



The many uses of microneedling

How it works, potential applications, and what patients should know

By Emily Margosian, assistant editor

Once an experimental treatment pioneered through the use of tattoo pistols devoid of ink, microneedling has boomed in popularity among physicians and patients alike in recent years. Despite its humble debut in the early 1990s, “microneedling may occupy a specific niche for patients who desire treatments with little to no recovery, while still attaining measurable results” ([Dermatol Surg. 2018;44\(3\): 397-404](#)).

Indeed, as an early adopter of microneedling, Tina Alster, MD, professor of dermatology at Georgetown University Medical Center and director of the Washington Institute of Dermatologic Laser Surgery, reports it has now become one of her most popular procedures. “This is a procedure that has had a resurgence,” she says. “It’s interesting how many physicians have dragged their feet on this treatment option — there are certainly a lot of disbelievers out there — but, as a laser user for nearly three decades, I find that I’m talking about and performing more microneedling than laser procedures these days, simply because it works.”

This month, *Dermatology World* explores microneedling’s many uses in clinical practice, including:

- Device specifics
- Treatment techniques
- Post-procedure recommendations
- Potential applications
- Safety concerns and contraindications
- Efficacy – does it work?

DEVICE 101: GETTING STARTED

While dermatologists searching for a microneedling device once had a limited number of options to choose from, the market has widely diversified as demand for the procedure has risen. Currently there are two device types available: fixed-needle rollers or electric-powered “pens” with disposable sterile tips. Most physicians now opt for pen-style devices, while fixed-needle rollers are more often marketed for at-home use (see sidebar for more on how to counsel patients considering at-home microneedling).

“Aestheticians have been using those roller devices for a while, but the newer (medical grade) electric-powered systems have individual-use tips that contain a variable number of needles — usually 12 to 36 fine-gauge needles,” says Dr. Alster. “The needles actually vibrate in and out of the skin as deep as three millimeters, thereby penetrating much deeper than the roller-type devices and affecting more dermal remodeling as a consequence.” As different types of skin require different depths of needle penetration, achieving optimal clinical outcomes is often dependent on needle depths being fine-tuned to a specific skin location and thickness.

Device specifics vary according to needle length, quantity, configuration, and material — and making sense of all the available options can be tricky. “There are a lot of microneedling devices on the market today and many of them are being pushed hard with marketing materials,” says Paul Graham, DO, a fellowship-trained, board-certified dermatologic surgeon, practicing in Fort Myers, Florida. “I chose my microneedling device based on the number of needles it has and the ability to adjust the speed of the treatment. I currently use Collagen PIN, and have been really happy with it. I haven’t had the opportunity to use any other device, so I can’t really comment on the differences, however, treatment results are ultimately dependent on a properly trained operator, more so than the actual device.”

According to Victoria Negrete, MD, a dermatologist from Neenah, Wisconsin, her choice of preferred device was an easy one to make. “I use SkinPen, which is currently the only option that is FDA approved,” she says.

Dr. Alster personally recommends dermatologists look for electric-powered devices with disposable needle tips that contain between 12-36 needles, adjustable speeds, and depths of penetration from between one to three millimeters. “There are currently three quality devices out there, but the main driving issue for me was really the number of needles and the quality of the tips,” she says. “Some of these devices have tips that only have 12 needles, others have 36. I chose the device that had individual disposable 36 needle tips because I think that the more micro-wounds that you create in the skin to ‘aerate the lawn,’ the better the clinical response.”

TREATMENT TECHNIQUES

While microneedling is favored for its low risk of complications, ensuring a procedure goes smoothly begins with effective pre-treatment counseling. “When doing a consultation with my patients, I always talk to them about pre-treatment ‘skin priming,’” said Dr. Graham. “This includes the use of a SPF, a vitamin A, and an antioxidant. I have my patients use this skin care regimen for four weeks prior to treatment as I believe this is the amount of time it takes to increase the wound healing response to the procedure.”

Dr. Negrete recommends that all her microneedling patients stop the use of tretinoin and avoid sun exposure one week prior to treatment in order to avoid any adverse effects during the healing process.

Likewise, the use of topicals during or immediately following the procedure should be treated with caution. A 2014 case series described patients developing biopsy-proven, foreign-body type granulomas after the application of topical vitamin C during microneedling ([JAMA Dermatol. 2014;150: 68-72](#)), and Dr. Alster recommends dermatologists verify that any topicals used in conjunction with microneedling are approved for use on open skin. “Some people use microneedling in order to propel topicals into the spaces that are created in the skin, however there have been published reports of irritation from substances that are not approved for intradermal use,” she says.

Although anesthesia for microneedling is not mandatory, per Dr. Negrete, “Topical anesthetics can definitely make the treatment more comfortable,” as pinpoint bleeding is the desired clinical target. Dr. Graham utilizes anesthesia for most of his microneedling procedures, explaining, “I almost always have patients numb with either a 4% or 30% lidocaine gel prior to the procedure to ease the discomfort. This will make the treatment much more comfortable and allow it to go uninterrupted. Patients typically say that the pain associated with the procedure is a ‘3’ or ‘4’ out of a ‘1 to 10’ pain scale. If skin rejuvenation is the goal, topical numbing is not required and this usually occurs at a depth of 0.2 to 1 mm.”

“Sometimes less is more. Just because the results are hard to believe, doesn’t mean that they’re not true.”

“Topical anesthesia is needed,” agrees Dr. Alster. “Particularly in areas that are more sensitive, such as on the upper lip. I typically apply a topical anesthetic of 30% lidocaine cream for as little as 10 minutes up to an hour prior to treatment in order to reduce discomfort.”

During the procedure itself, keeping the treated area properly lubricated is key to avoiding any unintended injury. “It is important to apply sufficient hyaluronic acid gel (supplied by the device company) on the treatment area surface to facilitate the gliding action of the microneedling

device and to prevent any untoward injury to the overlying epidermis,” suggests a 2018 *Dermatologic Surgery* article ([44\(3\): 397-404](#)). Dr. Alster also recommends pulling the skin taut while microneedling to maintain a gliding movement throughout the procedure. “While you’re performing treatment, it is advisable to stretch the skin tight in order for the needles to penetrate the skin without catching or dragging as the vibrating tip is moved across the tissue,” she says.

Dr. Graham recommends the use of a mix of horizontal, vertical, and circular motions during treatment, equating all three movements as one “pass” of the device. “I typically do a total of three to six passes depending on the indication,” he says. “When treating acne scars, you may have to max out the depth in order to get down to the reticular dermis where the majority of the scarred collagen is found.”

Pinpoint bleeding serves as an endpoint for microneedling, therefore physicians are advised to avoid a cookie-cutter approach to the procedure. Dr. Graham recommends keeping a close eye on how individual patients and different areas of the body respond during microneedling in order to determine when it’s time to conclude treatment. “Sometimes, one to two passes give the same pinpoint bleeding as three to six passes in different skin types. It is hard to predict this, and, therefore, it is operator-dependent to reach a certain desired endpoint,” he says.

Dr. Alster agrees that the duration and vigor of the procedure can be highly variable. “The upper lip can take a matter of a few minutes to treat. Even larger body areas, such as hips that are being treated for stretch marks, can be completed within 15 to 30 minutes,” she says. “Sometimes pinpoint bleeding is observed after a couple of microneedling passes, while others may require six to eight passes to elicit the same response. It depends on how thick the skin is, and the individual’s response to the treatment.”

POST-PROCEDURE RECOMMENDATIONS

After pinpoint bleeding has been achieved, Dr. Alster recommends applying ice water-soaked gauze to remove excess blood and hyaluronic acid gel. She notes that the use of tap water is discouraged due to possible contamination which could pose risk of infection in the treated area. “Have the ice water soaked-gauze available for immediate use after the treatment, or during the treatment if there’s extra bleeding and you want to re-treat a particular area,” she says. “It is important to have a blood-free area so you can actually see what you’re doing and to stop the bleeding when the procedure has been completed.”

Dr. Graham advises patients to take a hiatus from their normal skin care regimen for a minimum of at least one day following treatment in order to avoid complications. “For our treatments, we thoroughly counsel the patient about the importance of post-treatment care, and typically recommend the discontinuation of all products until 24 to 48 hours post treatment in addition to the use of a low-potency topical steroid during the first two days to blunt unnecessary inflammation,” he says.

Although recovery time varies from patient to patient, generally “the skin will stay pink for as little as a few days to upwards of a week, depending on how vigorous the microneedling procedure is,” says Dr. Alster. “Any residual erythema can be easily camouflaged with makeup, which I permit as early as the day following the procedure.”

POTENTIAL APPLICATIONS

As microneedling has grown in popularity, the procedure has been increasingly linked to a range of dermatologic applications, including treatment for pigmentary issues (such as dyschromia and melasma), as well as a potential tool for combatting hair loss. And while the procedure remains a popular candidate for patients looking to resolve a variety of cosmetic concerns, **microneedling has shown the most promise as a treatment for:**

- Acne and surgical scars
- Skin rejuvenation and wrinkles

Treating acne and surgical scars

Literature — and physician anecdotal evidence — suggests microneedling can be a powerful tool in dermatologists’ arsenals against long-term scarring. “More publications have outlined the use of microneedling for acne scarring than for any other scarring condition,” states *Dermatologic Surgery*. “Clinical improvements of acne scars have been substantiated by histologic skin changes. Although various microneedling protocols have been outlined, a series of 3 to 5 treatments at 2- to 4-week intervals typically produce clinical improvements ranging from 50% to 70%” ([2018;44\(3\): 397-404](#)).

“I mostly use microneedling for acne scars,” confirms Dr. Negrete. “It’s a great cost-effective option with pretty decent results.” Dr. Graham agrees, noting that in addition to acne scarring, “specifically boxcar and rolling,” he most commonly performs microneedling as a treatment for traumatic and unwanted surgical scars.

Compared to other treatment options for scarring — particularly lasers — microneedling possesses a distinct set of advantages. “Scar tissue is much denser and tough. The penetration of the microneedles into the fibrotic tissue provides a controlled injury without the associated heat production (and redness) commonly seen upon laser irradiation, thereby reducing recovery time. The clinical results that I’ve been achieving with microneedling have been so compelling that I will often grab my microneedling device rather than a laser for a wide variety of scars,” says Dr. Alster. Beyond a shortened recovery time, microneedling also allows physicians to treat isolated areas of scarring without creating lines of demarcation between the treated and non-treated areas. “When we treat with lasers, we are oftentimes limited to using them over a whole cosmetic unit,” explains Dr. Alster. “For instance, a small scar in the center of a patient’s cheek would warrant laser treatment of the entire cheek in order to avoid color mismatch between treated and untreated (adjacent) skin. This is unnecessary with microneedling, as there is no heat-induced erythema that can potentially lead to dyspigmentation — a particular concern in patients with darker skin tones.”

Skin rejuvenation and wrinkles

Few take pride in displaying signs of the aging process, and microneedling has emerged as a viable option for patients looking to smooth their complexions. “I’m recommending microneedling first and foremost for perioral rhytides which can be quite difficult to treat due to their prominent and sensitive location,” Dr. Alster says. “They tend to be deeply etched and fibrotic and, as such, resemble scars in their response to microneedling. In fact, I use microneedling to treat perioral rhytides in lieu of laser ablation and/or injectable fillers.”

Beyond the face, the procedure’s absence of heat and relative speed make it an ideal option for treating skin imperfections across large areas of the body. “I often use microneedling for reducing stretch marks — whether they’re on the abdomen, the arms, the buttocks, or thighs. Again, you’re limited with lasers in many of these areas because of the longer recovery rates related to diminished blood supply and fewer pilosebaceous units. With microneedling, prolonged healing has not been an issue,” says Dr. Alster.

SAFETY CONCERNS AND CONTRAINDICATIONS

Largely considered a non-invasive procedure, microneedling has few true side effects. While most patients will experience some redness, swelling, and skin flaking, symptoms typically resolve one to two days post-treatment. While infection is a possibility, patients can dramatically reduce their risk by following their dermatologists’ directions. “We don’t provide prophylactic (topical or oral) antibiotics,” says Dr. Alster. “I think that I’ve never seen an infection related to a microneedling procedure that I’ve performed in large part because I’m not advising that patients use any active skin products for the first several days. The only time that I have seen problems other than redness or swelling have been when people have inadvertently applied active topicals, such as glycolic, retinoic, or ascorbic acid on the tissue after treatment.”

Fortunately, while dyspigmentation was once an anticipated complication in darker skin types, microneedling rarely causes such damage in patients with skin of color. “Microneedling is one of those procedures that is well tolerated with minimal downtime, and is safe to use in all skin types,” says Dr. Graham. “I have had very few complications with this procedure since I started offering it four years ago, and find that microneedling does offer patients improvement without the risks to the skin that occur with various laser devices. It is widely known that lasers have risks in darker skin types including hyper and hypopigmentation and these risks are mitigated, if not eliminated, with microneedling.”

While microneedling is safe for most patients, contraindications include:

- Active infection
- Inflammatory acne
- Keloid predisposition
- Skin cancer in the treatment site
- Immunocompromised patients

And while dermatologists may have more than one reason to cringe at patients sporting recent tans, significant sun exposure should also be grounds for denying microneedling treatment in order to avoid any dyspigmentation. “I don’t like to treat anyone who is obviously tan or has had recent sun exposure,” says Dr. Alster. “That’s a very different situation than someone who has intrinsically dark skin. When exposed to the sun, melanocytes in patients of any skin phototype are activated and are producing more melanin. As a consequence, sun-exposed skin is more prone to inflammation and/or injury of any type. For that reason, I make patients postpone treatment until all redness or tan has faded — whether that takes a week or a month.”

EFFICACY: DOES IT WORK?

Assuming most patients are not excited by the prospect of enduring dozens of needles stamped into their skin any more than necessary — just how many microneedling treatments does it take to see visible results? While outcomes depend upon the individual patient and treatment application, generally microneedling sessions are recommended at two week to monthly intervals until the desired clinical results are achieved ([Dermatol Surg. 2018;44\(3\): 397-404](#)). However, other patients (perhaps more needle-phobic individuals) may elect to receive single microneedling sessions only once or twice a year to maintain their cosmetic outcomes.

Dr. Graham says that while results are variable across different individuals and treatment indications, “Patients often start noticing an improvement after the third treatment, and I attribute this to the lag time it takes collagen to be produced and remodeled. For the most part, people are typically happy with the improvement, but I really feel the downfall to microneedling is that often patients do not do enough treatments. I always recommend patients to do a maintenance microneedling session once a year as well as practicing good sun protection to maintain results.”

According to Dr. Negrete, while patients can be satisfied with just one treatment, visible results do require some patience. “Treatment frequency varies. Patients do not necessarily need ongoing treatments to retain results, although it typically takes several months to see the full benefits,” she says.

Ultimately, the frequency of microneedling depends not only on patients’ perception of the treatment’s success, but also the severity of the area being treated. “I tell people it’s sort of like weeding the garden,” says Dr. Alster. “The more you weed your garden, the fewer weeds you have. So, with each subsequent treatment, you see fewer and fewer scars or wrinkles as progressive neocollagenesis takes place. Some of my patients with traumatic scars only have one treatment because they experience significant improvement after a single session, whereas there are others who have deeper scars or wrinkles that often require three or more treatments at monthly intervals.”

Beyond its clinical possibilities, the low financial burden of microneedling may continue to make it a popular choice among both patients and physicians. “It’s really been a game-changer for me and my practice,” says Dr. Alster. “I have all these expensive lasers, but I’ve been able to incorporate a less costly, less aggressive alternative for my patients with good cosmetic outcomes, and they really appreciate that. Even for physicians who are just starting out, it’s not a big cost outlay if you’re interested in expanding what you’re able to provide to patients. It’s just taken a while for some of my colleagues to catch on to the fact that sometimes less is more. Just because the results are hard to believe, doesn’t mean that they’re not true.”

AT-HOME MICRONEEDLING

Despite the claims of many an Instagram influencer, true microneedling is not an at-home procedure. “I’m not a big fan of them,” says Tina Alster, MD. “My biggest concern is that the needles on many of these at-home devices are virtually impossible to clean adequately. People can unknowingly autoinoculate a wart virus, molluscum, or herpes simplex. I see a lot of problems with patients who have used the roller devices and inadvertently spread an infection that they didn’t know that they had. I end up having to treat the infection — and deal with any fibrosis or scarring as a consequence.”

The lack of current regulation surrounding at-home microneedling devices also potentially puts patients at risk. “Due to the arc of the needle, these devices often cause more damage than benefit as they are rolled across the surface of the skin. The risk of these devices is also increased because there is no central regulation on how they are made,” says Paul Graham, DO. “They may contain nickel or various other allergens that can contribute to skin reactions.”

Additionally, while the shorter, duller needles found on most at-home roller devices may stimulate enough blood flow to give a temporary brightening effect, they ultimately fall short of the long-term results of the electric-powered pen devices utilized by physicians. “In-office, you’re able to ensure that not only are the needles sterile, but that they also don’t become dull,” says Dr. Alster. “For instance, when I’m treating large surface areas — such as striae on the buttocks or thighs — I may replace the treatment tip mid-session.”