

Clinical Guidance on the Treatment of Lower Limb Wounds

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**Applicable to**

To all Sirona staff that see patients with lower limb wounds which have failed to heal within two weeks, and disorders of the lower limb.

GPs, Practice nurse staff, Prison staff, Emergency care and rehabilitation staff. All staff who are involved in wound care.

**Executive Summary**

To ensure that individuals presenting with a lower limb wound, which has failed to heal within two weeks, receive a comprehensive assessment, subsequent diagnosis and appropriate management plan from a registered nurse who has additional competencies in lower limb management.

To support the nursing team in the management of lower limb wounds and the prevention of recurrence in the provision of a reference document using up to date evidence*.*

**Implementation**

• All patients presenting with a wound on the lower limb, which has failed to heal within two weeks, will have a full holistic assessment.

• All registered nurses carrying out lower limb assessments will be trained and competent to do so.

• All patients with a lower limb wound should have an Ankle Brachial Pressure Index (ABPI) or Toe Brachial Pressure Index (TBPI)

• Lower limb ulceration is a chronic and recurring condition and holistic assessment is the key to management

• The Policy will assist clinical staff to ensure patients effective care.  
  
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Consultation Process

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| 2 | Helen Harris | October 2016 | Section 7 – bandaging updated to reflect new compression systems |
| 3 | G. Powell.  T. Power,  J. Dursley,  P. Cox | September 2020 | Amended to bring Policy up to date and in line with current practice |
| 4 | G. Powell,  P. Cox & R. Walker | June 2022 | Improvement of assessment for patients with lymphoedema and addition of assessment intervals. Additional information regarding critical limb ischaemia. Addition of appendix 7 and amendment to Appendix 3. |

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1. Introduction

**Definition of a Venous Leg Ulcer (VLU)**

*An open lesion between the knee and the ankle that remains unhealed for two weeks in the presence of venous disease (NICE 2013).*

Leg ulcers are a chronic and recurring condition, VLU are the most common type of leg ulcer (SIGN 2010). There are at least 730,000 patients affected by leg ulceration in the UK, which equates to 1.5%.The number of diagnosed VLU (278,000) indicates 1 in 170 adults have a VLU.(Guest et al 2015)

There is no single aetiology; however it is thought that approximately 40-85% of people with a leg ulcer are as result of venous hypertension (Wounds International 2015). Arterial or mixed arterial/venous disease is responsible for the remaining percentage of ulceration including the conditions such as diabetes, rheumatoid disease, malignancy and vasculitic conditions as described by Guest et al 2015.

Inadequate assessment and ineffective treatment may result in the persistence of ulcers for many years, some never healing (Wounds International 2015). This will have an increased cost implication to the NHS. For example one VLU over a 12 month period is estimated to cost £7,600 to treat (Guest el al 2017)

The annual cost to the NHS for chronic wounds is estimated at £5.3 billion per annum (Guest 2015) of which 66% of this cost is incurred in the community.

VLUs have been found to have a significant impact on patient’s quality of life, with associated personal, social and psychological effects. (EWMA 2016). Evidence from Ousey et al (2013) suggests that wounds of more than 6 months duration are at a greater risk of acute admission.

Inappropriate treatment adversely affects the time it takes a wound to heal (Vowden & Vowden 2016).

Compression therapy should be first line treatment for VLU’s to optimise healing in both acute and chronic leg wounds (Wounds UK 2015)

2. Bulk of wording

**Definitions**

* + **Surfactants** lowers the surface or interfacial tension between a liquid and a solid (such as debris and biofilm), helping to disperse the latter, which can then be removed more easily with a cleansing pad or cloth (Malone & Swanson cited in Murphy et al 2020).

3. Purpose

To ensure that all patients presenting with a wound to the lower limb receive a comprehensive assessment and subsequent diagnosis from a registered nurse who have additional competencies in lower limb ulcer management.

To ensure that all patients diagnosed with a lower limb wound receive treatment according to agreed guidelines. To ensure that leg ulcer management guidelines are monitored and evaluated. It is intended that these guidelines undergo a review every three years.

The Guidelines will facilitate each practitioner to utilise and update skills, knowledge and competencies**.**

* A guideline conforming to current best practice has been agreed by Sirona Clinical Cabinet
* Handheld/automated Doppler devices must be available for each practitioner undertaking lower limb assessment.
* Sirona has at least one lead nurse to act as a source of expert advice in leg ulcer management.
* Sirona will work within these guidelines.
* Sirona has a responsibility to provide a nursing workforce who can offer assessment and compression therapy as a skill and ensure their competency is maintained.

**GP Practices**

Each GP practice is aware of the management of lower limb ulceration based on these guidelines and knows of a named individual who can act as a point of contact and expertise.

Each GP practice ensures that all those patients presenting with a lower limb wound are appropriately assessed and treated.

4. Assessment And Diagnosis

The first step in successfully managing a patient with a wound to the lower limb is recognising the wound with a confirmed aetiology e.g. lower limb wound with a venous aetiology. Wounds that commonly fall into not being recognised as leg ulcers are pre-tibial lacerations (or other trauma wounds) and surgical incisions where veins have been harvested for coronary bypass grafts, and are not healed within 14 days.

A detailed assessment of the patient’s general health and past medical history is essential when diagnosing and determining treatment of the ulcer and should be carried out using the assessment tool incorporated within the electronic EMIS template. Assessment is not a one off procedure but an ongoing one, and re-assessment should take place every four weeks (Wounds UK 2018).It is paramount that underlying disease processes are addressed and stabilised to ensure maximum potential to heal. The lower limb assessment should be completed within 28 days of admission to caseload.

It is intended that the lower limb assessment should be carried out by a Registered Nurse holding competencies in the theory and practice of the management of leg ulcers. Leg ulcer assessment is a highly complex skill; practitioners who lack the skill can tend to focus on the wound rather than the patient, not recognising the under- lying causes that need to be addressed.

**Red Flags – requiring immediate escalation to a relevant practitioner/specialist**

* Spreading infection of leg or foot
* Red, hot, swollen leg or foot
* Chronic Limb Threatening Ischaemia
* Suspected Deep Vein Thrombosis (DVT)
* Suspected skin cancer

Patients with a foot wound, whether diabetic or not, must be referred to podiatry for assessment.

**Chronic Limb Threatening Ischaemia**

**Signs and symptoms:-**

* Severe pain or numbness in the feet and/ or legs (often relieved by hanging leg over the bed or walking around)
* Absent or diminished pulses in the feet
* A noticeable decrease in temperature of the lower limb/ foot compared with the rest of the body
* Gangrene
* Rapidly deteriorating leg ulcers

**Risk factors:-**

* Age
* Smoking
* Diabetes
* Overweight/ obesity
* High cholesterol
* High blood pressure
* Family history of vascular disease

**Treatment/ onwards referral**

**Urgent** referral to on call vascular registrar 0117 950 5050 and inform patient’s GP.

5. Doppler Assessment

Doppler Ultrasound / Ankle brachial pressure index (ABPI) is an integral part of the assessment of leg ulceration. The ABPI can be measured by using a hand held Doppler device or automated device; such as MEDI MESI Automated device or Huntleigh Dopplex Ability Automatic ABI system. Doppler assessment enables an objective measurement of the peripheral arterial system to the limbs to be made, supporting the clinical findings and so aiding the planning and implementing of a management regime. It is a crucial element of holistic assessment, which can enable early intervention and improve patient outcomes.

**A Doppler Assessment is part of the assessment process and should not be used alone.**

A Doppler Assessment may be carried out by a Registered Nurse, Registered Nursing Associate or Assistant Practitioner who has:-

* Has attended the Sirona Leg Ulcer Management training, or has documented evidence available of a similar level of course being attended and achieved in another area within the last 2 years.
* Has completed and achieved the competency framework for Doppler Assessment within 6 months of completing the training.
* Agrees to attend 3 yearly updates of this training.

Doppler assessment is twofold, comprising of interpretation of both signals (sounds) and pressure index (Worboys 2006). Doppler signals should be listened to using a hand held Doppler. When using the MEDI MESI device the interpretation of waveforms is needed (Wound UK 2019). The Doppler assessment compares the ankle systolic pressure to the brachial systolic pressure. Patients who have a normal arterial circulation will have an ankle systolic pressure that is the same as, or higher than, their brachial pressure. Ankle pressures lower than the brachial pressures are indicative of arterial disease.

* Monophasic sounds indicate unhealthy, sclerosed arteries.
* Biphasic sounds indicate that the arteries are beginning to harden.
* Triphasic sounds show that the arteries are normal and healthy (Whayman 2014).

**Frequency of Doppler Assessments**

A Doppler should be undertaken as part of the lower limb assessment when an ulcer is initially identified, within 28 days of admission to a caseload.

Reassessment and repeat Doppler’s are required at any time if the patient experiences a change in symptoms such as pain, deterioration to the ulcer, a vascular event (e.g. TIA, CVA, MI.), or change in renal function.

Annual re-Doppler’s are **not** required for patient’s whose lower leg ulcer is improving or for those who have healed and are in compression garments. However, diabetic patients and those with an initial ABPI below 0.79 will require an annual reassessment and Doppler.

**ABPI Indicators for compression therapy –** please see flow charts on pages 11-13 for the interpretation.

**ABPI measurements need to be interpreted with caution in people with diabetes, who may present with a normal or raised ABPI. A falsely elevated ABPI may be obtained as people with diabetes may have hardening of the arteries and the arteries may become incompressible (Whayman 2014). Toe pressures or an arterial duplex is highly recommended.**

**Full Compression should not be applied until a full holistic assessment and ABPI have been performed and the blood flow to the limb is confirmed as being sufficient. Neither should be used in isolation. Training is available to learn about recording ABPI. A period of practice with assessment by a mentor should follow.**

**Toe pressures**

Toe pressures can be undertaken by registered nurses from the Wound Care Service or registered podiatrists who are competent to undertake this role. A toe Doppler kit must be used to undertake this assessment. Toe Brachial Pressure Index (TBPI) is the ratio derived from comparing the toe pressure to the brachial systolic pressure.

Toe pressures may be undertaken if:-

* Falsely high ABPI readings occurred due to calcification
* Pain, or the extent of the ulceration, prevents ABPI measurements
* There is gross lower limb and/or foot oedema (Moffatt et al 2007)

**Doppler Assessment in Patients with Lymphoedema and Chronic Oedema.**

Lymphoedema is a progressive condition which, if left untreated, may result in the following: - an increased risk of cellulitis and possible sepsis, lymphorrhoea and skin changes, delayed healing of skin tears and wounds along with reduced mobility.

The vascular lower limb assessment includes the patient’s past medical history, current medication, recording of symptoms and risk factors, a Doppler assessment to calculate the Ankle Brachial Pressure Index (ABPI) and a clinical examination (BLS 2019).

Oedema and/or induration of the lower leg can make it difficult to undertake an accurate ABPI and can give a false high ABPI reading due to the accumulation of fluid in the limb making the arteries difficult to compress. For patients with lymphoedema to their lower limbs, there is a need to focus on clinical assessment, rather than relying on an ABPI alone to assess vascular status. It may be more harmful for the patient to omit / delay compression than to apply it. Ignoring the symptoms, or delaying treatment while awaiting an ABPI may lead to a deterioration of the condition.

A 5 mHz Doppler probe is suitable for those with oedematous lower limbs.

For patients with lymphoedema who have biphasic and triphasic signals, using a handheld Doppler, and a normal clinical assessment with no signs of arterial disease, full compression can be applied without carrying out a formal ABPI. If Peripheral Arterial Disease (PAD) is suspected then the patient should be referred to the vascular services for an assessment. The Sirona Lymphoedema Service will undertake a Doppler assessment for all new patient’s with lower limb oedema.

If the patient has monophasic sounds but no signs or symptoms of PAD reduced compression may be used in the interim, as delaying compression treatment may be more harmful for the patient than omitting it. Partsch and Mortimer (2015) highlighted that compression increases arterial blood flow even in patients with PAD. This is demonstrated when the surrounding oedema is reduced arterial blood flow increases. Close monitoring is required and the compression should be discontinued if there are any signs of worsening arterial disease, such as increased ischaemic pain. Compression can be revised as appropriate following specialist vascular assessment/treatment.

Patients, who present with lymphoedema with the absence of significant cardiovascular risk factors, and the signs and symptoms of PAD, do not need to have routine ABPI measurements, provided the vascular status has been thoroughly assessed (BLS 2019). See BLS Vascular checklist in Appendix 7.

The ABPI does not need to be repeated annually for renewal of compression in those with lymphoedema, unless there has been a change in risk factors or a vascular event such as a TIA, CVA.

**Peripheral Arterial Disease**

Peripheral Arterial Disease (PAD) occurs at an early age and progresses more rapidly in patients with diabetes, compared with patients without diabetes. There is a difference in the distribution of disease in the patients with diabetes. Distal vessels, particularly the tibial and peroneal, are more frequently involved in patients with diabetes. In patients without diabetes, the femoral iliac and aorta are more commonly affected. Changes do occur in the micro circulation, particularly thickening of the capillary basement membrane that influences blood flow. Other regulatory mechanisms controlling local blood flow are affected, therefore influencing perfusion of the tissues. If PAD is displayed on assessment using the MESI, then a hand held Doppler should be used to determine the ABPI or TBPI, and a referral to vascular is needed. (Wound UK 2019).

**Diagnosing PAD in people with diabetes.**

1. Do not exclude a diagnosis of PAD in people with diabetes based on a normal or raised ABPI alone. Toe pressures are recommended. (See table 1 page 12)

An assessment including Doppler assessment should be carried out as soon as possible after the initial presentation but **must** be carried out **within 2** weeks as this is sufficient time to ascertain that there is delayed healing that requires investigation (Wounds UK 2016).

ABPI assessments are not intended for the diagnosis of venous disease, but rather for exclusion of significant arterial disease and therefore confirmation of safe practice to confirm the use of compression treatments (Wounds UK, 2016).

As such, it is important that the clinician understands why this is being undertaken in order to appropriately interpret the results, to confirm the purpose of testing, its implications and to communicate effectively to the patient.

An ABPI must be recorded as part of a holistic assessment of all patients who require compression therapy.

8. Flow Chart for Venous Ulcers

**Assessment including Ankle Brachial Pressure**

**ABPI 0.8 - 1.3**

**TBPI 0.7 - 1.5**

Normal Doppler Index with a combination of Monophasic and Biphasic signals with difficult or muffled sounds and significant arterial factors indicating possible arterial component.

Dress Wound according to local wound formulary – where possible this should be a simple non adherent dressing.

Reduced compression (20 mmHg) initially

Increase to Full Compression (40 mmHg) if tolerated. Follow Complex venous pathway (Appendix 3)

Normal Doppler Index with Triphasic and Biphasic sounds – and no other significant arterial factors

Dress wound according to local wound formulary – where possible this should be a simple non adherent dressing

Apply Full Compression (40mmHg) at the ankle

Treatment pathway standard venous (Appendix 3)

Address pain control

Address underlying disease e.g. Diabetes, Rheumatoid Arthritis – refer if unstable

Address Dermatology issues – refer to Specialist Nurse for advice

**Patient Education**

Ulcer Healed.

Aim is to prevent reoccurrence.

Fit with compression hosiery **- Follow hosiery pathway.**

Refer to Vascular surgeon for assessment of veins for treatment if ulcers reoccurring despite hosiery.

Ulcer not improving - consider complex treatment pathway

Or

Ulcer deteriorating -

Reassess and Doppler.

Refer to Wound Care Service for further assessment

9. Flow Chart for Mixed Venous and Arterial Ulcers

**Assessment including Ankle Brachial Pressure**

**ABPI 0.65 - 0.79**

**TBPI 0.64 - 0.69**

All monophasic signals and significant arterial components – Predominantly Arterial Ulcer

Appropriate wound dressing.

**Not for compression therapy.**

Refer for urgent vascular opinion.

A combination of monophasic and biphasic signals with difficult or muffled sounds & significant arterial factors – Mixed venous / arterial ulcer

Appropriate wound dressing. Reduced compression 20 mmHg

Treatment pathway mixed aetiology

Address pain control

Address underlying disease e.g. Diabetes, Rheumatoid Arthritis – refer if unstable

Address Dermatology issues – refer to Wound Care Service for advice.

**Patient Education**

Not healed

Healed

**ABPI 0.65-0.7**

Contact Wound Care Service for advice.

May require referral to Vascular Surgeon for assessment of arteries and possible surgical treatment.

**ABPI 0.7- 0.8**

Class 2 German RAL compression hosiery for moderate/high level’s oedema.

British Standard hosiery for minimal oedema

**See Lower Limb pathway**

**ABPI 0.65 -0.7**

Class 1 German RAL compression hosiery for moderate/high level’s oedema.

British Standard hosiery for minimal oedema

**See Lower Limb pathway**

**ABPI 0.7 – 0.8**

Refer to Wound Care Service for advice

Refer to Wound Care Service if ulcers reoccurring

10. Flow Chart for Arterial Ulcers

**Assessment indicating Arterial Components including Ankle Brachial Pressure**

**ABPI less than 0.64 or above 1.3**

**TBPI 0.64 and below or over 1.5**

**If ABPI above 1.3** refer to Wound Care Service for Toe Doppler.

**If ABPI between 0.64 – 0.51** refer to Wound Care Service.

**If ABPI less than 0.5 or TBPI less than 0.64 - Urgent referral to Vascular Surgeon**

Appropriate dressing selection according to Wound Formulary

Address underlying disease e.g. Diabetes, (need toe pressures) Rheumatoid Arthritis – refer if unstable

Address pain control

**No Compression** - K-soft bandages and K-lite bandage applied with a spiral technique will offer some support.

For patients with oedema apply 1 x layer of K-Soft bandage and 2 x layers of K-lite bandage.

11. Diagnosis

Having made an assessment of the patient, the ulcer and the foot circulation, a working diagnosis should be formulated which involves classifying the ulcer. Following assessment including clinical signs and symptoms, and a full medical history, the ABPI result should be used to formulate the appropriate treatment plan (see flow charts on pages 11-13). Treat patients according to the underlying pathology of their diagnosis using the following flowcharts. A patient should be given one of the three treatment pathways available.

Patients where diagnosis is unclear should be referred to the Wound Care Service. If required a Vascular Consultant opinion can be sought by the GP.

**Classification of leg ulcers**

* Arterial leg ulcer – a leg ulcer in the presence of arterial disease
* Venous leg ulcer – a leg ulcer in the presence of venous diseases
* Mixed leg ulcer – a leg ulcer in the presence of both arterial and venous disease

12. Lymphoedema

Lymphoedema results from a failure of the lymphatic system. Consequences are swelling, skin and tissue changes and predisposition to infection. It most commonly affects the lower or upper limbs, but may also affect midline structures such as the head and neck, trunk, breasts or genitalia.

Lymphorrhoea is described as lymph leaking from oedematous tissues when breaks appear in the skin. Lymphorrhoea appears as beads of fluid which seep from the affected area, putting the patient at risk of skin damage and an increased risk of problems such as cellulitis.

It is well recognised that Lymphoedema is a progressive condition which, if left untreated, may result in an increased risk of cellulitis (and sepsis). Lymphorrhoea and skin changes, delayed healing of skin tears and wounds along with reduced mobility, due to increase size and weight of the limb are symptoms of Lymphoedema.

See Doppler assessment section (page 10) regarding assessment of patients with lymphoedema to their lower limbs.

**Investigations of the venous system in secondary care**Table 1  
Timeline

Description automatically generated with low confidence  
Source: - Wounds UK (2016) Best Practice Statement: Holistic Management of Venous Leg Ulceration.

13. Arterial Investigations

Table 2

A picture containing table

Description automatically generated

Source: - Wounds UK (2016) Best Practice Statement: Holistic Management of Venous Leg Ulceration.

14. The treatment of venous leg ulcers – the role of the vascular surgeon

Vascular surgeons manage patients with disease of the arteries, veins and lymphatics. For patients with leg ulcers, they have two principal roles.

1. **The Ischaemic leg**

The first is to guide revascularisation for patients with occlusive disease of their arteries**. It is not safe to compress patients with ischaemic legs**. Referral to vascular surgery will allow both assessment and treatment planning. It is always important to include any Doppler pressure measurements and details of treatments (current and historical) in your referral.

The vascular surgeon will confirm your findings and, if there is severe ischemia, will assess the arteries for intervention by duplex ultrasound, Computer Tomography (CT) or Magnetic resonance (MR) angiography. This will give a clear map of the arterial tree and guide treatment.

For patients with short segment stenosis or occlusion of the arteries, the first modality is usually angioplasty with or without the addition of an intra-arterial stent. The aim is to return the circulation to as near normal as possible, to permit full compression and aid ulcer healing.

In some circumstances, the anatomical location of the narrowing/occlusion or the extent of it may require open surgery, such as endarterectomy (removing obstructing atheroma) or bypass. This will usually significantly improve the circulation.

If you are looking after a patient who has undergone angioplasty/stenting or bypass, it is important to remember that these procedures can fail over time. **Always re-check the ABPI before recommencing a course of compression**. If you find that it has fallen then consider re-referral to the vascular service. It is much easier to angioplasty a narrowing in a stent or bypass, than to try and re-open it once occluded.

1. **Vascular surgery to incompetent veins**

Patients with normal arterial circulation who fail to heal, despite being in appropriate compression therapy after a reasonable period (3-6 months) should be considered for a Vascular surgery referral. Patients with healed ulcers following a period of compression should be referred for assessment for interventions to their veins, as indicated in the National Institute for Health and Care Excellence (NICE) guideline 168 (2013). The ESCHAR trial (Barwell et al 2004) which demonstrated a significant reduction in recurrence of ulcers in patients who had their superficial venous reflux successfully treated. In younger, normally mobile patients such treatments may permit cessation of compression hosiery.

Some patients have significant reflux, or obstruction to flow, in their deep venous system. If this is identified, then vascular surgery may be contra-indicated and the patient will require lifelong compression. The vascular service will advise what treatments are required and why.

Modern treatment for varicose veins are largely day-case outpatient procedures and nearly all patients can be treated with either ultrasound guided sclerotherapy (liquid or foam based treatments), or catheter based ablation techniques (radiofrequency or LASER). These have largely replaced the traditional surgical technique of ligation and stripping of incompetent truncal veins. Studies of effectiveness suggest that catheter base vein ablation offers a similar level of effectiveness to surgery with fewer complications, less pain and a quicker return to full activity. Foam sclerotherapy is a little less effective, but much cheaper and provides an acceptable outcome to catheter-based interventions. It may require more frequent repeat treatment to achieve the same outcome. Not all patients can have catheter based treatments. NICE recommends that catheter based treatment or foam sclerotherapy should be the preferred treatment.

To date the main trials have focussed on the role of open surgery, in the healing or prevention of recurrence of venous ulcers. There are now a number of newer “minimally invasive” treatments being offered to patients and this section attempts to provide an overview of less invasive alternatives to surgery.

1. **VNUS closure**

This technique involves passing a probe up the saphenous vein, using ultrasound to accurately guide placement. Once correctly located near the junction with the deep veins, the vein is then surrounded by a cuff of injected saline containing local anaesthetic for pain relief. The probe is then heated up and withdrawn slowly. The probe heats the vein to a high temperature and denatures the vein wall causing fibrosis. The technique has a good success rate of over 80% (Nicolini 2005). Further injections or phlebectomies may be required to remove residual varicosities.

1. **Endovenous laser therapy**

This technique is very similar to VNUS closure but uses a laser fibre passed into the vein under ultrasound guidance. Once correctly located, the leg is injected with saline and local anaesthetic to prevent heating of surrounding tissues and to minimise pain. The laser is then activated as the fibre is withdrawn, causing thermal injury to the vein wall. Subsequently, residual varicosities may need treatment. Again the technique has a good success rate of over 80% (Min Robert et al. 2003).

Problems include, recurrence (related to laser energy used (Proebstle et al. 2004) phlebitis, pain and bruising. Long-term durability is not known. (NICE, 2013)

1. **Ultrasound guided foam sclerotherapy**

Injection sclerotherapy has been promoted for the treatment of venous disease in mainland Europe for some years. The technique of creating foam by forcing air through sclerosing agents allows the injected foam to displace blood and come into contact with a significant proportion of the vessel wall. This makes it more effective than standard liquid sclerotherapy techniques (Hamel et al.2003). A needle is located in the saphenous vein under ultrasound guidance and then the foam injected. The ultrasound probe is used to compress the vein and limit the flow of foam into deep veins once it reaches the junction with the deep system. The technique may obliterate all varicosities or subsequent injection or phlebectomy may be needed to remove residual varicosities as in a) and b).

**Summary**

There are a variety of treatments, suggesting that no one treatment is significantly superior to another. Practitioners looking after patients with venous ulceration are advised to consult the NICE website (www.nice.org.uk) for further updates on currently available treatments

15. General Management of Leg Ulcers

**Essential Skin Care**

The effective skin care of patients with ulceration of the lower limb involves washing (Lindsay, 2007; Stephens and Lindsay, 2008 cited in White et al 2016). This is not new information having been widely recommended in the literature for decades (White et al 2016). The aim of washing lower legs is to remove dry and flaky skin, remove build-up of topical steroids and emollients, and for the patients wellbeing and comfort (Dealey 1999).

The advocated method of washing is as follows:-

* Soak the leg in a clean (plastic-lined) bucket of warm water at each treatment.
* Remove dry scales and wound edge encrustations to allow emollients to moisturise the skin using a debridement pad or cloth.
* Gently cleanse the leg using soap substitutes (Nix, 2006; Nix and Haugen, 2010 cited in White et al 2016).
* Thoroughly dry the limb, particularly between the toes. This whole process can be time-consuming, especially if the patient has a lot of scale to remove and oedema of the toes, making drying difficult. Nevertheless it should be done as it is of considerable clinical benefit insofar as it affords the clinician time to observe the whole limb in detail(Hodgkinson and Nay, 2005), soften dry skin and scale, and most important, is valued by patients for the ‘feel good’ or wellbeing factor.

**Hyperkeratosis** is thickening of the outer layer of the skin- the stratum corneum commonly seen in patients with venous insufficiency or lymphoedema. It is associated with an over-proliferation of the keratin producing cells over the service of the skin, International Lymphoedema Framework (2012). Daily Skin care/Hygiene regime is important for patients with hyperkeratosis. Patients should be encouraged to carry out this care and perform regular care. Promoting self-care where possible is important in promoting and maintaining skin health (Whitlaker 2012, Pidlock and Jones 2013).



**Hyperkeratosis to lower leg**

Scottish Intercollegiate Guidelines Network (SIGN 2010) suggests cleansing of the affected leg should be kept simple using warm tap water and a non-lanolin based emollient. Tap water on exposed bone or tendon is not recommended.

Dry scales should be removed from the legs particularly around the ulcer edge to allow new growth of epithelium. (Sterile single use forceps can be used with care).Removal of the scales must be safe and atraumatic (Whitlaker 2012). Recent NICE guidelines (NICE 2014) support the use of a monofilament debridement pad in the management of hyperkeratosis. Emollients should be removed before using the monofilament debridement pad. The instructions should be read before use.

Unique convenient safe system of care (UCS) cloth is another device that can be used to promote good skin hygiene and debridement of skin scales.

A bland non lanolin moisturiser should be applied to the legs after cleansing and drying. The emollient will help to form a waterproof barrier over the skin surface, which helps to prevent the water within the skin evaporating and keeps the underlying skin hydrated. (Coley 2009).

Standard Infection Control Procedures should be adhered to as per Sirona Policies.

**Local Wound care**

Dressings do not heal leg ulcers but can be used to control symptoms such as odour or pain. They should be simple and cost effective; usually a simple non-adherent dressing is the initial dressing of choice. Refer to Sirona Wound Formulary available via Sirona Intranet & BNSSG CCG Remedy website.

**Treatment of infection**

When clinically assessing wounds, the practitioner should always be mindful of the presence of infection (White et al 2011).

Bacteria can usually be grown from a leg ulcer but in most circumstances they can be ignored as they don’t interfere with healing. All broken areas of skin will rapidly become colonised with bacteria in any normal environment.

Routine bacteriological swabbing is **unnecessary** (Wounds International 2015) unless there is evidence of clinical infection such as: - see table 3 cellulitis and venous signs. Wound swabbing should not be taken at initial presentation even if the ulcer might be infected (NICE 2020). **Antibiotics do not promote healing when a leg ulcer is not clinically infected** (NICE 2020).

**Table 3: -Cellulitis and venous signs and symptoms.**

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Source: - Wounds UK (2016) Best Practice Statement: Holistic Management of Venous Leg Ulceration.

Antibiotics are the main treatment for cellulitis, oral for a mild infection but intravenous antibiotics may be required if:

* There is a more severe infection
* The infection has not responded to oral antibiotics
* The patient has other health problems.

Other treatment is aimed at:

* Treating any breaks in the skin that allowed the infection in e.g. dressing the ulcer or the fungal infection.
* Treating pain or swelling, with analgesia and elevation
* Gentle cleansing with a soap substitute
* Elevation and resting the limb

In patients with recurrent cellulitis, prophylactic penicillin is sometimes used; refer to nurse specialist regarding skin care management and advice.

Local microbiological advice should be sought if the clinical condition is not improving. Consider referral or seeking specialist advice for adults with an infected leg ulcer if they:-

* Have a higher risk of complications because of comorbidities, such as diabetes or immunosuppression
* Have lymphangitis
* Have spreading infection that is not responding to oral antibiotics
* Cannot take oral antibiotics (NICE 2020)

The signs and symptoms of wound infection can be found in Table 4 below.

**Bacterial swabs should only be carried out where there is clinical evidence of infection. A swab will only tell you what bacteria are present; it will not tell you if there is an infection.**

Please follow the **Sirona Lower Limb and compression therapy pathway** for guidance on managing infected wounds.

**Antibiotic selection –** Please refer to the **BNSSG Primary Care Antimicrobial guidelines** and

**NICE Guidance NG152 (2020) Leg Ulcer Infection: Antimicrobial Prescribing** for guidance on antibiotic usage.

**MRSA: see local Guidelines re wound care & MRSA**

**Biofilms**

“Biofilms are communities of microbes that attach to and grow on surfaces.”(Wounds UK 2017). Biofilms are formed by microbes (mainly bacteria). It is estimated that biofilms are present in up to 100% of wounds and they can cause delayed wound healing (Wounds UK 2017, Wounds UK 2019). In chronic wounds biofilms are made up of different microbial species. The biofilm builds a protective shield in the wound and become inactive which protects from the person’s immune system and antimicrobial agents.

A biofilm cannot be seen by the naked eye but as potential biofilm may be suspected if the following are present:-

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Source - International Wound Infection Institute (IWII) (2016)

**Management of a biofilm**

Proactive treatment of biofilms includes repeatedly physically disrupting and removing the biofilm, and preventing it reforming (Wounds UK 2017). “In addition to removing dead, non-viable tissue,…some forms of vigorous/active cleansing and debridement will remove biofilms (cited in Wounds UK 2017).This would include the use of mechanical debridement with debridement pads or cloths. **Surfactants** can also be useful to aid cleansing and remove or prevent biofilm formation. Disrupting and removing the biofilm may increase the vulnerability of the biofilm to antimicrobial agents (Wounds UK 2017).

**International Wound Infection Institute (IWII) wound infection continuum (2016)**

Diagram 1.

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Signs and symptoms associated with stages of the wound infection continuum.

**Table 4**

A picture containing timeline

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Source - International Wound Infection Institute (IWII) (2016)

16. Compression For Venous Ulceration

The key to the successful healing of chronic venous ulcers (Lower limb ulceration) will be to correct the underlying venous hypertension using graduated compression therapy (Wounds International 2015, Wounds UK 2015).Compression should be first-line treatment to optimise healing and can benefit patients in both acute and chronic management. Compression treatment should be started as early as possible, so long as the clinician has established that compression is safe to use in the individual patient. This includes patients with pre-ulceration risk factors (e.g. with swelling/pain changes in lower limb) for prevention of ulceration (Wounds UK 2015).

Effective compression will;

* Exert pressure on the underlying tissue and vessels
* Reduce distension and pressure in the vessels
* Reverse venous hypertension
* Reduce oedema
* Switch off inflammation
* Stimulate removal of fibrin
* Skin may become more supple

Compression may also be appropriate for the treatment of some other aetiologies; however caution should be taken where patients have evidence of the following conditions; Arterial disease, Diabetic ulceration, rheumatoid ulceration, Peripheral neuropathy or loss of sensation to the lower limb. Full compression systems should only be applied after a full assessment and ABPI/Doppler studies have been carried out. The above patients who have these, aetiologies may not be suitable for the mini assessment, see appendix 2.

The most effective way of achieving compression therapy is by the use of graduated compression. This is where the highest pressure is applied at the ankle and the compression gradually reduces towards the knee. The pressure required to do this is 40mmHg at the ankle, decreasing to 17mmHg below the knee. This is known as applying **full compression**. **Reduced compression** is used to treat patients with mixed aetiology ulcers and provides 20mmHg at the ankle.

There are several types of compression systems available to support patients’ needs:-

Compression hosiery kits, compression wraps, compression bandage systems and compression hosiery.

A two layer hosiery kit should be the first line treatment for patients with a normal limb shape, no oedema and the wound exudate is low to moderate and contained within the provided wound dressings. The need to hosiery aids should be considered. Refer to the Lower Limb pathways to assist your selection of the correct compression system for individual patients considering patient preference, lifestyle, frequency of application, size and shape of leg, oedema, exudate management, pain management and options to promote self-care.

It is important that the science of bandaging is considered if safe and effective compression is to be delivered.

**Laplace’s Law**

This Law of Physics states that there are a number of important factors which determine the pressure achieved under any given bandage.

P = TN x 4630

CW

The level of pressure exerted by a compression garment on the leg is dependent on:

The Tension (T) of the bandage / hosiery material.

The Number (N) of layers of the compression applied.

The Width (W) of the bandages used.

The Circumference (C) of the limb.

Tension (T): is determined by the amount of elasticity of a bandage and the degree to which it is stretched.

Number of Layers (N): the more the layers applied to a leg, the higher the sub-bandage pressure obtained.

Width of bandage (W): higher pressures are achieved from narrow bandages and lower pressures with wider ones. A 10cm bandage is appropriate in most cases.

Circumference of the Limb (C): **The thinner the leg, the higher the pressure that will be achieved from a given bandage**. Dangerously high pressures can be obtained with compression bandages on thin legs. **The larger the leg/ankle, the lower the pressure achieved from a given bandage** It is vital that this principle is taken into account when instituting a regime of compression if therapeutic pressures are to be achieved in large limbs or pressure necrosis is to be prevented in those patients with small ankles.

Using Laplace’s law graduated compression is achieved because of the natural shape of the limb. Most legs are narrower at the ankle than the knee so graduated compression is achieved automatically if a bandage is applied at the same tension and overlaps all the way up the leg.

**Measuring of lower legs**

All the compression bandage systems used within the formulary, except Coban, use the principles of Laplace’s law to achieve graduated compression. Therefore it is essential that lower limbs are measured prior to applying any bandaging and after applying wool padding. Both the ankle and calf measurements should be taken and documented in the patient’s records. Lower limbs must be measured at each intervention as the limb size may change particularly where oedema is present. Where limbs are wider at the ankle than the calf due to oedema etc., padding needs to be applied to the calf to ensure it is approximately 10 -14cm larger than the ankle.

Always adhere to bandage manufactures recommendations regarding limb circumference.

**Shape of the limb**

Patient’s leg shape may be affected by oedema, injury, congenital abnormality or other disease processes (Moffatt et al 2007). Lipodermatosclerosis (inverted champagne bottle shape) caused by venous disease, fibrosis of the ankle and calf muscle wastage can also affect the shape of the lower limb. It will be difficult to achieve graduated compression, with compression bandages, with a poor limb shape and the therapeutic benefits of the compression bandaging may not be achieved.

The lower limb should be assessed by the competent practitioner undertaking the compression bandaging, and wool padding (K-Soft bandaging) used to achieve the desired limb shape.

Remember to use the post padding measurement to select your correct compression bandaging system.



**Lipodermatosclerosis**

Source: - https://medicalfoster.com/lipodermatosclerosis/

**First line treatment for a leg wound prior to completion of holistic assessment.**

A simple dressing applied to a leg wound on first contact is expected, with layer 1 k-soft bandage and layer 2 k-lite bandage applied for base of toes to below knee. In some cases, such as ankle circumference over 24cm, two layers of layer 2 (k-lite bandage) could be applied. This gives good support, reduces oedema and promotes venous return. The patient should then be reassessed for a full compression system (40mmhg) within 2-4 weeks.

The aim is to leave the bandages in place for a week; initially they may have to be changed more frequently if the exudate strikes through the bandage.

**First line treatment bandages.**

**Layer 1, Orthopaedic wool: K-soft**

This layer is applied directly over the primary dressing. It is laid on and no stretch applied during application. Its main functions are to protect bony prominences, act as an absorbent layer, and to reshape the limb. This layer applies no compression. Padding should be applied from the base of the toes to below the knee in a spiral.

**Layer 2, conforming bandage: K-lite**

This layer provides a second absorbent layer and smooths the first layer in preparation for the 3rd and 4th layers. This layer should be applied in a spiral from the base of the toes to below the knee.

This layer can be used in conjunction with layer one to provide support bandaging to limbs that are not suitable for compression.

**Compression Bandage Systems**

Compression bandaging systems can only be applied by trained and competent community practitioners. There are several types of compression bandages available including inelastic, elastic and multi-layer systems.

**Caution Cardiac failure: -** For people with advanced, unstable cardiac failure, liaise with their cardiac clinician to agree how to offer compression to optimise healing while minimising additional cardiac burden.

**KTWO® Calibrated 2-layer compression system- High compression. This is the first line compression bandage used within the Sirona Lower limb and Compression Therapy Pathway.**

KTWO® is a multilayer multi-component compression system, designed to ensure even distribution of pressure between two dynamic bandages. The system applies the effective therapeutic pressure required to treat venous leg ulcers and associated symptoms along with severe oedema in chronic venous insufficiency. The system consists of two separate dynamic bandages:

K Tech (1st layer) which is a composite layer formed of wading and a moderately elastic compression fabric.

K Press (2nd layer) which is applied over the first layer, is a cohesive bandage.

KTWO is not recommended when an ABPI is below 0.8; K TWO reduced is advocated for these patients.

Both the KTWO and the KTWO reduced come in two ankle sizes 18-25cm and 25-32cm. 10CM bandage width for leg ulcer management.

**Table 5: K Two Bandage Combinations**

|  |  |
| --- | --- |
| **Ankle circumference & first line compression** | **Bandage combination** |
| Less than 18cm  K-Soft bandage is applied in a spiral technique to bring the circumference of the ankle up to a minimum of 18cm | 2 or more layer 1 K-Soft bandage  K-Two kit 18-25cm yellow box |
| 18-25 cm | If padding and shaping of the limb is required use 1 or more K-Soft bandages to achieve desired shape  K-Two kit 18-25cm yellow box |
| 25-32cm | If padding and shaping of the limb is required use 1 or more K-Soft bandages to achieve desired shape  K-Two kit 25-32cm blue box |

**NB: The ankle circumference must be measured before and after the Layer 1 K-soft bandage has been applied. The correct bandage kit is determined by the post shaping ankle measurement.**

The ankle circumference should be measured every time the bandages are reapplied as the limb’s size and shape may alter with reduction of oedema.

Reduced compression levels can be used on limbs with ABPI’s below 0.8 with advice from experienced practitioners. (See table 6)

**Table 6: Bandage Combination for reduced compression using K-Two bandage system, Juxta cures or compression hosiery (ABPI 0.51-0.79)**

When using K-Two reduced compression bandages always pad and shape the limb prior to application with 1 or more layers of K-soft bandages.

|  |  |  |
| --- | --- | --- |
| **ABPI** | **Bandage combination** | **Ankle Circumference** |
| 0.7 | * K-Two reduced 20mmHg bandage, * Juxta Cures set on 20mmHg * Class 2 RAL Hosiery | Under 18cm  Layer 1 K-soft bandage is used to bring the circumference of the ankle up to a minimum of 18cm. |
| 0.7 | * K-Two reduced 20mmHg bandage, * Juxta Cures set on 20mmHg * Class 2 RAL Hosiery | 18– 25cm |
| 0.7 | * K-Two reduced 20mmHg bandage, * Juxta Cures set on 20mmHg * Class 2 RAL hosiery. | 25 – 30cm |
| 0.65 -0.51 | * K-Two reduced 20mmHg bandage, * Class 1 RAL hosiery * Juxta Cures set on 20mmHg | Under 18cm    Layer 1 k-soft bandage is used to bring the circumference of the ankle up to a minimum of 18cm. |
| 0.65 -0.51 | * K-Two reduced 20mmHg bandage * Class 1 RAL hosiery * Juxta Cures set on 20mmHg | 18 – 25cm |
| 0.65 -0.51 | * K-Two reduced 20mmHg bandage * Depending on ankle size Class 1 RAL hosiery * Juxta Cures set on 20mmHg | 25 – 30 cm |

**The Short Stretch Bandage System**

The short stretch bandaging system is a two-layer bandage system comprising of padding / reshaping layer and a compression layer.

The short stretch bandages extend and recoil very little, so when applied at full tension they maintain a semi-rigid cylinder around the leg that does not give when the muscle beneath expands. Contraction and expansion of the calf muscle against this cylinder re-directs the energy, forcing it back into the leg to squeeze the veins, thereby promoting venous return. This creates a high ‘working pressure’.

When the leg is inactive ‘low resting pressures’ are exerted on the leg. Because the bandages do not exert constant pressure on the limb, it may be useful for patients who do not tolerate compression well. It also may be considered for patients with arterial or sensory impairment and cardiac failure.

Short stretch bandages are beneficial for managing patients with oedema, and their low resting pressure means they can be beneficial for people who suffer with night pain from their venous leg ulcer.

As the bandage is unable to follow the limb as it reduces in oedema it may slip initially and require reapplying more frequently. The aim is to leave the bandages in place for a week when there is no strikethrough or slippage.

Actico bandages are the short stretch bandages on our formulary. **They provide 40mmHg at the ankle so can only be used for patients suitable for this level of compression.**

There are two types of short stretch bandage available, cohesive and non-cohesive.

**Layer 1 – Orthopaedic wool**

This layer is applied directly over the primary dressing. The padding layer gives no compression. Its main functions are to protect bony prominences and other vulnerable areas, to act as an absorbent layer and reshape the limb.

**Layer 2 – Short stretch bandage**

The bandage is applied with even tension at full-stretch overlapping the bandage by 50% from the ankle to knee. If applying a second bandage (where the ankle circumference is greater than 25cm) apply ankle to knee in the opposite direction to the first bandage.

Table 7: Bandage Combinations for short stretch bandage systems

|  |  |
| --- | --- |
| **Ankle Circumference** | **Bandage Regimen** |
| Under 18cm | 2 or more layer 1 bandages |
| Layer 1 is used to bring the circumference of the ankle up to a minimum of 18cm | 1 x short stretch bandage |
| 18cm to 25 cm | 1 x Layer 1 bandages |
| 1 x short stretch bandage |
| Greater than 25 cm | 1 x Layer 1 bandages |
| 2 x short stretch bandages (2nd layer applied from ankle only in opposite direction to 1st layer) |

**NB: The ankle circumference must be checked after the Layer 1 K-Soft bandage has been applied and the bandage regimen determined by that measurement**.

**Bandage slippage**

The rigid nature of short stretch bandages means that reduction in oedema sometimes allows bandages to slip down the leg initially and so they may need re-application.

When applying any bandage regime ensure the gradient from ankle to calf is not too steep, the calf measurement should be 10-14cm larger than the ankle. Use the Layer 1 K-Soft, to pad out the ankle and improve the gradient. Coban Layer 2 has shown good results with slippage reduction. Try to ensure the limb has a good leg shape; use as many layers of layer 1 K-Soft bandage, as needed to achieve this good shape.

**3M™ Coban™ 2 layer Compression System. This system is on the specialist wound formulary.**

The Coban 2 layer compression system uses the principles of Pascal’s Law rather than Laplace’s law and therefore the difference in size of the ankle and calf measurement is not required to apply the bandage system. The system is latex free and has been specifically developed to overcome some of the challenges associated with other compression systems, such as foot wear problems. The system is 2 layer bandage system consisting of an inner comfort layer and an outer compression layer. The unique foam comfort first layer replaces the orthopaedic wool layer and is latex free. The cohesive compression layer provides effective sustained compression and is also latex free. Once applied the two layers bind together to form a slim, single layer bandage that is designed to resist slippage and enables the patient to wear normal foot wear.

**One size kit fits all ankle circumferences**

Suitable for patients with an ABPI of 0.8-1.3. For patients with an ABPI of 0.8-0.5 there is the Coban 2 lite kit. The system is a kit that contains two rolls and is designed to be used together and not in conjunction with any other compression bandages or Layer 1 K-Soft bandages. Each layer of the coban 2 layer system has a purple core to allow easy differentiation form the original coban self-adherent bandage.

**Footwear for patients wearing compression bandages**

Due to the thickness of the compression bandages patients may need to have a wider and larger size of footwear to accommodate the bandages. If footwear is too small it can cause the bandages to be pushed up the forefoot causing oedema and potential skin damage. Wearing correctly fitting footwear for patients with compression bandaging is vital to enable them to remain mobile, prevent social isolation and reduce the risk of falling. Patients may choose to purchase their own footwear and there are many companies who provide wider footwear and easy to apply options. If patients are unable to purchase their own footwear, shoes specifically for patients in bandaging are available via prescription (FP10), such as Crawford Healthcare Kerraped boots or L&R Medical’s Cellona shoes.

**Compression wraps**

These are reusable systems which are adjustable and are alternatives to compression bandages and leg ulcer hosiery kits. They provided graduated compression and consist of lower leg pieces with options to add foot, knee and thigh pieces. Their application can reduce clinical time and can be applied by non-registered staff. They are an excellent option for promoting self-care or carer involvement.

**Medi Juxta**

1. Juxtacure Equipment required:

The ‘Body’ of the garment

A Velcro detachable ‘spine’ clearly marked ‘ankle’ at one edge and ‘calf’ at the other edge.

Four cotton liners and four compression anklets

A ‘BPS’ card

Velcro tabs to secure the spine if concerns regarding accidental removal of spine by patient.

One pack of Juxtacures contains 1 body, 1 spine, and 1 pair of liners, 1 pair of compression anklets, 1 BPS card and spare Velcro tabs.

Also available on prescription are pairs of liners and standard or large pairs of compression anklets.

Measurements required to ascertain correct size;

Length of Limb- to order short, standard or long Juxtacures pack

Once Pack has been received

Measure ankle circumference and calf measurement.

To ascertain the correct size of the Juxtacures take the length (L) of the limb from above the lateral malleolus to two finger width below the knee flexure.

Table

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Adjust the Juxtacure spine to the patient’s ankle and calf measurements. The ankle measurement is on the bottom of the garment and the calf measurement at the top.



The excess is then cut off leaving approximately 5cm of overlap.



**Applying the Juxtacures**

Pull the Comfort™ Leg Liner over the leg and any dressings (if the length is past the knee, leave until the Juxtacures™ has been positioned and anchored, and then fold the Comfort™ Leg Liner back down over it).

Smooth out any creases.

The Comfort™ Anklet can be applied after the main body of the Juxtacures™ has been fitted.

Once the spine has been adjusted, apply the garment to the leg with the black material toward the skin.

When you are happy where it is positioned – tighten the straps, starting from the bottom and finishing at the top.

**Adjusting of the Juxtacures™ and setting the pressure (mmHg)**

Identify the correct scale on the BPS measuring card relating to the ankle circumference and check the pressure applied. You can highlight the correct part of the BPS card for the patient.



Repeat for the remaining three straps keeping the measure on the BPS consistent (e.g. if the ankle is set at 40mmHg, all other straps must read 40mmHg).

The patient should be reviewed within 24 hours to ensure that the device is comfortable; not compromising the skin / limb in any way and that it is not causing any discomfort.

It is expected that the limb will reduce in size as there will be a reduction in the oedema due to the improved venous return. Therefore on each visit for the first 2 weeks, the ankle and the calf circumference should be measured and documented.

If there is a reduction in the volume of the leg the spine will need to be adjusted, to match the new ankle and calf circumferences. This adjustment may need to be daily initially.

**Infection Control**

The Juxtacure is not a sterile system; therefore the infection risk can be mitigated but not eliminated. The following measures will reduce the risk of infection:

Prescribe for use on one named patient only; no part of the system can be used on another patient.

Compression including the Juxtacures is contraindicated where there is infection in the leg.

Use the most appropriate, potentially high absorbency dressing to contain the exudate.

If there is gross strike-through of exudate then the compression anklet and liner will need to be disposed.

**Washing and drying instructions**

The liner material is treated with a polymeric antimicrobial that prevents bacterial growth in the fabric and it must be laundered and thoroughly dried after each use. The breathe-o-prene fabric for the Juxtacures is a laminated fabric with a silver content on the black (skin facing) layer.

The Juxtacure, Comfort Leg Liner and Comfort Compression Anklet should be washed in the washing machine and tumble dried on a cool setting or air dried on a flat surface.

The socks and liners are designed to be laundered at up to from 30 to 65 degrees and should be changed for a clean one at each dressing change.

The Juxtacure itself can also be machine washed at the same temperature range, this will be dependent on whether there has been any strike through and should not be necessary at every dressing change.

**Patient Information:**

E-book of patient information booklet

<https://images.medi.de/Storage/Documents/UK/Juxtacures-patient-information-booklet.pdf>

The nursing staff will have on-going support from the Wound Care Service team and Medi representatives. This will be in the form of follow up visit with the patient until the nurse is safe and competent to assess, adjust and readjust the device.

Juxtafit is more appropriate for patients with chronic oedema or lymphoedema.

**Compression Hosiery Kits**

A compression hosiery kit is a 2 part hosiery system used to treat venous leg ulcers. They provide 40mmHg of compression at the ankle. The kits consist of a compression liner stocking followed by a higher compression stocking. There are several manufacturers of hosiery kits and the compression provided by each component differs but the total compression provided is 40mmHg.

For patients with a normal limb shape with limb distortion, no oedema and a low exuding wound compression hosiery kits should be the first choice of treatment. They are cost effective, save clinical time and promote self-care. They can be applied by carers and non-registered staff with minimal education.

17. Self-Care Solutions

The issue of patient self-care is now more relevant than ever, as it is easier for patients to manage their own care using compression kits than it used to be solely with bandages, and ongoing self-care can reduce recurrence rates and associated complications (Guest et al 2015). The NHS Five-Year Forward View (2014) makes patient empowerment and involvement a priority, with a specific directive to ‘support people to manage their own health – staying healthy, making informed choices of treatment, managing conditions and avoiding complications’ (NHS 2014). Self-care should be encouraged in suitable patients, but not forced – the patient must be able and willing to be involved in their own care (e.g. depending on skill level, dexterity and mobility). The patient should be prescribed a compression system that fits both their clinical and personal needs; family and carer involvement should also be taken into account.

18. Patient Engagement and Patient Education

Patient engagement is key to concordance with treatment. In order to achieve positive outcomes the patient must be actively involved in their care. Lack of concordance is a major issue in compression therapy, and encouraging education and self-care may improve outcomes. Following diagnosis, the patient’s view should be considered and discussed, establishing objectives and priorities with the patient and taking into account their choices and expectations. When a treatment regime has been agreed with the patient, agreed outcomes should be recorded and measured in order to track treatment and progress and involve the patient in their own care – e.g. evaluating progress with the patient such as reduction in wound size, pain, exudate levels or oedema. As treatment progresses, it is important that the patient is informed and involved at all stages in the rationale behind the treatment and the progress that is being made. (Wounds UK 2016)

|  |
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| Patient engagement and patient education Table 8 |
| Involve patient in decision making process, Consent, consider capacity. |
| Use positive language |
| Explain treatment and rationale at all stages, establishing patients and carers short term expectations |
| Use information leaflets and resources |
| Suggest patient help and support groups where appropriate |
| Involve family, carers and friends |
| Ongoing review of progress at least 4 weekly. |
| Continuity of care with consistent messages. |

**Exercise**

Exercise is an integral part of the patient’s care and patients should be encouraged to remain active and undertake simple exercises to enable venous return. This may include walking and simple calf and ankle stretches.

19. Pain Management

The pain level experienced by a patient should be monitored and documented regularly at each dressing change, ideally using a simple and objective system such as a visual or numeric analogue scale (Wounds International 2015). Compression therapy may help pain levels to decrease, as issues such as oedema and inflammation are resolved and venous return improves. Pain assessments can help to demonstrate effective treatment; normally as the ulcer heals the pain reduces.

Some patients may find tolerating compression therapy difficult due to pain. Therefore, it is vital that pain is managed appropriately, to improve the likelihood of patient tolerance as well as improving patient wellbeing and quality of life (Wounds International 2015).

Nurses need to ensure that pain is not exacerbated by poor compression application techniques, and neuropathic pain management may be essential for compression to be tolerated.

As VLUs are frequently painful, pain management using analgesia and/or dressings with pain-managing properties is likely to be required (SIGN, 2010). Ensure the effect of the analgesia is also monitored: ask the patient what their pain level is after taking analgesia, as well as their pain level at the current time. Pain in VLU patients has been found to fluctuate and may be difficult to control (Hodg) so selecting appropriate pain management strategies will depend on the individual patient**.** The patient may find keeping a pain diary helpful when looking at effectiveness of analgesia and compression therapy.

Compression will improve pain over time for venous ulcers but sometimes pain levels can rise in the first few weeks, due to physiological changes in the central nervous system (Wounds International 2015).

Chronic pain has a substantial effect on mood, quality of life and relationships. It can affect the ability to work, leading to financial implications. (British Pain Society 2019).

|  |
| --- |
| Table 9 – Factors to consider when managing pain |
| Be aware of triggers that increase pain |
| Recognise that pain may extend some distance from the wound |
| Recognise that for some patients, cleaning, soaking and temperature of the water may exacerbate pain. |
| Patients are pleased when their pain is understood by the nurse and that it is being taken seriously. Concordance is then improved. |
| Involve the patient in the procedure-this gives them greater sense of control and will help to reduce anxiety and pain. |
| Allow patients to remove their own dressings if they wish |
| Allow patients to wash and cream their own legs if they wish |
| Allow patients to halt or slow down a procedure |
| Some patients have stated that distraction though music and deep breathing helps reduce pain |
| Reassess pain and analgesia at each dressing change. |
| Regular analgesia is better than ad hoc administration. |

**Table 10 - Pharmacological therapy.**

Analgesic ladder (WHO 1996)

Pain score

Remember appropriate bowel prophylaxis

Ibuprofen or paracetamol PRN/regular

Mild 0-3

Severe 5-10

Moderate 4-5

Asses pain& whether PRN or regular analgesia is required or both

Short acting opioid e.g. Morphine PRN/regular

Add in simple analgesic as well

Short acting week opioid e.g. Codeine or NSAID PRN/regular

(Simple analgesic Paracetamol/Ibuprofen)

Adjuvant analgesics (a drug not primarily used to treat pain) may be effective without concurrent analgesics. Examples of adjuvant analgesics are anticonvulsants e.g. Carbamazepine, Gabapentin and Amitriptyline (Tricyclic drug). These are used for the treatment of burning, stabbing pains. Gabapentin relieves the pain by changing the way the body senses pain. Amitriptyline works by increasing the amounts of natural substances in the brain and changes the way pain is felt. Amitriptyline should be introduced in small doses and due to their sedative action, be taken at night. Doses in excess of 30mgs may be required and it may take several weeks before the correct dose is achieved.

Nurses and doctors should examine their goals for pain relief, and work with the patients to achieve appropriate outcomes of pain management. Pain can be multidimensional and analgesia is just one aspect of management. Patients should be taught how to manage their pain effectively. Analgesia should be used regularly rather than waiting until pain has developed. Practical strategies such as written instructions and dosette boxes can significantly improve pain therapies.

A comprehensive approach to pain control advocated by WHO (1996) should be adhered to, including working as a team is crucial for optimum care.

20. Difficulty Tolerating Compression

It is essential to try and engage patients with compression by compromising. Short stretch bandages produce low resting pressures and so may be better tolerated in some patients. Using compression liners and hosiery kit components are also a good way of adapting compression levels to aid concordance. Juxta Cure wraps aid mobility and ankle movement.

Practitioners frequently report that patients do not adhere to compression therapy because of pain, despite them having adequate arterial circulation (Moffatt 2004b). The main factors causing pain in these circumstances are due to: -

|  |
| --- |
| Table 11 - The main factors causing non adherence with compression due to pain |
| Inappropriate choice of compression system |
| Lack of adequate padding over bony and tendinous areas with bandages |
| Failure to adapt the compression bandage system to the limb size and shape |
| Over stretching bandages at calf level causing a tourniquet effect |
| Over stretching bandages below knee |
| Too many or too few layers of bandage causing a lack of graduation |
| Pressure damage to the skin |
| Bandage slippage causing trauma |
| Over stretching of bandage causing joint or muscle or joint pain |
| Inability to wear shoes |
| Traumas from foot wear over bandaging. Rucking back the bandages at the foot. |

**MANAGING EXUDATE**

Patients with heavily exuding legs, in compression therapy, may initially experience exudate striking through the bandages daily or on alternate days. Patients should be reassured that the compression is working and that the leakage should reduce. Leave the bandages for as long as possible and supply the patients with large 20 x 40 cm dressing pads that can easily be wrapped around the outside of the bandage until the community practitioner can attend the following day.

A good skin care regime is important to ensure exudate is removed as it can act as an irritant to surrounding skin. A superabsorbent dressing could also be added short term, for high levels of exudate, to allow compression to stay in place longer and protect the surrounding skin**. These dressing go directly on the ulcer** and do not need to be used once exudate is reduced. The use of surgipads is not recommended and superabsorbent dressings should never be layered.

**NB:** Strikethrough of exudate should not be left uncovered as this provides a port of entry for bacteria to the wound.

**Remember to shape the leg after applying superabsorbent pads and measure the ankle circumference after the padding to maximise the effect of the compression bandages.** If strike through of exudate continues exclude varicose eczema as the cause before referring to the Wound Care Service. The treatment of varicose eczema is a daily treatment for 7-10 days with emollient therapy depending on severity with a topical corticosteroid. (See varicose eczema SOP).

Excessive exudate production can be associated with a wide range of problems. Leakage and soiling can be particularly distressing to patients and carers, and can be burdensome causing an increased need for washing of clothing and bed linen. Leakage or strikethrough may result in odour; which may be a sign of increased wound bioburden or infection). Leakage or strikethrough to outer dressings or bandages can also increase the risk of infection by providing a route by which micro-organisms can enter the wound.

Excessive exudate can have a significant psychosocial impact on patients and affect their quality of life (Benbow & Stevens, 2010). For example, patients’ work, social and home lives may be disrupted by dressing changes, or by fear and embarrassment related to leakage or odour, causing social isolation.

|  |
| --- |
| Table 12 - Problems associated with excessive exudate production. |
| Leaking and soiling |
| Malodour |
| Increased risk of infection |
| Discomfort and/or pain |
| Protein loss & fluid/electrolyte imbalance |
| Peri-wound skin damage such as maceration and erosion |
| Wound expansion |
| Psychosocial effects |

21. Managing Varicose Eczema

Varicose eczema, also known as gravitational eczema, venous eczema or stasis eczema, is a common skin condition which affects the lower legs of adults. If left untreated the skin can break down to form ulceration, which can be difficult to heal. The following information guides the practitioner on how to treat the early stages of varicose eczema to prevent ulceration developing. However patients with venous ulceration may also present with dry or wet eczema.

People are likely to develop varicose eczema if they have had or suffer from:

* Venous hypertension, Varicose veins,
* DVT, phlebitis
* Cellulitis.

Due to venous hypertension fluid leaks through the capillaries causing red-brown stained areas on the lower legs (haemosiderin staining), which can become hot and itchy. Tiny blisters can also appear usually above the ankle.

If left untreated the skin can develop eczema, with red itchy spots, inflammation, dryness and flaking. The skin may become weepy with some skin crusting. When the skin around the lower legs becomes inflamed and flaky, as described above, the condition is called varicose eczema.

**Table 13 – Varicose Eczema Pathway**

**Varicose Eczema Pathway**

Signs & Symptoms

Itchy, Red and Swollen, Weeping Dry and Flaky, Scaly or Crusty

Asses for compression hosiery/wrap, including ABPI and continue daily emollient therapy and promote self-care

Add in topical steroid treatment **Daily** for 7 days using finger-tip unit measure, and then wean off over 7-10 days to prevent rebound

If no Improvement consider discussion/referral to Wound Care Service

**Steroid table. 14 - NICE (2018)**

|  |  |  |  |
| --- | --- | --- | --- |
| Mild  not used in leg ulcer managemant | Moderate | Potent | Very Potent  Specilist use only |
| Hydrocortisone 0.5%, 1%,2.5%  Fucidin H  Canesten HC  Daktacort  Timodine | Betamethasone Valerate Ready Diluted (RD)  Clobetasone butyrate | Betamethasone Valerate  Mometasone  Fucibet | Clobetasol propionate |

22. Flow Chart for a slow to heal Venous Ulcer (No Progression in Healing)

**Perform a full reassessment**

**.**

* Doppler ABPI - to rule out the advancement of Arterial Disease.
* Blood screening - to rule out new organic causes, such as anaemia, diabetes, hypothyroidism and low albumin levels.
* Wound bed assessment - to rule out wound infection, colonisation with bacteria (see table 4) and possible other aetiology of ulcer.
* Nutritional assessment including assessment of protein intake

Refer to Wound Care Service if need advice.

No abnormality detected on reassessment

Re-measure ankle circumference

Has the correct compression regime been applied for the ankle circumference and Doppler ABPI result?

.

Yes

No

Is the gradient of the lower leg normal?

Apply correct compression regime

Yes

No

Have you padded the lower leg with the sub-wadding layer to achieve a normal gradient?

Refer to Wound Care Service

Yes

No

Shape the leg with the sub-wading layer to mimic the shape of the normal lower leg.

23. Managing A Healed Ulcer

Once a leg ulcer has healed skin maintenance and prevention of recurrence is vital (Wounds UK 2019). 33-67% of patients with venous disease at risk of reoccurrence of their leg ulcer. Prevention of recurrence for patients with venous disease is achieved through compression therapy such as compression hosiery or a compression wrap, and they need to be informed that this is a lifelong treatment. The compression therapy maintains, supports and continues to control venous hypertension.

**Compression hosiery**

Compression hosiery is provided via prescription. Practitioners need training and education in the measurement, selection and application of hosiery. Patient education and involvement is key in the success of maintenance therapy. Compression hosiery is used to prevent recurrence of healed leg ulcers but can also be used to manage oedema, early signs of venous disease, varicose veins or active ulceration where other compression therapies are not suitable for the individual. Compression hosiery provides less compression than compression bandages or wraps and lower levels of compression are required for maintenance therapy.

**Standards of compression hosiery**

There are 2 main standards of compression hosiery available – British standard and RAL. British standard hosiery tends to be made of a thinner yarn whereas RAL may be thicker and stiffer. RAL hosiery is tested to a high quality standard

**Classes of compression hosiery**

Compression hosiery comes in 3 classes – 1, 2 and 3. Each class provides a different level of compression and the selection of which class is dependent on what condition they are selected for. British and RAL stockings provide different levels of compression in each class. See table 15 below.

**Table 15 – Classes of compression hosiery**

|  |  |  |
| --- | --- | --- |
|  | **British Standard** | **RAL standard** |
| **Class 1** | 14-17mmHg | 18–21mmHg |
| **Class 2** | 18-25mmHg | 25-32mmHg |
| **Class 3** | 25-35mmHg | 34-46mmHg |

Class 1 hosiery (light support) is suitable for superficial or early varicose veins or for individuals who can’t tolerate Class 2.

Class 2 hosiery (medium support) is suitable for prevention of recurrence of venous ulcers, or those with medium severity varicose veins.

Class 3 hosiery (firm support) if for severe varicose vein treatment, or those who have a lower leg wound but can’t tolerate other types of compression therapy.

**Circular knit or flat knit hosiery.**

Hosiery is constructed in two different ways – circular knit and flat knit.

**Circular knit** is a fine seamless fabric produced as a tube, using circular needles. The fabric is finer. These are suitable for people without oedema and who no or minimal limb distortion.

**Flat knit hosiery** is produced as one piece of material and then sewn together. They have a seam at the back. The fabric is stiffer and firmer and lies over skin folds without cutting into the skin. It is more suitable for people with chronic oedema and distorted limbs.

Compression hosiery is available in ready to wear options which are premade to set sizes, or made to measure where they are made for an individual.

There are open and closed toe options for patients, and below knee or thigh length options.

A hosiery selector guide is provided to assist with selection of hosiery for patients – see appendix 4 Medi Hosiery Hunter.

24. Education, Training and Competencies

**Aims of Education and Training**

Assistant practitioners, trainee assistant practitioners, Registered Nursing Associates and Registered Nurses need to attend in-house courses as a minimum standard. The aim of the training is to ensure that Assistant practitioners, trainee assistant practitioners, Registered Nursing Associates and Registered Nurses receive up-to-date evidence based training. The aims of lower limb education are:-

* To educate participants on the appropriate assessment of patients with ulceration, and the management of patients with lower leg wounds
* To ensure that resources are used appropriately in clinical practice.
* To minimise variation in practice
* To maintain the optimum health of the patient/client
* To consider the cost of intervention in providing an effective resource.

**Training should cover:**

* The Leg Ulcer Care Guidelines (This document)
* Pathophysiology of leg ulceration
* Leg ulcer assessment and documentation
* What is normal and abnormal wound healing
* Compression Therapy – theory, management and application
* Essential skin care and emollient therapy
* Health Education
* Prevention of recurrence
* Hosiery – measuring, fitting, application

**Competence in Application of Compression therapy**

To be competent to apply compression therapy unsupervised, staff members must have attended the Lower limb management course and be assessed on the core competencies of the course by a Mentor, (located in Sirona Competency Library).

A mentor must be a Registered Nurse who has undertaken the training and is competent in leg ulcer management.

**Competence in assessing patients and initiating compression therapy**

To be competent in assessing patients and initiating compression therapy the staff member must first have achieved the core competencies for application of compression, hosiery application and management of leg ulceration, (located in Sirona Competency Library).

They should then undertake a further training course in Doppler Assessment.

The candidate will need to identify a mentor who will supervise those assessing patients until competence has been gained and they can be assessed on the core competencies for assessment of patients with leg ulceration (located in Sirona Competency Library).

25. Monitoring Compliance

The specialist nurses from the Wound Care Service will monitor compliance as part of their in reach work with the community teams. This may include auditing practice.

26. Links To Procedural Documents

Sirona Consent Policy, Hand Hygiene Policy, Decontamination Policy and Standard Infection Prevention and Control Precautions.

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Appendix 1 – Assessment details

**Assessment**

It is intended that the assessment of lower leg wounds is carried out by a Registered Nurse who is competent in this skill. Assistant practitioner and registered nursing associates may undertake aspects of the assessment process but the final decision around the correct treatment pathway for the patient must be made by a Registered Nurse competent in this skill.

A detailed assessment of the patient’s general health is paramount in order to determine the cause of the lower leg wound and maximise the patients’ potential to heal. The Leg Ulcer Care Pathway form should be completed to undertake the holistic assessment of patients with lower leg wounds.

**General Assessment**

The rationale for the various components of the assessment process are discussed below.

**Age**. Leg ulcers are more prevalent in the elderly and the ability to heal is decreased due to a delayed immune response to initiate healing, thinning of skin and delayed epithelialisation. There is also an increased risk of arterial involvement in the elderly.

**Weight and Height**. - Malnutrition both in anorexia and obesity will affect healing.

**Blood Pressure / Pulse**. - To detect hypertension and cardiac arrhythmias.

**Capillary Blood Glucose**. – To detect raised blood glucose levels. If taking a venous sample of blood for other investigations than an HbA1c can be carried out instead of capillary blood glucose.

**Venous bloods for FBC, TFTs, and U&E**. - Anaemia, hypothyroidism and low albumin can delay healing.

Rheumatoid factor does not exclude vasculitis, as there will be many false positives.

**Medical History**

**Table 16 – Arterial and venous related risk factors**

|  |  |
| --- | --- |
| **Arterial Related Risk Factors** | **Venous Related Risk Factors** |
| Peripheral Arterial Disease  Arterial surgery  Diabetes Mellitus  Ischaemic Heart Disease  Myocardial Infarction/Angina  CVA / Transient Ischaemic Attacks  Rheumatoid Arthritis  Ulcerative Colitis  Smoker | Varicose Veins  Past venous surgery  Multiple pregnancies.(More than 3)  Phlebitis  Previous DVT  Period of prolonged bed rest  Trauma or orthopaedic surgery  Lower leg fractures  Previous venous ulceration |

The normal venous system has non-return valves which prevents venous blood pooling in the lower limb veins. Blood is pumped up the venous system by the pumping effect of the foot and the calf muscles. If the valves are faulty, a back flow of the blood results in high blood pressure in the veins known as chronic venous hypertension (CVH). This results in the vessel walls becoming stretched and weak and is sometimes seen as varicose veins. CVH is the underlying condition that may eventually lead to ulceration, and evidence of varicose veins can be one of the first signs of this condition.

**Deep Vein Thrombosis**

Approximately 4% of venous leg ulcers are caused by a DVT as a result of post thrombotic syndrome (Muldoon 2013 cited in Flanagan 2013). The location of the clot may damage a valve or cause an obstruction in the flow of blood back to the heart.

**Lifestyle factors**

Obesity and pregnancy are risk factors in the development of venous disease as the blood flow will be reduced when it reaches the pelvis. The result is obstruction and back flow to the lower limbs.

**Intermittent claudication and rest pain**

This indicates that the arteries are narrowed due to atherosclerosis and the arteries are less elastic and unable to respond to the pumping action of the heart. These patients should not be treated with compression without input from a vascular specialist.

**CVA or PAD or Cardiac events**

As above- presence of these conditions indicates that the patients’ arterial system compromised and may be indicative of arterial ulceration.

Associated conditions such as diabetes or rheumatoid arthritis.

Rheumatoid arthritis may result in venous disease due to poor mobility, reduced calf muscle pump and ankle function (Muldoon 2013 cited in Flanagan 2013). There may also be evidence of arterial insufficiency. Patients with diabetes may have similar underlying problems. These patients may have a combination of both venous and arterial disease (mixed disease).

**Lifestyle factors**

Smoking is a known contributory factor in arterial disease. Ascertaining the patients’ smoking status may aid diagnosis in order to differentiate between arterial and venous leg ulceration.

|  |
| --- |
| Table 17 Medication that can effect wound healing (Beitz 2017) |
| Delay healing  Cytotoxic antineoplastic, e.g. Hydroxycarbamide; immunosuppressive agents; antipsychotics; corticosteroids; nonsteroidal anti-inflammatory drugs9NSAIDs) and anticoagulants.  Increase oedema  Calcium channel blockers, e.g. amlodipine; NSAIDs  Cause ulceration  Nicorandil (Rix and Bull 2017)  Affect the surrounding skin  Systemic topical steroids  Positive effect  Pentoxyifylline is an effective adjunct to compression for treating VLU s (off label indication) and may be effective in the absence of compression (Jull et al 2012). High doses are required and major gastrointestinal side effects are common. Caution when prescribing is recommended as there may also be drug interaction. |

**Allergies**

Assess medication allergies, sensitivities to wound dressings, skin sensitivities and latex.

It is important to know of any interactions to previous treatments.

**Mobility**

Ability to mobilise and distance able to mobilise.

Use of mobility aids.

Abnormal walking gait

Ability to use foot and calf pump – does the patient walk from heel to toe?

The foot and calf muscles pump the venous blood back towards the heart. If they

are not activated regularly there will be increased blood pressure in the lower limbs. Oedema will develop, increasing the venous congestion. If muscle wasting is also present, such as in wheelchair users, this further increases the risk of venous ulceration.

Sitting for long periods of time with the legs hanging down induces oedema and the individual’s inability to use foot and calf pump, which contribute to venous hypertension.

**Clinical Examination & Investigation**

**Both legs should be examined at the initial assessment.**

Examination should note the venous and arterial signs and symptoms in Table 18

|  |  |  |
| --- | --- | --- |
| **Table 18** | **Venous Disease** | **Arterial Disease** |
| P:\dphippen\Shared\Nina's projects\Bristol Community Health\Information from Gail Powell\venous standard.PNG  P:\dphippen\Shared\Nina's projects\Bristol Community Health\Information from Gail Powell\venous standard2.PNG  Text  Description automatically generated with low confidence  mixed aetiology1 | Varicose veins  Itchy over varices  Ankle flare - telangiectasia  Staining/pigmentation – haemosiderin staining  Ulcer usually shallow  Ulcer usually in gaiter area  Eczema  Oedema  Aching heavy legs  Lipodermatosclerosis  Induration  Atrophie blanche | Shiny taut skin  Thickened toenails  Dependent rubor  Pale or blue feet  Ulceration to toes  Gangrenous toes  Cold legs / feet  Punched out ulcers  Poorly perfused wound  Pain in lower limbs  Capillary refill time more than 3 seconds  Loss of pedal pulses  Foot/toes blanche when raised.  Loss of hair  Muscle wasting |

**Varicose vein**

A close up of a person's skin

Description automatically generated with medium confidenceA picture containing person

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**Atrophie Blanche Venous Staining (Haemosiderin)**



**Ankle Flare**

A close-up of a person's legs

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**Lipodermatosclerosis**

How the ulcer occurred, its site and duration should be noted. Venous ulcers tend to deteriorate slowly. The longer an ulcer is present, the harder it is to heal due to chronic changes that occur in the wound bed and the exudate.

**Site** – It is important to record the site accurately. Venous ulcers are common in the gaiter area, whereas arterial and diabetic ulcers are more commonly present on the foot. Small, patchy, painful ulcers are often indicative of vasculitis. Atypical distribution of ulcers or ulcers with abnormal appearance should be referred to either a General Practitioner or Dermatologist. A biopsy may be indicated.

**Condition of ulcer bed** – this should be assessed for the presence of slough, necrosis or granulation and wound care products used appropriately to prepare the ulcer bed to heal using the local Trusts Formulary. A simple non-adherent dressing is recommended under compression bandaging for venous ulcers.

**Exudate –** note the colour, consistency and amount of exudate produced. This may give an indication of bacterial burden if purulent, malodorous or excessive.

**Measurement –** The ulcer should be traced or measured and photographed monthly. Measure the ulcer using the clock face principle – (the person’s head is always at 12 o’clock and their feet are at 6 o’clock). On the feet, the heels are at 6 o’clock and the toes 12 o’clock.

Measure the wound length from 12 o’clock to 6 o’clock.

The wound width is measured from 9 o’clock to 3 o’clock.

Wound depth is measured at the deepest part of the wound.

When measuring undermining, check for undermining at each “hour” of the clock face and record.

For tunnelling document using the clock face to reference the location of the tunnelling.

Clinical wounds photographs must be taken with a paper ruler to give an impression of the scale and extent of the wound. These should be labelled with the patient’s initials, last 4 digits of their NHS number, the type of wound and location & the photographer’s name.

Clinical photographs must only be taken on a digital camera, mobile phone or tablet provided by Sirona. Clinical photographs must be uploaded within 24 hours to the patient’s clinical record, and then deleted from the device.

**Nutritional Status; a MUST tool is available to aid assessment.**

A person with a wound needs 10 – 20% more energy than a healthy person at rest, and 1.5g - 2g of protein per Kg of body weight. A balanced diet including carbohydrate, protein, vitamins A and C, zinc and iron is essential

**Table 19 – Challenges in lower limb Management**

|  |  |
| --- | --- |
| Challenges | Potential solutions |
| Lymphovenous disease | Specialist bandaging technique using inelastic compression may be required to accommodate unusual limb shape or to treat toe swelling.  Refer to lymphoedema service, if available, and the skills/competencies are not available locally.  Skin care should be a priority as there is an increased risk of infection. |
| Assessment challenges  Difficulty obtaining an ABPI,  E.g., procedural challenges | Contact Wound Care Service  Check using appropriately sized blood pressure cuff and Doppler probe  For complex oedema, consider assessing toe pressures and refer to lymphoedema service. |
| Manual Handling challenges | Risk assessment and consider necessary additional equipment e.g. Hoist |
| Differentiating skin changes | Inspect skin, record changes and previous history  Consider an individualised skin care plan as a preventative measure  Refer to dermatology as appropriate |
| Management Challenges |  |
| Atypical VLU location, e.g. posterior lower leg | Implement additional strapping, offloading and redistribute pressure |
| Increased risk of pressure injury/ulcer | Appropriate risk assessment and pressure relief, it is vital to off load to prevent pressure injury/ulcer on heel |
| Reduced patient mobility | Provide appropriate activities, activity diaries, mobility equipment  Gait analysis and referral to Physiotherapy/podiatry |
| Achieving effective therapeutic compression is a challenge e.g. abnormal shaped limbs | Consider advanced bandaging techniques e.g. use of padding to normalise the limb shape, tension layers  If abnormal shape is due to lymphoedema, and there is no active ulceration or weeping, refer to the lymphoedema service for advice. |
| Skin folds of the leg | Consider inelastic compression bandaging with additional sub-bandage padding to address skin folds  Once distortion lessens step down to inelastic wrap system or flat knit hosiery |
| Venous obstruction due to large panniculus (dense layer of fatty tissue) | Encourage elevation to accommodate panniculus e.g. a riser/recliner chair |
| Healing Challenges |  |
| Malnutrition | Complete MUST assessment and follow nutrition care plan. Refer to dietetics if indicated, provide guidance, resources and education as per local policy |
| Skin hygiene/inability to self-care | Ensure appropriate skin hygiene protocols, provide guidance for resources and education as per local policy  Treat underlying/existing conditions e.g. Tinea pedis  Consider prophylactic antibiotics and refer to BLS and LSN recommendations (2016) for patients with lymphoedema. |

**Smoking Status**

Smoking is an arterial risk factor which can lead to arterial disease.

Smoking delays wound healing (McDaniel & Browning 2014). Cigarette smoking impairs the function of several cell types, such as neutrophils and macrophages, important to inflammatory and bacterial activity, and compromises oxygen delivery to the tissues. Smoking cessation has been associated with a reduction in infection (Sorensen et al (2003). Patients that smoke should be encouraged to reduce or quit smoking, and this should be part of the patients’ treatment plan.

**Pain – see tables 9 &10**

Assess the following:-

Type of pain and when it occurs

Location

Use pain assessment tool in pathway

Current analgesia

Formulate individual management plan.

**Psychological Status**

The psychological effects of painful ulceration should not be underestimated. Depression, even of a mild degree, may be exacerbated by pain and social isolation. The patient’s quality of life (QOL) will be adversely affected by these issues, which may make it difficult for the patient to comply with treatment. Strategies to help to break the cycle of poor concordance in non-healing ulcers may heal some that appear resistant to treatment. (Wounds UK 2019)

Well supported patients are more likely to comply with treatments; emotional support reduces emotional distress which can itself impair treatment and recovery. (Wounds UK 2019)

**Patients Understanding of the Ulcer**

Patients’ understanding and involvement in their treatment is essential, Patients who feel empowered with their care are more likely to adhere to treatment.

Education leaflets are useful to support the patient’s understanding. All patients should be provided with suitable written information about their diagnosis, treatment plan and self-care options and this should be discussed with them by the assessing practitioner.

**Promoting Continuity of care and Self-care**

Continuity of care with consistent messaging is a key component to best practice and may help to develop a strong theraputic relationship. The patient’s care plan should be the responsibility of a named clinician.

Suitable patients should be encouraged to take ownership of their health. A good patient-clinician relationship enables provision of consistent delivery of care.

Table 17 includes a checklist when considering self-care solutions for patients with venous leg ulceration.

Consider use of contract between nurses and patient to enhance concordance.

**Social Assessment**

Consider the following:-

Personal hygiene needs

Family support

Employment; does their job role involve prolonged standing (e.g. hairdresser) or sitting (office based role).

Accommodation, heating, living standards

**Table 20 – Self-care check list**

|  |
| --- |
| Check list when considering self-care solutions for patients with VLUs (Wounds UK 2015) |
| * Self-care should be encouraged in suitable patients, not forced * Patients must be willing and able to be involved, depending on skill level, mobility and dexterity. * Patients should be prescribed compression system that fits both their clinical and personal needs * Family and carer involvement should be taken into account. * Flexible healthcare solutions may be required e.g. different levels of compression * Information around red flags for when to seek medical advice. |

Appendix 2 – A Quick assessment guide for managing Venous Leg Ulcers short term

Quick Assessment **must** include

General Assessment from lower limb care-pathway

* Family history (CHD / Diabetes may be significant)
* Smoking history
* Past medical history
* Blood pressure

No arterial risk factors or other aetiology suspected

Less than 2 arterial risk factors and no other suspected aetiology

More than 2 arterial risk factors

**Date given for**

**Full assessment within 2 weeks**

Alter compression levels as appropriate

* Check ankle circumference
* Fit up to 20mmhg compression until full assessment completed
* Take blood ready for full assessment

Age – Arterial risk increases with age

* <50years unlikely to have significant arterial disease
* > 80 years it is highly likely that there will be an element of arterial disease

Full Assessment before applying any compression

This quick assessment guide has been designed to be used as a first line option, when as a practitioner you know that compression applied as soon as possible will promote effective wound healing.

***IT IS NOT DESIGNED TO TAKE THE PLACE OF THE FULL LEG ULCER ASSESSMENT PATHWAY AND A FULL ASSESSMENT SHOULD BE UNDERTAKEN WITHIN TWO WEEKS*.**

If a full assessment **cannot** be done within this time frame a quick assessment guide **should not** be considered.

When using these guidelines if you are unsure of your findings or the safest way to proceed please exercise caution and contact the leg ulcer specialist nurse or any of the specialist nurses.

The quick assessment guide **must** include:

* General patient assessment lower limb care pathway must be completed. This assesses actual arterial risk factors which must not be ignored. The arterial signs and symptoms need careful consideration.
* Age – It is generally considered that any person under the age of 50 years old is unlikely to have developed significant arterial disease. It is likely that someone over the age of 80 years will have developed some element of arterial disease. Therefore you need to consider age as a potential risk factor. The higher the age the greater the arterial risk.
* Family history – If someone has a strong family history of coronary heart disease or diabetes this needs to be considered as a potential arterial risk factor.
* Smoking –is an arterial risk factor and with age the risk of arterial disease is increased. A past smoker still needs to be considered as having arterial risks.
* Past medical history – consider any factors that may indicate that the ulcer may have other aetiology e.g. rheumatoid arthritis. If so do not apply any compression therapy.
* Blood pressure – If this is raised it could be significant. Monitor further and consider when assessing the risk factors.

If you have the resource, skill and opportunity it is worth using the Doppler machine to listen to the foot pulses. **If you consider they are monophasic, do not use these guidelines but undertake a full assessment before applying compression.** This does not replace doing a full ABPI assessment but may be a helpful tool as part of your quick assessment.

Appendix 3 – Lower limb and Compression therapy pathway

Graphical user interface, text, application

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Description automatically generated

Text, chat or text message

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A screenshot of a computer

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Graphical user interface, text, chat or text message

Description automatically generatedText

Description automatically generatedGraphical user interface, text, application, chat or text message

Description automatically generatedGraphical user interface

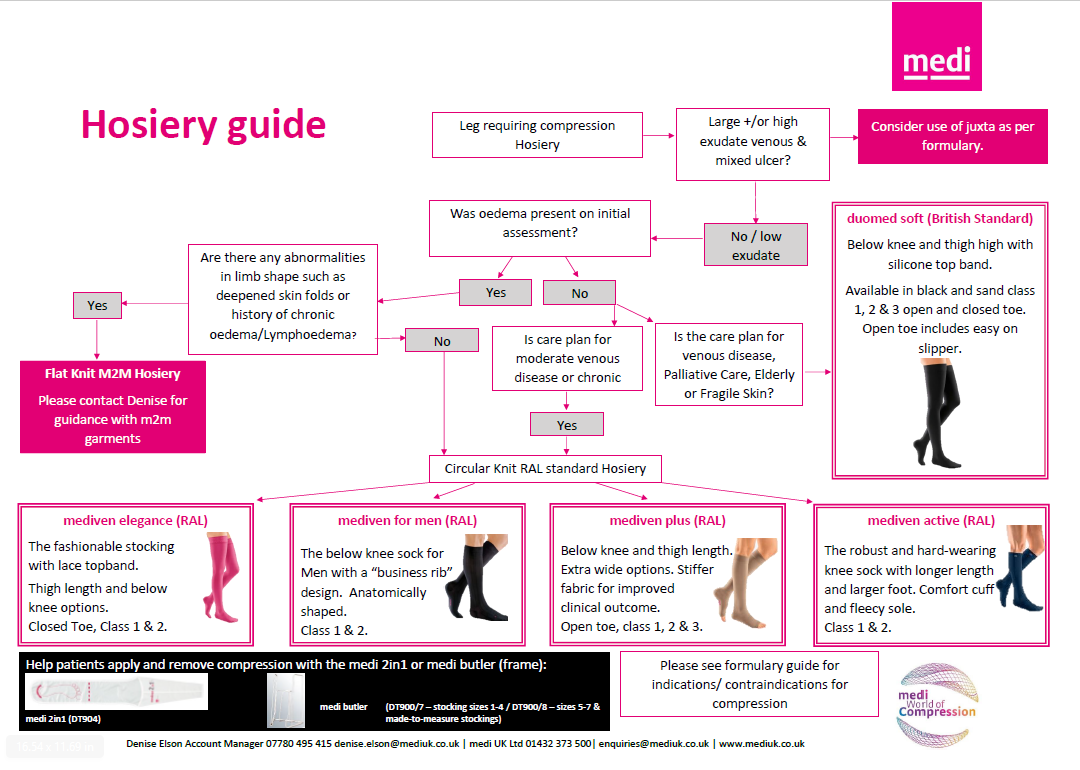
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Appendix 4 – Lower Limb Wound Pathway for Assessment – to aid assessment.

A picture containing text, outdoor, parking, screenshot

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Appendix 5 – Medi hosiery pathway



Appendix 6 – Medi Juxta Compression Wraps Care Pathway

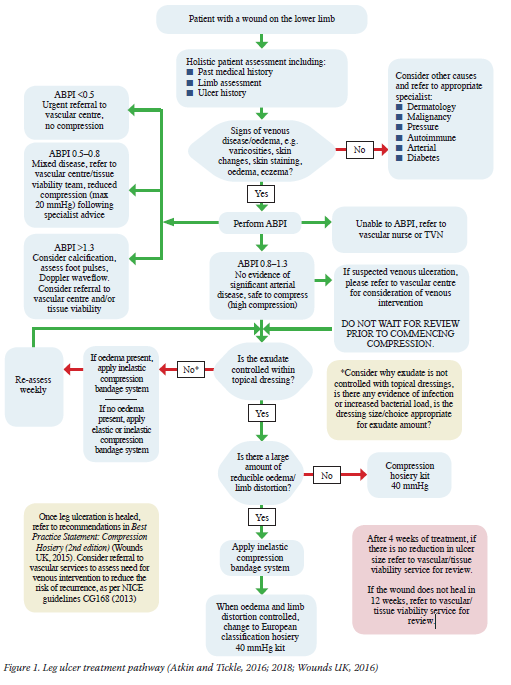
**Diagram, Teams

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Graphical user interface

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Appendix 7 – Best Practice Statement Leg ulcer treatment algorithm



Appendix 8 – British Lymphology Society vascular checklist

Table

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Table

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Appendix 9 - Equality Impact Assessment Tool

To be completed and attached to any procedural document when submitted to the appropriate committee for consideration and approval.

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | Yes/No | Comments |
| **1.** | **Does the document/guidance affect one**  **group less or more favourably than another on the basis of:** | No |  |
|  | * Race | No |  |
|  | * Ethnic origins (including gypsies and travellers) | No |  |
|  | * Nationality | No |  |
|  | * Gender (including gender reassignment) | No |  |
|  | * Culture | No |  |
|  | * Religion or belief | No |  |
|  | * Sexual orientation | No |  |
|  | * Age | No |  |
|  | * Disability – learning disabilities, physical disability, sensory impairment and mental health problems | No |  |
| **2.** | **Is there any evidence that some groups are affected differently?** | No |  |
| **3.** | **If you have identified potential discrimination, are there any valid exceptions, legal and/or justifiable?** |  |  |
| **4.** | **Is the impact of the document/guidance likely to be negative?** | No |  |
| **5.** | **If so, can the impact be avoided?** |  |  |
| **6.** | **What alternative is there to achieving the document/guidance without the impact?** |  |  |
| **7.** | **Can we reduce the impact by taking different action?** |  |  |