Pneumatic Skin Flattening
Offers Painless Hair Removal

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Pneumatic Skin Flattening (PSF) is a controlled vacuum handpiece from Inolase, Ltd. (Netanya, Israel) that adapts to most lasers and other light-based devices for truly pain free hair removal. "Pain is a big concern for many of my patients when using intense pulsed light (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, U.S. "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. 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," Dr. Ke explained.

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. 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 noted.

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."

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. By causing an upward compression effect, these structures are actually being elevated, closer to the skin surface," Dr. Ke explained. The upward compression also temporarily expels blood from the area. "Blood is a competing target for laser hair removal. By expelling blood, you are eliminating one of the competing chromophores. Consequently, the treatment becomes more specific and efficient, primarily targeting the follicle."

Blood expulsion and skin flattening also make the skin more transparent. "The hair follicles become much more visible," Dr. Ke noted. "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 UCLA Medical Center in Los Angeles, Calif., U.S. concurs 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 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."