



Is Microneedling Really the Next Big Thing?

PUBLISHED ON JUNE 24, 2014

Wendy Lewis explores the buzz surrounding skin needling |*Plastic Surgery Practice* July 2014

By Wendy Lewis

Skin needling, also called microneedling therapy, collagen induction therapy (CIT), and percutaneous collagen induction (PCI), is a minimally invasive skin-rejuvenation procedure that involves the use of a device that contains fine needles. The needles are used to puncture the skin to create a controlled skin injury. Each puncture creates a channel that triggers the body to fill these microscopic wounds by producing new collagen and elastin. Through the process of neovascularization and neocollagenesis, there is improvement in skin texture and firmness, as well as reduction in scars, pore size, and stretch marks.

Among the earliest proponents was Michael Pistor, the French doctor who is credited with having developed mesotherapy in 1952. In the 1990s, Montreal plastic surgeon Andre Camirand, MD, experimented with using tattoo guns without ink to treat postsurgical scars. South African plastic surgeon Des Fernandes, MD, founder of the Environ™ skin care range, introduced skin needling using a roller for treating vertical perioral wrinkles at the International Society of Aesthetic Plastic Surgery (ISAPS) congress in Taipei in 1996.

There has been a recent proliferation of devices and systems on the market in this category that vary in the diameter and length of the microneedles, generally ranging from 0.5 to 3.0 mm. Essentially, there are two basic categories of devices: battery- and cord-powered systems. Each design has some advantages, and personal preference determines operator selection. There are also flat-edged tips versus beveled tips. Current devices range from mechanical to manual models with shorter needle lengths designed for

home use to rollers or stamps with longer needles designed for skin professionals only.

PCI has proved to be a simple and fast method for safely treating wrinkles and scars. Because the epidermis remains intact, the procedure can be repeated safely and is also suited to regions where laser treatments and deep peels are not typically performed.¹ PCI therapy is now becoming widely used as a treatment for photoaged skin to improve the skin's appearance and quality, and to improve or even prevent scarring.²

Microneedling can be performed in an office setting and does not require extensive training or costly equipment. Single-use systems are available for up to a few hundred dollars, with multiple-use devices costing roughly a few thousand dollars, depending on the model. It is cost-effective, and can be done on areas of skin that may not be suitable for peeling or laser resurfacing, such as around the eyes and mouth, hands, and chest. The procedure is well tolerated by patients with minimal downtime, and can be easily personalized by going deeper on some areas where skin damage requires a more aggressive approach.

INTRODUCING MICRONEEDLING

Topical anesthetic cream is used to keep the patient comfortable during the procedure. Patients should be advised that multiple treatments will be necessary. The number of needling sessions depends on the individual skin condition. Three or four treatments may be recommended for mild to moderate acne scarring, whereas deeper scars and stretch marks may require upward of five treatments. An interval of 4 to 6 weeks between treatments is typically recommended. Many practitioners are also doing maintenance treatments at intervals of 6 to 12 months. When utilized for generalized skin resurfacing, products such as topical growth factors and antiaging serums are better absorbed in the skin as an adjunct to treatment.

“Microneedling is a safe, chemical-free method that triggers new collagen production,” says Beverly Hills, Calif, nurse and aesthetic trainer Sylvia Silvestri, RN. “Because it can be performed on all skin colors and types, it is sometimes the preferred treatment over laser as there is no risk of burning the patient.”

Related Resources:

- DermaFrac
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- Collagen P.I.N.
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- SkinPen by Bellus Medical
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Who Can Microneedle?

Because microneedling devices do puncture the skin, there are varying opinions on who can perform these treatments on a state-by-state basis. "There is no standard. On some systems you can control the depth, so we allow medical assistants to do microneedling at a depth of less than 100 microns," says New Jersey dermatologist David J. Goldberg, MD, JD.

Washington DC-based dermatologist Cheryl Burgess, MD, is a big proponent of microneedling and has seen positive results with darker skin types. "In my experience, there is minimal postinflammatory hyperpigmentation," she says. "I generally prefer the scattered needle pattern devices versus a circular pattern like the Dermapen." Dermapen has an ergonomic design that can be used to target either the whole face or very small areas that are hard to reach with some larger devices, such as the sides of the nose, above and below the eyes, and the upper and lower lip. In Silvestri's practice, microneedling is being used for acne scars, fine lines, skin tightening, and shrinking pore size. "What patients like about it is that there is little to no downtime. Some redness may occur immediately after treatment, but it usually subsides by the next day," she says. "It can be used all over the body, but the face, neck, and chest are the most treated areas."

Like many practitioners, Silvestri has trialed several microneedling systems. She is currently using the Eclipse MicroPen™. "The needle depth can be adjusted for the patient, and it has a battery, which means no messy cords for the user."



The Eclipse MicroPen is a cordless device with a patented high-speed motor for fast penetration of the needles. The adjustable needle depth allows users to customize the treatment. In most cases, a topical hyaluronic acid (HA) peptide gel is applied to clean skin to help the tip glide across the skin while delivering topical HA deep into the skin. As the tip is applied to the skin, thousands of superficial micro-channels are created every second. The second version, called MicroPen™ Elite, will be launched in Q3 2014.

DECIPHERING DEVICES

With a plethora of microneedling gadgets flooding the market, practitioners should be wary of poor-quality instruments that can lead to breakage of needles in the skin, and potentially cross contamination if skin gets suctioned into the tips. Users are cautioned to clean the device thoroughly with a cotton-tipped swab in-between treatments.

Not all needles are the same, and the treatment can be technique dependent. For example, overly aggressive needling may cause scarring and potential hyperpigmentation in certain skin types. Another point to consider is that for some devices, if you do not buy the tips from the manufacturer, you may void your warranty.

To sort through the confusion over safety, Juvapen® includes lot numbers on its needle boxes that clearly state the date of sterilization. The shelf life of these components is typically 2 years. Juvapen has teamed up with Omni Bioceutical Innovations, Scottsdale, Ariz, to offer human-derived growth factors as an add-on to the treatment. A course of three to four treatments is recommended, and patients go home with a topical growth factor cream for use in-between treatments.

SkinPen™ by Bellus Medical, Dallas, is a vertical microneedling device with a cordless design that creates a series of hundreds of vertical microscopic channels in the dermis using straight needles of variable depth (0.25 to 2.5 mm) to penetrate at a 90o angle. The SkinPen Advanced Microneedle Cartridge is a single-use disposable tip that features a patented Bio-Sleeve technology to prevent cross-contamination, an exhaust port to prevent suction and reduce risk of broken capillaries, and 12 sterile 32-gauge medical-grade steel needles.

Louisville, Ky, plastic surgeon Nana Mizuguchi, MD, introduced the new Collagen P.I.N.™ device in his practice as a facial-rejuvenation treatment. Collagen P.I.N. is a medical-grade automated microneedling device that has a sterile needle-tip containing 12 tiny microneedles. A thin layer of serum is applied to the patient's skin, and the practitioner selects the depth he wants.

Next, in a single motion, the Collagen P.I.N. is gently glided across the skin in one direction until the treatment area has been covered, resulting in thousands of microscopic channels. "It's ideally suited for the stimulation of collagen and elastin. It can improve fine lines, wrinkles, skin texture, and help improve the appearance of acne scars," he tells *Plastic Surgery Practice*. "For optimal results, we recommend a series of four to six treatments."



According to Mizuguchi, patients are getting more educated about the benefits of microneedling, and they are asking for it. "With forums like Facebook and RealSelf and the Internet in general, patients know more today than ever about up-and-coming treatments and what has worked for someone else," he says. "They share their before-and-after photos, whether good or bad, how much they paid for the treatment, and whether or not their outcome was good."



Another innovative model, DermaFrac™, is a newer modification of the microneedling technique that utilizes the microconduits created by the microneedling to simultaneously passively diffuse antiaging peptides or other topical agents with pharmaceutical properties.³ DermaFrac microchanneling combines needle penetration and infusion capability with topical solutions. This versatile system also features crystal-free microdermabrasion and LED therapy that are customizable for each individual patient's skin condition.

"DermaFrac is a unique device and a dermal microchanneling system that uses vacuum pressure and a handpiece with a tip that consists of a .25 and 0.5mm needle lengths to create micro injuries in and around the dermal epidermal junction," says Dallas dermatologist Martin Kassir, MD. "We also have four different kinds of infusion material that are simultaneously infused into these channels in the skin. It is a very easy

procedure to perform."

In 2014, British Columbia-based dermatologist Lance Setterfield, MD, the author of *The Concise Guide to*

Dermal Needling Expanded Medical Edition (Acacia Dermacare; 2nd edition, 2013), concluded that 0.5-mm needles produced the best results in the shortest time, as compared to 1-mm and 2-mm needles.

TRY THIS AT HOME?

Professional skin needling is considered a safe skin treatment when performed by a medical aesthetician, nurse, or physician. This should not be confused with the myriad of home care microneedling devices designed for patient use. Specially designed home skin needling models with short, fine needles of approximately 0.2-mm depth may be used two to three times per week to reduce pore size, oil production, fine lines, and to enhance delivery and effectiveness of topical agents.

“Many patients ask about the home rollers. If patients choose to do DIY microneedling at home, I recommend the Derma Roller home roller,” Silvestri says. “The quality of the needles is of the utmost importance, as there are many knock-off products sold on the Internet with poor-quality needles.”

Microneedling at home can be done three times per week combined with an HA or Vitamin C serum, she adds. The Derma Roller was invented by Horst Liebl in Germany as a drum-shaped roller. It is a handheld device that uses 200 fine needles to create microchannels in the skin, and offers a range of five needle sizes from 0.5 to 2.5 mm. When the Derma Roller is used with topical serums, the skin’s absorption of vitamins, enzymes, lipids, and other ingredients are enhanced. The repair process begins almost immediately. In approximately 1 to 2 hours after the application of the Derma Roller, these micro-channels fully close through the body’s natural healing process, and the patient’s normal routine can be resumed.

MEET THE MICRONEEDLE DELIVERY SYSTEMS

Microneedle delivery systems offer a minimally invasive and painless method of transdermal drug administration—for example, with vaccines. To enhance transdermal drug transport, microneedles can be inserted into the skin to increase its permeability, after which the drug is applied. Drugs could also be coated onto the microneedles and then inserted into the skin. Hollow microneedles are used to inject drug solutions into the skin.⁴



One example of this is the Aquagold™ Plus system from Aquavit Pharmaceuticals Inc, New York City, which is a microneedle drug-delivery platform that appears to be quite simple to use. “All the myriad microneedling devices simply make holes in the skin—somewhat akin to the older dermal rollers,” says New Jersey dermatologist David J. Goldberg, MD, JD. “Thus, they have historically been called ‘poor man’s lasers.’ ”

Aquagold, in contrast to microneedlers, is a unique delivery system that delivers cosmeceuticals, fillers, plasma-rich protein, and toxins through a system where the microneedles are as small as hair follicles and thus nearly painless, he says. “We can utilize Aquagold for retinol, growth factors, antioxidants, or hydroquinone in any combination, and deliver them into the dermis for a faster, more active effect. Similarly, dilute HA fillers can be delivered to more difficult areas, such as upper lip vertical lines and small crow’s feet, and microBotox can be used for pore tightening

and flushing,” Goldberg explains.

New Haven Conn-based dermatologist Lisa Donofrio, MD, is also a proponent of the Aquagold delivery system. “I usually mix a ‘cocktail’ of dilute HA, NuCell growth factor infusion, and dilute neurotoxin, [and] results are seen immediately (skin firmness, radiance), but continued results in texture can be seen over the next month as collagen is stimulated by both the needling and the infusion,” she says. Donofrio typically recommends a series of three sessions spaced 1 month apart.

It is clear that the category of microneedling is poised to explode in the near term, and we can expect to see more clinical data to confirm claims that doctors are seeing in their practices. There has been a sea change from what once was marked skepticism to almost widespread acceptance of this category of skin treatments. The time is right to investigate these therapies, as undoubtedly, patients will be asking for them.



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Original citation for this article: Lewis W. Is microneedling really the next big thing? Wendy Lewis explores the buzz surrounding skin needling. *Plastic Surgery Practice*. 2014;(7),24-28.