

Advanced Wound Care

INCREASE BLOOD FLOW

INCREASE TISSUE PERFUSION

INCREASE TISSUE OXYGENATION

MicroVascular Therapy

FOR

**Diabetic Ulcers, Decubitus Ulcers
Any chronic, Non-healing Wound**

"An average periwound TcPO₂ of less than 20 mmHg was associated with a 39-fold increased risk for early healing failure..."*

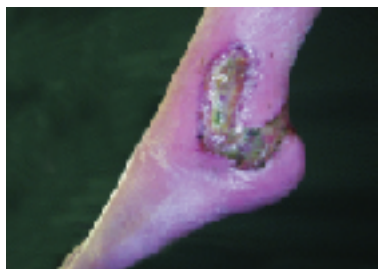
*Pecoraro, R.E., Ahroni, J.H., Boyko, E.J., Stensel, V.L. Chronology and determinants of tissue repair in diabetic lower-extremity ulcers, Diabetes, 1991

Vascular Impairments Complicate Treatment

Effects of vascular disease occur in both the larger macrovascular and the smaller microvascular arteries, which supply local cellular nutritive flow. Equally important is the fact that the disease is multifocal and can be found in the peripheral, cerebrovascular, and cardiovascular systems at the same time. Progression of neuropathy leads to autonomic dysfunction (loss of sympathetic nerve innervation) with resultant arteriovenous shunting and microvascular thermoregulatory dysfunction. This in turn results in abnormalities in the microvascular response to injury, with attendant reduced tissue perfusion. That lack of oxygen keeps the ulcer from healing. In cases of infection, the impaired blood flow reduces the delivery of oxygen to the affected tissues, making aggressive treatment of ischemia a priority.*

*Miller, M.S., Vascular Impairments Complicate Treatment, Biomechanics, 2003

RSD and Pressure Ulcers-A Real Challenge!



The patient, a 57 year old woman, suffered a minor fracture of her tibia and was given a plaster cast as part of her treatment. The pressure of the cast coupled with the patient's poor circulation, combined to create a pressure ulcer that ran down the side of her ankle, wrapped around the heel and up the other side of her ankle.

To compound the situation, or perhaps triggered by the series of events, the patient also developed Reflex Sympathetic Dystrophy (also known as Complex Regional Pain Syndrome) marked by a heightened sensitivity to dermal contact. She was unable to undergo debridement, or tolerate the use of topical dressings.

At the MicroVas Treatment Center, the patient received MVT three times a week which did not cause her pain. At one point, the therapist tried a simple saline gel and the patient reacted with extreme pain (10/10) and it had to be washed off immediately.

Subsequently, the treatment regimen consisted of MicroVas treatments and sterile gauze dressings only. The photos at left show her remarkable progress over a 60 day time period.

ISCHEMIA:

...an inadequate vascular supply fails to provide the inducers, substrates, and oxygen necessary for wound healing.

Problem Wounds: How to Promote Healing, Prevent Recurrence. Consultant, 11/01/2000 Strauss, M.B.

HYPOXIA

Hypoxia plays a critical role in wound healing since it impairs collagen synthesis and prevents fibroblast proliferation and migration.

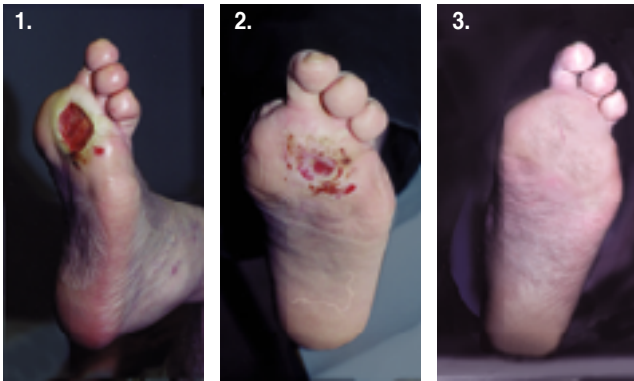
Harkless, et al, Podiatry Today, 2000, 1045-7860



In the time it takes you to read this brochure, five people in America will experience amputation

87,000 annually, One every 2 minutes at a cost of \$37 billion dollars*

*Vinik, A.I. et al, Diabetic Neuropathy: A Small-Fiber Disease, MedScape Today, 2003



Two Year Old Ulcer Healed In 60 Days

A 63 year old male diabetic was suffering from a non-healing foot ulcer which had persisted for two years despite a vigorous program of traditional wound care. He had already lost two toes and was facing the possibility of foot amputation within a relatively short time.

After MicroVascular Therapy (MVT) five times a week for ten weeks at HealthSouth Rehabilitation Hospital of Tulsa, Oklahoma, the ulcer was completely healed and his foot was pain free.

Examined several months after treatment, it appeared the same as in photo three, at left.

Post-Surgery Non-Healing Wound

□□□The patient is a 53 year old female diabetic who slipped and fell on some stairs. The fall resulted in a compound fracture of the leg with significant trauma to the surrounding tissue. She was transported to St. Francis hospital in Tulsa where the orthopedic surgeon on call, used plates attached with screws to stabilize the break. Four months later, because of poor circulation, the incision was showing no signs of healing, as shown in the top photo at right. The patient was fearful of an amputation since the wound was growing worse.

□□□After the patient began MicroVas treatments, the effects were quickly apparent. Not only was the wound healing, but a fracture in the tibia was also healing. After more MicroVas treatments, the patient was examined by her doctor who was surprised to see the extent of healing that had occurred.

□□□



GRADIENTS

...the pressure gradient between normal and stenotic regions is known to be the most important factor for collateral vessel development.

Nisanic Y, et al, J Invasive Cardiology. 2002 Mar; 14(3): 118-22

NON-SURGICAL REVASCULARIZATION?

□□□Revascularization has been growing in popularity for a number of reasons, but the operation addresses only the macrovasculature and achieves results in a limited area, while the ischemic problems may be of a more general nature. Surgical revascularization is less than a perfect answer. A recent study of amputations at a major VA hospital* reported that 26% of the amputees had undergone prior revascularization with 48% of those having early failure.

□□□MicroVascular Therapy (MVT) dramatically raises the wound/periwound pressure gradient in most patients (see OU study inside). The increases in baseline indicate the process of angiogenesis. We postulate that MVT forces the development of collateral circulation to such an extent that it could be considered "non-surgical (micro)revascularization" and is the basis for our clinical successes.

*Cruz CP, et al, Major lower extremity amputations at a Veterans Affairs Hospital; Am J Surg 2003 Nov; 186(5):449-54.



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