Introduction

The Assessment, Prevention and Management of Leg Ulcer Guidance pack is intended to establish a standardised approach and framework for health care professionals undertaking care of patients with an active ulcer or at risk of ulceration.

There are at least 730.000 patients with leg ulcers in the UK, which equates to 1.5% of the adult population Venous Leg Ulcers (VLU) are the most common type of leg ulcers; 1 in 170 adults are diagnosed with VLU, equating to approximately 278,000 people in the UK.

Patients with VLUs often present with repeated cycles of ulceration, healing and recurrence. Such ulcers can take weeks or months to heal and 12-month recurrence rates are estimated at between 18% and 28%, so on-going management and prevention of recurrence should be treated as a priority.

Leg ulcers have been found to have a significant impact on patients' quality of life, with associated personal, social and psychological effects, this also has a considerable financial impact on healthcare providers, as well as a wider social and economic impact.

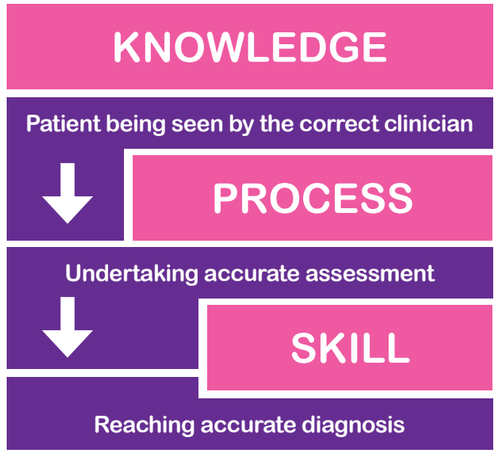
Useful definitions

- **A venous leg ulcer** is defined as an open lesion between the knee and the ankle joint that occurs in the presence of venous disease and takes more than two weeks to heal (NICE 2013).
- **Arterial ulcers**, also referred to as ischemic ulcers, are caused by poor perfusion (delivery of oxygen and nutrient-rich blood) to the lower extremities.
- **A mixed ulcer** occurs in the presence of both arterial and venous disease and where a combination of disease processes contributes to the formation and persistence of the ulcer.

Assessment

Undertaking a thorough, holistic assessment is crucial in order to obtain an accurate diagnosis and progress to appropriate management. The image to the right details the assessment pathway.

Any patient with a lower limb wound, regardless of duration, must be assessed and treatment commenced as early as possible. The initial assessment should be formed of three parts:



General assessment, including medical / family history and lifestyle / psychosocial issues

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Leg assessment

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Wound / skin assessment

Early intervention to prevent an acute wound becoming a chronic leg ulcer can be achieved with appropriate early assessment and management.

Assessment and appropriate management of acute lower limb wounds

- Assess patients who present with acute lower limb wounds (e.g. pre-tibial laceration) as candidates for immediate compression in order to reduce the risk of chronicity.
- To prevent delays in treatment, patients can be prescribed up to 17mmHg compression (e.g. class 1 British standard hosiery) in the absence of a full vascular assessment if no risk factors for arterial insufficiency are identified.
- The Best Practice Statement for compression hosiery (Wounds UK, 2016) concludes that patients who are prescribed up to 17mmHg without a full vascular assessment should have the following:
  - A diagnosis
  - Intact sensation
  - No signs of limb ischaemia
  - Appropriate build (poor shape/size of the limb can contraindicate)

If the wound then fails to show signs of healing within a 2-week period, a full holistic assessment, incorporating a vascular assessment, should be carried out, with a view to diagnosing and treating the wound as a VLU if appropriate.

Risk factors

A handy checklist for patient risk factors that may contribute to developing a venous leg ulcer

- ☐ Obesity or being overweight – this increases the hydrostatic pressure in the veins of the lower limb and abdomen
- ☐ Issues with mobility and/or walking – this compromises the activation of the calf muscle pump, which aids venous return
- ☐ Previous deep vein thrombosis (DVT) – blood clots in the deep venous system can damage the valves in the veins, which will affect venous return
- ☐ Varicose veins – swollen and enlarged veins caused by malfunctioning valves
- ☐ Previous injury or surgery to the leg, such a fracture, may cause DVT, damage to the veins, lymphatic's, or impair walking, ankle mobility and gait
- ☐ Increasing age – associated with increased co-morbidities and reduced mobility
- ☐ Chronic oedema – associated with inflammatory processes, and compromises skin and tissue condition
- ☐ Family history of VLUs
- ☐ History of intravenous drug use
- ☐ Pregnancy

Checklist for patient risk factors that may contribute to developing an arterial leg ulcer

- ☐ Intermittent Claudication
- ☐ Previous myocardial infarction
- ☐ History of angina
- ☐ Previous CVA or TIA
- ☐ Diagnosis of Arteriosclerosis
- ☐ History of smoking
- ☐ Pain on rest / elevation of limbs
- ☐ Hypertension
- ☐ Ischaemic heart disease
- ☐ Other disease affecting the microcirculation e.g. Diabetes, Rheumatoid Arthritis

General Assessment

Assessment	Influencing factors
Age	Arterial and Venous disease increase with age
Culture	Personal and religious beliefs should be respected
Gender	Higher female prevalence
Allergies	Increased risk of contact dermatitis
Sleep pattern	Individuals sleep patterns should be identified
Mobility	Awareness of walking limitations, gait and appropriate footwear are essential. Fixed ankle joints and muscle wasting leads to poor venous return
Substance/Tobacco usage	Exacerbates arterial disease and effects wound healing
Medication and disease	NSAID, cytotoxic drugs e.g. methotrexate. Patients with anti-immune disease e.g. rheumatoid arthritis, lupus, malignancies, are more likely to be taking this medication
Family History	Increased prevalence of ulceration occurs with family history of diabetes, varicose veins and venous ulcers
Nutrition and hydration status	MUST assessment. Appetite / diet. BMI
Presenting symptoms and pains	Pain assessment
Previous treatments and outcomes	Check patient medical history to see previous dressing regimes
Patients understanding of current condition	Discuss with patient

Assessment	Social and environmental factors
Accommodation (consider risk assessment)	Accessibility General living standards Heating Stairs Sleep position / environment
Carer support	Involvement of carers/relatives/neighbours Effect on personal relationships
Employment	Ability to carry out normal tasks and impact on healing while doing this e.g. sitting and standing for long periods. Employment history
Financial Status	Reliance on benefit entitlement if unable to work Cost of prescription charges
Activities of daily living	Stigma of ulceration. Alteration of social pattern Loss of independence. Social isolation can delay healing

Assessment	Psychological factors
Past experience	Previous experiences with condition/treatment, health professionals, carers, non-involvement, poor outcomes
Current factors	Poor understanding of their health needs Lack of motivation Clinical depression Stigma of ulceration Dependence on nursing service Belief in treatment Other stresses on well being Pain control

Leg Assessment

Venous Signs and Symptoms:-

Presenting Factors	Cause
Pigmentation (staining of the skin on the medial lower third of the leg)	Red blood cells leak out of the capillaries into the tissue and break down leaving an end product known as haemosiderin that stains the skin. Normally brown in colour, but can range from red to black.
Lipodermatosclerosis (Hardening of skin and underlying tissues)	Fibrosis is caused by fibrin leaking out of the capillaries and linking itself around them forming a cuff. This can give rise to the 'inverted' champagne bottle appearance of the leg. It is susceptible to trauma and can be identified by feeling the hardness of the leg.
Friable skin	May be due to ageing process, infection (if also bleeding) or repeated use of topical steroid applications.
Superficial Varicose Veins	Patients should be standing to properly assess this condition. Surgery can prevent recurrence but not occurrence of ulcer.
Ankle Flare	Distension of the tiny veins of the medial aspect of the foot around the malleolus. Due to venous hypertension.
Varicose eczema	Water logging effect of oedema which causes proteolytic enzymes to act as irritants. Bacteria may exacerbate it leading to wet infected eczema. Affected by lipodermatosclerosis and ulceration exudate.
Atrophe Blanche	A vascular area of thin ivory white skin stippled with red dots of dilated capillary loops. Very painful, possibly vasculitic in origin.
Induration	Fibrin laid down in the gaiter area forming hard inelastic woody skin. End stage of lipodermatosclerosis
Oedema 'Restless' legs	Venous incompetence leads to venous hypertension and the superficial system suffers high capillary pressures. The capillaries fail and they become tortuous and dilated. Swelling caused by venous obstruction varying from mild ankle swelling to gross oedema of the whole leg It is usually soft, pitting and non-tender and subsides with elevation. Nocturnal venous stasis with pooling of blood in the venous system can cause cramps and pains and causing patient to get up and walk around.

Arterial Signs and Symptoms

Presenting Factors	Cause NB: All below may be attributed to diminished blood supply
Coldness, shiny, tightness of limb	
Dusky toes especially on dependence	May feel like sensation of 'warm' water running through legs.
Cramp	Pain in calf, toes, buttocks or thigh always associated with exertion, e.g. brisk walking, hill climbing, cycling, relieved by stopping. Quickly subsides. Consider intermittent claudication.
Absence or difficult to detect foot pulses	
Oedema	May present continually exacerbated by dependence.
Poor capillary refill	Over 3 seconds in great toes.
Atrophic thickening of nails	
'Night' pain while foot /leg elevated or in bed often relieved by hanging limb out of bed	Consider reduced arterial blood supply to limb compromised by Elevation.

Presentation with any of these factors may indicate arterial disease as well as mixed vascular disease.

Arterial Screening Using a Handheld Doppler

An assessment with a Doppler Ultrasound is a skilled technique. Nurses should not attempt this technique if they have not received training and are not deemed competent. ALL patients who are at risk of or already have a leg ulcer should have arterial screening using a non-invasive hand held Doppler.

Arterial assessment is an essential component of leg ulceration management. The most common of these is the Ankle Brachial Pressure Index (ABPI) assessment; it is important that the clinician understands why this is undertaken in order to appropriately interpret the results. ABPI assessment is not intended for the diagnosis of venous disease, but rather for exclusion of significant arterial disease and therefore confirmation of safe practice (i.e. to confirm that use of compression treatment is safe). Measuring ABPI provides an assessment of the patient's peripheral arterial system; however, in certain patients/situations, further or alternative investigations/referrals may be required for example Duplex or referral to vascular team.

ABPI must never be used in isolation but as part of the holistic assessment in conjunction with clinical history, clinical presentation and arterial sounds as part of the holistic process BOTH legs will be assessed although only one limb may be affected or treated.

More information about a Doppler assessment can be found on insert B.

Wound Assessment

Initially, it is important to establish the cause of the wound. From there, the wound and surrounding skin should be assessed using the structured assessment method of TIMES.

TIMES principles:

- Tissue (non-viable or deficient) – assess tissue quality and type
- Infection or inflammation –assess for signs of infection or possible biofilm
- Moisture imbalance – any exudate should be assessed in terms of colour and viscosity as well as volume
- Edge of wound – assess for signs of over-granulation, encrusted debris, rolled edges and possible malignancy
- Surrounding skin – assess whether the skin is red/inflamed, any itching or blistering, signs of hyperkeratosis or dry skin, lipodermatosclerosis, excoriation, moisture-associated dermatitis or hygiene issues.

Factors Differentiating Types of Ulcers

CLINICAL OBSERVATIONS	VENOUS	ARTERIAL	MIXED
Ulcer position	Usually in gaiter area Often medial malleolus	Classically Dorsum Lateral border of foot/ extremities	Ulcers may present in various positions
Ulcer depth	Shallow, flat	Can be deep	
Ulcer border	Irregular border Sloping margins	Punched-out' appearance	
Ulcer bed	Wound bed maybe sloughy/granulating	Ulcer bed poorly perfused /pale Necrosis and slough present	
Size	Variable size from small to encircling the leg	Small	
Exudate	High exudate levels	Dry/low exudate levels	
Pain	May be painful; pain relieved by elevation of the limb	Painful; pain not relieved by elevation of the limb	

Classification

After initial assessment has been completed and VLU diagnosed, VLUs should be classified as simple or complex.

Simple Venous Leg Ulcer

- ABPI 0.8–1.3
- Area <100cm2
- Present for <6 months

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Manage in a primary care/community-based setting.

Education
Commence full compression. If limb not distorted, no reducible oedema present and exudate controlled within the primary dressing, use compression hosiery . Otherwise use compression bandages and assess for hosiery at each dressing change.

Complex Venous leg ulcer

- ABPI 0.8–1.3
- Area ≥ 100cm2
- Present for ≥ 6 months
- Controlled cardiac failure
- Current infection and/or history of recurrent infections
- History of non-concordance
- Wound has failed to reduce in size by 20–30% at 4–6 weeks despite best practice

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Education
Commence full compression. If limb not distorted, no reducible oedema present and exudate controlled within the primary dressing, use compression hosiery. Otherwise use compression bandages and assess for hosiery at each dressing change.
If non-healing at 12 weeks consider vascular referral

Mixed aetiology ulcer

- ABPI <0.8 or >1.3
- Symptoms of arterial disease, e.g. intermittent claudication, rest pain, even if ABPI within normal range
- Diabetes/peripheral neuropathy
- Rheumatoid arthritis (vasculitic ulcer)
- Uncontrolled cardiac failure
- Sickle Cell Anaemia

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Education
Refer to TVN or nurse with appropriate competencies to consider for reduced compression hosiery or bandages Diabetic/rheumatology/ cardiology Some patients may be managed in collaboration with a specialist service that manages VLUs. Further investigations may include duplex scans *N.B. If ABPI <0.5 consider urgent referral to vascular

Arterial Ulcer

- ABPI < 0.6 or below
- Symptoms of arterial disease e.g. intermittent claudication, rest pain

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Education
Dress wound as Woundcare Formulary – NO COMPRESSION
Refer to appropriate specialist for further investigation and care e.g. Vascular, further investigations may include duplex scans

Mixed and other aetiology ulcers may still require management with compression; however, they should be referred to the appropriate specialist for further investigation and care. Further investigations may be required, such as duplex scanning or biopsy.

Measuring ulcers

Failure to respond to best practice treatment within 4 weeks automatically classifies an ulcer as complex.

In order to gauge this, all leg ulcers should be measured. For most wounds weekly measurement is adequate as it is unlikely that any significant change will be seen in a shorter period. Some wounds may only show changes over 2-4 weeks. It is important to consider the reason for measuring the wound when determining the frequency. Insert C provides guidance on how to measure wounds for size.

For consistency, measurement should be made at the same point in assessment each time (i.e. either before or after debridement).

Photographing the wound is a useful way of ensuring objective recording of the wound. Photographs should be taken using equipment which your workplace has consented for you to use and steps taken to ensure consistency in recording. Tips for photographing wounds are outlined in Insert D.

Wound and Skin Management

It is important to bear in mind that patients with a leg ulcer often develop skin problems from prolonged use of products and may have skin sensitivities that need to be managed along with their leg ulcer treatment.

Category	Issues	Actions
Tissue	Necrotic tissue Tissue Quality issues e.g. slough, debris	Appropriate and thorough cleansing methods should be used as a first step. See Insert E Guide to Leg Care. Debridement is necessary to remove slough and devitalised / necrotic tissue. Some types of dressing, e.g. hydrogels, will aid autolytic debridement.
Infection	Colonisation or infection. Possible biofilm Cellulitis Sepsis	A high proportion of ulcers will have biofilm, which should be identified and managed using disruption methods (e.g. mechanical debridement) and antimicrobial control. An appropriate antimicrobial dressing should be used for a 2-week period to manage infection and then reviewed. Chronic or recurrent infection indicates a complex ulcer and must be managed accordingly Differentiate venous disease from possible cellulitis (Insert F) Use Sign Checker and see local sepsis guidelines
Moisture imbalance	Oedema and associated lymphorrhoea. Exudate. Dry/desiccated wounds.	Appropriate management of oedema should be undertaken using appropriate compression systems and selection of an appropriate absorbent dressing to retain exudate effectively, to remove fluid and reduce the levels of harmful proteases. Apply moisture balance dressings to donate fluid where necessary, to rehydrate and aid autolytic debridement.
Edge of wound	Rolled edges (epibole). Encrusted exudate. Overgranulation. Possible signs of malignancy	Rolled edges may indicate a static wound that should be reassessed. Encrusted exudate may require gentle removal during cleansing to remove local barriers to wound healing. Refer to the local wound formulary for the management of over granulation. If the edge of wound raises suspicions, the patient should be referred to dermatology immediately for biopsy.
Surrounding skin	Inflammation. Hyperkeratosis/dry skin. Venous eczema (wet or dry). Oedema/exudate skin damage from excoriation and/or moisture associated dermatitis. Lipodermatosclerosis. Fragile skin. General skin hygiene.	Establish causes of any skin issues (see action for management of oedema/exudate). Remove hyperkeratotic skin scales using cleansing and atraumatic exfoliation. Treat eczema with appropriate topical steroid therapy, (Insert G) Monitor the skin for signs of reaction to treatment. Establish an on-going emollient-based skin care regimen. Encourage self-care; support the patient in any skin hygiene and self-care issues (see Insert E for guidance).

Common cause of sensitivities

- Topical antibiotics, e.g. Neomycin, Framycetin sulphate
- Bases of applications, e.g. Lanolin
- Preservatives, e.g. Parabens
- Components of products, e.g. (Latex in certain products) and elastic hosiery/bandages
- Certain adhesives used in dressings
- Nickel
- Paste bandages (patch test before use)
- Cetastyrl Alcohol

Misdiagnosis and resulting inappropriate treatment can be common, particularly in differentiating venous disease from cellulitis. It is vital to recognise diagnostic features of clinical presentation, of both venous disease and cellulitis, in order to ensure accurate diagnosis and correct management (Insert F). Compression treatment should be continued as long as the patient's pain levels allow this. In the case of cellulitis, compression can help prevent further lymphatic damage.

Compression and Management

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: in 'at-risk' patients, compression can prevent ulcer development. As long as the clinician has established that compression is safe to use in the individual patient, the question should not be whether to use compression but what sort of compression to use.

Early management with compression hosiery should be used, including in patients with pre-ulceration risk factors (e.g. with swelling/ pain, changes in lower limb) for prevention of ulceration. When treating leg ulcers, clinicians should aim to use full compression whenever the vascular assessment deems it appropriate, in order to achieve therapeutic benefit to prevent delays in healing.

Compression Options

Details of the different compression systems available:-

Compression system	Advantages	Disadvantages	Patient perspective
Compression hosiery kits (first-line treatment where possible)	Does not require a high level of skill to apply. Delivers known and consistent compression levels. Allows for patient self-care. Cost-effective. Delivers compression to the foot. Hosiery kits can be applied by the patient, carer or healthcare professional. In each of these scenarios use of a hosiery kit facilitates time efficient care delivery as well as potential quality of life improvements.	Not suitable for unusual limb profiles. Not suitable for rapidly decreasing limb sizes. Exudate needs to be maintained within dressings.	Low profile – no limits to footwear/clothing. Facilitates self-care.
Compression bandages	Adaptable so permits good anatomical fit in unusual-shaped limbs. Suitable for most limb shapes/sizes. Inelastic compression bandages can facilitate volume reduction/ reshaping. High-stiffness systems (e.g. inelastic bandages) produce the greatest improvements in venous blood flow. Inelastic bandages have a higher static stiffness index, generating higher working pressures on movement and lower resting pressures. Inelastic bandages can be used on both mobile and immobile patients, as fluctuations in pressure can be achieved even with small or passive movements to facilitate venous return.	Compression value dependent on application technique – high level of skill required to apply.	Can be bulky – may limit footwear and clothing. Does not facilitate self-care.
Compression Wraps (under tissue viability nurse guidance only)	Compression value adjustable – value dependent on application technique. Allows for easy adjustment as limb volume decreases. Facilitates self-care. Delivers compression to the foot.	Not practical if ulcer is highly exuding.	Low profile – minimal impact on footwear/ clothing. Allows self-care/family care. Can be adjusted to adapt to limb circumference changes and improve comfort.

Different compression options may be suitable for different patients, depending on the clinical challenges present:

- Oedema
- Exudate
- Limb shape
- Pain management
- Post-thrombotic changes
- Height of the individual
- Obesity
- Psychosocial or lifestyle issues.

All patients should be assessed for factors that may contraindicate compression therapy.

Patient preference should also be taken into account, in terms of psychosocial and lifestyle issues as well as practical considerations.

Table 1 is a guide to which compression options are suitable for different patients depending on the clinical scenario – e.g. exudate levels or distorted limb shape may affect the choice of compression system.

Table 1: Appropriate compression options depending on the clinical scenario

Scenario	Hosiery kits	Compression bandages	Adjustable wraps
Normal Leg shape	✔	✔	✔
Low to moderate exudate	✔	✔	✔
Self-caring patient	✔	✘	✔
Carer involvement	✔	✘	✔
Distortion due to oedema	✘	✔	✔
High Exudate	✘	✔	✘
Deep skin-folds	✘	✔	✘

Practical issues should be taken into consideration, such as:

- Reusable systems (e.g. hosiery kits) should be used where possible, as healing rates are comparable to compression bandaging and they provide a cost-effective option
- Staff and patient skill levels need to be considered
- Availability may need to be taken into account.

ABPI's outside of Normal Range

- Patients who have compromised arterial circulation (ABPI <0.8) will need referral to TVN for further assessment and if appropriate reduced compression..
- Those with an ABPI of >1.3 should receive a specialist referral for vascular assessment due to potential calcification.
- Patients with ABPI <0.6 should not receive compression therapy and should be referred to a vascular specialist.

Compression for patients with diabetes

The following recommendations are made:

1. All patients with diabetes should have their feet tested to ensure sensation is intact prior to compression therapy.
2. Where 'diabetic' complications have already been recognised (e.g. reduced sensation, microvascular disease), an MDT approach is required. This can involve input from Diabetes Specialist Nurses, Tissue Viability, Vascular, Endocrinology and Podiatry.

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 on-going self-care can reduce recurrence rates and associated complications. 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 capacity, 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.

Communication and trust in the clinician are key factors in achieving the optimum results of compression treatment, as are providing information and support. If patients are unable to tolerate compression therapy due to pain, they should be appropriately referred.

Treatment pathway

A structured treatment pathway should be used in the management of all leg ulcers (Insert I Leg Ulcer Treatment Pathway). The pathway aids diagnosis and triggers commencement of appropriate treatment.

The treatment pathway should be used to facilitate decision-making to best meet the individualised needs of each patient.

Factors to consider when selecting a compression system
Results of holistic assessment (including comorbidities, past medical history and underlying conditions)
Results of leg assessment (presence of oedema, condition of skin, limb shape and size)
Results of wound assessment (location, exudate level, pain)
Compression system properties (stiffness, pressure, number of layers cohesiveness, elasticity)
Assessment of patient's lifestyle and psychological issues
Moderate to high compression must be applied to the foot to prevent oedema. Where there is little compression to the foot, the high compression to the gaiter region can create an oedematous foot and toes, thereby causing additional issues. The use of toe garments is recommended to aid oedema reduction.

Treatment Monitoring and Review

At each review, the appropriateness and effectiveness of the current system should be assessed against the following aims, as well as any specific patient-agreed objectives:

- Ideally 20-30% reduction in size
- Reduction in pain
- Maintaining/Improvement in mobility
- Improvement in general skin condition
- Improvement in patient-reported outcomes
- Improvement in patient's overall quality of life
- Success in managing infection/exudate/ oedema if appropriate.

The longer the wound is present, the greater the risk of complexity – so it is important that the treatment plan is reassessed and changed if objectives are not being met or the patient is referred if necessary.

It is important to explore why the treatment may not be working, involving the patient in the decision-making process and investigating possible concordance issues or other causes. The issues should be resolved by developing an action plan and offering the patient alternative options if possible. It may be necessary to try a different method of compression treatment – i.e. don't just change the dressing options. If the wound is not progressing, it is necessary to trigger multidisciplinary discussion and involvement. If the leg ulcer has not healed after a maximum of 12 weeks of treatment, the patient should be referred to an appropriate specialist.

Triggers for reassessment
Inability to tolerate compression therapy
Compression therapy applied but not delivering improvement
Wound deteriorating
Wound remaining static despite treatment
Deterioration of general skin condition or maceration and exudate damage
Increase in wound size
Increase or change in pain
Decrease in mobility
Malodour
Depression or patient quality of life issues
Inability to deliver consistent management.

Responsibilities and continuity of care

The patient's care plan should ideally be the responsibility of a named clinician. All practitioners involved with leg ulcer care should have undergone appropriate education and training in relevant skills – it is the practitioner and their organisations responsibility to ensure this.

Holistic Management

Compression should be used as first-line treatment, but it is important that treatment is optimised by being used in conjunction with a holistic approach and that underlying challenges are addressed. A person-centred approach in this respect is crucial.

Mobility

Patient mobility is key to optimising compression therapy and helps to minimise complications. It is important to encourage patients to be as mobile as possible within their individual capabilities. Evidence suggests that hosiery kits are favourable to bandaging in terms of not restricting mobility. Walking if possible, maintaining ankle flexibility, and selecting a compression system that allows patients to wear their own shoes will help patients to remain active – see Box 1.

Box 1. Tips for patient mobility
Try to keep active by walking regularly if possible
Encourage venous return by regularly exercising your legs – moving your feet up and down, and rotating them at the ankles
Avoid sitting or standing still with your feet facing downwards – elevate your feet at least every hour
Whenever you're sitting or lying down, keep your affected leg elevated – ideally with your toes level with your heart.
Consider referral to therapy

Nutrition

Nutrition plays an important role in the prevention and treatment of ulcers. It may be an issue if patients are either overweight or underweight, and malnutrition can impair the wound healing process. Consuming a healthy and balanced diet and maintaining a suitable weight can reduce the risk of developing several conditions that predispose an individual to ulcers, as well as encouraging healing in patients with existing wounds. Obesity or being overweight increases the risk of developing an ulcer and can add to the complexity of existing ulceration, but the patient receiving the correct dietary nutrients regardless of weight status is also a vital issue in healing.

Nutritional status has a direct influence on the health of body tissue and its ability to heal. During the healing process, the body needs increased amounts of calories, protein, vitamins A and C, and sometimes the mineral zinc. It is the role of healthcare professionals to promote a healthy lifestyle that includes eating a healthy, varied diet, which should include at least five portions of fruit and vegetables daily, and should be:

- High in fibre
- Low in salt
- Low in refined carbohydrates
- Low in fat (especially saturated and trans fats

In some cases, it may be necessary to refer patients within the multidisciplinary team to deal with nutrition and weight issues. However, patients dealing with ulcers may benefit from general nutritional advice – see Box 2.

Box 2. Patient tips to aid compliance with dietary advice
Set SMART goals: Specific, Measurable, Achievable, Realistic, Time-specific, e.g. 6–12kg weight loss over 3–6 months
Offer praise and encouragement
Review diet regularly
Change diet gradually
Offer consistent messages from all healthcare professionals
Enlist social support – e.g. family, friends and carers
Use a multidisciplinary approach

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 analogue scale. Compression therapy may help pain levels in VLU or mixed aetiology leg ulcers to decrease, as issues such as oedema and inflammation are resolved and venous return improves.

Arterial leg ulcers are frequently very painful as a result of ischaemia, oedema, arthritis and/or critical colonisation of the wound. Management should be tailored to meet individual needs of the patient and adequate analgesia be prescribed.

Leg ulcers are frequently painful; pain management using analgesia is likely to be required. 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. A multidisciplinary approach to pain management is required to improve the likelihood of patient tolerance as well as improving patient wellbeing and quality of life.

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. 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 regimen 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 – see below for tips on encouraging patient involvement and promoting concordance.

Tips for patient education and involvement
Involve patient in decision-making process
Use positive language
Explain treatment and rationale at all stages, establishing patients' and carers' long- and short-term expectations
Use information leaflets and resources
Telemedicine (e.g. online video calling, apps, smartphone support)
Suggest patient help and support groups where appropriate
Involve friends, family and carers where possible
Ongoing review of progress
Continuity of care with consistent messages

Prevention of Leg Ulcer Recurrence

Compression therapy for life is essential to reduce the risk of VLU. When the VLU has healed, maintenance and prevention of recurrence is vital. As soon as the patient has healed, the maintenance phase of management should be commenced.

Maintenance compression

The patient should be maintained in compression hosiery wherever possible, and educated on the risk of ulcer recurrence to optimise their on-going self-care – compression should be a lifelong option for those patients at risk. Insert I outlines hosiery application and the use of application aids. Compression wraps are available to improve self-management where necessary. See Insert I.

Good protocol and appropriate maintenance makes recurrence less likely, therefore it is important to work with the patient to devise options for them that are feasible in the long term and will suit the patient's on-going lifestyle. The ideal maintenance system needs to be simple and practical to use on an on-going daily basis.

Surgical correction

Patients with a VLU that has healed in compression may be assessed for suitability of corrective venous surgery to reduce the risk of recurrence. Minimally invasive vein surgery is undertaken as a day case under local anaesthetic and should be considered for suitable patients to reduce risk of recurrence if locally available.

On-going review and monitoring

The patient should be reviewed again at 6 and 12 months, and annually when the maintenance phase has begun. Depending on the patient's level of risk, reassessment may include a review of ABPI. Please see Insert K for guidance.

At review, it is also important to gauge how the patient is coping with the maintenance phase of treatment, and re-prescribe/resupply compression therapy as required.

It is important to bear in mind that during the maintenance period, patients and carers will have responsibility for keeping compression hosiery in good condition, so it is critical that they receive effective education in order to maximise the life and effectiveness of a garment until the next prescription.

Patients should also be educated on keeping vigilant for any signs that they need to contact their clinician for reassessment –e.g. further trauma or changes to the lower leg; concerns about DVT or oedema. In such cases, the patient should be reassessed within two weeks. The patient should be referred due to any concerns that require further support.

On-going holistic care

Promoting on-going self-care (daily hygiene plus regular skin care) is a key determinant of positive outcomes.

The maintenance phase presents a great opportunity for the patient, their carer and/or family member, to take ownership of any aspects of the skincare regimen they feel comfortable with. Patient education helps patients to adhere to their treatment and can increase their confidence to take on additional components of management.

A simple skincare regimen, along with maintenance compression and exercise, will help to maintain skin integrity and prevent recurrence. Where possible, this should form part of the patient's daily care plan, emphasising the importance of washing, cleansing and emolliating the skin. Prescribing emollients, both as leave-on skin treatments and soap substitutes, will help to maintain overall skin integrity. In the case of hyperkeratosis maintenance debridement may be required to prevent build-up of plaques/scales.

An on-going simple exercise regimen should also be maintained if possible for the patient – e.g. staying as active as possible, walking if the patient is able, simple stretches/ankle exercises and deep breathing exercises (Insert J).