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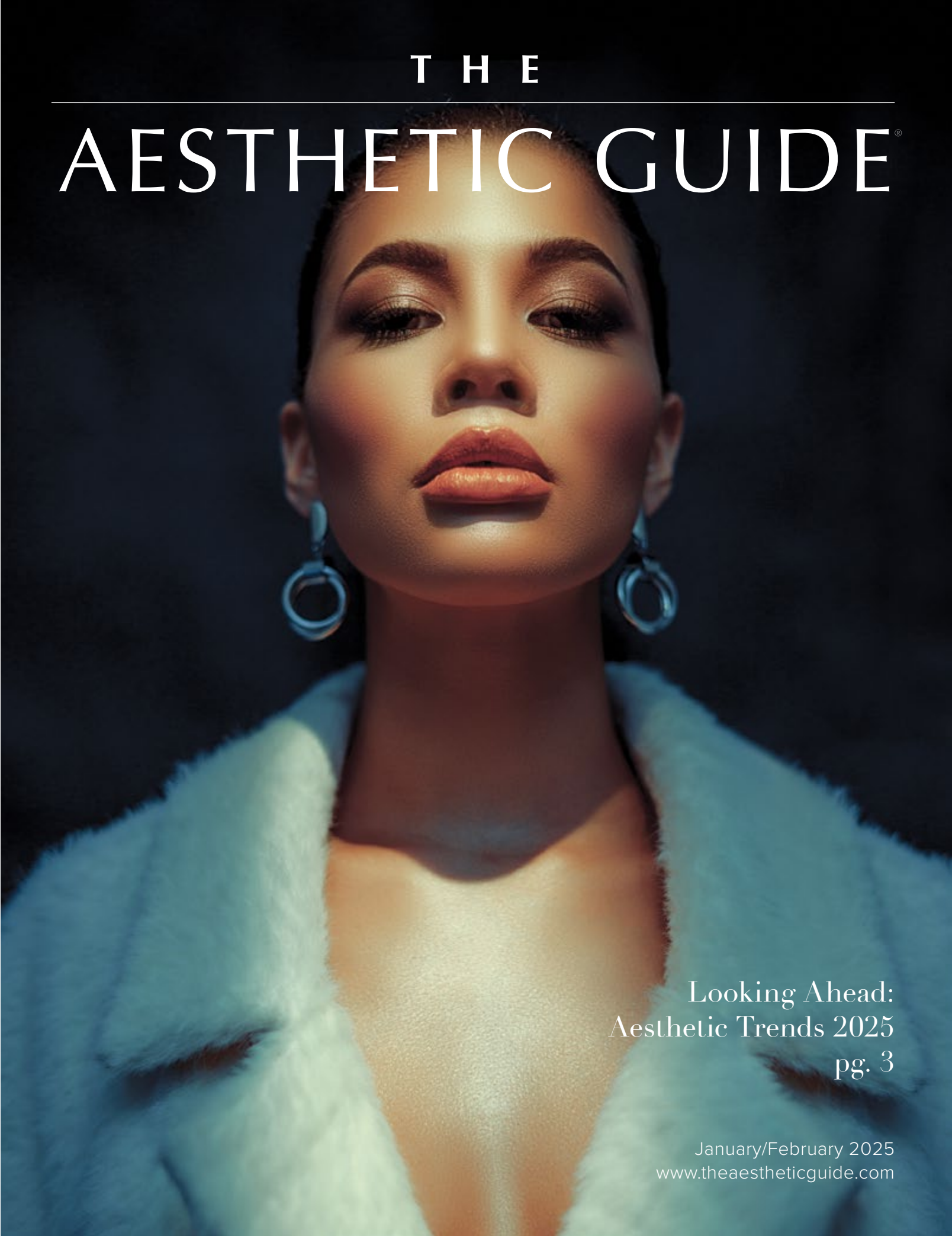

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Q-switched 532 nm Laser Maximizes Results with Fewer Adverse Effects

By Lisette Hilton, Contributing Editor

The 532 nm wavelength laser is known as a go-to device for treating pigmentary disorders with one caveat: the wavelength can increase the risk of post-inflammatory hyperpigmentation and prolonged erythema, especially in skin of color. It's a dilemma that many aesthetic practitioners face when treating common pigmentary concerns, including solar lentigo, seborrheic keratosis and melasma.

In response, the global medical aesthetics company Classys (Seoul, South Korea) has developed the Reepot, a Q-switched 532 nm Nd:YAG laser, that features its patented Vasculature Salvage Laser Surgery (VSLS®) approach to preserve treatment efficacy while reducing the risk of adverse effects.

532 nm Pros and Cons

The principle of selective photothermolysis is a relative concept that applies primarily within a narrow range. When applied to skin lesions, a laser's energy is predominantly absorbed by specific chromophores depending on its wavelength. However, unintended absorption by other chromophores also occurs, according to dermatologist Young Jin Kim, MD, of the BOMS Dermatology Clinic in Seoul, South Korea. "This phenomenon, regardless of the laser wavelength, becomes a major cause of increased risks of adverse effects, as the laser's fluence, pulse duration, pulse stacking and overlap ratio increase," he stated.

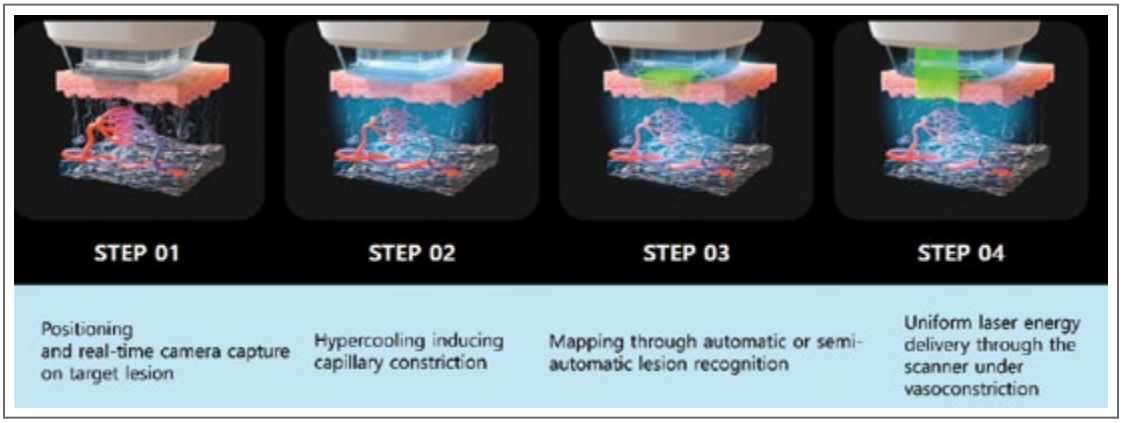
Due to its penetration depth, the 532 nm wavelength is ideal for addressing the epidermis and superficial dermis – where most pigmentary disorders are located. The wavelength offers superior outcomes in pigment treatment, with about 2.5 to 3 times higher melanin absorption compared to commonly used 694 nm and 755 nm wavelengths, and about 10 times higher absorption compared to 1064 nm, explained Dr. Kim.

On the flip side, the 532 nm wavelength also exhibits high absorption by oxyhemoglobin, making it prone to capillary damage even at low fluence levels. "This damage can delay wound healing by increasing local infiltration of inflammatory cells and excessive release of inflammatory cytokines," Dr. Kim shared. "Consequently, risks of post-inflammatory hyperpigmentation and persistent erythema are elevated, particularly in individuals with darker skin types."

A Cool Concept

The Reepot's VSLS concept minimizes the shortcomings of traditional Q-switched Nd:YAG lasers while maximizing therapeutic productivity. "Two core technologies were employed to achieve this goal: CryoPhotoThermoLysis (CPTL®) uses a sapphire handpiece capable of powerful contact hyper cooling by reaching temperatures as low as -15 °C," Dr. Kim commented.

"This cooling mechanism induces artificial constriction of capillaries during laser



Reepot laser usage protocol
Photo courtesy of Classys



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irradiation, thereby minimizing blood flow within the treatment area and reducing unnecessary heat diffusion to surrounding tissues."

The sapphire contact surface also applies pressure to the skin, causing capillary collapse. "The combination shortens the physical and optical path of laser delivery, enhancing penetration compared to non-contact laser irradiation methods," he explained. "So, even under high fluence levels and pulse stacking that would typically exceed standard safety ranges, pinpoint bleeding and blistering can be effectively prevented, allowing for safer and more reliable treatments."

The second technology, Autoderm®, is an automatic lesion recognition algorithm designed to map the optimal laser treatment area. This ensures consistent and uniform laser irradiation regardless of the operator's skill level, facilitating standardized and effective procedures, according to Dr. Kim.

Minimizing Side Effects

Published histological analyses conducted on Yucatan minipigs demonstrated minimal extravasation of red blood cells even at significantly higher fluence levels compared to traditional laser irradiation.[1] Researchers have also found the Reepot helps to minimize adverse events associated with challenging conditions, such as extensive solar lentigines and seborrheic keratosis. "Traditional treatment methods have faced significant limitations due to various histological features, including sparse melanin pigmentation, hyperkeratosis caused by epidermal proliferation and elongation of rete ridges. Additionally, a considerable number of patients present with coexisting melasma, further complicating treatment," Dr. Kim shared.

Conventional approaches often required multiple treatment sessions to minimize the risk of side effects, yet complete and recurrence-free removal still proved challenging, according to Dr. Kim.

A case series of subjects with refractory solar lentigines treated with the Reepot laser showed it safely and effectively addressed these challenges.[2]



Before and 11 days after treatment with the Reepot laser
Photos courtesy of Classys

Beyond Pigmentary Disorders

Reepot's high power density makes it a suitable device to use when removing non-pigmented lesions with hyperkeratosis, such as viral warts. "Considering its mechanism of action, there is significant potential for its application in the treatment of precancerous lesions," Dr. Kim suggested. "For patients willing to accept about two weeks of downtime, the Reepot laser is a promising treatment for extensive photoaging-related pigmentation and fine wrinkles, particularly in individuals with fair skin tones. Remarkably, substantial improvements can often be achieved with a single treatment session."

The Reepot laser can be used as a standalone treatment, as well as in combination with various skin boosters, such as pulsed dye lasers, that promote skin regeneration before and after the procedure to enhance outcomes. ■

References:

1. Kim YH, Cheon YS, Jeong GH, et al. The efficacy and stability of 532 nm nanosecond Nd: YAG Vasculature Salvage Laser Surgery (VSLS) system in ex vivo pigmented micropig skin. *Lasers Med Sci.* 2023 Aug 10;38(1):180. doi: 10.1007/s10103-023-03844-9. PMID: 37558911.
2. Lee SY, Kim KR, Kim S, et al. Refractory solar lentigines successfully treated with 532-nm nanosecond Nd:YAG Vasculature Salvage Laser Surgery (VSLS) system: Case series. *Skin Res Technol.* 2024 Sep;30(9):e70055. doi: 10.1111/srt.70055. PMID: 39300791; PMCID: PMC11413330.

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RF Microneedling Combination Treatments Improve Results

By Cindy J. Papp, Contributing Editor

Radiofrequency (RF) microneedling has earned a reputation as a safe and effective treatment for skin regeneration. Popular among patients and providers thanks to its reputation for collagen stimulation and tissue repair, advanced technologies have made it even more comfortable and effective.

Scarlet SRF, manufactured by Viol Co., Ltd (Seongnam, South Korea) and distributed in the U.S. by Aesthetic Management Partners (AMP), is a revolutionary RF microneedling platform notable for its versatility and efficacy. According to Dan Margolin, MD, owner and founder of Physician Aesthetic Specialists in Lenex, Kan., Scarlet RF can be used to treat scars, large pores, skin laxity, pigment issues and diffused redness. "We [also] use it to tighten areas of the face and body, including stretch marks or crepey skin such as on the abdomen, with excellent results for both tightening and lift."



Dan Margolin, MD
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Physician Aesthetic Specialists
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Deborah Manjoney, MD, FACS
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Dr. Margolin takes advantage of combination therapies to maximize the technologies of Scarlet RF. "We have had amazing results utilizing platelet-rich plasma (PRP) in conjunction with Scarlet RF. We use an ultrasound to drive the PRP into the skin, so there is no longer a need to inject it. We also supplement it with EXOIE™ (AMP), an exosome-based product for in-office use as well as at home. Our favorite combination therapy is Scarlet RF to build collagen and elastin within the deeper layers of skin, followed by NOUVADerm, a 1927 nm thulium skin resurfacing laser, which directs most of its power at the surface level for a comprehensive and effective regenerative treatment."

"We treat general, mild skin laxity, fine lines and acne scarring with Scarlet RF and achieve an overall lift and smoothing of the skin," reported Deborah Manjoney, MD, medical director of Wisconsin Vein Center Medispa in Pewaukee, Wis. "Scarlet RF can be used on delicate skin around the eyes, and the penetration depth of the needles can be easily adjusted and customized. We find that Scarlet RF has a quicker social recovery than microneedling alone."

"Our favorite treatment protocol is the combination of three Scarlet RF treatments, one month apart, with fractionated thulium laser resurfacing," Dr. Manjoney continued. "We always ask our patients to use preparation and post-care for Scarlet RF." She also recommends patients use EXOIE products.



Patient shown before and five and a half months after two Scarlet RF treatments
Photos courtesy of Deborah Manjoney, MD, FACS

Flora Waples, MD, founder and medical director at RESTORE Medical Spa (Denver, Colo.), uses Scarlet RF for anti-aging, scars, rosacea and eyelid treatments. "We like to pair this with our 1927 nm laser immediately after the Scarlet RF treatment with topical polydeoxyribonucleotides (PDRNs) and may pair it with our long pulse 1046 nm Nd:Yag laser to get the larger capillaries that the RF microneedling cannot pick up. One of the best things about Scarlet is that since the needles are uninsulated, they cauterize the entire length of the puncture wound for less swelling and bruising. I especially like how I can treat the blush of rosacea and am now retiring my IPL, as it was very hard for patients to tolerate."

According to Dr. Waples, Scarlet RF is her favorite RF microneedling device. "Overall, Scarlet RF microneedling offers a great solution for various skin concerns, delivering noticeable and lasting results with minimal discomfort and very little recovery time." ■

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