

CANADIAN CONSENSUS STATEMENT ON THE MANAGEMENT OF VENOUS LEG ULCERS

This consensus statement is a practical guide for clinicians from all backgrounds and levels of experience for managing patients with Venous Leg Ulcers (VLUs) and is an adjunct to published guidelines on the treatment of VLUs

Diagnosis of VLU

- A. For patients with a leg ulcer, it is necessary to assess the cause of the ulcer, their health literacy, environmental factors and goals of care, before proceeding to treatment. Clinical assessment includes a thorough history of ulceration, venous disease, arterial disease, underlying medical conditions, and medications; and a thorough examination of the patient, their ulcer, and palpation of pulses. Investigations will include assessment for venous and arterial disease as well as other causes of ulceration and impaired healing. Ulcers may have mixed etiology.
- B. Clinical Features
- Location – from the sub-malleolar region to the knee, most often in the medial gaiter area, and occasionally on the dorsum of the foot
 - Ulcer Appearance does vary, but typical features may include -
 - Superficial ulceration not extending below the deep fascia
 - Size may be small or large, with irregular, serpiginous, and sloping edges
 - Surface – combination of coagulated exudate, slough and granulation tissue. Additional diagnoses such as micro or macrovascular arterial disease, vasculitis, trauma, surgical etiology, severe infection or inflammatory disorders are suggested by the presence of black necrotic tissue, visible fascia, visible tendon, undermined edges or sinuses
 - Exudate is often heavy, but may vary from light to heavy depending on the degree of edema control with compression and elevation, or the presence of infection
 - Surrounding tissue may have some of the following features of venous disease –
 - Hemosiderin staining; stasis dermatitis; pigmented, brawny and indurated skin (lipodermatosclerosis); visible varicosities and spider veins; atrophy blanche around the malleoli without a livedoid pattern of the surrounding vasculature
 - Edema – may also be caused by lymphedema, cardiac, renal or other systemic disease, especially if bilateral or above the knee, and is increased with dependency
 - Surrounding skin - maceration if excess exudate is not wicked away; sometimes dry, crusty, scaly or itchy; sometimes with contact dermatitis
 - Pain, if present, has features of aching, heaviness or tightness that may be relieved by leg elevation and may be more severe with infection, atrophy blanche and more advanced disease
- C. Investigations
- Diagnosis of venous disease (if limited access, management may start prior to investigation as long as arterial status has been established)
 - Non-invasive lower limb venous Duplex ultrasound to assess for
 - Deep veins – assess for incompetence or previous deep vein thrombosis

- Superficial veins – identify sites of incompetence
 - Vein mapping to assess for suitability for venous ablation
- Diagnosis of other co-existing conditions
 - Arterial status
 - Ankle-brachial pressure index (ABPI) and/or toe-brachial pressure index (TBPI) or toe pressure. TBPI especially in patients with diabetes and ABPI above 1.4
 - In areas without access to the above, assessment of audible waveforms on hand held Doppler with access to online waveform assessment (multiphasic waveforms indicate adequate arterial supply)
 - Non-invasive lower limb arterial Duplex ultrasound when available
 - Blood panel CBC, liver function, renal function, HbA1C
 - Investigation of other identified clinical conditions e.g. rheumatoid arthritis, lymphedema, etc
 - Assess gait and altered ankle mobility that may impair calf muscle pump function

Treatment of VLU

A. Treat the underlying cause of impaired calf muscle pump function

- Apply an optimal compression system if - ABPI is normal (0.9 to 1.4); ABPI is elevated and TBPI or toe pressure is normal; or if the hand-held Doppler waveform is multiphasic
 - Optimal multi-layer bandage system (30 – 40 mm Hg at the ankle)
 - Other compression system options include elastic (bandages or stockings), inelastic (bandages), adjustable wrap systems with hook and loop fasteners, intermittent pneumatic compression systems, other compression socks. The selection may depend on patient mobility, pain, patient tolerance, ability to apply, environment and access.
- Encourage calf muscle contraction exercises, especially a daily walking regimen, to improve calf muscle pump function. Consider support from physiotherapy or rehabilitation medicine, and daily leg elevation above the heart, if limited ankle motion, strength, mobility or impaired gait
- If not able to tolerate optimal compression, if ABPI is reduced but greater than 0.5, or if the patient has significant congestive heart failure which requires cardiologist evaluation -
 - Apply a lower compression multilayer system that the patient will tolerate, with the aim to progress to optimal compression as symptoms and tolerance allow
 - Use caution at ABPI between 0.65 and 0.9, and extra caution between 0.5 and 0.65 when stockinette with tubular or longitudinal compression may be considered in place of compression wraps
 - Add Muscle Pump Activator (MPA) which is a form of neuromuscular electrical stimulation of the common peroneal nerve, as an adjunct treatment once it is established that the patient/caregiver can access it and can follow the treatment protocol. This activates the calf muscle pump and is not a compression system
- If not able to tolerate any compression due to pain or other causes -

- Add MPA once it is established that the patient/caregiver can access it and can follow the treatment protocol, with the aim to progress to add lower compression and then optimal compression
- Recommend daily leg elevation above the level of the heart and a regular exercise regimen to improve calf muscle pump function, especially a daily walking regimen, and consider support from physiotherapy and rehabilitation medicine

B. Treatment of the ulcer

- Wound management
 - Cleanse the ulcer and surrounding skin. Saline or clean potable water may be used, and if available or accessible, use an antimicrobial solution e.g. hypochlorous acid
 - Debride devitalized tissue if vascular perfusion is normal, depending on the scope of practice, skills and experience of the health care provider. Methods may include - enzymatic, biological, mechanical, sharp debridement (under topical/local anesthesia if needed) or autolytic to debride de-vitalized tissue and to allow healthy granulation tissue formation. Different methods may be used sequentially as access and wound needs change
 - Apply a dressing that ensures adequate moisture balance and that supports moist wound healing – if excess exudate, use a moisture absorbing and/or wicking dressing; if dry, use a moisture retentive or donating dressing
 - Treat infection in deep and surrounding tissue with antibiotics and antimicrobial dressings
 - Manage pain if present – may need to reduce or delay compression until pain has reduced
 - Treat surrounding skin irritation or dermatitis; protect surrounding skin from excess exudate; and maintain good skin care
 - Treat ulcers deemed to be non-healable - cleanse with saline, clean potable water or antimicrobial solutions; and use dressings to support wound maintenance goals
 - Ulcers should be measured using a consistent method weekly or at each visit if seen less often

C. Treat underlying conditions

- Ensure that all underlying medical conditions that may impact ulcer healing (e.g. diabetes, heart failure, anemia, nutritional and metabolic deficiencies, etc) and physical and mental wellbeing are being actively treated. Involve other health care providers as indicated.

D. Actions if not on a healing trajectory – no size reduction in 2 to 4 weeks, or reduction less than 30% at 4 weeks after initiating treatment

- Review the assessment and diagnosis of ulceration to exclude other ulcer etiologies or causes of impaired healing e.g. skin cancer, autoimmune conditions, medications that impeded healing, smoking, etc.
- Assess if treatment protocol has been properly implemented and is being adhered to
- Reassess if infection is present and being managed
- When above have been addressed, review and optimize treatment of calf muscle pump function
 - Reassess the compression system that is in place to ensure that it is optimal

- Review exercise and walking regimen
- Add MPA if not already in place
- Consider referral to appropriate source for superficial venous ablation if indicated
- When diagnosis is confirmed and calf muscle pump function is optimized, consider the introduction of advanced wound treatments, depending on local availability, in a sequential manner with assessment of the healing response at each step –
 - A dressing that is antimicrobial and that can disrupt or eradicate biofilm
 - A dressing with protease inhibition properties
 - Improve the wound bed with negative pressure wound therapy or with a matrix substitute
 - Deliver growth factors through dressings that release physiological growth factor levels
 - Add new cells to the wound as skin grafts, cultured cells or skin substitutes
- Consider other adjunctive treatments as appropriate, such as – oral pentoxifylline, electrical stimulation of the wound bed, topical oxygen therapy, hyperbaric oxygen therapy or therapeutic ultrasound. Some might be introduced earlier and for some evidence in VLU may be equivocal

Treatment post VLU healing

A. Prevent VLU recurrence

- Lifelong compression therapy, initially continuing compression wraps for at least 2 weeks or longer to ensure full ulcer healing. This is especially important in those with recurrent ulcers, more advanced disease and those awaiting appropriate compression systems
- Fit compression stockings (below knee in most cases) in most instances. If not feasible, use a compression wrap system with hook and loop fasteners. Compression ideally at 25 – 40 mm Hg, or adjust to a lower pressure suitable for arterial disease, or that the patient can tolerate and will continue to wear
- Encourage calf muscle contraction exercises, especially a daily walking regimen, to improve calf muscle pump function. Consider support from physiotherapy or rehabilitation medicine for those with limited mobility
- Reinforce education regarding venous disease and prevention of ulcer recurrence, protecting the skin from trauma, the need for life-long compression garments and their replacement, and the need for exercise to activate the calf muscle pump
- Consider referral for superficial venous ablation by surgery or other less invasive techniques if appropriate

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