

### Transcript Details

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Laser and Energy Devices Session: Dr. Ross

### Vic Ross:

I'm Vic Ross. I'm a laser and cosmetic dermatologist. I'm here at Maui Derm 2025 to talk about my talk I gave. And the talk I gave was really about lasers and really the concepts of lasers, principles of lasers, and other light-based and energy-based technologies and how they relate to the skin in actual practical applications. So we started discussing the basics of lasers, how laser light is created, the differences between laser light and non-laser light. And then progressed to talking about the different types of lasers. So basically you have gas lasers, solid state lasers, diode lasers, all of which have become increasingly easy to produce and more robust and more reliable than they were, say, 20 or 30 years ago when I started my fellowship.

So once we take that laser technology, how do we apply it to the skin? Well, laser is really just a convenient source of photons. There are other sources of photons that don't involve lasers. But when you have this source of photons, it's very convenient. How do we relate that to the skin? Well, we relate it to targeting three chromophores in the skin, water, blood and melanin. And if you know the relative absorption of those targets relative to the wavelength of light, you can predict what types of reactions would occur if you apply different colors of light to the skin. For example, if you're treating a vascular lesion, you would use a green-yellow light in lighter skin to target, say, a blood vessel on the nose. Likewise, if you were treating a sunspot on someone's face, you might use a red light laser. So you use the right laser and the right wavelength and the right pulsation and a sufficient effluence to cause damage, that's called selective photothermolysis. And my mentor, Rox Anderson, came up with that over 40 years ago.

So you take this light, you apply it so you have very spatially localized heating. So only the bad guy gets hurt. The good guy, which is the normal surrounding skin, stays cool and relatively unscathed. So lasers used properly are really like a smart bomb and you can use them creatively to treat lots of things. Hair removal is another good example. Hair removal, you're taking advantage of the difference between the pigment of the hair and the surrounding skin so that the hair gets hot and the other part of the skin stays cool. And then we talked about some other non-laser-based technologies or other non-light technologies such as ultrasound, radiofrequency, and even a device called Tixel, which are little pyramidal titanium crystals that come in contact with the skin and create direct heat. So the key thing is taking energy from a box and producing heat in a controlled fashion in the skin, again, to achieve the desired result. And as long as you understand the basic concepts and you understand heat transfer, you can make a very good case for treating your patients safely and effectively with minimal discomfort.