requiring up to 20 sessions.”

Her study presented a new protocol based on the R20 method, in which she combined Er:YAG, multipass Q-switched laser and topical application of a 4% perfluorocarbons product.

Dr. Atta-Motte treated 10 subjects (six had cosmetic tattoos; four had professional tattoos). Her study protocol was topical application of Fiflow (PFC with 4% perfluorocarbons) followed by one pass with an Er:YAG laser followed by reapplication of Fiflow and then up to four passes with a Q-switched Nd:YAG laser. (Energy levels were determined by patch test prior to treatment). At the end of treatment Fiflow was applied once again.

After three months all subjects had significant improvement in their tattoos with no scarring observed. Three patients showed improvement in existing scarring caused by the tattoo. In the six patients with cosmetic tattoos, four had satisfactory clearance with no retreatment needed.

The DESCRIBE PDF (perfluorodecalin-infused) Patch is used in the U.S. to prevent frosting, allowing for multipass treatment, and offers the added benefit of blocking splatter that can enter the treatment room. It is also said to speed recovery time. But adjunct therapies, such as PFD and PFC do add cost to the treatments.

“If you wait 10 minutes, that frosting will disappear, so you don’t necessarily need a patch,” says Dr. Wu.

Patient Education

The No. 1 factor that needs to be addressed when offering laser tattoo removal procedures is patient expectations. Even with advances in laser technologies and multipass protocols, patients will need to undergo a series of sessions to achieve satisfactory clearance.

“Treatments need to be spaced out, so the journey could take years, and patients need to understand that,” says Dr. Wu.

Dr. Friedman recommends scheduling treatments eight to 12 weeks apart to allow the body time to eliminate the shattered ink particles through lymphatic drainage and phagocytosis. The number of treatment sessions varies depending on the tattoo size, location, ink color and duration. But, on average, patients should prepare for at least eight sessions.

“The longer patients wait between treatments, the better they do,” says Dr. Kirby. “Treating at more frequent intervals does not increase ink resolution speed and, in fact, might paradoxically increase the overall length of time required to remove a tattoo.”

In 2009, Dr. Kirby and his colleague Alpesh Desai, DO, developed “The Kirby - Desai Scale” to evaluate tattoo removal treatment. It takes into account six parameters—skin type, location, amount of ink, ink layering, color of tattoo, and scarring and tissue changes—and provides an estimated number of treatments required to remove patients’ specific tattoos, he says.

In accordance with his scale, dense, multicolored tattoos with texture changes or scarring located on distal extremities tend to be the most challenging.

“But the truth is, when a patient arrives for an initial tattoo assessment, we simply don’t know what type of ink was placed, and there is absolutely a level of unpredictability associated with all laser tattoo removal treatments,” says Dr. Kirby.

An additional consideration is that professional tattoos are more difficult to remove than amateur ones, because the ink is placed more deeply in the dermis. And although tattoos fade with age, older ones can be more difficult to remove because they become more integrated into the skin, says Dr. Wu.

That is why it’s important not to overpromise. “You have to keep expectations real and be flexible,” says Dr. Glassberg. “And if it’s not working, don’t get stuck on whatever you have; change modalities or refer the patient to someone who has those tools.” **ME**



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