



Guidelines for the Assessment and Management of Leg Ulceration

Recommendations for Practice

October 1998

These guidelines have been prepared by CREST

CREST is a small committee of doctors established under the auspices of the Central Medical Advisory Committee, to promote clinical efficiency in the health service in Northern Ireland while ensuring that the highest possible standard of clinical practice is maintained.

CREST wishes to express its appreciation to Mrs Mary Waddell and the working group for producing this guidance, to all the members of the sub-groups and to all those who contributed in any way to the development of these guidelines.

Special thanks are due to Mrs Heather Reid for the major contribution which she made to the production of these booklets.

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LEG ULCERS

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References: A list of references and further reading may be obtained by contacting the CREST Secretariat

Foreword

The guidelines are designed to give a structure to the assessment and management of patients with leg ulceration. They will help the practitioner in the classification of the ulcer and the formulation and implementation of an appropriate care pathway.

The guidelines are not intended as a rigid or inflexible tool, but as an aid to practitioners in choosing appropriate care and management, and to reducing variation in practice.

Any new strategies and services developed to prevent and treat leg ulcers need to be supported by training programmes.

1. SUMMARY OF CONCLUSIONS AND KEY RECOMMENDATIONS

A number of key recommendations highlighted throughout the report are listed below. Each recommendation is graded so as to give the reader an indication of the type of evidence supporting it.

- GRADE A** Requires at least one randomised controlled trial as part of the body of literature which is of overall quality and consistency addressing the specific recommendation.
- GRADE B** Requires availability of well conducted clinical studies but no randomised clinical trials on the topic of recommendation.
- GRADE C** Requires evidence from expert committee reports or opinions and/or clinical experience of respected authorities. Indicates absence of directly applicable studies of good quality.

Assessment:	Grade	See Section
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- | | | |
|---|---|-----------------------|
| <ul style="list-style-type: none"> • It is essential that an accurate assessment of the cause and contributory factors of the ulcer is determined before the onset of treatment. | B | 3 |
| <ul style="list-style-type: none"> • Palpable pulses alone are not always an accurate indication of arterial status. | B | 3.3 |
| <ul style="list-style-type: none"> • Arterial disease of the leg is most commonly detected by a combination of clinical examination and measurement of a reliably taken ABPI. | A | 3.4 |
| <ul style="list-style-type: none"> • All patients with leg ulcers should have blood glucose recorded to exclude diabetes. | C | 3.4.1 |
| <ul style="list-style-type: none"> • There is no indication for routine bacteriological swabbing of venous ulcers. | B | 3.4.1 |
| <ul style="list-style-type: none"> • Serial measurement of the surface area of the ulcer is useful for monitoring healing. | B | 3.5 |
| <ul style="list-style-type: none"> • A non-healing or atypical leg ulcer should be considered for biopsy. | C | 3.5 |

Management of Venous Ulceration

- | | | |
|--|---|---------------------|
| <ul style="list-style-type: none"> • Graduated compression bandaging, properly applied, and combined with exercise is the treatment of choice for most cases. | A | 4 |
| <ul style="list-style-type: none"> • High compression bandages have a higher healing rate than low compression bandages | A | 4.1 |
| <ul style="list-style-type: none"> • Compression bandages should only be applied by a suitably trained and experienced practitioner. | B | 4.1 |
| <ul style="list-style-type: none"> • Padding to protect bony prominences is recommended under high compression bandage systems | C | 4.1 |
| <ul style="list-style-type: none"> • Arterial insufficiency is a contra-indication to the use of compression except in a modified form under specialist supervision | C | 4.1 |
| <ul style="list-style-type: none"> • An effective skin care policy is important to protect the surrounding skin | C | 4.2 |
| <ul style="list-style-type: none"> • No specific dressing has been demonstrated to encourage ulcer healing | A | 4.3 |

	Grade	See Section
• Systemic antibiotics should be used to treat clinical infection	A	4.4
• Topical antibiotics and antibacterial agents are frequent sensitizers and should be avoided	B	4.4
• Graduated compression is the main treatment for venous eczema	B	4.5
• A high percentage of patients with venous disease display contact sensitivity	B	4.5
• Patients with contact eczema should be referred for patch testing	B	4.5
• Standard series patch testing is inadequate. A leg ulcer series is recommended	B	4.5
• Optimal nutrition facilitates wound healing, maintains immune competence and decreases the risk of infection	B	4.6
• Walking and passive ankle exercises should be encouraged	C	4.7
• Pain may be a feature of both venous and arterial disease and should be addressed	B	4.8
• There is insufficient evidence to support the use of systemic drug therapy in the treatment of venous leg ulcers.	B	4.9
• Patients with venous ulceration should have the opportunity for assessment of venous function by Duplex Ultrasound to determine suitability for superficial venous surgery	B	4.10

Prevention

• Primary Prevention – A history of DVT is a common cause of venous disease. The use of compression hosiery worn peri-operatively and during pregnancy may reduce the incidence.	C	5.1
• Chronic venous leg ulcers almost always recur unless preventative measures are maintained.	C	5.2
• Accurate measurement of lower-limbs for compression hosiery is essential.	C	5.2
• Graduated compression hosiery of at least class II is the single most effective intervention in preventing leg ulcer recurrence.	B	5.2
• Graduated compression hosiery should be prescribed for life.	B	5.2
• Drug therapy is unproven in the prevention of recurrence of leg ulcers.	B	5.2

Diagnostic Reassessment

• All patients with intractable ulceration should have full diagnostic assessment including ABPI at appropriate intervals.	B	6
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Referral for specialist advice

- | | Grade | See Section |
|--|--------------|--------------------|
| • Leg ulcer clinics in hospital and community provide an appropriate referral point for the primary care team. | C | 7 |

Provision of Care

- | | | |
|---|---|-------------------|
| • Properly supported community leg ulcer clinics improve outcomes | B | 8 |
| • Some components of treatment are not available on GP prescription. Trusts should consider how these can be made readily available to community nurses. | C | 8 |
| • An integrated pathway of care should be developed between hospital and community | C | 8 |
| • It is recommended that each general practice unit/primary health care team should have access to an identified nurse professional with a specific interest and training in leg ulcer management | C | 8 |
| • Systems should be put in place to monitor standards of care and outcomes | A | 8 |

Education

- | | | |
|---|---|---------------------|
| • For patients, knowledge and understanding is a major factor in compliance with treatment regimes. Verbal education should be reinforced by written information. | C | 9.1 |
| • All health care professionals involved in leg ulcer care should be trained in leg ulcer assessment and management. | C | 9.2 |

Management of Arterial Ulcers

- | | | |
|---|---|----------------------|
| • Compression bandaging should not be applied as severe damage to the leg can result. | C | 10.1 |
| • All patients with arterial ulceration should be referred for a vascular opinion. | C | 10.1 |
| • All patients with an ABPI less than 0.6 without active ulceration should also be referred for a vascular opinion. | C | 10.1 |

Management of Mixed Ulcer

- | | | |
|--|---|----------------------|
| • Arterial insufficiency is a contraindication to the use of compression except in a modified form under specialist supervision. | C | 10.2 |
|--|---|----------------------|

2. INTRODUCTION

A chronic leg ulcer may be defined as an area of loss of epidermis persisting for 4 weeks or more.

2.1 Epidemiology

UK studies suggest that 10 per 1000 of the population will suffer leg ulceration at some time. About 1.5-3 per 1000 have active leg ulcers and prevalence increases with age, with a 2:1 preponderance of females. Leg ulceration is often thought to be a disease of the elderly, but the Lothian and Forth Valley Leg Ulcer Study found that 22% of patients developed ulceration before the age of 40. This study also showed that 50% of ulcers had been open for 9 months, 20% for 2 years and 8% for over 5 years; 67% of patients in this study were already in recurrence.

2.2 Aetiology

Approximately 70% of leg ulcers are caused by chronic venous insufficiency. Other causes include:

- Arterial disease (10-15%);
- Mixed arterial and venous disease (10-20%);
- Diabetes (5-8%);
- Vasculitis (2-5%);
- Lymphoedema (1%);
- Trauma (2%);
- Others including malignancy (1%).

2.3 Delivery of Care

The overwhelming majority of leg ulcer patients are managed in the community with approximately 5% managed in hospital. In about 70% of cases treatment is determined primarily by the Community Nurse.

The percentage of District Nurses' workload related to the management of leg ulcer patients is thought to be between 9-22%, although in these studies it is unclear if this included travel time.

Referral of leg ulcer patients for specialist assessment is surprisingly low. In one study 51% (77) patients with leg ulcers of duration longer than 6 months had never been referred. Of these 77 individuals, 11 had ulcers for longer than 3 years and 1 for longer than 50 years.

2.4 Cost

Estimates of cost differ widely, ranging from £1,061 to £5,200 per annum per patient. Overall costs to the NHS are estimated to be between £120-£600 million per annum, the bulk of this expenditure being attributed to the direct cost of community nursing time.

Indirect costs to patients and their relatives e.g. lost productivity are not known.

2.5 Social and Psychological Issues

Little interest has been shown in the psychological and social implications of chronic leg ulceration, but it has been shown that depression and pain interfere with social and daily activities.

2.6 Compliance

It is widely recognised that patient knowledge and understanding are major factors in compliance with treatment regimens. Recurrence of leg ulcers is less common in patients who comply with treatment programmes.

2.7 Current Situation in Northern Ireland

Leg ulcer management in the province varies between providers. Some Trusts have established community or hospital clinics with leg ulcer nurse specialists. Early audit results show an improvement in healing rates and quality of life for patients living in areas with established leg ulcer clinics.

3. PATIENT ASSESSMENT GUIDELINES

Assessment of patients presenting with lower limb ulceration

It is essential that an accurate assessment of the cause and contributory factors of the ulcer is determined before the onset of treatment



It is essential that an accurate assessment of the cause and contributory factors of the ulcer is determined before the onset of treatment

3.1 Clinical History

RECORD	RATIONALE
<u>Patient Details</u>	
Age/Sex	Incidence of leg ulceration increases with age. Male/Female ratio 1:2
Diabetes	Diabetic patients at risk of large and small vessel disease.
Rheumatoid Arthritis Connective Tissue Disease	May develop vasculitis which causes occlusion of small vessels leading to tissue ischaemia.
Trauma	May be the primary causative factor with or without an underlying disease process.
Smoking	Risk factor for arterial disease.
Current Medication	May be an indicator of current medical status. Steroids and cytotoxic drugs delay healing.

3.2 Vascular History

RECORD	RATIONALE
History of D.V.T./ Phlebitis/Varicose veins/ previous leg ulceration	Indicative of venous disease.
Intermittent claudication	Indicative of arterial disease. Of limited value in immobile patients.
Night Cramps	Calf cramps are common in chronic venous insufficiency.
Rest pain in lower leg	Indicative of advanced arterial disease.
Ischaemic heart disease Hypertension CVA	Arterial disease affects all arterial systems.
Previous surgical history	Serious illness or surgery, particularly pelvic surgery is a risk factor for DVT.
History of lower limb trauma	Often associated with DVT.
Previous venous surgery	Indicative of venous disease

3.3 Examination of Lower Limb



Palpable pulses alone are not always an accurate indication of arterial status.

RECORD	RATIONALE
Oedema Brown pigmentation, purple/ red Eczema/ Dermatitis Presence of lipodermatosclerosis Ankle flare Atrophie blanche	All signs of chronic venous insufficiency.
Assess mobility and degree of ankle movement	Immobility, limited or fixed ankle joint will affect efficiency of calf pump.
Palpable pulses	Not always an accurate indicator of arterial status.
Tissue necrosis fore foot or toes Decreased temperature Hair loss Buerger's test positive	Indicative of arterial disease

3.4 Investigations



Measurement of Ankle Brachial Pressure Index (ABPI) is the most reliable way to detect arterial insufficiency

RECORD	RATIONALE
Locate by palpitation and Doppler the dorsalis pedis and posterior tibial pulses at the ankle.	To confirm presence/absence of arterial disease.
Record Systolic Pressures on two foot pulses and calculate the ABPI	Not reliable in patients with diabetes and other processes where calcification of the vessels may be present.

3.4.1 Laboratory Investigations



- There is no indication for routine bacteriological swabbing of venous ulcers.
- All patients with leg ulceration should have a blood glucose recorded to exclude diabetes.

RECORD	RATIONALE
Full Blood Count (FBC)	Anaemia may delay healing. Sickle cell disease may present as ulceration.
Urea and Electrolytes	Patients in renal failure have an increased risk of arterial disease.
Glucose	To exclude diabetes
Auto-immune Screen	If rheumatoid or other connective tissue disorders are suspected.
Wound Swab	Not done routinely. All chronic wounds colonised by bacteria. Swab only if clinical signs of infection present, delayed healing or rapid development or breakdown of ulcer.

Note: Other blood and biochemical investigations will depend on the patient's clinical history and local protocols.

3.5 Wound Assessment



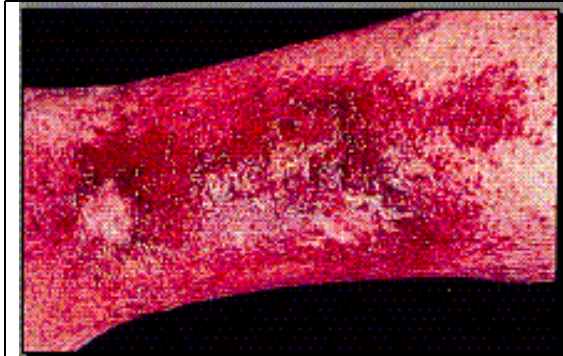
- **Serial measurement of the surface area of the ulcer is useful for monitoring healing.**
- **A non healing or atypical leg ulcer should be considered for biopsy**

RECORD	RATIONALE
<u>Measurement of Ulcer Area</u> may be obtained by: (i) Measuring the 2 maximum perpendicular axes i.e. length and breadth (ii) Tracing technique (iii) Photography	Serial measurement of the ulcer is useful for monitoring healing.
<u>Ulcer Depth</u> (i) Superficial – skin loss only (ii) Deep – subcutaneous tissue (iii) Underlying structures i.e. tendon deep fascia, bone	May indicate arterial insufficiency
Ulcer edge Rolled edge	Generally an unreliable determinate of ulcer aetiology. May be associated with malignancy. An atypical leg ulcer should be considered for biopsy.
<u>Ulcer Base</u> Epithelialization Granulation Slough Eschar	Aid to choice of dressing and indicator of progress.
<u>Level of Exudate</u> Minimal Moderate High	Will influence dressing choice and frequency of dressing change
<u>Odour</u>	May indicate colonisation.
<u>Site of Ulcer</u> Gaiter Fore foot or heel	Venous ulcers are usually confined to the gaiter area. May indicate ischaemia or diabetes.
<u>Pain</u> Assess level, frequency and duration of pain.	To relieve distress and aid compliance with treatment.

Examples of Leg ulcer Pathology



Venous Eczema
Note the dry scaly skin.



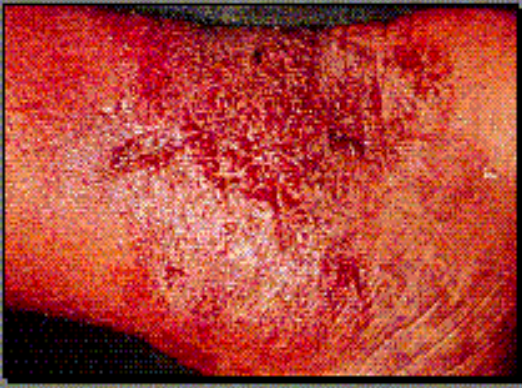
Contact Eczema.
Note the defined area of sensitisation.



Cellulitis.
Note the spreading area of inflammation.



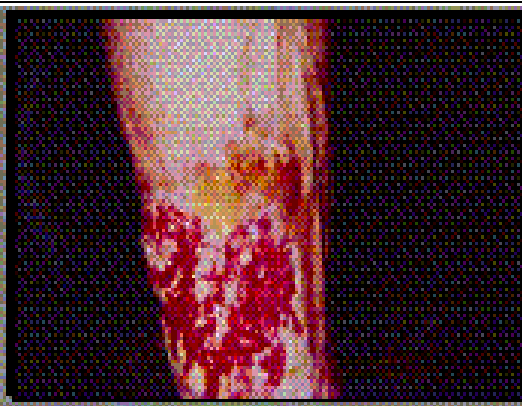
Venous Leg Ulcer.
Note the position of the ulcer and pigmentation.



Atrophie Blanche.
Note the ivory white plaque and pigmentation.



Arterial Ulcer.
Note the "punched out" appearance.



Malignant Leg Ulcer.
Note the "cauliflower" appearance and ragged edge.

4. PATIENT MANAGEMENT GUIDELINES

Note: The following guidelines apply to the management of venous ulceration.



Graduated compression bandaging, properly applied, and combined with exercise, is the treatment of choice in venous ulceration.

4.1 Compression Bandaging



- High compression bandages have a higher healing rate than low compression bandages
- Compression bandages should only be applied by a suitably trained and experienced practitioner
- Padding to protect bony prominences is recommended under high compression bandage systems
- Arterial insufficiency is a contra-indication to the use of compression except in a modified form under specialist supervision

ACTION	RATIONALE
<u>Compression</u> Venous ulceration should be treated with high compression bandaging to achieve a pressure between 30-40mmHg at ankle graduating to half at calf in a normal shaped limb.	Aids venous return and reduces venous hypertension.
Arterial insufficiency (<0.8) is usually a contra-indication to high compression except under specialist supervision.	Compression on an arterially compromised limb may lead to ischaemia .
Protect bony prominences.	To prevent pressure necrosis.
Use compression with caution in diabetic patients and those with connective tissue disease.	These patients are more susceptible to small vessel disease.

Note: Incorrect bandaging technique may be harmful.

Guide to a Good Bandaging Technique

- Each turn of the bandage should be of equal tension.
- Most bandages are applied in spiral form overlapping the preceding layer by 50%.
- The ankle circumference will determine the type and regime of bandage.
- Only use bandages of 10cm width.
- Protect all bony prominences with padding.

4.2 Ulcer Management



An effective skin care policy is important to protect the surrounding skin.

ACTION	RATIONALE
<p><u>Cleansing</u> Immerse or irrigate with warm tap water or normal saline, avoiding antiseptics. An emollient may be added to the water.</p>	<p>Therapeutic for patient and removes debris from the wound. Antiseptics are unnecessary and may delay wound healing. Moisturises the surrounding skin.</p>
<p><u>Skin Care</u> Moisturise with emollient. Descale by soaking, moisturising and/or mechanical removal. Barrier products may be necessary.</p>	<p>To prevent dryness, scaling and eczema. Scales act as a focus for infection and can cause pressure necrosis under compression bandaging. Protects surrounding skin from exudate.</p>
<p><u>Debridement</u> Chemical eg. Enzymes. Dressings eg. Hydrocolloids, Hydrogels Excision Biosurgical eg. Larvae</p>	<p>Presence of necrotic tissue may delay healing and encourage bacterial growth.</p>

4.3 Ulcer Dressings



No specific dressing has been shown to improve healing rates in venous ulcers.

ACTION	RATIONALE
<u>Dressings – Type and Technique</u> A clean technique is acceptable.	Most chronic wounds are colonized therefore an aseptic technique is unnecessary.
A 'simple' non-adherent permeable dressing is recommended.	Removal of an adherent dressing damages healing tissue.
Exudative wounds may require a more absorbent dressing.	Impermeable dressings allow accumulation of exudate which may macerate skin.
Dressings may be left in situ for one week.	Frequent dressing change may delay wound healing.

4.4 Infection



- **Systemic antibiotics should be used to treat clinical infection**
- **Topical antibiotics and antibacterial agents are frequent sensitisers and should be avoided**

ACTION	RATIONALE
Routine swabbing of ulcers is unnecessary. A wound swab should be taken if clinical signs of infection are present.	All chronic wounds may be colonised with micro-organisms and positive swabs do not require treatment unless clinical signs of infection are present. To assist in the identification of the infecting organism and selection of the most appropriate antibiotic based on the laboratory sensitivity tests.
Systemic antibiotics should be prescribed when the clinical signs of infection are present. Treatment of cellulitis may require a prolonged course of high dose antibiotics.	Infection may delay the healing process. Topical antibiotics should not be used as they lack efficacy, encourage resistance and may cause contact allergy.

Note:

- The presence of bacteria in a leg ulcer does not mean that it is infected as all chronic ulcers can be colonised by micro-organisms which are not producing any inflammatory reaction.
- A diagnosis of infection should therefore be made on clinical evidence, e.g. cellulitis.
- Odour or increased exudate does not necessarily indicate infection and can be managed with selective dressings.
- Treatment of cellulitis may require a prolonged course of high dose antibiotics.

4.5 Eczema/Dermatitis

Eczema presents as an itchy, inflammatory condition of the skin characterised by erythema, weeping and scaling.



- **Graduated compression is the main treatment for venous eczema**
- **A high percentage of patients with venous disease display contact sensitivity**
- **Patients with contact eczema should be referred for patch testing**
- **Standard series patch test is inadequate. A leg ulcer series is recommended**

ACTION	RATIONALE
<u>Venous Eczema</u> Treat with sustained compression, either with hose or bandages applied regularly and indefinitely	Reduces venous hypertension.
Emollients or barrier preparations are used for mild eczema	Soothing to patient and alleviates dryness and irritation.
Ointments are generally preferable to creams.	Ointments are better for a chronic dry eczema and are less sensitizing than creams.
Mild to moderate topical steroids (eg. BNF Chapter 13.4) are used in more severe cases or unresponsive eczema.	Anti-inflammatory effect.
If potent topical steroids have been used, gradual withdrawal may be required.	To avoid relapse of eczema.
<u>Contact Eczema</u> Remove suspected allergen and treat with appropriate topical steroid.	May affect up to 70% of cases.
Referral for Patch Testing (leg ulcer series) is recommended.	Identification of sensitizing agent is important for future management.

4.6 Nutrition



Optimal nutrition facilitates wound healing, maintains immune competence and decreases the risk of infection

ACTION	RATIONALE
Ensure a varied, balanced nutritional diet.	Facilitates wound healing, maintains immune competence and decreases the risk of infection.

4.7 Elevation, Exercise and Mobility



Progressive loss of ankle joint movement can accompany venous ulceration. Good calf muscle pump function is an important aspect of ulcer healing. Walking and passive ankle exercises should be encouraged. When resting, elevation of the limb above chest level is beneficial.

ACTION	RATIONALE
Encourage mobility.	Improves venous return by activating calf muscle pump.
Elevate limbs.	Aids venous return and reduces oedema.
Avoid long periods of standing.	Standing increases venous hypertension.

4.8 Pain



Pain may be a feature of both venous and arterial disease and should be addressed.

ACTION	RATIONALE
Assess site, frequency and level of pain and treat appropriately.	To relieve distress and aid compliance with treatment.

Note: Pain is a feature of approximately 60% of all venous ulcers. Increased pain levels or new episodes of pain may indicate infection.

4.9 Systemic Pharmacotherapy



There is insufficient evidence to support the use of systemic drug therapy in the treatment of venous leg ulcers

Four main classes of drugs have been investigated for use in the treatment of venous ulceration, these are listed below:

- fibrinolytics e.g. stanozolol, defibrotides
- hydroxyrutosides e.g. oxerutins
- methylxanthines e.g. pentoxifyline or oxypentifyline
- aspirin

All of these drugs have been used in randomised control trials to investigate their efficacy in the treatment of venous ulceration. Evidence to support the use of systemic drug therapy has been inconclusive for a number of reasons including the small number of patients involved in the trials.

4.10 Venous Surgery



Patients with venous ulceration should have the opportunity for assessment of venous function by Duplex Ultrasound to determine suitability for superficial venous surgery.

5. PREVENTION OF VENOUS ULCERATION

5.1 Primary Prevention



A history of DVT is a common cause of venous disease. The use of compression hosiery worn peri-operatively and during pregnancy may reduce the incidence.

5.2 Secondary Prevention of Ulcer Recurrence



- Chronic venous leg ulcers almost always recur unless preventative measures are maintained.
- Accurate measurement of lower limbs for compression hosiery is essential.
- Graduated compression hosiery of at least class II is the single most effective intervention in preventing leg ulcer recurrence.
- Graduated compression hosiery should be prescribed for life.
- Drug therapy is unproven in the prevention of recurrence of leg ulcers.

ACTION	RATIONALE
Measure and prescribe suitable compression hosiery, preferably class two or class three.	To increase venous return and reduce venous hypertension.
Moisturise skin regularly with bland emollient.	To help maintain integrity of the skin.
Avoid prolonged standing.	Standing increases venous hypertension.
Encourage appropriate weight reduction.	Obesity reduces mobility and hinders elevation of the legs.
Review regularly and re-measure limb.	To check compliance. To review hosiery (It is generally accepted that hosiery should be replaced at least every six months) To monitor arterial status.

Note: Stanazolol and oxerutinins have been compared to placebo in randomised controlled trials to investigate their effects on leg ulcer recurrence. The trials found that neither drug reduced incidence.

6. DIAGNOSTIC REASSESSMENT

In the following situations full diagnostic assessment including ABPI should be repeated:

- Ulcer failing to reduce in size after 12 weeks in spite of compliance;
- Recurrent episodes of ulceration;
- Ulcers increasing in size despite adequate compression therapy;
- Development of intermittent claudication or rest pain.



All patients with intractable ulceration should have full diagnostic reassessment including ABPI at appropriate intervals.

7. REFERRAL FOR SPECIALIST ADVICE



Leg ulcer clinics in hospital and community provide an appropriate referral point for the primary care team.

Patients in the following categories who have not been recently assessed by a specialist may require referral:

- peripheral vascular disease, with an ABPI of less than 0.8;
- diabetes mellitus;
- diagnostic uncertainty with a suspicion of malignancy;
- proven rheumatoid arthritis or other connective tissue disease;
- eczema/dermatitis failing to respond to moderate potency topical steroid;
- severe unresponsive cellulitis;
- failure to improve at 12 weeks despite adequate compression bandaging or failure to heal completely in 12 months;
- suspicion of primary lymphoedema eg ulceration without evidence of chronic venous insufficiency.

Note: It is desirable that the appropriate specialist will have an expressed interest in lower limb ulceration.

8. PROVISION OF CARE

The last decade has seen a resurgence of interest in both assessment and management of leg ulceration.

This has been driven by a recognition of the extent of the problem in the community and of the attendant social and physical disability.

Many different patterns of provision of care have been explored and the experience so far available would support a number of conclusions.



- **Properly supported leg ulcer clinics improve outcomes**
- **Some components of treatment are not available on GP prescription. Trusts should consider how these can be made readily available to community nurses**
- **An integrated pathway of care should be developed between hospital and community**
- **Each general practice unit or primary health care team should have access to an identified nurse professional with a specific interest and training in leg ulcer management**
- **Systems should be put in place to monitor standards of care and outcomes**

9. EDUCATION

9.1 Patient Education



For patients, knowledge and understanding is a major factor in compliance with treatment regimes. Verbal education should be reinforced by written information.

ACTION	RATIONALE
Educate the patient regarding their condition and treatment.	Aids patients understanding and encourages compliance.

9.2 Professional Education



All health care professionals involved in leg ulcer care should be trained in leg ulcer assessment and management.

The diagnosis of leg ulceration requires specific skills and training particularly in assessment of ABPI.

In the management of leg ulceration, the proper application of graduated compression bandaging and compression hosiery is critical. Poor technique can result in either failure to heal, or tissue necrosis and potential limb loss.

To improve the quality of care it is essential to adopt a more effective evidence based management strategy, and this must address the educational and training needs of all health and social services professionals involved in leg ulcer care.

10. ARTERIAL / MIXED ULCERS

If there are no signs of chronic venous insufficiency and the ABPI is abnormal (greater than 1.2 and less than 0.8) arterial aetiology should be assumed and a vascular opinion sought.

10.1 Management of Arterial Ulcers

Arterial ulcers are caused by insufficient blood supply to the lower limb, with resultant tissue ischaemia and necrosis.

Risk factors include smoking, hypertension, hyperlipidaemia and diabetes. The assessment of patients presenting with arterial ulceration is the same as that for all lower limb ulceration, but the management is different.



- **Compression bandaging should not be applied as severe damage to the leg can result.**
- **All patients with arterial ulceration should be referred for a vascular opinion. If ABPI is less than 0.5 this referral should be urgent.**
- **All patients with an ABPI less than 0.6 without active ulceration should also be referred for a vascular opinion.**

10.2 Management of Mixed Ulcers



Arterial insufficiency is a contraindication to the use of compression except in a modified form under specialist supervision.

In the presence of chronic venous insufficiency plus an abnormal ABPI of less than 0.8, compression therapy may be appropriate but should be carried out under specialist supervision.

Patients with diabetes have a higher risk of peripheral vascular disease and as a result ABPI readings may be unreliable (greater than 1.2) due to arterial calcification.

In the presence of diabetes or rheumatoid disease, compression bandaging may be appropriately and safely carried out. However, in these circumstances specialist advice should be sought before compression bandaging is used.

General Management

The general principles of wound management apply, with some specific provisos.

ACTION	RATIONALE
<p><u>Dressing Technique</u></p> <p>Use an aseptic technique.</p>	<p>Patients with arterial ulcers are more prone to infection.</p>
<p><u>Debridement</u></p> <p>In dry necrotic wounds debridement should be used with caution.</p>	<p>In a poorly vascularized foot an open wound can become infected.</p>
<p><u>Infection</u></p> <p>When sending a swab to the laboratory inform bacteriologist that it is from an arterial ulcer.</p> <p>If organisms are isolated, treat with high dose antibiotics for at least 2 weeks. If cellulitis present intravenous antibiotics should be used.</p> <p>Observe wound more frequently.</p>	<p>More rigorous reporting of Organisms and Sensitivities is needed as infection with or without clinical signs needs to be treated.</p> <p>In a poorly vascularized limb a higher blood serum level of antibiotics is needed for a longer period of time in order to eradicate the bacteria.</p> <p>Deterioration can be rapid.</p>
<p><u>Oedema</u></p> <p>In an oedematous limb do not encourage elevation above level of heart.</p>	<p>Will effect tissue perfusion.</p>
<p><u>Pain</u></p> <p>Control pain. Opiates may be necessary.</p>	<p>To relieve distress.</p>
<p><u>Mobility</u></p> <p>Encourage Walking.</p> <p>Encourage limb dependency if no oedema present.</p> <p>Encourage patient to keep warm.</p> <p>Discourage smoking.</p> <p>Ensure shoes are good fit.</p>	<p>Walking will encourage development of collateral circulation. To aid perfusion of the limb.</p> <p>Smoking reduces oxygen levels in blood and destroys Vitamin C.</p> <p>To prevent damage to foot.</p>

APPENDIX 1 Bandaging and Stocking Classification

Type of Compression	Pressures Achieved	Performance Characteristics
High Elastic Compression Type 3C	25 – 40 mmHg	<ul style="list-style-type: none"> sustained compression for up to one week can be washed and re-used.
Multi-layer High Compression	35 – 40 mmHg	<ul style="list-style-type: none"> sustains pressure for one week not re - usable
Light Compression Type 3A	14 – 17 mmHg	<ul style="list-style-type: none"> can be used on their own to give light to moderate compression or as part of the four layer system.
Moderate Compression Type 3B	17 – 23mmHg	<ul style="list-style-type: none"> can be used on their own to give light to moderate compression or as part of the four layer system.
Very light Compression i.e. Elastocrepe	Low pressure obtained	<ul style="list-style-type: none"> gives low pressure only. Loses pressure by 20% after a single wash. Does not sustain pressure for one week.
Light Support Crepe		<ul style="list-style-type: none"> gives negligible compression losing 40-60% of pressure in 20 minutes. used as part of four layer system.
Inelastic Compression	30 – 40 mmHg	<ul style="list-style-type: none"> popular in mainland Europe gives low resting pressure maximum pressure on activity. re-usable
Compression Stockings	Class I 14 – 17 mmHg Class II 18-24 mmHg Class III 25-35 mmHg	<ul style="list-style-type: none"> used to treat varicose veins used to treat more severe varicosities and to help prevent ulcer recurrence for treatment of severe chronic venous hypertension and lymphoedema.

APPENDIX 2 - Common Sensitizers

Commonly Reported Allergens in Patients with Chronic Ulcers

Allergen	Source
Topical antibiotics e.g. framycetin, neomycin, gentamicin	Medicaments e.g. some tulleles, powders, creams and ointments.
Lanolin (wool alcohols, amerchol L101)	Many creams, ointments and emollients.
Cetyl stearyl alcohol	Present in many cream preparations e.g. in aqueous cream and some corticosteroid cream. Also in some ointments e.g. emulsifying ointment and in some paste bandages.
Colophony (Rosin, Esters of Rosin)	Sticking plaster, adhesive in some bandages and some hydrocolloid dressings.
Rubber Chemicals e.g. Thiuram mix, including latex	Bandages, tubular elastic bandages, elastic stockings containing natural rubber and latex gloves worn by carer.
Preservatives e.g. parabens and chloroxynol	In many medicaments and in some paste bandages.
Antibacterials and antiseptics e.g. quinoline mix, chlorhexidine	Solutions, creams, tulleles.
a. Balsam of Peru/fragrance mix b. Benzocaine	Home care preparations: a. with perfume; b. with local anaesthetic action.
Tixocortol pivalate	Marker of corticosteroid hypersensitivity particular to hydrocortisone.

APPENDIX 3 Suggestions for Audit of Leg Ulcer Management

Section A Assessment/Management

1. Has ABPI (Ankle/Brachial Pressure Index by Doppler) been recorded in ulcer leg/both legs?
2. Has ulcer size been measured before and during treatment?
3. In the past year has FBC/weight/evidence of glycaemia been recorded?
4. Has patient been treated with compression, where ABPI > 0.8?
5. Has patient been given verbal/written advice?

Section B Training

1. Is Doppler ultrasound available for measuring ABPI?
2. Has every nurse managing patients with leg ulcers had training in Doppler measurement / compression bandaging in past 3 years?

Suggestion:

Tackle Section A by taking a sample of the next 10-20 patients presenting with leg ulcers for care. If you find results which might be improved, consider the following ideas:

- does your clinical area have access to Doppler measurement?
- do nursing staff need a training update?
- is there a practice policy agreed for management of leg ulcers?
- should you consider using a proforma for assessment?
- should you flag notes for opportunistic screening, or send for patients for assessment?

Further help on audit projects may be obtained from your audit facilitator, or local audit committees.

APPENDIX 4 - SAMPLE LEG ULCER ASSESSMENT FORM

Note: This form contains the minimum information required - you may wish to expand this form in your own clinical setting.

Initial Assessment

DATE ASSESSED		VENUE		ASSESSOR	
SURNAME			GP NAME		
FIRST NAMES			GP CYPHER NO		
DOB			GP ADDRESS		
ADDRESS					
TELEPHONE			HOSPITAL		
OCCUPATION PRES/ PREV			HOSPITAL CONSULT ANT		
CHI/ NHS IDENTIFIER			HOSPITAL UNIT NO		

Social Circumstances

LIVES:	ALONE	SLEEPS:	IN BED	MOBILITY:	WALKS ALONE
	WITH SPOUSE		IN CHAIR		WITH AID

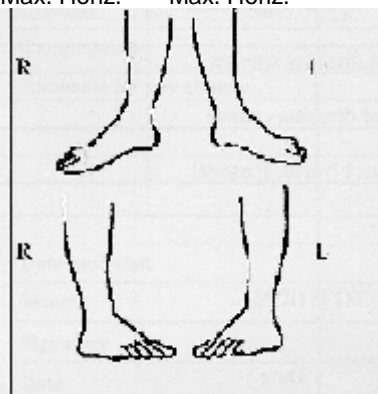
Medical History

IHD/ CVA/ TIA			PVD		
DIABETES			ARTHROPATHY		
DVT/ VVS			VEIN SURGERY		
OTHER					
SYSTEMIC RX	1.	3.	5.		
	2.	4.	6.		
ALLERGIES (DRUGS/ DRESSINGS)	1.	3.			
	2.	4.			
PATCH TEST	YES/ NO	RESULT			
ULCER PAIN - MILD/ MOD/ SEVERE	CONTINUOUS		INTERMITTENT	AT DRESSING CHANGE	

Weight		Smoking Hx		Hb	
Height		BP		BS	
BMI				Other	

Ulcer Examination:

Max. Vert. Max. Vert.
Max. Horiz. Max. Horiz.



Length of History

Year of 1st episode.....Current episode.....

	Ulcer 1	Ulcer 2
Depth: Superficial/ Deep/ Underlying Structure		
Base: Epithelializing/ Granulation/ Slough/ Necrosis		
Exudate: Min/ Mod/ High		
Signs Venous Disease: Lipodermatosclerosis/ Pigment/ Oedema/ Ankle flare/ Atrophie blanche/ Other		
Surrounding Skin: Macerated/ Dry/ Scaly		
Eczema: Wet/ Dry/ Infected		
Odour: Slight/ Offensive		

LEG ULCER ASSESSMENT FORM

Vascular Assessment Limb Examination

	Right	Left		Right	Left
PERIPHERAL OEDEMA	Yes/ No	Yes/ No	INT. CLAUDICATION		
ANKLE CIRCUMFERENCE			REST PAIN/ NIGHT PAIN		
CALF CIRCUMFERENCE			BUERGER'S TEST POS/ NEG		
ANKLE MOVEMENT FULL/ FIXED/ LIMITED			FOOT TEMP Warm/ Cool/ Cold		

PALPABLE PULSES

	Right	Left
DORSALIS PEDIS		
POST.TIBIAL		

DOPPLER EXAMINATION (MMHG)

Right	Systolic Pressure
BRACHIAL	
DORSALIS PEDIS	
POST. TIBIAL	

DOPPLER EXAMINATION (MMHG)

Left	Systolic Pressure
BRACHIAL	
DORSALIS PEDIS	
POST. TIBIAL	

To calculate ABPI use Highest Ankle Systolic Pressure Highest Brachial Systolic Pressure	Right ABPI	Left ABPI

ULCER CLASSIFICATION _____

MANAGEMENT:

- Objectives
- 1.
 - 2.
 - 3.
 - 4.

Cleanser		Walking	
Skin care		Ankle exercise	
Dressings		Duration of daytime leg elevation	
Compression - bandages		Date of next dressing change	
- hosiery		Frequency of dressing change	
Pain control		Clinic; District Nurse; Hospital	

REFERRAL FOR SPECIALIST ADVICE: YES/ NO TO WHOM:

Signature _____ Date _____

Leg Ulcer Management Continuation Sheet

PATIENT NAME:

DATE OF BIRTH:

INITIAL MANAGEMENT:

PHYSICAL THERAPY:

Mobility
Duration of daytime leg elevation
Duration of daytime leg pump exercise

Treatment Regime

Seek advice if:

1. After 1 month - no decrease in size
2. Anytime - excessive/ uncontrolled pain
3. Anytime - cellulitis, oedema, pyrexia

DATE/ ULCER NUMBER					
Bandage					
Intact/ Disturbed					
Exudate strike through					
Yes/ No					
Odour					
Pain					
Lab Results					
(Swabs/ Bloods)					
Ulcer Bed					
(epith/ gran/ slough/ necrosis)					
Clinical Infection Yes/ No					
Action (swab/ antibiotic)					
Measurements/ mapping					
Assessment overall:					
Worse/ Same/ Improving					
Applications					
(Ointments/ Moisturiser)					
Dressing					
Compression					
Rationale for any change					
Date next visit					
Venue					
Signature					
Date					

APPENDIX 5 - Guideline Development Sub-Group

Mrs Lilian Bradley [Chairman]	Leg Ulcer Advisor Ulster Community and Hospitals Trust
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Dr Hilary Jenkinson	Consultant Dermatologist United Hospitals Trust
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Appendix 6 CREST WOUND MANAGEMENT GROUP

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Glossary

Ankle flare

The presence of small thread like venules particularly on the medial aspect of the ankle signifying valve incompetence of the perforator veins.

Atrophie blanche

A smooth ivory white plaque of sclerosis stippled with telangiectasis and surrounded by hyperpigmentation occurring on a lower leg or foot.

Buerger's test

In the presence of critical arterial disease, where perfusion pressure of the lower limb is significantly impaired (ABPI<0.5), Buerger's test can be demonstrated viz.:

the patient lies supine and the limb is elevated to about 45°C for a period not less than two minutes. The foot may go pale, with no demonstrable capillary return, and the presence of venous guttering in the foot can be seen. To complete a positive test, the patient then sits with the leg dependent over the edge of the bed and after a further 1-2 minutes an intense dusky red hyperaemic response is seen.

Calcification of arteries

The arterial wall is usually soft and supple. Atherosclerotic disease causes thickening of the wall with cholesterol and smooth muscle proliferation. Calcification in the wall can also occur, and this is common in larger aorto-iliac vessels in atherosclerotic disease. On occasions, particularly in DIABETIC and RENAL FAILURE patients, calcification can affect the more distal vessels below the knee, and can be circumferential, preventing normal compression and closure of the vessel on application of a sphygmomanometer cuff.

Cellulitis

Cellulitis of the lower leg can occur in patients with venous hypertension and/or lymphoedema; it may occur in an otherwise normal limb. In cellulitis there is an acute onset of a red, hot, swollen, painful and tender skin lesion. There is rapid spread of the red tender area. Pyrexia and systemic upset are present. Bullae, skin necrosis, lymphangitis and lymphadenopathy may occur.

Colonization

The presence of micro-organisms in a wound where they may be multiplying but are not causing clinical signs of infection or eliciting an immune response.

Chronic Venous Insufficiency

Defined as ambulatory venous hypertension, with an abnormally high pressure in the superficial lower leg veins generated by standing or walking. The fundamental mechanism is damage to vein valves rendering them incompetent, particularly the perforator valves. Clinical signs of CVI are; oedema, pigmentation, eczema, lipodermatosclerosis, atrophie blanche and ulceration.

Gaiter Region

This is the area of the lower limb over which venous ulceration may occur. It extends circumferentially from the upper third of the calf down across the ankle joint and onto the dorsal foot and medial and lateral heel. It does not extend to the sole of the foot or distal forefoot or toes.

Infection

Infection is characterised by invasion of the tissues by micro-organisms which stimulate an inflammatory response seen clinically as heat, swelling, pain, odour and erythema. Pyrexia may also be present.

Intermittent Claudication

Pain experienced in the calf, thigh or buttock muscles after walking for a reproducible distance, and which disappears following a few minutes rest. By implication, arterial disease should be suspected and sought.

Lipodermatosclerosis

Gradual replacement of the subcutaneous fatty tissue by sclerotic fibrous tissue resulting in fixation of the dermis onto the deeper tissues. Accompanies chronic venous insufficiency clinically diagnosed by the presence of hard "woody" subcutaneous tissue.

Acute lipodermatosclerosis

Term given to the acute inflammatory process characterised by redness, inflammation, fluid weeping and occasional bullous formation. Often confused with bacterial cellulitis or eczema. No known micro-organism involvement and antibiotics are not indicated. Despite inflammatory picture, acute lipodermatosclerosis is often not painful. If acutely inflamed skin is left without compression, new ulceration will occur.

Lymphoedema

Swelling of the lower leg associated with obstruction or dysfunction of lymphatic drainage. Can accompany a number of conditions including chronic venous insufficiency. May predispose to fungal infections, episodes of cellulitis, bacteraemia and ulceration.

Phlebitis

Acute inflammatory process involving localised superficial vein segments, characterised by pain, exquisite tenderness, and inflammation. Usually accompanied by thrombosis of the superficial vein, and in up to 30% of cases, deep venous thrombosis may be present. Often treated with non-steroidal anti-inflammatory drugs and soothing lotions. In severe cases, Heparin is the most effective management, especially for pain. Care should be taken to exclude possible visceral malignancy as a cause for phlebitis.

Light compression may lead to symptomatic relief but care should be taken to exclude DVT.

Reactive Hyperaemia

The reflex increase in tissue blood flow which follows a short period of relative arterial ischaemia. Can usually be induced by an occlusive blood pressure cuff on a limb. In a critically ischaemic limb, the hyperaemic changes can be induced by limb elevation and subsequent dependence, and is characterised by a dusky red colour.

Venous Eczema

Venous eczema is an itchy, red scaling or papulovesicular rash, occurring sub-acutely or chronically on the lower leg of someone with venous hypertension. Pyrexia or systemic upset are not a feature of uncomplicated eczema.

Venous Guttering

The complete emptying of venous channels in the lower leg and foot to form an indented gutter instead of a rounded vein. It occurs on raising the limb of a supine patient in the presence of critical arterial ischaemia (Buerger's Test)

ABBREVIATIONS

CVA Cerebrovascular Accident i.e. stroke

TIA Transient Ischaemic Attack

DVT Deep Vein Thrombosis

ABPI Ankle Brachial Pressure Index

IHD Ischaemic Heart Disease