

## The Multi-Purpose Photochemical Laser

K-Laser can treat a wide variety of foot conditions.

By Bruce B. Zappan, DPM

It was the 17th century when Sir Isaac Newton first identified the visible spectrum of light through a prism. Albert Einstein took this simple discovery and extrapolated on it in 1905 in a series of four scientific papers. In one of these papers, he explained, "light comes as a particle known as a photon." In 1917, he expanded his theories and laid down what is the basis for modern-day laser technology. He postulated that "amplified stimulated emission has the same frequency and phase as the incident radiation," meaning that excited photons have the ability to penetrate deeper into tissues to produce a reaction.

Laser stands for Light Amplification by Stimulated Emission of Radiation. Class 1, 2, and 3A (low power) lasers are found in laser printers and laser



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nanometers (nm) that stimulate the body's natural ability to heal and are used for relieving joint and deep tissue pain. They do this by a chemical reaction known as photobiomodulation. This photochemical effect allows photons to combine with cytochrome c oxidase, which increases synthesis of ATP and in turn adds to the available energy for cells.

In addition, nitric acid, a natural vasodilator, is released, providing more oxygen and nutrients to tissues. Permeability of the plasma membrane allows calcium and iron to trigger cell division while RNA and DNA synthesis increases, including growth factors. Photochemical lasers can also form blood vessels (angiogenesis), improve immune systems, activate changes in neurons, and synthesize collagen by fibroblast contraction.

With so many conditions to treat and the diversity of lasers on the market, it's difficult to know what to invest in. Versatility is the key and that is why I chose K-Laser.

**A photochemical laser causes no pain and produces a vast improvement in verruca in as little as six days after treatment.**

### The K-Laser Therapy Laser

K-Laser is the highest of the Class 4 lasers. The original model offers a dual wavelength (from 800 up to 970

pointers, and have a wattage of between 1 to 5 milliwatts. Class 3B lasers have medium power at under 0.5 watts and are found in industrial or research lasers. Lasers used in medicine are Class 4, the highest powered at over 20 watts.

### Types of Lasers

There are three main types of lasers used in medicine. Thermal lasers convert energy to heat, which vaporizes tissue. These lasers are long pulsed and can be utilized for skin lesions, warts, hair removal, and fungal nail treatments. Photomechanical lasers break up molecular bonds within tissues, causing photo-dissociation. These lasers are short pulsed and very color-sensitive, making them perfect for removing tattoos and other vascular lesions including port wine, angio-mas, and telangiectasias.

### Photochemical Lasers

The last group of lasers are photochemical lasers, which border the red and infrared spectrums of light. These lasers have specific wavelengths measured in



nm), but the latest models have the advantage of three or four wavelengths in a much wider range (660nm to 970nm). At 800 nm, ATP production is stimulated, which increases the available energy for cells. At 905 nm, there is increased absorption by hemoglobin, which brings

*Continued on page 148*

## K-Laser (continued)

in more oxygen and nutrients and flushes away metabolic waste build-up. At 970 nm, absorption by water molecules helps to enhance micro-circulation.

Thanks to the wide range of wavelengths, K-Laser therapy lasers have an increased number of clinical applications. K-Laser can be used to treat pain and promote healing in injuries such as fractures, sprains, and tears of the cartilage, ligaments, muscles, or tendons. It can also be utilized for inflammatory conditions such as bursitis, capsulitis, myositis, plantar fasciitis, shin splints, tendonitis, arthritis (rheumatoid or osteoarthritis), neuropathy, neuromas, tarsal tunnel, fibromyalgia, and RSD (complex regional pain syndrome).



Dr. Zappan treating a patient using the K-Laser

healing was “much more rapid than I expected and the laser treatment was completely painless.”

### Verruca Plantaris

Treating verruca plantaris with a thermal laser will abrade or cauterize tissues, but requires multiple treatments that are usually quite painful and necessitate local

anesthesia. A photochemical laser causes no pain and produces a vast improvement in as little as six days after treatment. K-Laser treatments attract a huge amount of oxygen to the verruca site to kill the papilloma viruses. The dark hemorrhages characteristic of verruca will disappear as healthy tissues regenerate. Each treatment

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**In combination with L-arginine amino acid cream and neuro-vitamins containing alpha-lipoic acid, the K-Laser therapy laser has greatly reduced symptoms in my diabetic patients.**

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### Plantar Fasciitis

Plantar fasciitis is greatly improved in over 80% of my patients who have K-Laser treatments. The procedure takes approximately 3 minutes and will need to be repeated 2 to 5 times. The laser increases production of ATP, which stimulates healing and washes away toxic waste. Since many patients pay out-of-pocket for laser treatments, our office combines this service with traditional treatments such as strappings and orthotics. Always try to work within the patient's budgets to get them the care they need from the K-Laser.

### Onychomycosis

Of the fungal nail treatments available, topical prescription medications alone have low success rates — approximately 17.8% for efinaconazole and 9% for tavaborole. Oral medications such as terbinafine can take up to four months to produce results and have a cure rate of only 49%. K-Laser Treatments offer a 65-70% cure rate and generally require only two to six treatments spaced twice per week for average to medium cases. In cases where complete elimination of fungal nails is not possible, patients still report a vast improvement in the appearance of the nail and a reduction in pain.

### Case Study 1

One patient, a 65-year-old male, presented with 4mm thickened, painful fungal toenails. His fungal culture was positive for *Trichophyton rubrum*. His treatment plan included regular nail debridements, topical tavaborole OD to toenails, and five treatments from the K-Laser therapy laser. After four months, the patient stated that there was a “very significant improvement”. He also commented that

will produce a visible result that patients will appreciate. In more severe verruca cases, prescribe salicylic acid 60% or 5-fluorouracil once daily following laser treatments and continue this dual therapy as needed.

### Wound Healing

Wounds and infections such as diabetic ulcers, venous insufficiency, and those resulting from trauma all respond well to K-Laser treatments. Deep ulcerations secondary to venous insufficiency will begin to heal in just 10 to 21 days. Each treatment promotes angiogenesis and patients can visually see results as the discoloration fades and the skin returns to a healthy pink color. Increased blood flow triggered by the K-Laser transports essential oxygen and nutrients to wounds to accelerate healing and increase tissue regeneration. In addition, K-Laser treatments can reduce the appearance of scars, burns, herpes zoster, and psoriasis.

### Neuropathy

Neuropathy has many causes, including alcoholism, diabetes, autoimmune disease, heavy metal

*Continued on page 150*

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## **K-Laser** *(continued)*

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poisoning, chemotherapy, Lyme disease, Charcot-Marie-Tooth, trauma, tumors, vitamin deficiencies, and bone marrow disorders, not to mention idiopathic neuropathy.

### **Case Study 2**

A 27-year-old Caucasian female presented after experiencing three weeks of complete numbness to adjacent sides of her right first and second toes. Touring Italy and walking several miles each day in sandals had injured the digital nerves. The first laser treatment had minimal effect, but the second treatment resulted in a 75% return of feeling to the great toe and 50% to the second toe. By the fourth treatment, she had fully recovered.

### **Diabetic Neuropathy**

The K-Laser has also produced amazing results for patients suffering from diabetic neuropathy. There are 30 million diabetics in the United States (9.4% of the population) and over half this number will experience neuropathy. In combination with neuro-vitamins which contain

alpha-lipoic acid and L-arginine amino acid cream, the K-Laser has greatly reduced symptoms in my diabetic patients. Of course, regular monitoring and control of diabetes is important to prevent the recurrence of further neuropathy.

### **Additional Uses**

Used pre-operatively, K-Laser treatments stimulate ATP production; post-operatively, they reduce inflammation, scar tissue, and pain; and they promote accelerated wound healing. The K-Laser can also be used in conjunction with stem cell therapy after injection. The increased blood flow created by the laser helps progress the stem cells through the body rapidly.

Lasers are wonderful tools for expanding your treatment options and bringing in additional revenue sources, but choosing a model for your practice can seem like a monumental task. It is important to check the class, effectiveness, and safety of the laser as well as the reputation of the company. Remember, photochemical lasers such as K-Laser will treat a wider variety of conditions and have a high rate of success in podiatric treatments.

*For more information, visit [www.k-laser.com](http://www.k-laser.com)*

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