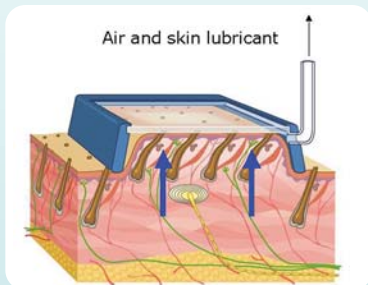


Pneumatic Skin Flattening Enables Painless Tx at Higher Energy Settings

By Bob Kronemyer, Associate Editor



Pneumatic Skin Flattening (PSF) operation principle: suction, elevation, upward compression and flattening of the skin.

“With laser hair removal, often times the laser spot size is quite small, so patients have to endure this pain repeatedly. In these long sessions, pain tolerance can really be an issue.”

Pneumatic Skin Flattening (PSF) is a controlled vacuum handpiece from Inolase, Ltd. (Netanya, Israel) that adapts to most lasers and other intense pulsed light (IPL) devices for truly pain free hair removal. The handpiece has also reduced pain while treating pigmented lesions and tattoos. The number of treatment sessions required may also be fewer because the technology allows for higher energy settings.

“Pain is a big concern for a lot of my patients when using IPL or laser for hair removal, especially the bikini line, and in men treating the entire back,” said Malcolm Ke, M.D., an assistant professor of dermatology at Case Western Reserve University in Cleveland, Ohio. “Furthermore, with laser hair removal, often times the laser spot size is quite small, so patients have to endure this pain repeatedly. In these long sessions, pain tolerance can really be an issue.”

PSF blocks pain during high energy treatments with light-based systems by taking advantage of the gate control theory of pain, whereby the sensation of pain is not a direct result of a single pain

receptor, “but rather a perception modulated by a number of neural stimuli,” Dr. Ke explained. “The PSF attachment allows us to activate the faster conducting pressure sensing nerves around a treatment site. This activation competitively blocks the synaptic gate pathway of pain, thus preventing the brain from acknowledging painful stimuli.”



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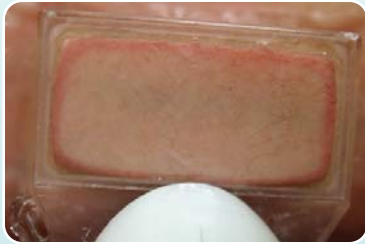
Because PSF is painless, it does not require analgesic cream, which can be costly, messy and time-consuming to apply. In addition, when applied to large body areas, these creams “carry significant morbidity,” Dr. Ke noted. “For example, lidocaine toxicity can cause seizures, central nervous system (CNS) depression and even arrhythmias. There have been a number of reported deaths in college-aged students from the application of topical

anesthesia for hair removal over large areas such as the legs.”

Dr. Ke, director of the Skin Surgery, Laser and Aesthetic Center at Case Western Reserve University, believes that energy level plays a role in the efficacy of hair removal. “But naturally there is a point where higher energies may not necessarily be more efficacious, and may only cause greater side effects,” he said.

Using negative pressure and a sapphire window, PSF brings the target area closer to the surface. “Therefore, you achieve more efficient delivery to the specific hair follicle,” Dr. Ke explained. “By causing an upward compression effect, these structures are actually being elevated, closer to the skin surface. So you don’t need as high of a fluence to target these hair follicles.”

Upward compression also temporarily expels blood from the area. “Blood is a competing target for laser hair removal,” Dr. Ke said. “By expelling blood, you are eliminating one of the competing chromophores. Consequently, the treatment



Skin transparency is enhanced by Pneumatic Skin Flattening (PSF)

“For hair removal, the handpiece allows you to really target energy on the hair because the adjacent skin will get less melanin because the skin is flattened.”

becomes more specific and efficient, targeting primarily the follicle.”

Blood expulsion and skin flattening also make the skin more transparent. “The hair follicles become much more visible,” Dr. Ke said. “Anecdotally, my patients seem to feel the areas treated with PSF have better results. Erythema is also significantly diminished. There is less post-procedure pain, which is often associated with erythema.”

Dr. Ke also uses the PSF handpiece for treating lentigines. “I’ve even used the attachment for Q-switched tattoo removal, thus requiring no topical or intralesional anesthesia. Treatment is fast and painless with PSF. Patients keep coming back for treatment because it is a pleasant experience rather than a painful one. The number of sessions might also be decreased because of increased efficacy, but this is yet to be determined.”

Gary Lask, M.D., director of Dermatologic Surgery and the Dermatology Laser Center at the University of California, Los Angeles Medical Center

concur that the PSF handpiece significantly reduces pain. “In my mind, PSF offers better pain reduction than Zimmer air-cooling,” he said. “Some of the studies from Europe and Israel also indicate that treatment is potentially more efficacious because of the actual flattening of the skin, better penetration and less competition from melanin on the top part of the skin’s surface.”



Nathalie Fournier, M.D.
Dermatologist
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“I no longer have to use any aesthetic cream when using the PSF handpiece,” said Nathalie Fournier, M.D., a dermatologist in private practice in Montpellier, France, who attaches the handpiece to the alexandrite laser for hair removal. “I also use IPL with the PSF. Pain is reduced very significantly.”

At the upcoming annual conference of the *American Society for Laser Medicine and Surgery* (ASLMS), Dr. Fournier will

present a study on pain reduction with the PSF handpiece for the removal of lentigines involving about 30 patients. “On a scale of zero to ten, patients graded their pain as being two to four points lower than without the handpiece,” she reported. “For example, if the pain was a six without the handpiece, the pain with the handpiece is two or three.” A previous study consisting of a greater number of patients for hair removal found similar results.

“You can use the same energy levels as without the PSF handpiece because you don’t lose energy through the handpiece,” Dr. Fournier said. “In addition, because you reduce the pain, you also reduce the competitive targets by flattening the skin. As a result, you are able to slightly improve the settings. You can increase the parameters.”

When treating lentigines with IPL without the PSF handpiece, “erythema appears immediately around the lentigines, such as on the cheeks, and there is a darkening of the lesions,” Dr. Fournier said. “But with the handpiece, there is no redness, only the darkening of the lesions.”

“PSF allows you to increase the energy while reducing pain. We’re now able to perform hair removal with the diode laser and the alexandrite laser without pain.”

Dr. Fournier, who operates a laser center, also noted that the PSF handpiece easily attaches to all of her light-based systems. “For hair removal, the handpiece allows you to really target energy on the hair because the adjacent skin will get less melanin because the skin is flattened,” she explained. “Any patient with normal skin that is not infected can be treated with the handpiece, even if the patient is pregnant. The only contraindication is in people with a disease who develop a blister during treatment. But this is very, very uncommon.”

The main difference between PSF and other vacuum-assisted treatment techniques is that PSF “flattens the skin. It also expels the blood from the surface of the skin. Most systems don’t expel the blood,” Dr. Fournier said. “This makes treatment more efficient. The capability to flatten and compress the skin versus just evacuation without flattening makes a big difference. If you don’t flatten the skin, you still have all the competitive targets that you try to avoid when treating with one wavelength.”

Tattoo removal with the PSF handpiece is particularly advantageous, according to Moshe Lapidoth, M.D., head of the

laser unit at Rabin Medical Center in Tpatach Tikva, Israel. “PSF is a very effective modality,” he said. “One of the major problems we face when treating tattoos is the pain associated with treatment. Q-switched lasers are very painful. The PSF handpiece reduces the pain significantly compared to treatment without the handpiece. We also have the impression that the handpiece allows us to reduce the number of treatment sessions by over 25%. Patients also end up with less edema and less oozing.”



Moshe Lapidoth, M.D.
Head of Laser Unit
Rabin Medical Center
Tpatach Tikva, Israel

Dr. Lapidoth also said it is likely that patients develop less infection and less hyperpigmentation/hypopigmentation when treating tattoos with the PSF handpiece. “Treatment is definitely safer than without using the handpiece,” he said. “It is also very easy to operate. I have found no contraindications. Pigmented lesions and vascular lesions can be treated as well. When treating pigmented

lesions with the handpiece, we cause bleaching and reduce the number of hemoglobin molecules in the treatment area. Thus, there is less competition and we can use higher energy settings.”

“To achieve better results with any light-based device, you need to increase the energy,” said Monica Elman, M.D., a dermatologist in private practice in Tel Aviv, Israel. “PSF allows you to increase the energy while reducing pain. We’re now able to perform hair removal with the diode laser and the alexandrite laser without pain. We have also reduced pain when treating pigmentation on the face, chest and hands with an IPL, while at the same time increasing energy.”

A split-face study of treating pigmented lesions concluded that the side treated with the PSF handpiece resulted in less pain. “We found similar results for the neck, chest and upper part of the hand,” Dr. Elman conveyed. Furthermore, because patients no longer require a topical numbing agent, “patients do not have to show up early to the clinic. The number of treatment sessions may also be reduced from using increased energy settings.”