

Primary Prevention of Venous Leg Ulcers

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Question

What is the best available evidence regarding the effectiveness of strategies used in the primary prevention of venous leg ulcers?

Clinical Bottom Line

A general definition for Venous Leg Ulcer (VLU) is a wound of full or partial thickness usually on the ankle (commonly the medial malleolus) or the calf and is unresponsive to appropriate treatment. Venous Leg Ulcers result from venous insufficiency or elevated venous pressure. The resulting local oedema which can progress to ulceration, may be caused by incompetent venous valves in the superficial, perforator, or deep vein systems and/or inadequate function of the calf muscle pump ¹(Level I) ³⁻⁵(Level IV)

Primary prevention targets people who are **at risk** of developing a VLU and involves timely implementation of compression, calf muscle exercise and leg elevation to aid venous return and reduce lower leg oedema associated with venous insufficiency. ² (Level I) ³⁻⁵ (Level IV)

VLU prevention strategies aim to alleviate an underlying pathology or a predisposition to venous disease. A prior history of deep vein thrombosis (DVT) or venous sclerosis (in either the superficial or deep veins) contributes to the development of venous disease by obstructing the flow of blood in the veins causing lower leg oedema, venous stretching and swelling which compromises venous valve function leading to poor venous return from the legs to the heart and venous hypertension. Resulting pooling and extravasation of venous blood causes lower leg oedema which is associated with high VLU occurrence and recurrence rates. ⁶⁻⁸ (Level IV)

- Prevention of VLUs therefore consists of primary strategies to manage venous hypertension and secondary strategies to prevent a VLU developing once an individual experiences lower leg oedema, the cardinal sign of venous hypertension or insufficiency. ⁶ (Level IV)
- Primary prevention strategies include raising awareness in the general population to prevent DVT and/or venous sclerosis (e.g. avoid prolonged calf muscle inactivity and address clotting disorders). Expert-based opinion recommends the following clinical applications ² (Level I):
 - A detailed patient history to identify and address predisposing factors for arterial or venous disease.
 - Application of compression therapy for the prevention of an initial VLU development.
- Secondary prevention strategies involve the management of individuals with symptoms of DVT, venous hypertension

and/or sclerosis by using evidence-based guidelines recommending the following clinical applications ² (Level I) ³⁻⁸ (Level IV):

- Early detection and management of DVT; e.g. implementing prophylactic strategies such as anticoagulant therapy and/or applying compression stockings.
- Light compression applied with caution for mixed arterial/venous disease (ABI 6-8) is indicated to reduce oedema.
- Phlebotic interventions to improve venous tone and decrease capillary hyperpermeability.
- Venous surgery
- Facilitate client education of VLU etiology and participation in preventative self-management practices.
- Preventative recommendations to the client include the following strategies: ² (Level I) ⁶⁻⁸ (Level IV)
 - Daily calf and foot muscle exercises including ankle flexes, heel raises and leg squats
 - Walking and regular exercise
 - Managing hypertension
 - Wearing compression stockings if indicated
 - Elevate legs above heart if possible while sitting
 - Conduct daily self-examination of legs and feet and report problems early
 - Use a soap substitute and moisturize legs to keep skin hydrated ⁶ (Level IV) ⁹ (Level I)
 - Stop smoking
 - Avoid mechanical trauma (no tapes, shaving, friction)
 - Follow a nutritional diet and vitamin supplementation if indicated
 - Maintain fluid intake of ≥ 8 glasses of water/ juice/ flavoured water per day
 - Lose weight if obese or over-weight
 - Medication review
- Compression therapy is considered to be an essential component in the prevention, treatment and management of VLU's. The application of compression bandages or stockings, worn on the lower limbs aims to prevent venous ulceration by reducing the pressure difference in the veins, reducing lower leg oedema, accelerating blood flow and providing assistance in returning the blood back to the heart. There are various types of compression bandages available, some are applied as a single component bandage

while others involve the application of multi-component and multilayered systems.¹ (Level I)⁹ (Level II).

- Many factors influence patient adherence with preventative and management therapy; included amongst these factors are the following examples⁹ (Level II)¹⁰ (Level I)¹² (Level IV):
 - Patients and clinicians' knowledge and education about VLU's.
 - Aesthetic, cosmetic and physical factors associated with prescribed treatment
 - Patients' psychological perception of their relationship with the clinician/s, and vice-versa.
 - Economic factors related to the cost of therapy

Other Factors for Consideration

- In approximately 20% of cases, lower limb ulceration results from arterial disease either in isolation or in combination with venous disease¹ (Level I).

Risk Factors

- Compression is contra-indicated, in patients with arterial disease^{7,12} (Level IV)
- A lack of knowledge about the causes and other variables impacting on VLU's is associated with poor adherence to compression therapy and with prevention strategies¹¹ (Level II)

Characteristics of the Evidence

This evidence summary is based on a structured search of the literature and selected evidence-based health care databases. The evidence in this summary is from:

- A systematic review including seven randomised controlled trials that compared compression systems¹
- An update to a systematic review of Best Practice Recommendations for the Prevention and Treatment of Venous Leg Ulcers²
- An evidence-informed Venous Ulcer Algorithm and two evidence-based clinical practice guidelines^{3,4 & 5}
- Expert opinion from the Wound Healing and Management Node Expert Reference Group⁶
- A wound care manual⁷
- Scottish national clinical guidelines (SIGN) for the management of chronic venous leg ulcers⁸
- A literature review of ten studies which included three Randomised Controlled Trials (RCT) and identified and classified influences on patient's non-concordance to compression therapy into six main dimensions⁹
- A systematic review of 31 studies which included 12 case studies and emphasised the importance of the distinction between non-adherence and intolerance to compression therapy¹⁰
- A cross-sectional survey (N=122) which identified an association between patients' lack of knowledge about the causes of VLU's and poor adherence to compression therapy and the treatment regime¹¹

- An international consensus document on the application of compression therapy in Venous Leg Ulcers¹²

Best Practice Recommendations

- A holistic assessment of the patient is required in order to ascertain the patient's capability of adhering to the prescribed treatment regime. For example, patients who have work that involves standing long periods of the day cannot easily rest and elevate their legs; such factors will influence the choice of compression system and exercise advice (Grade A).
- A view of the patient as a collaborator with the health professional in their treatment decisions increases patient involvement in their treatment and the likelihood of adherence to that treatment (Grade B).

References

1. Perrin M. Rationale for surgery in the treatment of venous ulcer of the leg. *Phlebology*, 2004;45:276-280. (Level I)
2. Burrows C, Miller R, Townsend D, Bellefontaine R, MacKean G., Orsted HL, Keast DH. Best Practice Recommendations for the Prevention and Treatment of Venous Leg Ulcers: Update 2006. *Advances in skin & wound care*; 2007,20(11) At: www.woundcarejournal.com (Level I)
3. Association for the Advancement of Wound Care Venous Ulcer Algorithm Accessed Feb 28, 2011 at: <http://www.aawconline.org/professionalresources.shtml> and <http://www.guideline.gov/content.aspx?id=13559&search=venous+ulcer+algorithm> (Level IV)
4. American Society of Plastic Surgeons. Evidence-based clinical practice guideline: chronic wounds of the lower extremity. Arlington Heights (IL): American Society of Plastic Surgeons; 2007 May. 21 p. [132 references] <http://www.guideline.gov> Accessed Feb 28, 2011 (Level IV)
5. Wound Ostomy Continence Nurses Society. Clinical Practice Guideline #4. Management of Wounds in Patients with Lower-Extremity Venous Disease, 2005. <http://www.guideline.gov> Accessed Feb 28, 2011 (Level IV)
6. The Wound Healing and Management Expert Reference Group. (Level IV)
7. Carville K. Wound Care Manual. 5th ed. Australia: Silver Chain Foundation; 2007. (Level IV)
8. Scottish Intercollegiate Guidelines Network (SIGN). Management of chronic venous leg ulcers: A national clinical guideline. August 2010 At: www.sign.ac.uk (Level IV)
9. Moffatt C, Kommala D, Dourdin N, Yoonhee C. Venous leg ulcers: patient concordance with compression therapy and its impact on healing and prevention of recurrence. *Int Wound J*. 2009; 6(3):86-93. (Level II)
10. Van Hecke A, Grypdonck M, Defloor T. A review of why patients with leg ulcers do not adhere to treatment. *J Clin Nurs*, 2009;18:337-49 (Level I)
11. Finlayson K, Edwards H, Courtney M. The impact of psychosocial factors on adherence to compression therapy to prevent recurrence of venous leg ulcers. *J Clin Nurs*, 2010;19:1289-97. (Level II)
12. World Union of Wound Healing Societies (WUWHS). Principles of best practice: compression in venous leg ulcers. A consensus document. London: MEP Ltd, 2008 (Level IV)

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