MODULE 3.0

Chronic Venous Insufficiency
and Venous Leg Ulcers

(Approx 30 mins)

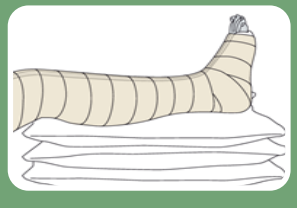
Learning Objectives

At the end of this module, learners will be able to:

List characteristics of venous ulcers and chronic venous insufficiency

Describe how compression therapy works in the management of venous ulcers

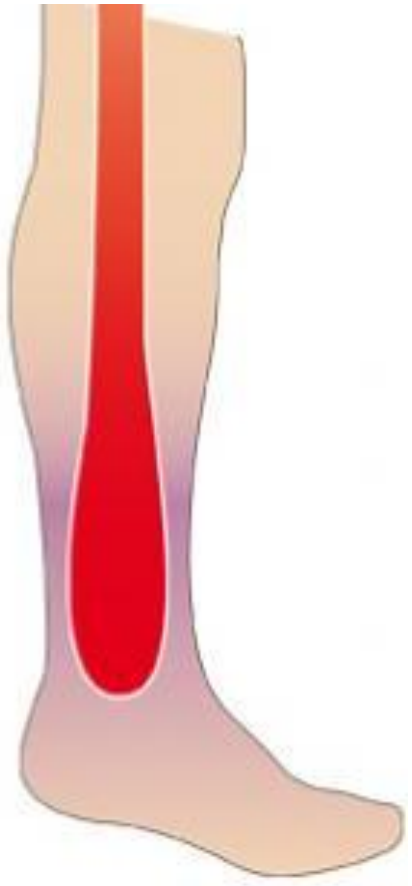
Identify complications of venous stasis and red flags for specialist referral



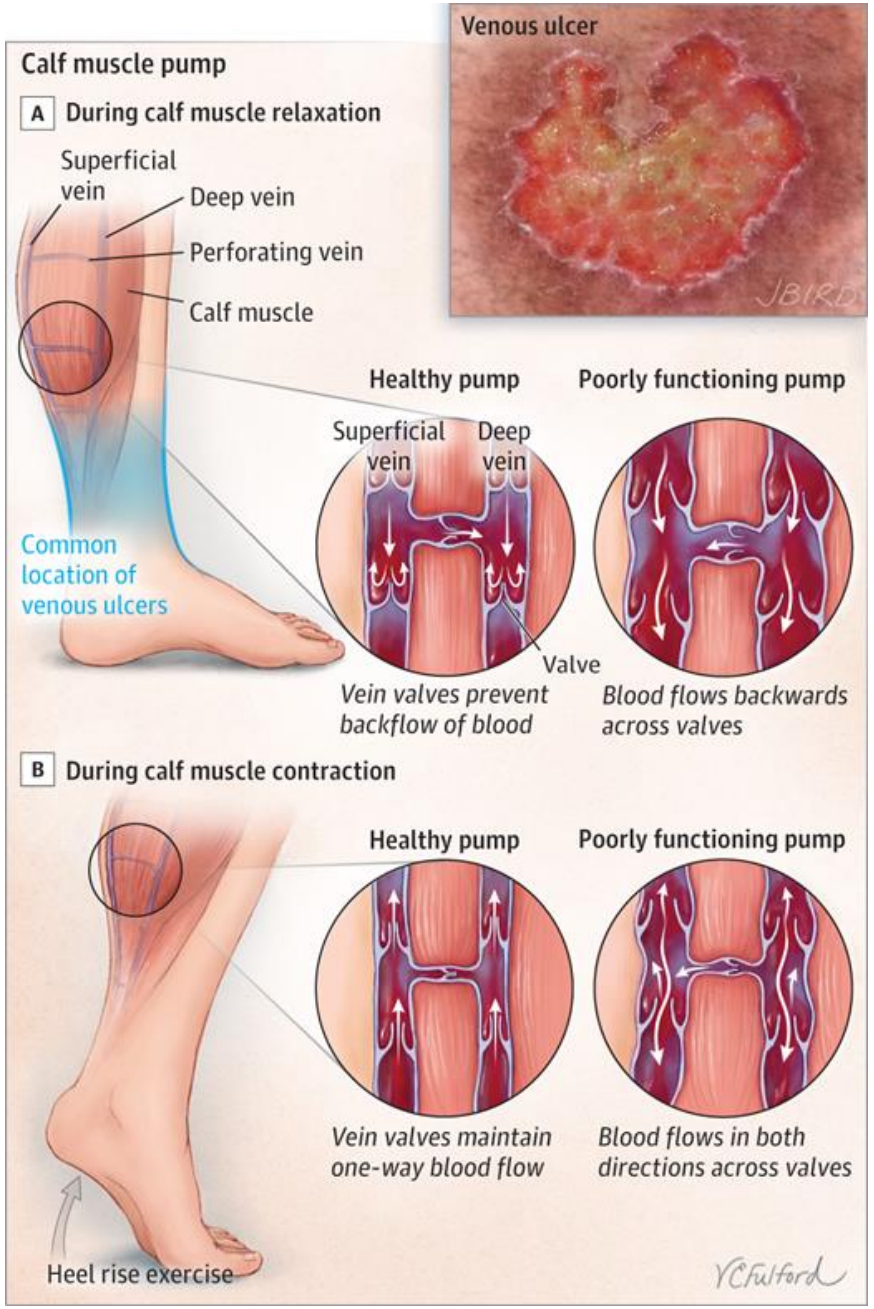
Provide education to patients on prevention & management of venous stasis ulcers

Chronic Venous Insufficiency (CVI)

- Chronic venous insufficiency or venous stasis results from incompetent valves in the veins of the lower leg.
- In healthy leg veins, one-way valves keep blood flowing up to the heart, against gravity.
- When valves become damaged or “stretched,” venous blood refluxes backward down the veins into a congested leg.
- Fluid leaks out of veins leading to swelling (edema), irritation of the skin, and eventually skin breakdown.



- Lack of exercise and lack of physical activity involving the lower legs make CVI worse.
- A collection of veins are located deep inside the lower leg, supported by powerful calf muscles that help push blood back up to the heart with every contraction.
- When veins are stretched or unhealthy, or the calf muscle pump is not working well, it can lead to venous hypertension in the lower leg veins.



High intravascular pressure results in extravascular fluid collection (edema) in the lower leg, resulting in impaired blood flow and nutrition to the skin.

If not corrected, venous hypertension leads to:

Risk factors for CVI

- Older age (>50 years)
- Obesity
- Previous DVT
- Damage to lower leg veins – e.g. surgery (such as saphenous vein harvest for CABG), trauma
- Varicose veins and incompetent venous valves
- Physical inactivity
- Family history

Features of Venous Leg Ulcers (VLU) and Stasis Dermatitis due to CVI

Location on lower leg

- between knee and ankle
- “gaiter” or sock distribution – between lower third of calf and 1 inch below malleolus
- most commonly anteromedial calf

Lower leg edema

- typically worse by end of day
- less with leg elevation
- pedal pulses may be difficult to feel due to edema

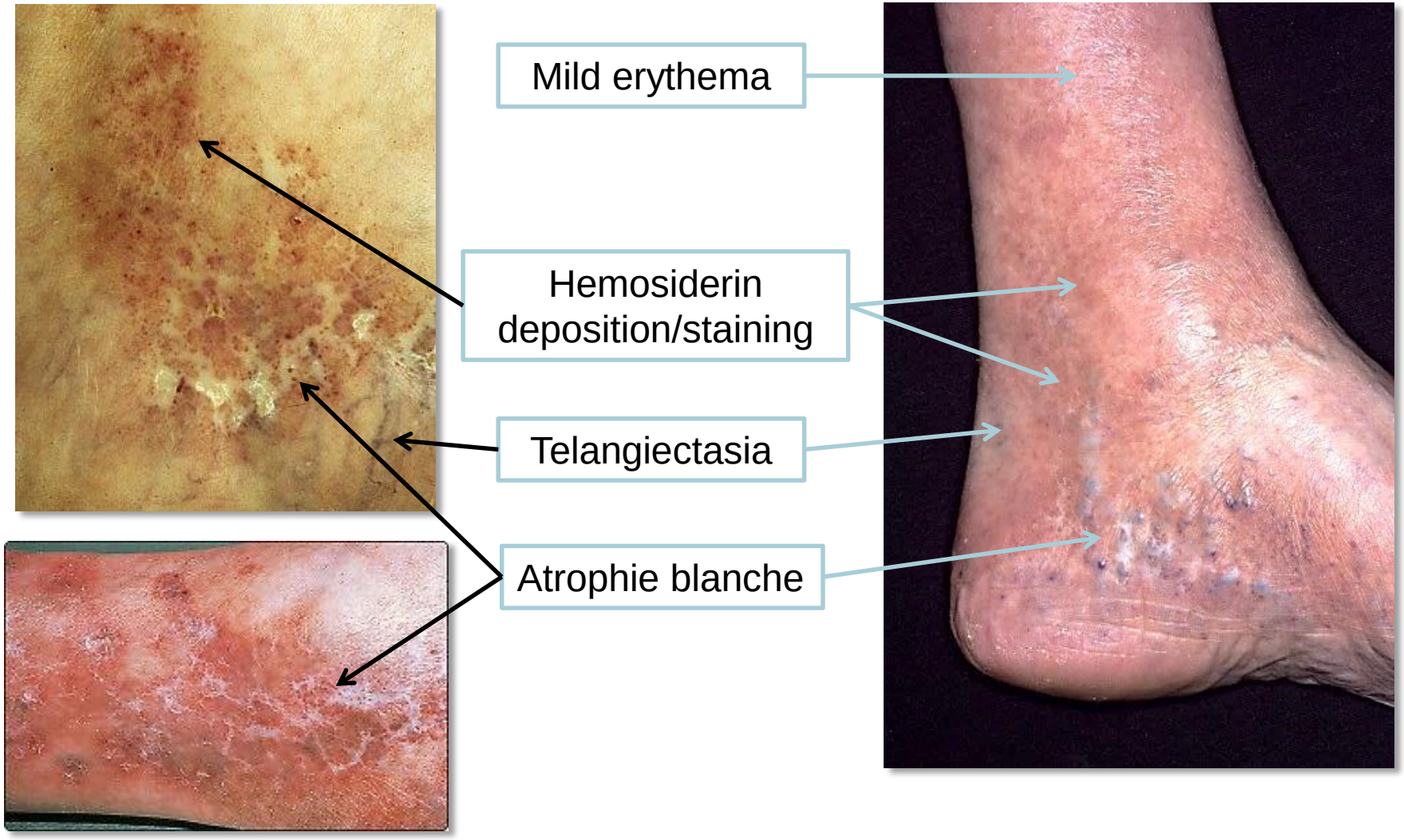
Stasis dermatitis: acute phase

- erythematous
- maculopapular rash
- skin edema
- vesicles or bullae if marked
- edema
- pruritis

Stasis dermatitis: chronic phase

- post-inflammatory skin changes/ scarring
- hemosiderin deposition in skin
- atrophie blanche (smooth ivory white scarring of skin stippled with telangiectasia and surrounded by hyperpigmentation)
- hyperkeratosis (dry, thickened/ scaling skin)
- mild erythema
- dependant edema
- hypopigmented, atrophic skin change at site of previous ulceration

Chronic venous stasis skin changes



Chronic venous stasis and ulcer skin changes

Dry, scaling/lichenified skin

Post-inflammatory scarring

More features of venous leg ulcer

- shallow ulcer base
- dark red granulation tissue with yellow adherent slough
- irregular border
- large amount of wound exudate /drainage when leg edematous
- relatively painless – achy, dull pain worsening as day progresses; increased pain if infected
- surrounding skin features of acute or chronic stasis dermatitis – may mimic cellulitis if acute

Venous Stasis Cellulitis and/or Acute Dermatitis without ulceration

- In patient with leg **swelling**, **skin erythema** and **pain** without an open skin wound, consider acute dermatitis secondary to CVI.
- Treat with systemic antibiotics if presentation suggests cellulitis. Swelling, erythema & pain do not rapidly respond to antibiotic therapy.
- Manage features of CVI, venous stasis in contralateral leg.
- Provide patient with handout on CVI and venous ulcers; emphasize importance of leg elevation.
- **Left untreated, there is high risk of skin ulceration**.

Once acute infection has resolved, refer to homecare for compression therapy. (LEW referral form not required.)

Venous Leg Ulcer Management - physician/NP role

1) Use the LEW Pathway referral form to make a non-urgent referral to the homecare nurses.
   - Specific orders are not required
   - Treatment will be initiated according to pathway protocols for venous wound management

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TRIAGE DECISION:

☐ **URGENT REFERRAL (red flags) – send patient to ER, or page on-call vascular surgeon and fax this form**

☐ **NON-URGENT REFERRAL to homecare** for treatment according to pathway protocols *(home care nurse may order a wound swab in referring physician / NP name if required)* – **fax this form to nearest homecare team**

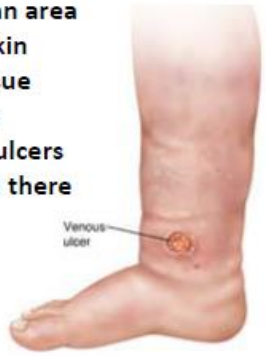
☐ **NON-URGENT REFERRAL for vascular assessment** of diabetic foot ulcer – **fax this form to vascular specialist**. Non-urgent diabetic foot ulcers should also be referred to homecare for initiation of treatment.

Venous Leg Ulcer Management - physician/NP role

2) While patient is waiting for wound care nursing assessment and management, MD/NP may apply a simple non-adherent gauze dressing with adequate padding to absorb exudate, and wrap lower leg with an elastic/Kling bandage.
3) Treat with oral antibiotics if cellulitis or wound infection.
4) Prescribe topical corticosteroid such as Clobetasol cream if acute dermatitis surrounding ulcer; wound care nurse will apply this when doing dressings.
5) Encourage patient to keep lower leg elevated as much as possible and perform calf muscle exercises.
6) Provide patient information handout – from LEW Pathway website.

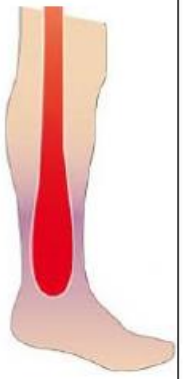
1. What is a venous leg ulcer?

A leg ulcer is an area of damaged skin where the tissue underneath is exposed. Leg ulcers develop when there is poor blood circulation in the veins of your legs.



In healthy leg veins, blood pressure is kept at the right level by the valves in your veins. These valves prevent blood from flowing backwards and keep blood moving through your veins.

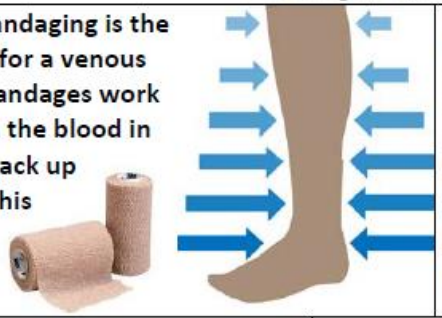
When the valves become damaged, the blood pressure in the veins of your legs will rise. This causes fluid to leak out of them leading to swelling, irritation of the skin, tenderness and eventually the formation of an ulcer.



2. Treatment for venous leg ulcers

Compression bandaging

Compression bandaging is the best treatment for a venous leg ulcer. The bandages work by helping push the blood in your leg veins back up to your heart. This allows the skin to heal.



Your nurse will put a dressing on your wound, then cover it with a compression bandage. The nurse will change your dressing and compression bandages regularly.

To open a PDF of the patient hand-out *What is a venous leg ulcer?* **click on the link in the sidebar.**

Elevation

When resting or sleeping, you should try to keep your ankles up higher than your heart. This allows the fluid to drain from your legs.

Skin Moisturizer

Dry scaly skin around the ulcer is common. It needs to be treated with a non-perfumed moisturizer to keep the skin from drying out too much. The wound care nurse will provide information on what you do for the skin on your leg.

Try to keep active and [illegible]. Walking can help as it pumps blood from your lower leg up to the heart. You should avoid standing still for more than a few minutes, but if you have to stand you could exercise the muscles in your lower leg by moving your toes inside your shoes or moving your feet. You can also do some exercises when you are sitting.

Venous Leg Ulcer Treatment

1) Leg and wound assessment
   - Nurses perform comprehensive assessment
   - Details of leg and wound are documented
2) Wound dressing
   - Skin emollients are applied to protect the peri-wound skin - perfume and lanolin-free*
   - A topical moderate-high potency corticosteroid (e.g. clobetasol) may be applied if acute dermatitis of surrounding skin
   - An absorbent dressing is applied to the wound
   - Leg is wrapped – with compression if arterial flow adequate (requires ABPI prior to compression bandaging)

*High risk of skin sensitization in these patients from lanolin, topical antibiotics, antiseptics, preservatives in dressings, resins, latex

More on wound dressing

- A venous ulcer usually produces heavy exudate, especially once compression is applied.
- Dressings must absorb exudate produced by the ulcer and protect the peri-ulcer skin.
- The goal is to maintain a moist wound bed while managing exudate.
- A typical dressing is changed twice a week.
- For an uncomplicated wound, a nurse will select an alginate or foam dressing from the formulary

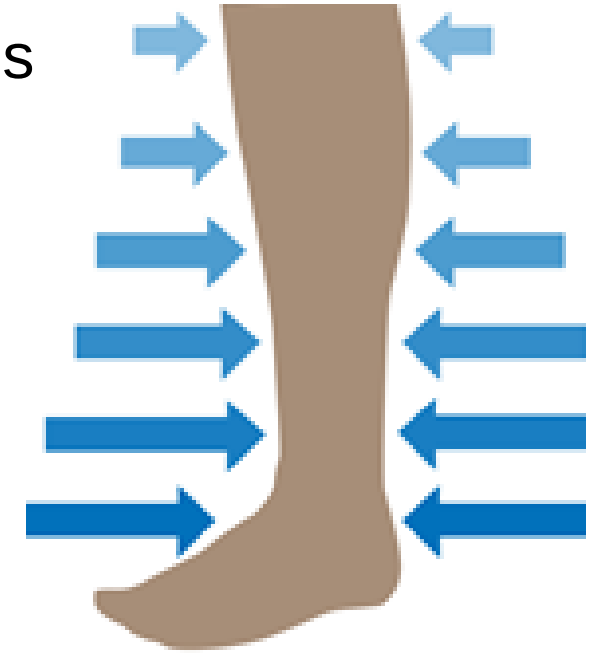
Dressings are selected according to wound characteristics such as:

- ☐ amount of exudate
- ☐ location of wound
- ☐ skin condition
- ☐ condition of wound bed
- ☐ presence or absence of infection

Venous Leg Ulcer Treatment

3) Compression bandaging

- The cornerstone of treatment for venous insufficiency is compression therapy.
- Compression removes excessive extravascular fluid from the limb.
- Graduated compression (tighter at the ankle) also aims to restore the normal flow of venous blood up the leg
- Before applying compression, a wound care nurse needs to exclude significant peripheral arterial disease by performing ABPI test.



More on compression bandaging

- Graduated high compression wrapping may be applied if there is adequate arterial flow to feet (ABPI ≥ 0.8). This is part of standard protocols; separate order from MD/NP is not required.
- If mild to moderate arterial obstruction (ABPI 0.5-.79), modified compression can be considered. MD/NP may be consulted.
- If inadequate arterial flow (ABPI ≤ 0.49) compression is not recommended. MD/NP should refer patient to vascular specialist.

Graduated compression *stockings* should not be used for treating VLU or an edematous leg with dermatitis. **Stockings are used to prevent edema, not reduce it.**

How to perform an ABPI

To open a two-minute video *Ankle Brachial Index Procedure Using a Handheld Doppler* from the New England Journal of Medicine, **click on the link in the sidebar.**

Interpretation of ABPI/TBPI in Determining Compression

ABPI Value	Interpretation/Clinical Significance	Compression Therapy
>1.3	Abnormally high range; TBPI indicated	Incompressible arteries
0.8 – 1.3	Compressible (normal range)	High compression (up to 30-40 mm)
0.51 – 0.79	Mild to moderate obstruction/ peripheral arterial disease	Modified compression (20-30 mm)
≤0.5	Significant ischemia	Compress only if ordered by specialist
TBPI Value	**Interpretation/Clinical Significance**	**Compression Therapy**
≥ 0.7	Normal	High compression
.41-0.69	Mild to moderate peripheral arterial disease	Modified compression
≤ 0.4	Severe ischemia	Contraindicated

More on compression bandaging

To open a 15-minute video *demonstration of compression bandaging* by a homecare nurse, **click on the link in the sidebar.**

Venous Leg Ulcer Treatment

4) Oral antibiotics if ulcer infected/cellulitis
   - Avoid topical antibiotics – risk of skin sensitization

5) Other drugs to consider
   - statin*
   - pentoxifylline^

*Evangelista MT, Casintahan MF, Villafuerte LL. Simvastatin as a novel therapeutic agent for venous ulcers: a randomized, double-blind, placebo-controlled trials. Br J Dermatol 2014;170(5):1151-1157.
^Jull A, Arroll B, Parag V, Waters J. Pentoxifylline for treating venous leg ulcers. Cochrane Database Syst Rev 2007;3:CD001733.

Practical tips about compression therapy

- Although nurses aim for a level of compression that is tolerable to the patient, there may be some discomfort.
- Compression bandaging must be kept dry; patients can coordinate with nurses to bathe on the day that wound dressing is changed.
- For patients in remote locations without frequent homecare, a self-applied product may be available. This will be organized by wound care nurse.
- Patients will be advised to elevate the compressed leg frequently to avoid swelling in the foot, and to walk as much as possible.
- Nurses may take photos of a leg wound on a patient's phone, so patient can show this to physician.

When to refer for specialist assessment

- Clinical features of peripheral arterial disease (PAD) and low ABPI – preventing use of compression therapy (See Module 5 for skin and nail features of chronic arterial ischemia/PAD)
- Ulcer not healing adequately after 12 weeks of appropriate compression therapy
- Suspicion of skin malignancy
- Dermatitis not responding to topical steroids and compression therapy
- Frequent recurrence of VLU

As per LEW pathway protocols, **the wound care nurse will notify the referring physician/NP** if any of the above occur, so that a specialist referral can be initiated.

Monitoring and surveillance

- Most venous stasis ulcers close in 6 months with optimal care.
- Once the wound has healed, there is a high risk that an ulcer will recur. 50% of VLU recur in 10 years.
- Encourage patients to be aware of increasing edema or skin changes.
- Encourage patients to engage in preventative management including lifetime use of compression garments.
- **Primary care providers can play an important role in promoting adherence to compression therapy.**

Compression therapy – long term use of compression stockings

- Once the venous ulcer has healed, the wound care team will fit the patient for **compression stockings.**
- Most patients will fit into standard stockings, but some will require custom fitting by a physiotherapist (for very large limbs).
- This will be arranged by the homecare team.
- Compression stockings are to be put on early in the morning and removed at bedtime.
- Aids are available for patients who have difficulty applying the stockings.

Compression stockings – how much compression?

- 18-25 mmHg: low compression for varicose veins and mild swelling
- 20-30 mmHg: moderate compression for prevention/long-term management of edema related to venous insufficiency
- 30-40 mmHg: high compression for post-thrombotic venous insufficiency
- 50+ mmHg: control of lymphedema

Coverage for compression stockings

- Compression stockings are covered by the SAIL program if they are ordered by a PT or OT, wound specialist nurse or diabetes nurse (arranged by the homecare team).
- A patient who has had a venous leg ulcer is covered for 2 pairs of compression stockings every six months, for life.
- Compression stockings are also covered by most private insurance plans – prescription required from physician/NP.
- Only medical garments (>20 mmHg compression) are covered.

For patients with private insurance, medical-grade compression garments are fitted and sold at **medical supply stores and many local pharmacies.** Patients can call ahead to ensure that a trained fitter is on staff.

Resources for patients and providers

The Lower Extremity Wound Pathway provides a web platform to house resources for providers and for patients.

On **provider pages** you can find the referral form, treatment tools and protocols for nurses.

On **patient pages** there are hand-outs and links to other sources of information about caring for wounds and high-risk legs and feet.

To open the *Lower Extremity Wound Pathway web pages*, **click on the link in the sidebar.**

References

- Scottish Intercollegiate Guidelines Network (2010). *Management of chronic venous leg ulcers: a national clinical guideline.*
- O'Donnell, Thomas F. et al. *Management of venous leg ulcers: Clinical practice guidelines of the Society for Vascular Surgery and the American Venous Forum.* 2014: Journal of Vascular Surgery , Volume 60 , Issue 2 , 3S - 59S

END OF MODULE

Proceed to Module 3 Quiz