Infrared Diode PhotoTherapy

At the forefront of our treatment regimen is the use of an infrared diode device, also known as low-level light therapy, photon therapy or photo therapy. This therapy outputs infrared light ranging in wavelength from 430-880 nm. The best wavelengths to use are infrared, specifically the narrower wavelengths in the near infrared (NIR) band centering around 900 nm. When used appropriately on the affected area, these lights promote the release of nitric oxide from the endothelial cells, increasing local blood flow, and stimulating angiogenesis.

Nitric oxide is also known to play a critical role in increasing the flow of blood into body tissues. Better blood flow serves to bring fresh nutrients and oxygen into the injured area and remove bacteria and toxins out of it. This therapy has been around for some time now and is well documented and researched. Because of the limited depth of penetration of the light and the limited area that can be treated (only directly under the lights), this therapy is best used when any particular local area has been identified with a loss of local blood perfusion such as on the plantar surface of the foot, a local injury that is slow healing, or the diabetic foot.

By localizing the area to be treated,stimulating the release of nitric oxide, and increasing circulation to the peripheral nervous system, infrared therapy was found in one study to produce a 67% reduction in pain as well as a 66% increase in foot sensation (2).Prendergrast, Miranda, and Sanchez found a decrease in foot pain from an average of 8 on the Visual Analog Scale to 3 following 10 treatment sessions (3). This study also found that 16 of the 27 subjects achieved normal foot sensation.

An important measure of sensory nerve growth following treatment is the patient's ability to exhibit protective sensation to a Semmes-Weinstein monofilament. A study in the Journal of the American Podiatric Medical Association found that 98% of subjects exhibited improved sensation after 30 days, and 100% showed improvement after 90 days (4).

A well-documented consequence of peripheral Neuropathy is an increase in falls and fear of falling. As peripheral nerve regeneration takes place with our collective treatment system with multiple modalities, one of the results is improved proprioception and balance.

A double-blind, randomized, placebo controlled study published in the Journal Diabetes Care (with the plantar surface of the diabetic foot), found remarkable improvements in balance following a course of infrared therapy. At the beginning of the study, 90% of subjects reported substantial balance improvement; after treatment this declined to only 17%. Another study published in 2006 found a 78% reduction in falls and a 72% increase in activities of daily living (5). The rate of wound incidence in diabetic peripheral neuropathy also dramatically decreased with the administration of this therapy. One study found the rate of new diabetic foot wounds to be 1.5% in the treatment group vs. the national average of 7.3% (6). This results in a substantial cost savings as well as a reduction in patient risk due to wound healing complications. As promising as the results of infrared treatment as a monotherapy may be, we have seen more comprehensive results with the addition of several other therapies.