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# Seminars in Cutaneous Medicine and Surgery

## Introduction

OVER THE PAST 20 years lasers have gone from being available only in a few academic medical centers to being widely available and used by mainstream dermatologists in private practice. Lasers are rapidly becoming an essential part of dermatology practice. The theory of selective photothermolysis developed by Anderson and Parrish in 1983 has, along with technological development, unlocked the power of lasers for the safe and effective treatment of many skin lesions.

In this issue of *Seminars in Cutaneous Medicine and Surgery*, we have selected topics dealing with the most recent developments in laser surgery. These 7 topics were selected to bring the reader up-to-date on the state-of-the-art in laser surgery. The authors are leaders in the laser field with special expertise on the topic that they wrote about.

Laser skin resurfacing is continuing to rapidly evolve with the introduction of Er:YAG and, most recently, variable pulse Er:YAG lasers that promise to make the procedure safer and easier on the patient while maintaining the efficacy of the CO<sub>2</sub> resurfacing laser. Radiofrequency resurfacing, "reverse thermal gradient" (RTG) nonabrasive radio frequency resurfacing, microdermabrasion, intense pulsed light, the long pulse 1,320 nm and 1,540 nm Nd:YAG lasers, nonablative Er:YAG laser, and pulsed dye laser show promise as alternatives to ablative cutaneous resurfacing for patients with mild rhytides or scars who are unable to deal with a wound and the relatively long healing phase of even Er:YAG resurfacing.

The laser treatment of benign pigmented lesions is well established, but there is continuing controversy about the appropriateness of treating congenital and acquired nevi with lasers. The new long-pulse lasers developed for laser hair removal have shown promise in fading nevi without the frequent repigmentation seen with Q-switched laser systems. Several long-pulsed laser systems are being studied for the treatment of leg telangiectasias with increasingly good results. Sclerotherapy is still the gold standard, but the newest laser systems are rapidly catching up.

Protection of the epidermis with cooling during laser treatment of dermal lesions such as unwanted hair and vascular lesions seems to be very important to reduce side effects and allow higher energy fluences to be used to enhance treatment efficacy. Active, passive, contact, and cryogen spray epidermal cooling systems have been developed, each one with its proponents for specific indications. The choice and quality of the cooling system

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is becoming an essential part of laser treatment especially for hair removal where very high-energy fluences are needed for long-term hair reduction. Long-term hair reduction is now feasible because of the availability of varying wavelengths and pulse durations, allowing even very dark-skinned individuals to benefit from laser treatment. The use of longer wavelengths, longer pulse durations, and high-energy fluences with dynamic cooling of the epidermis, have significantly

improved the efficacy of treating vascular lesions, especially port-wine stains. These birthmarks can now be faded with fewer laser treatments while the recovery is faster and the pain of treatment is dramatically reduced.

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