The ancient art of tattooing has been around for thousands and thousands of years and it is conceivable that the phenomenon of tattoo regret started shortly thereafter. This concept of lamenting the placement of a tattoo has continued into modern times.

It is well established that the US witnessed a surge of tattoo requests beginning in the 1980s, so it is possible that we are now just seeing the tip of the metaphorical iceberg in regard to a maturing segment of the patient population who seek laser tattoo removal procedures. I, for one, think this is exactly the case.

As a dermatologist with significant clinical experience and expertise in laser tattoo removal, I always counsel patients who are seeking this treatment the truth: There are many ways to remove a tattoo and when there are many ways to do anything in life, there isn’t necessarily one single best way to accomplish your goal. It is imperative that you educate yourself about the risks and benefits of the different treatment options, rely on expert recommendations, and place a weighted emphasis on current “gold standard” practices.

NON-LASER AND NON-SELECTIVE LASER OR LIGHT BASED TATTOO REMOVAL

It is very unfortunate to have to report that I still see non-laser and non-selective laser or light based tattoo removal attempts. The benefit of these techniques is that they are often inexpensive, fast, and require only one (or a limited number) of treatment sessions. The downside, however, is that they are non-selective so while they do destroy tattoo ink they also have predictable unwanted side effects including an increased risk of infection, ink retention, prolonged and poor healing, post procedural pain, poor aesthetics, dyschromia and scarring. To be more specific, non-light based tattoo removal includes the following techniques: thermal tissue destruction (cauterity, cigarette use, infrared coagulator, hot metal contact, etc.), cryotherapy (via liquid nitrogen), chemical tissue destruction (via acids and salabrasion technique), and mechanical destruction (dermabrasion, serial punch biopsies, and surgical excision).

Non-selective lasers and other light based devices can also be used to remove tattoos and they include: Intense Pulsed Light (IPL), the Argon laser, and the Carbon-Dioxide laser. Because the final results are often less than aesthetically optimal and the risks outweigh the benefit, with rare exception, these techniques, thankfully, have fallen by the wayside in most cases but still are employed by unprincipled clinicians.

PULSED LASER SELECTIVE TREATMENT OF TATTOOS

The use of selective, pulsed lasers is considered the gold standard means by which the aesthetic industry removes unwanted tattoo ink, because of the ability to selectively target the ink chromophore and minimize damage to the surrounding healthy tissue because of incredible speed. The unfortunate fact, however, is that these laser treatments are uncomfortable and, since multiple treatments are required, the time commitment can be significant. That said, selective laser treatment is still the best option available, and it is predicated by two overlying concepts.

1) Selective photothermolysis: The treatment of tattoos was revolutionized by Anderson and Parrish’s principle of selective photothermolysis. They postulated that if
a wavelength was well absorbed by the target (tattoo pigment) and the pulse width was equal to or shorter than the target’s thermal relaxation time, the heat generated would be confined to the target. With the advent of Q-switched (QS) lasers operating in the billionth of a second range and picosecond (Pico) lasers operating in a trillionth of a second range, the promise of efficient tattoo removal has become a reality for many.

2) Wavelength of light extruded by the device: Different tattoo ink colors preferentially absorb different wavelengths of light; To destroy a tattoo as selectively as possible, a wavelength is chosen to achieve selective absorption for that ink color while minimizing the nonspecific thermal effects from the surrounding hemoglobin and melanin. The wavelengths available for the QS lasers include the Ruby (694nm), the Alexandrite (755nm), and the Nd:YAG (1064/532nm). The wavelengths available for the Pico second lasers include Alexandrite and the Nd:YAG.

CONTROVERSIES AND ETHICAL CONSIDERATIONS

Any aesthetic practitioner with considerable experience will tell you that some device manufacturers over promise and under deliver, and often the true value of a purchased unit can’t be determined until after years of use in a clinical setting. Some recent purchasers of Pico second laser devices have expressed frustration that the technology, although technically considerably faster than the QS speed laser, doesn’t translate into increased ink resolution. Since many laser treatments are needed to remove a tattoo, regardless of the device manufacturer chosen, it remains to be seen if the promised theoretical advantages of a new technology will offer a true improvement to either or both patients and clinicians. Healthcare providers, of elective procedures or otherwise, have the ethical obligation to fully educate themselves on nuances of treatment options and offer patients complete and accurate information.

PATIENT TRUTHS IN TATTOO REMOVAL

As with any procedure, a patient must have realistic expectations if a successful outcome is to be obtained, so the following concepts need to be made extremely clear.

Multiple treatment sessions are required to remove a tattoo: Because of great variation in tattoo ink color and quantity as well as location of a tattoo on the body, no tattoo is identical to another and every tattoo being treated by a selective laser device will need to receive multiple treatments to achieve complete ink resolution. The number of laser treatments required to remove a tattoo can be difficult to accurately estimate so in 2008 a colleague and I performed a retrospective study and offered the dermatological community a means (the Kirby-Desai scale) by which to better estimate the number of laser treatments needed to remove a tattoo. This scale takes six different categories into consideration: Fitzpatrick Skin Type, tattoo location, tattoo ink color, subject amount of ink in tattoo, presence of scarring from initial ink placement, and whether the tattoo was a cover-up. Although far from perfect because of both user subjectivity and the impossibility of completely accurate objectivity, this algorithm has been widely adopted as a more accurate estimation tool that providers can use to explain to patients the number of laser tattoo removal sessions likely needed to achieve their goal.

The treatment is painful: Patient discomfort is a barrier to any elective procedure and patients need to understand that laser tattoo removal is no exception. Although the light is extruded at unbelievably fast speeds, the treatment is still not pleasant. Topical anesthetic, local anesthetic, cooling the skin, and patient distraction are some of the methods incorporated to make the procedure as tolerable as possible.

Patient compliance with the aftercare instructions is imperative to the removal process: Laser light is sterile, so it can’t cause infection, yet patients still experience bacterial infections post treatment. Why? Non-compliance. Many patients seeking tattoo removal are healthy young adults and they don’t want their care to interfere with their active lifestyles. It’s imperative to really emphasize the importance of taking care of the treated area properly so that adverse events can be minimized and unanticipated side effects can be mitigated as much as possible. The vast majority of unwanted side effects following laser tattoo removal that I have witnessed have been largely due in total or part to non-compliance.

THE FUTURE OF TATTOO REMOVAL

While QS and Pico lasers provide a dramatic improvement over previous tattoo removal modalities and are now considered the gold standard treatment option, it is possible that we will see even more efficient removal techniques in the future. Future lasers may fire even more rapidly, and the use of femtosecond (one quadrillionth of a second) lasers could further enhance our ability to remove tattoos rapidly without damaging surrounding tissue. We may also see “tunable” lasers so that a clinician can still use a single device but one that offers a wider array of wavelengths to choose from. Lastly, continued large-scale clinical studies will help the entire medical community to home in on the treatment protocols that offer patients safe, effective and rapid ink resolution.

To read Dr. Kirby’s take on tattoo trends, download the Modern Aesthetics® app or read this article online at ModernAesthetics.com.