

What to Look for in Wound Therapy for your patients with Non Healing Foot Ulcers

A checklist to find out if they've really "Been There, Done That!"



A trained nurse gives end-diastolic compression.

PHYSICIANS AND SURGEONS regularly see patients with non healing lesions, often in combination with acute infection, gangrene and pain. Everything has been tried — nothing works. But is that really true? Has the patient received *aggressive wound treatment*, or merely conventional wound care?

The therapist needs to have enough different clinical tools available to turn up the treatment intensity until a positive healing response is achieved, and *not* merely classify the wound as unhealable. Heroic effort *is* justified!

A clinician with the familiarity and training in the techniques that can really make a difference. Instead of trying to coax a difficult wound to heal with standard wound care, *special skills* and an inventive attitude are needed to effectively turn around the situation and induce a positive healing response. Many specialists are expert only in their area. Being admitted to a large teaching hospital does not guarantee satisfactory wound treatment!

The failure to heal a lesion on a patient's foot becomes an enormous quality-of-life and financial burden for the patient, and a huge financial liability for the health care system.

If you have been sending your high-risk patients to a wound or foot clinic, and patients are often deemed "unhealable", here are some points that you can ask about to find out if these patients have really **"been there, done that."**

What specialized training did you receive to do this work?

Each profession (nurse, physiotherapist, massage, chiropractor) has one to four day seminars every year on various aspects of wound therapy. One such recent workshop would be minimal; hearing a presentation at an annual convention would not usually be considered enough training.

What is the typical outcome for your patients?

In most outpatient clinics with the right equipment and expertise, the cure rate should be in the upper 90 percents. But if many patients are very elderly or in poor health, expect less success.

Will the patient get therapy at home?

Equipment can often be set up at home so that patients will benefit from daily treatment.

What methods do you use?

A full set of therapeutic equipment is needed to work effectively.

Travel by the patient to a clinic with the needed therapeutic expertise and equipment is well justified. As well as the ability

to give high-quality wound care, to do wound bed preparation and to apply specialized dressing systems, *eight modalities* are important in wound therapy. The experienced clinician will successfully justify and acquire the needed equipment.

1. End-Diastolic Compression

Poor blood circulation is a significant factor in nearly all recalcitrant foot lesions, causing a deficit of oxygen and nutrients together with a build up of fluid and waste metabolites. End-diastolic compression using Circulator Boot™ equipment is an essential technique for any clinic that treats at-risk patients. The system times the pneumatic compression pulses, typically 85 mm Hg pressure, to occur at end-diastole. This increases blood flow in the feet and legs to break up emboli and induce angiogenesis. It disperses antibiotics through the tissues and is effective against deep infections. The Circulator Boot is arguably the overall most efficient and cost-effective therapy for foot lesions, especially when infection is present.

2. Bio Stimulation Laser

When equipped with an output power of at least 250 mW visible and 250 mW infra red light, plus the ability to uniformly scan the entire wound with an applied dose of 3 to 4 Joules/cm², Low-Level Laser Therapy (LLLT) stimulates granulation tissue and augments collagen synthesis to produce healing.

3. Galvanic Stimulation

A pulsed-DC current, passing through the wound bed, accelerates wound healing. It will usually turn around a stubborn wound to produce healing, and will significantly shorten the healing time. *All* wounds that require daily nursing care should receive either galvanic or laser stimulation to speed healing and wound closure, if only as a cost-saving measure.

4. TENS and Interferential Stimulators

Electro therapy using nerve stimulation (TENS) or interferential current techniques can accelerate wound healing by relieving the swelling and increasing blood flow to the feet.

5. Vacuum-Assisted Closure

A mild vacuum applied intermittently to the wound by means of an airtight dressing can aid in wound closure.

more aggressive approach is indicated. Changing to a more intensive program should produce a positive outcome.

With a results-driven and patient-focussed approach, the successful, well-trained wound therapist puts out the effort to achieve successful outcomes and therefore is able to further contribute to the evidence base of good wound practice. Since these modalities are all time-tested and well supported by clinical research data, you can ask for published reports that support the techniques being used.

Some questions can be helpful in determining a course of action: (1) Why is the lesion not healing? — Ischemia, neuropathy, infection, tumour? (2) Is the vascular status of the foot documented with non-invasive vascular tests? (3) Is the neurological status documented? (4) Have appropriate cultures been taken? (5) Is osteomyelitis present? With the answers to these questions, the proper role of reconstructive surgery, end-diastolic boot therapy, multi electrolyte solutions, local antibiotics, and local hygiene becomes apparent.

Don't forget the psychology of wound healing! A chronically diseased foot causes pain and anxiety which produce an autonomic response that restricts peripheral blood flow and further inhibits healing. A psychologist or biofeedback technician, using computerized, multi mode biofeedback methods, can teach the patient how to produce a relaxation response that increases peripheral blood flow and warms the feet. Video tapes are available with a similar purpose.

Wound therapy cases will benefit from *diagnostic techniques*, such as Skin Perfusion Pressure, Doppler and tcPO₂. Because it measures the blood pressure in the micro circulation adjacent to the wound, *Skin Perfusion Pressure* is preferred as the best predictor* of wound healing potential, and as an ideal secondary measure to verify the effects of therapies intended to increase peripheral blood flow. Since healing progress often can be a delayed response, measurements showing increased circulation can be a strong motivating factor for the patient to continue with the course of treatment until achieving success.

Are all of these diagnostics and therapies justified for the patient? *Definitely!* Even the resection of a deeply infected ulcer or the amputation of a toe is *not* a natural expected disease progression; rather it is usually the failure to apply timely and appropriate therapy. It is the beginning of a never-ending series of clinic visits, home-care, chronic pain, further amputations, hospitalizations, prosthesis fittings and disability. The provincial healthcare systems in Canada cannot afford to sustain overly cautious wound care!

In contrast, *successful healing* of the lesion results in restored quality-of-life and independence. It is extremely rewarding and satisfying for the patient, the therapist and the physician!

6. Local Antibiotic Injection

An adjunct to end-diastolic compression therapy, the therapist injects a suitable antibiotic directly into and around the infected tissues using an ultra-fine needle prior to a therapy session. The compression pulses disperse the antibiotics for treating bacterial infections, including cellulitis and osteomyelitis.

7. Multi Electrolyte Soak

Another adjunct to end-diastolic compression therapy, "Sea Soaks" provides the important micronutrients needed to aid in healing. In a soak solution during a therapy session, and along with antibiotics and hydrogen peroxide, this provides a *soft debridement* that largely replaces the sharp debridement sessions which can be damaging to delicate tissues.

In clinical testing, what do the researchers say about end-diastolic pneumatic compression?

"Excellent outcomes in patients with severe peripheral arterial occlusive disease suggest that the wound care community consider expanded utilization of this modality."
— Zink, J. 2003.

About local antibiotic injection?

"Both osteomyelitis and soft tissue infections can be successfully treated without any surgical interventions."
— Dillon, RS. 1986.

About laser therapy for pain control and tissue repair?

"Laser therapy has a positive treatment effect on tissue repair processes and also, on pain control." — Parker, J. Meta-analysis. 2000.

Ideally, the wound clinic needs to have several modalities available because each patient's need is different. Patients may not all respond adequately to each method. In a physician-run clinic, the physician can determine which methods are appropriate for the wound therapists to use, depending on whether the central issues are infection, blood flow or wound closure.

The status of the wound after 30 days of treatment is generally a good predictor of final healing potential. If a wound has not shown a healing response after 30 days of wound care, then a

* Clinical reports are on file.

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