Wound Therapy Information Sheet

The Sun Home Health Companies

General Background

Chronic wounds are defined as wounds that have gone through the repair process without producing satisfactory anatomic and functional integrity. Chronic wounds include pressure ulcers, venous ulcers, and diabetic foot ulcers with causes that are related to venous insufficiency, pressure, trauma, diabetes, vascular disease, and immobilization. Although the causes for chronic wounds vary, in all cases at least one of the phases of wound healing is compromised. Morbidity associated with difficult to heal chronic wounds negatively affects the quality of life of patients and may lead to high healthcare costs (Barbul, 2005; Hayes, 2003).

Venous Stasis Ulcers

Venous stasis occurs due to the incompetence of either the superficial or deep venous systems. Chronic venous ulcers are usually due to the incompetence of the deep venous system and are commonly painless. The consensus is unclear as to the exact pathophysiologic process that leads to ulceration and impaired healing with venous ulcers. Regardless of the pathophysiologic mechanisms, the characteristic clinical picture is that of an ulcer that fails to re-epithelialize despite the presence of adequate granulation tissue. The wound is usually shallow with irregular margins and pigmented surrounding skin (Barbul, 2005).

The goals of venous leg ulcer treatment are to heal existing ulcers and prevent their recurrence by reducing venous hypertension, increasing venous return, increasing fibrinolytic activity in the
tissues, and improving tissue oxygenation. Improved venous return is achieved by rigid or flexible compression therapy using compression stockings, Unna boots, elastic wraps, orthotic compression devices, and pneumatic compression pumps. Multilayered compression therapy, which is more effective than single layer therapy, consists of the application of a nonadherent primary dressing, a secondary nonocclusive dressing (e.g., cotton gauze), a zinc oxide impregnated bandage (e.g., Unna boot), and a self-adherent elastic wrap. Wound care in these patients focuses on maintaining a moist wound environment, which can be achieved with saline moist gauze, films, foams, hydrocolloids, hydrogel and alginate dressings. Other, more modern approaches include use of vasoactive substances and growth factor application, as well as the use of skin substitutes. Surgical interventions for chronic venous ulcers include wound debridement, sclerotherapy, vein ligation, venous valve reconstruction, and skin grafting
with autologous or allogeneic skin grafts (Barbul, 2005; Hayes, 2003).

Pressure Ulcers

A pressure ulcer is a result of pathologic changes in blood supply to the dermal and underlying tissues, usually because of compression of the tissue over a bony prominence. Chronic ulcers of the skin include arterial ulcers, venous stasis ulcers, diabetic ulcers, and pressure ulcers. Pressure ulcers generally appear in soft tissue over a bony prominence (Thomas, 2006).

Initial treatment for pressure ulcers is aimed at relieving pressure by positioning the patient frequently and at a fixed interval to relieve pressure over the compromised area. A number of medical devices, classified as static or dynamic, are designed to relieve pressure. Static devices include air, gel, or water-filled containers that reduce the tissue-to-surface contact. Dynamic devices use a power source to fill compartments with air that support the patient's weight or alternate the pressure on different areas of the body. It is suggested that patients who fail to improve, or who have multiple pressure ulcers, should be considered for a dynamic type device, such as a low air loss bed or air fluidized bed (Thomas, 2006).

Other treatment measures of pressure ulcers include treating pain; assessing nutrition and hydration; removing necrotic debris; maintaining a moist wound environment, which is associated with more rapid healing rates compared to dressings that are allowed to dry; encouraging granulation tissue formation and promoting re-epithelialization; and controlling infection (Thomas, 2006).

When evaluating pressure ulcers, a staging system is typically used that measures tissue destruction by classifying wounds according to the tissue layers involved. The National Pressure Ulcer Advisory Panel Statement on Reverse Staging of Pressure Ulcers (NPUAP) describes the stages as follows (NPUAP, 2003):

Stage I Pressure ulcer is an observable, pressure-related alteration of intact skin whose indicators as compared to the adjacent or opposite area on the body may include changes in one or more of the following: skin temperature (i.e., warmth or coolness), tissue consistency (i.e., firm or boggy feel), and/or sensation (i.e., pain, itching). The ulcer appears as a defined area of persistent redness in lightly pigmented skin, whereas in darker skin tones, the ulcer may appear with persistent red, blue or purple hues.

Stage II Partial-thickness skin loss involves epidermis, dermis or both. The ulcer is superficial and presents clinically as an abrasion, blister or shallow crater.

Stage III Full-thickness skin loss involves damage to, or necrosis of, subcutaneous tissue that may extend down to, but not through, underlying fascia. The ulcer presents clinically as a deep crater with or without undermining of adjacent tissue.

Stage IV Full-thickness skin loss has extensive destruction, tissue necrosis, or damage to muscle, bone, or supporting structures (e.g., tendon, joint capsule). Undermining and sinus tracts may also be associated with Stage IV pressure ulcers.

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Diabetic Neuropathic Ulcers: The major contributors to the formation of diabetic ulcers include neuropathy, foot deformity, and ischemia. It is estimated that 60–70% of diabetic ulcers are due to neuropathy, 15–20% are due to ischemia, and another 15–20% are due to a combination of both. The neuropathy is both sensory and motor and is secondary to persistently elevated glucose levels. Maintaining optimal blood sugar levels is important. The management of diabetic wounds involves local and systemic measures. The treatment options include relief of pressure at the wound site, surgical debridement, control of infection, and arterial reconstruction. Treatment should address the possible presence of osteomyelitis, and should employ antibiotics that achieve adequate levels both in the bone and soft tissue. Other therapeutic options include recombinant human growth factors, bioengineered skin substitutes, dressings comprised of extracellular matrix protein, and a variety of synthetic dressings (Barbul, 2005; Hayes, 2003).

Complications of Surgically Created Wounds

VAC has been proposed as an alternative to surgery to treat complications of surgically created wounds (e.g., sternal wound complication following cardiac surgery). NPWT has been used in patients who have complications of surgically created wounds (e.g., dehiscence) or traumatic wounds (e.g., flap or graft) when there is a need for accelerated formation of granulated tissue that cannot be achieved by traditional topical methods (e.g., the patient has a condition or comorbidity that will not allow for healing times achievable with other topical treatments). In addition, vacuum-assisted wound closure has also been utilized as a noninvasive treatment of deep sternal wound infections following cardiac surgery (i.e., poststernotomy mediastinitis), as an alternative to more invasive treatment such as surgery (e.g., secondary closure or secondary closure with vascularized muscle flaps). Treatment options in postoperative nonhealing wounds include the following:

- Management of infection (e.g., antibiotic therapy)
- Wound incision and drainage
- Debridement
- Rewiring (postcardiac surgery)
- Closed irrigation (with antibiotic solution)
- Packing of wound

V.A.C.® Therapy: Vacuum-Assisted Closure

VAC, or negative pressure wound therapy (NPWT), uses a subatmospheric pressure technique to assist in the treatment of acute, subacute and chronic wounds. VAC is reported to assist in wound closure by application of localized negative pressure, which helps remove fluid from the wound, increase blood flow, decrease bacterial colonization and stimulate the growth of granulation tissue to promote wound closure. Maximum benefit from NPWT depends on effective wound healing strategies and appropriate wound care which include the following:

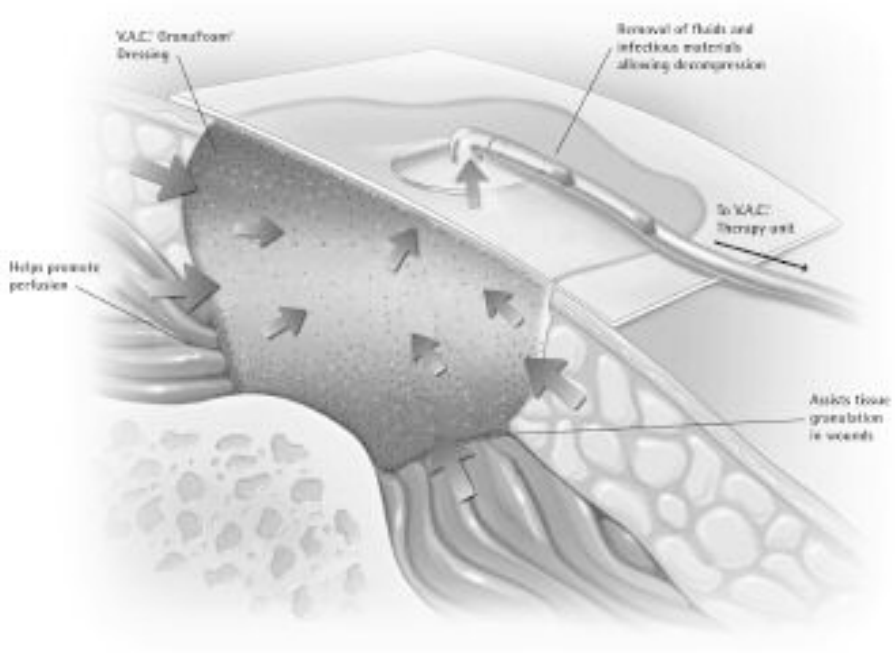
- Accurate diagnosis and appropriate treatment of underlying causes (e.g., adequate nutrition, pressure relief surfaces for pressure ulcers, maximization of vascular supply for optimal perfusion, appropriate offloading in lower extremity wounds).
- Compliance with therapy. Maintain active negative pressure therapy for at least 22 out of 24 hours a day. If therapy is turned off for more than two hours a day, the dressing should be removed and replaced with a traditional dressing.
- Patients with a history of noncompliance, or inability to adhere to the treatment regime, need to be monitored closely throughout NPWT.
- Clinical evaluation and guidance on a regular basis. Overall outcomes may be improved when a wound care physician or expert clinician is involved in supporting clinicians using NPWT to evaluate, monitor and adjust the clinical care plan based on patient assessment.
- Actively receiving treatment for osteomyelitis, including appropriate debridement, if necessary, and antibiotic therapy.

Is V.A.C.® Therapy For Me?

V.A.C.® Therapy is prescribed for use by your physician. As with any prescription medical device, it is important to follow physician's orders and product instructions, and not to adjust settings or perform therapy application without the express direction and/or supervision of your trained clinical caregiver. Important product and therapy indications, contraindications, precautions and safety tips apply. Please consult your clinician, product guide reference and user guides prior to use.

How Does V.A.C.® Therapy Work?

The V.A.C.® Therapy System consists of a computer-controlled therapy unit, canister, sterile plastic tubing, foam dressing and clear V.A.C.® Drape. The foam dressing will go on or inside your wound. One end of the tube will connect to the foam. The other end of the tube will connect to the canister that connects to the V.A.C.® System. The wound area will be sealed with the clear V.A.C.® Drape, similar to a large bandage. The V.A.C.® System will pull infectious materials and other fluids from your wound through the tube and collect them inside the canister.



Home Safety

Please remember these tips to keep a safe home environment.

- Do not use extension cords with this product.
- Keep electrical cords out of traffic areas.
- Do not attempt to service or repair this equipment.
- If you have any problems with the equipment call 1-888-786-2968
- Do not allow liquids to come in contact with the V.A.C.® Therapy unit
- If your home does not have three-pronged outlets, use a three-pronged adapter. For safer use of the adapter, securely attach the ground wire to the center screw of the outlet cover plate.
- Do not overload your electrical outlets.

Health Safety

If you see a sudden increase of blood under the drape, in the tubing or canister:

- Immediately turn off the V.A.C.® Therapy Unit.
- Clamp and disconnect the tubing between the dressing and the unit.
- Apply pressure and elevate, if possible.
- Call your Home Health Nurse or physician for further medical assistance, or 911 in case of an emergency.

If the V.A.C.® Therapy System is off for more than two hours, call your clinician to place a non-V.A.C.® dressing, such as moist saline gauze or one that has been previously prescribed by your physician or initiate steps to properly resume V.A.C.® Therapy.

If you are experiencing signs of possible infection such as fever, tenderness, redness, swelling, itching, rash, increased warmth in the wound area, purulent discharge or a strong odor, call your Home Health Nurse or physician immediately.

If you are experiencing signs of serious infection such as nausea, vomiting, diarrhea, headache, sore throat with swelling of the mucus membranes, disorientation, high fever (> 102o F), low blood pressure, dizziness or a sunburn-like rash:

- Immediately call your clinician for further medical assistance, or 911 in case of an emergency.
- With direction from your clinician, the V.A.C.® dressing may be removed and replaced with a non-V.A.C.® dressing, such as moist gauze or one that has been previously prescribed by your physician.