Non-surgical forms of facial rejuvenation represent the most rapidly growing area in facial rejuvenation. People want to look youthful and rested, but few can justify the two weeks of healing time required to achieve this goal. Many of my patients want to look younger to compete in the work place, but it is difficult for them to justify taking time off work to achieve this goal in such an unstable economy. Fractional photothermolysis is one of the recent innovations in laser resurfacing that allows us as physicians to offer our patients an effective form of skin rejuvenation that fits their busy lifestyle.

The original laser used in skin rejuvenation was the Ultrapulse CO2 laser released in 1992. This is an ablative laser vaporizing the entire skin surface. It is very effective and remains the gold standard when treating wrinkles. The main problems with traditional CO2 resurfacing result from the harsh nature of the procedure. Healing times are between 7 and 10 days, and there are increased risks of wound healing complications. Aggressive treatment yields good results, but fewer and fewer patients are willing to go through the prolonged healing process.

Non-ablative laser technology emerged in the late 90’s, and non-ablative lasers were touted as a no downtime treatment for skin rejuvenation. This family of lasers heats the skin via various methods causing new collagen to form creating more youthful skin with improvement in fine lines. Non-ablative lasers are also essentially complication-free due to the fact that no skin ablation is occurring. Elimination of a 10 day healing period was very attractive to our busy patients, but there was a certain level of frustration for both patients and physicians as non-ablative treatments frequently failed to produce significant improvement in skin texture especially in the treatment of wrinkles. My experience with early non-ablative lasers is best described by the saying, “If it sounds too good to be true it probably is.”

The middle ground between no downtime non-ablative lasers and harsh ablative CO2 lasers was introduced in 2004 with the advent of fractional photothermolysis (Fraxel) by Reliant Technologies in Palo Alto California. Fractional photothermolysis is a process where a specific portion of the skin is ablated by creating microtreatment zones of thermolysis (MTZs). MTZs are a focused beam of laser energy ablating cylindrical portions of the skin extending between 400 and 1,200 microns into the skin, while leaving skip areas of non-ablated skin between each MTZ (Figure 1). Most fractional resurfacing technologies create MTZs covering between 20% and 40% of the skin surface leaving the remaining portion of the skin surface untreated.

Figure 1. Microtreatment zone of Ablation extending 1.2 mm into the skin surface. Note the central zone of ablation and surrounding zone of coagulation. The remaining skin between each MTZ is spared of injury allowing for more rapid healing.
Presently, I use the second generation Fraxel Re:store technology for fractional resurfacing. Patients undergo a series of 4 treatments in my office under topical anesthetic cream. Each treatment resurfaces 20% of the entire skin surface, while the entire series resurfaces 80% of the skin surface. The patients are red and swollen over night and puffy the next day. Most return to normal activity the following day. Hundreds of thousands of microtreatment zones of ablation fractionally resurface the skin, resulting in healthy younger skin with decreased photo damage and reduction of fine lines. Skip areas of untreated skin between the MTZs contain the healthy skin elements required for rapid healing. In terms of healing time and results delivered by fractional resurfacing lasers, the price of beauty is right for busy patients in 2009.

**Biography**

Steven K. Struck is certified by the American Board of Plastic Surgery. He is a Stanford trained plastic surgeon practicing in Atherton and Los Gatos, California. He has conducted numerous studies involving fractional resurfacing of the face and combining surgical facial procedures with resurfacing.

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