



# National Wound Care Strategy Programme



## Leg Ulcer Recommendations August 2023



Working in partnership with

*The***AHSN***Network*



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## Glossary:

**ABPI:** Ankle brachial pressure index (ABPI) is a non-invasive method of assessing peripheral arterial perfusion in the lower limb by measuring the ratio of systolic blood pressure at the ankle to systolic blood pressure in the arm using a manual “Doppler” ultrasound device.

**Acute Limb Ischaemia:** Rapid decrease in blood flow to lower limb due to acute occlusion. Symptoms are sudden-onset, acute pain, pallor, pulseless, perishingly cold paraesthesia / acute sensory change, paralysis/ acute motor dysfunction.

**ANTT:** Aseptic non-touch technique. This is the practice of avoiding contamination by not touching key elements of the wound or the dressing, e.g., the inside surface of a sterile dressing where it will be in contact with a wound.

**Chronic Kidney Disease:** is defined as a reduction in kidney function or structural damage (or both) present for more than 3 months, with associated health implications<sup>1</sup>.

**Chronic Limb Threatening Ischaemia (CLTI):** is a clinical syndrome defined by the presence of peripheral arterial disease (PAD) **in combination** with rest pain, gangrene or a lower limb ulceration greater than 2 weeks in duration<sup>2</sup>.

**Chronic oedema:** Is defined as swelling that lasts for more than 3 months<sup>3</sup>.

**Erythema:** Inflammation of the skin, often referred to as ‘redness’ although it may present differently in a range of skin tones.

**Healed:** Is defined as complete epithelisation.

**Hyperkeratosis:** Thickening/ scaling of the outer layer of the skin, common around a leg ulcer.

**Leg Ulcer:** An ulcer that originates on or above the malleolus but below the knee that takes more than 2 weeks to heal.

**Lymphoedema:** is defined as a gradual abnormal build-up of lymph fluid in the tissues resulting from a failure of the lymphatic system. Consequences are swelling, skin and tissue changes and predisposition to infection.

**Mild Graduated Compression:** Compression therapy that is intended to apply 20mmHg or less at the ankle. This is about half of the therapeutic dose of strong compression therapy.

**Peripheral Arterial Disease (PAD):** is a common condition where a build-up of fatty deposits in the arteries restricts blood supply to the limbs.

**Strong Graduated Compression:** is either an elastic compression system applied to give at least 40mmHg of pressure at the ankle or an inelastic system applied in accordance with manufacturers’ recommendations. Strong compression delivers what current evidence suggests is the full therapeutic dose for treating venous leg ulcers.

**Toe Pressure:** Toe pressure (TP) provides a functional measure for small arteries in periphery of the lower limb. TP is used when screening for peripheral arterial disease (PAD) of the lower limb, particularly in the presence of lower limb medial arterial calcification common in those with diabetes. A toe pressure of  $\geq 60$ mmHg indicates adequate perfusion to heal an ulcer if other factors are optimised.

**Venous insufficiency:** Venous insufficiency is a form of venous disease where problems with the venous system affects the return of blood from the lower limb to the heart. Venous insufficiency is commonly due to failure within the valves in the veins and can affect the deep or superficial venous systems.

**Venous leg ulcer:** Ulcers on the leg(s) that are caused by venous insufficiency.



## Introduction

The National Wound Care Strategy Programme (NWCSP) has been commissioned by NHS England to improve the care of pressure ulcers, lower limb wounds and surgical wounds. This document is specifically for leg ulcers, which are a common form of lower limb wound.

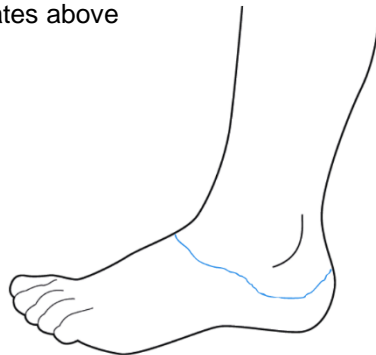
In England, there is considerable variation in leg ulcer practice and outcomes which increases care costs and extends healing times<sup>4</sup>. This unwarranted variation offers major opportunities to improve healing rates and reduce recurrence rates and thus reduce individual suffering, spend on inappropriate and ineffective treatments and the amount of clinical time spent on care<sup>4</sup>.

Prevention of injuries (which may be the start of lower limb ulceration) is outside the remit of the NWCSP, but early appropriate care can prevent leg wounds becoming leg ulcers.

Leg ulcers are ulcers on the lower leg (originating on or above the malleolus and below the knee) that have not healed within 2 weeks<sup>5</sup>.

A **leg ulcer** originates above the blue line.

A **foot ulcer** originates below the blue line.



There are an estimated 739,000 leg ulcers in England with estimated associated healthcare costs of £3.1 billion per year<sup>6</sup> placing a significant burden on NHS services<sup>7</sup>.

Most leg ulceration occurs due to venous insufficiency, for which there is robust evidence to support the use of compression therapy<sup>8,9</sup> and endovenous surgery (for superficial venous incompetence)<sup>10</sup> as first-line therapies to promote healing and prevent recurrence. Other causes of leg ulceration include peripheral arterial disease, reduced mobility and/or cardiac failure, with or without venous disorders<sup>5</sup>.

There is a robust business case that demonstrates that commissioning equitable and accessible services for people with leg ulcers would reduce unwarranted variation of care, increase the use of evidence-based care and discourage the over-use of therapies for which there is insufficient evidence, resulting in higher healing rates and lower recurrence rates<sup>6</sup>.

## The process for developing and updating these recommendations

The original recommendations were developed using an evidence-informed approach, including consideration of research evidence, healthcare resources, clinical settings, and patients' preferences<sup>11</sup>. The original recommendations were based on evidence retrieved using a systematic approach to searching which is outlined in Appendix 1 and then sense-checked with academics, health practitioners and patients and carers before a wider consultation with those registered with the



NWCSP stakeholder forums. This update has followed the same process but following feedback from stakeholders, it has been decided to publish the leg ulcer recommendations and foot ulcer recommendations as separate documents. Together, these form the suite of lower limb wound recommendations.

## The purpose of these recommendations

The purpose of these recommendations is to provide clear advice to health and care practitioners, service managers and commissioners about the fundamentals of evidence-informed care for people with leg ulcers. Implementing these recommendations will achieve better individual outcomes and more effective use of healthcare resources<sup>6</sup>.

The recommendations outline a pathway of care that promotes early assessment and diagnosis, enabling fast access to evidence-informed therapeutic interventions, with escalation of treatment or service provision for people requiring more complex care.

The recommendations thus offer a framework for the development of local delivery plans that include consideration of:

- Relevant research evidence (where it exists) to inform care.
- Configuration of services and deployment of workforce.
- Appropriate education for that workforce; and
- Relevant metrics to measure quality improvement.


These recommendations signpost to relevant clinical guidelines or outline evidence-informed care that will improve healing and optimise the use of healthcare resources. They do not replace existing evidence-informed clinical guidelines or replace clinical judgement and decision making in relation to the needs of the individual. They are intended for use in all clinical care settings and aim to support implementation of evidence-based clinical practice.



# Recommendations

## A. Identification and immediate and necessary care

1. Immediately escalate to the relevant clinical specialist, those with the following ‘red flag’ symptoms/ conditions:

- 
- Acute infection<sup>12</sup> (e.g., increasing unilateral erythema, swelling, pain, pus, heat).
  - Symptoms of sepsis<sup>13</sup>.
  - Acute or suspected chronic limb threatening ischaemia<sup>14 15</sup>, (e.g., PAD **in combination** with rest pain, gangrene, or lower limb ulceration >2 weeks duration).
  - Suspected acute deep vein thrombosis<sup>16</sup> (DVT).
  - Suspected skin cancer.
  - Bleeding varicose veins<sup>5</sup>.

2. Arrange for a comprehensive assessment to be undertaken **within 14 days**.

If there is also foot ulceration, refer to the NWCSP Recommendations for Foot Ulceration<sup>17</sup>.

For people with complex comorbidities and/or receiving end of life palliative care, seek input from their other clinicians to agree an appropriate care plan.

If a wound is due to thermal injury, consider referral to burns/plastics service.

3. Treat any leg wound infection in line with NICE Guideline (NG152) Leg Ulcer infection - antimicrobial prescribing<sup>12</sup>.

4. Clean wound, surrounding skin and apply emollient as required<sup>18</sup>.

5. Record image(s) of wound using digital imaging<sup>19</sup> and include in onward referral.

6. Apply simple, low adherent dressing (with sufficient absorbency)<sup>18</sup>.

7. Those **without** red flag symptoms **and** at low risk of pressure damage over bony prominences should be offered first line mild graduated compression (20mmHg or less at the ankle - see explanatory notes). Closely monitor for skin integrity and sign of vascular insufficiency if there is known or suspected impaired sensation.

Those **with** red flag symptoms should **not** be offered compression as part of immediate and necessary care. However, following assessment and appropriate management by the relevant clinical specialist, compression therapy may be considered on a case-by-case basis.

8. Signpost to relevant, high-quality information in a relevant format (e.g., braille, different languages) and identify, discuss, and incorporate opportunities for supported self-management<sup>20</sup> into the treatment plan in line with each individual’s capacity, capability and wishes.



## B. Assessment, diagnosis, and treatment

### Assessment and diagnosis:

1. Within 14 days, assess and identify causes and risk factors for non-healing by undertaking and documenting comprehensive assessment that includes:
  - Full history, including any previous history of leg ulceration and underlying cause.
  - Review of medication.
  - Pain and analgesia needs.
  - Psychosocial needs.
  - Possible infection.
  - Nutrition.
  - Record image(s) of wound using digital imaging<sup>19</sup>.
  - Assess the ulcer in line with the wound minimum data set<sup>21</sup>.
  - Undertake a lower limb assessment that includes:
    - Peripheral vascular assessment<sup>15, 18</sup> (ABPI and/or TPI using manual APBI measurement devices<sup>22</sup>).
    - Skin and lymphoedematous changes.
    - Assessment for sensation.
2. Diagnose and identify the causes of non-healing and formulate a treatment plan to address those causes.



## Treatment:

3. Optimise management of contributing disease (e.g., diabetes<sup>23,24</sup>, chronic kidney disease<sup>1</sup>, PAD<sup>14,15</sup>).
4. Treat infection in line with NICE Guideline (NG152) Leg ulcer infection - antimicrobial prescribing and local policy for infection and antimicrobial stewardship<sup>12</sup>.
5. Offer analgesia to alleviate pain.
6. Cleanse the wound bed, skin around the ulcer and the whole limb and consider debridement if required.
7. Treat skin conditions (e.g., eczema) and apply emollient to surrounding skin, as needed.
8. Apply a simple low-adherent dressing with sufficient absorbency.
9. Offer advice on skin care, footwear, exercise and mobility, rest, and limb elevation (to include both limbs) nutrition, and as appropriate, smoking cessation, and weight management.
10. Identify, discuss, and incorporate opportunities for supported self-management within the treatment plan in line with the individual's and their carers' capacity, capability and wishes.
11. Provide the individual and their relevant health care providers responsible for supporting ongoing care with verbal and written information about:
  - The diagnosis of the ulcer.
  - When to seek advice and specific information (including names and phone numbers) about who to contact from the previous clinical care provider.
  - If image(s) of the ulcer have been captured, these should be shared with the individual (if they wish) and the health care provider responsible for ongoing care using NHS compliant digital technology.
  - Signs of infection.
  - Hygiene (including hand hygiene).
  - Advice on dressing changes and taking image(s) of their own ulcer to monitor healing.
12. Prior to transfer to another healthcare provider, individuals should be provided with enough dressings to care for their wound for one week and informed of the name of the clinician in that organisation, responsible for overseeing their care.





### For leg ulcers due to suspected venous disease with adequate arterial supply

13. Refer to vascular services for diagnosis of venous disease (e.g., clinical assessment with venous duplex scan) and possible vascular intervention in line with NICE Varicose Veins Diagnosis and Management Clinical Guideline<sup>5</sup>, using the NWCSP Venous Disease Assessment and Referral Form template or equivalent<sup>25</sup>.
14. Measure and record the ankle circumference.
15. Apply strong compression therapy<sup>8,9,18</sup>:
  - an elastic compression system applied to give at least 40mmHg of pressure at the ankle, or
  - an inelastic system applied in accordance with manufacturers' recommendations.

Strong compression **hosiery** should be considered as first-line compression therapy choice where possible. The need for application aids should be considered.

Strong multi-component compression **bandaging** (in preference to compression hosiery), should be offered to those with:

- chronic ankle/leg oedema not reduced by elevation, or
- abnormal limb shape; or
- copious exudate, or
- very fragile skin.

Consideration should be given to sensation. People with impaired sensation may be unable to identify discomfort from inappropriately applied compression therapy so may require closer monitoring.

For those with advanced, unstable cardiac failure, liaise with their cardiac clinician or heart failure nurse to agree how to offer compression to optimise healing while minimising additional cardiac burden.

16. Provide verbal and written information to the individual about the benefits of compression using the NWCSP resource<sup>26</sup> or equivalent.
17. If symptoms do not rapidly improve, escalate for advice in line with local care pathways e.g., dedicated leg ulcer service, tissue viability service, vascular service, dermatology service, lymphoedema service, rheumatology service, endocrine service.



### For leg ulcers with suspected venous disease and peripheral arterial disease ('mixed' aetiology)

18. For those with an ABPI<0.5, (CLTI)
  - Refer urgently to vascular services for possible vascular intervention as set out in the NICE Clinical Guideline for peripheral arterial disease using NWCSP Peripheral Arterial Disease / Chronic Limb-Threatening Ischaemia Assessment and Referral Form template<sup>25</sup> or equivalent.
19. For those with an ABPI>0.5,
  - Refer to vascular services for diagnosis of vascular disease (venous disease and/or arterial) and possible vascular interventions.
  - Pending vascular opinion, if the limb is oedematous with no signs of acute or chronic limb threatening ischaemia, continue with mild graduated compression that delivers up to 20mmHg at the ankle.

### For leg ulcers with peripheral arterial disease only

20. Refer to vascular services for possible vascular intervention as set out in the NICE Clinical Guideline for Peripheral Arterial Disease<sup>15</sup> using NWCSP Peripheral Arterial Disease / Chronic Limb-Threatening Ischaemia Assessment Referral Form template<sup>25</sup> or equivalent.

### For leg ulcers of other or uncertain aetiology

21. Refer to appropriate service for an opinion depending on symptoms and local arrangements e.g., dermatology/rheumatology/vascular/endocrinology.
22. Pending opinion, if the ABPI >0.8, consider the use of strong compression therapy (see Point 15 above).

### For leg ulcers with lymphoedema


23. Those with concurrent lymphoedema and leg ulceration should receive care from a clinician with capabilities to manage lymphoedema.
24. ABPI assessment for those with lymphoedema is not essential in the absence of significant cardiovascular risk factors and clinical signs or symptoms of PAD **provided** the vascular status has been thoroughly assessed <sup>27</sup>. If there are concerns, a referral for further vascular assessment and possible intervention should be made.
25. Care should also include <sup>29,30</sup>.
  - Advice on exercise to increase lymphatic uptake, which may include walking or chair-based exercises.
  - Elevation of limb where exudate is significant.
  - Compression but with consideration to
    - Protection of the forefoot and toes from increased oedema.
    - Compression starting from the smallest circumference (e.g., the toes) and if needed extending above the knee.
    - Advice on nutrition and weight loss where appropriate with referral to bariatric services if indicated.



## C. Ongoing care of leg ulceration

### 1. At each dressing change:

**Immediately escalate to the relevant clinical specialist those with the following 'red flag' symptoms/ conditions:**

- 
- Acute infection<sup>12</sup> (e.g., increasing unilateral erythema, swelling, pain, pus, heat).
  - Symptoms of sepsis<sup>13</sup>.
  - Acute or suspected chronic limb threatening ischaemia<sup>14, 15</sup>, (e.g., **PAD in combination** with rest pain, gangrene, or lower limb ulceration >2 weeks duration).
  - Suspected acute deep vein thrombosis<sup>16</sup> (DVT).
  - Suspected skin cancer.
  - Bleeding varicose veins<sup>5</sup>.

***Following assessment and appropriate management by the relevant clinical specialist, compression therapy is likely to be beneficial to most except those with acute or suspected chronic limb threatening ischaemia.***

2. If appropriate, treat infection in line with NICE Guideline (NG152) Leg ulcer infection - antimicrobial prescribing and local policy for infection and antimicrobial stewardship<sup>12</sup>.
3. Offer analgesia to alleviate pain.
4. As far as possible, use ANTT to cleanse the wound bed, skin around the ulcer and the whole limb and consider debridement if required.
5. Treat skin conditions (e.g., eczema) and apply emollient to surrounding skin, as needed.
6. Apply a simple low-adherent dressing with sufficient absorbency.
7. Offer advice on skin care, footwear, exercise and mobility, rest, and limb elevation (to include both limbs) nutrition and as appropriate, smoking cessation and weight management.
8. Review care and identify, discuss, and incorporate opportunities for supported self-management<sup>20</sup> into treatment plan in line with the individual's and their carers' capacity, capability and wishes.
9. If being treated with compression therapy, review reduction in ankle circumference and consider whether compression therapy should be adapted.
10. Review effectiveness of treatment plan and if there is deterioration, escalate in line with local pathway.



## D. Review of healing

At 4 weekly intervals (or more frequently, if concerned).

1. Monitor for healing by:
  - Completing ulcer assessment in line with the wound minimum data set<sup>21</sup>.
  - Taking digital wound image(s) and comparing with previous images.
  - Measuring ankle circumference to assess for reduction in limb swelling.
2. Review effectiveness of treatment plan.

Leg ulcers that show no significant progress towards healing or are deteriorating should be escalated for advice in line with local care pathways e.g., dedicated leg ulcer service, tissue viability service, vascular service, dermatology service, lymphoedema service.

3. Review opportunities for supported self-management and discuss and incorporate into treatment plans as agreed with the individual. This may include remote monitoring techniques.

At 12 weeks:

4. Monitor for healing by:
  - Completing a comprehensive re-assessment.
  - Taking digital wound image(s) and comparing with previous images.
  - Measuring ankle circumference to assess for reduction in limb swelling.
5. Review effectiveness of treatment plan.

Leg ulcers that remain unhealed should be escalated for advice in line with local care pathways e.g., dedicated leg ulcer service, tissue viability service, vascular service, dermatology service, lymphoedema service, rheumatology service, endocrine service.

For those where there is no progress to healing and other treatment is not possible, seek to agree an appropriate care plan which may include palliation of symptoms as an acceptable outcome.



## E. Care following healing

### For all types of leg ulcers, offer care as follows:

1. Advice should be given on how to reduce the risk of re-ulceration. This should be tailored to the individual but should consider skin care, footwear, healthy eating, and exercise (and if appropriate, smoking cessation).
2. Verbal and written information about the diagnosis and ongoing treatment plan should be provided and discussed. Opportunities for supported self-management should be identified, discussed, and incorporated into treatment plans as agreed with the individual.
3. Details should be provided for who to contact if there are any issues.

### For healed venous leg ulcers with adequate arterial supply (with or without lymphoedema)

4. If, in the view of the vascular service, venous intervention (e.g., endovenous ablation) has successfully resolved venous hypertension, compression therapy may no longer be required but the patient should be advised to seek medical advice, should symptomatic varicose veins or the ulcer recur.
5. If there is ongoing venous hypertension, with or without lymphoedema, encourage the use of ongoing compression therapy (usually in the form of compression hosiery) at a 'dosage' level that maintains healing and is acceptable to the individual. (This is likely to be the same or similar to the level used during healing).
6. Advise individuals to adhere to manufacturers' instructions regarding the replacement of compression therapy garments.
7. Review 6-monthly for replacement of compression garments and ongoing advice about prevention of recurrence. Advise that changes in lower limb symptoms, skin problems, or issues with compression therapy garments (e.g., hosiery) should prompt the individual to seek an earlier review which should include a comprehensive lower limb assessment that includes:
  - Peripheral vascular assessment.
  - Lymphoedematous changes.
  - Assessment for sensation.

### For healed leg ulcers with venous disease and peripheral arterial disease ('mixed' aetiology) (with or without lymphoedema)

8. If the level of peripheral arterial disease permits, in partnership with vascular services, encourage the use of an appropriate level of ongoing compression therapy (usually in the form of compression hosiery) and provide advice on caring for hosiery.
9. Advise individuals to adhere to manufacturers' instructions regarding the replacement of compression therapy garments.



10. Review 6-monthly for a comprehensive lower limb assessment that includes:
  - Peripheral vascular assessment.
  - Skin and lymphoedematous changes.
  - Assessment for sensation.
11. Replace compression garments and provide ongoing advice about prevention of recurrence. Advise that changes in lower limb symptoms, skin problems or issues with compression therapy garments (e.g., hosiery) should prompt the individual to seek an earlier review which should include a comprehensive lower limb assessment.

### **For healed leg ulcers with peripheral arterial disease**

12. No further care required but advise to seek immediate clinical advice if there is recurrence of PAD/CLTI symptoms or ulceration.

### **For healed leg ulcers of other or uncertain aetiology**

13. No further care required but advise to seek immediate clinical advice if there is recurrence of symptoms or ulceration.



## Explanatory Notes:

### Identification and immediate and necessary care

The listed 'red flag' symptoms are those that the NWCSP Lower Limb Workstream has identified as requiring immediate attention from a relevant specialist to reduce the risk of rapid deterioration or serious harm.

It is good practice to cleanse the wound bed, peri-wound (around the wound) and the limb and apply emollient to moisturise the surrounding skin. The method of cleansing will depend on the situation in which care is being undertaken and individual needs. While debridement may be required for leg ulcers, in most cases, this will not form part of initial and necessary care.

No robust evidence has been identified to support the superiority of any dressing type over another for standard care of leg ulcers. Therefore, simple low-adherent dressings with sufficient absorbency are recommended as first line care but this recommendation does not replace clinical judgement and decision making in relation to the needs of the individual.

The recommendation for leg ulcers that are non-healing (or at risk of non-healing) to be treated with mild compression is based on clinical expert consensus that, providing people with 'red flag' symptoms/conditions (such as the symptoms of arterial insufficiency) are excluded, the benefits of first line mild compression outweigh the risks, even for people without obvious signs of venous insufficiency. In most clinical situations, it is not possible to precisely measure the level of compression that is applied since this is dependent on several factors including ankle circumference, choice of compression system and clinician skill.

For this guidance, 'mild graduated compression' is defined as a compression system that is intended to apply 20mmHg or less at the ankle. This is based on the World Union of Wound Healing Societies<sup>30</sup> definition of 'mild graduated compression' and is intended to illustrate what is meant as 'mild graduated compression' rather than being a precise level of compression required.

### Assessment, Diagnosis and Treatment

#### *Assessment and Diagnosis*

People with leg ulcers usually only seek clinical advice when healing is delayed or there are risk factors for non-healing. People with non-healing leg ulcers should receive assessment within 14 days of initial presentation to a healthcare professional as it is likely that such ulcers will already have been present for some time before this and further delay increases healing times and suffering.

A multi-disciplinary team (MDT) approach to care is essential. The multidisciplinary team for diagnosis and treatment may include clinicians from podiatry, nursing, medicine, tissue viability, vascular, lymphoedema and dermatology services with the capabilities / competencies identified for advanced practitioners.

Accurate ulcer assessment is essential for monitoring wound healing as wound size and wound bed status form the baseline against which all subsequent treatment effectiveness will be measured. Wound imaging should be incorporated into wound assessment and regarded as part of standard practice.

Palpation of pulses is known to be an unreliable form of vascular assessment of arterial supply so, as a minimum, vascular assessment of arterial supply should be undertaken by either using a manual Doppler to measure the ankle brachial pressure index (ABPI)<sup>22</sup>, including toe pressures or another evidence-informed method.

If venous disease is suspected, a venous duplex scan is considered a gold standard form of assessment for individuals with lower leg ulcers so should also be part of assessment.



Assessment for sensation is recommended to reduce the risk of pressure damage from compression therapy. People with impaired sensation may be unable to identify discomfort from inappropriately applied compression therapy so may require closer monitoring.

Lymphoedematous changes include swelling that does not resolve on elevation / overnight, thickening of skin and subcutaneous tissues, shape distortion, hyperkeratosis, and predisposition to infection.

Measurement of the ankle circumference is essential at every visit to determine the reduction in oedema but is also essential to determine the appropriate compression regime.

### **Treatment**

*Dressings:* No robust evidence has been identified to support the superiority of any dressing type over another for any type of non-healing leg ulcers. Therefore, simple low-adherent dressings with sufficient absorbency are recommended as first-line care but this recommendation does not replace clinical judgement and decision making in relation to the needs of the individual.

*Compression Therapy:* People with leg ulcers with an adequate arterial supply and where no aetiology other than venous insufficiency and/or lymphoedema is suspected, should be offered compression therapy. In most clinical situations, it is not possible to precisely measure the level of compression that is applied since this is dependent on several factors, including ankle circumference and clinician skill.

For these recommendations, strong compression is defined as an elastic compression system that is intended to apply at least 40mmHg at the ankle or a non-elastic (e.g., short stretch) system applied in accordance with manufacturers' recommendations.

The margins of uncertainty around the current evidence for compression therapy mean that it is not possible to recommend one type of compression system over another<sup>8</sup> and a range of systems are used in England.

There is evidence that for those willing to wear them, two-layer compression hosiery kits are an effective alternative to four-layer bandaging for healing venous leg ulcers. There is also evidence to suggest that they are more cost effective, may reduce recurrence rates and increase quality of life and are more likely to enable people to self-care. However, two-layer compression hosiery kits are not suitable for all people with venous leg ulcers so multi-component compression bandaging should be offered to individuals with significant oedema, exudate, fragile skin, and abnormal limb shape<sup>31</sup>.

'Wrap' compression systems offer another form of compression therapy and their clinical and cost effectiveness is currently being evaluated in an NHS funded randomised controlled trial (VENUS-6)<sup>32</sup>. Clinicians who wish to offer wrap compression systems are encouraged to do so within the trial to enable swift recruitment and completion of this study.

Mild compression is thought to have benefits for people with leg wounds, even without obvious signs of venous insufficiency by supporting the vein to improve venous return and by reducing oedema, reduce pressure on both veins and arteries. These benefits are thought to outweigh potential risks in people without 'red flag' symptoms.

Ultimately, the decision as to the type of compression therapy should be decided between the clinician and the person with the wound. Where the individual is reluctant to accept compression, the reasons for this should be explored and shared decision making undertaken. This should include the need to explore appropriate strategies to encourage concordance with therapeutic levels of compression.

*Endovenous Ablation:* For those with venous insufficiency, there is good evidence in favour of endovenous ablation for healing venous leg ulcers and preventing recurrence<sup>10</sup> and this is the recommendation in the NICE Guideline for Varicose Veins<sup>5</sup>. However, there will be some people for whom a vascular referral would be inappropriate (e.g., those unsuitable for surgical/endovenous





intervention due to frailty) so this recommendation does not replace clinical judgement and decision making in relation to the needs of the individual patient.

### **Ongoing Care**

There should be regular ongoing care for those people with leg ulcers which is in accordance with the treatment plan. Ongoing care may be provided in a variety of settings e.g., general practice, community nursing services and care homes. Supported self-management should be offered to people with leg wounds who are able and willing to be responsible for some aspects of their leg ulcer care.

Ongoing care also aims to ensure people with red flag symptoms/conditions or who show signs of deterioration in the leg ulcer are escalated to the appropriate team in a timely manner. Onward referral routes to the relevant service, specialist or speciality will need to be established. Timely escalation can result in reduced amputations, reduced hospital admissions and improved healing rates.

### **Review of Healing**

*Review and Escalation:* The literature<sup>8, 9, 10</sup> on healing rates for venous leg ulcers suggest that at least 75% of individuals with venous leg ulceration uncomplicated by other conditions should heal within 24 weeks. Therefore, if after 4 weeks of treatment, there is no evidence of progress towards healing, such people should be escalated for advice in line with local care pathways e.g., dedicated leg ulcer service, tissue viability service, vascular service, dermatology service, lymphoedema service. Similarly, those who are unhealed at 12 weeks should have a comprehensive re assessment and be escalated for advice in accordance with local pathways.

### **Care following Healing**

Most leg ulcers are due to lower limb venous disease which is a chronic long-term condition characterised by episodes of remission (healing) and relapse (recurrence of ulceration).

Endovenous ablation can eliminate the need for long-term compression in patients with purely superficial venous hypertension (i.e., structural venous disease). Such individuals can then be discharged from a service. If there is some remaining functional venous disease (e.g., failure of calf muscle pump), compression may need to continue<sup>37</sup>.

For ulceration due to an underlying cause other than venous disease, management of the underlying cause (e.g., peripheral arterial disease or lymphoedema) may be needed from the relevant specialist service.



# Appendix 1: Search strategy for research evidence

The search strategy was limited to pre-appraised sources of research evidence, using a 4S approach<sup>1</sup> to structure a search strategy as shown.

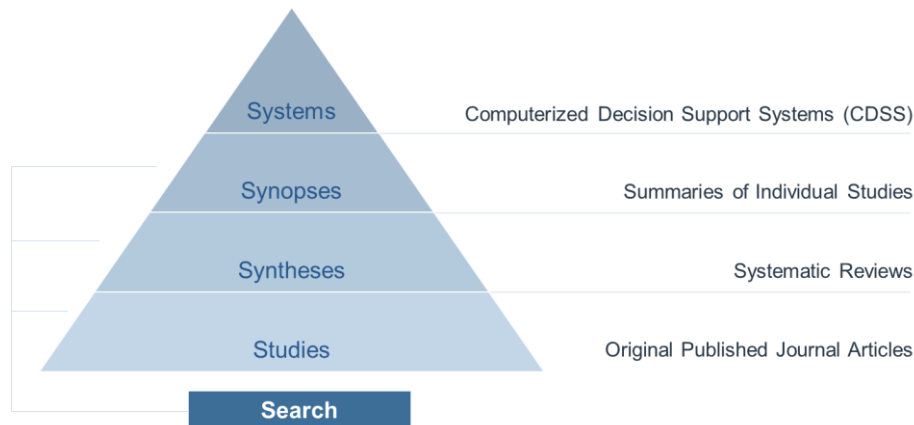


Figure 1 4S search strategy approach

- **Systems:** searched UK computerised decision support systems for chronic lower limb wounds.
- **Synopses:** searched for summaries of the current state of knowledge about the prevention and treatment of chronic lower limb wounds.
- **Syntheses:** searched the Cochrane Library of Systematic Reviews to identify reviews for chronic lower limb wounds leg ulcer treatment.
- **Studies:** searched the NIHR library for NIHR funded studies completed after publication of the relevant Cochrane systematic reviews for venous leg ulceration.

<sup>1</sup> Haynes RB Of studies, syntheses, synopses, and systems: the “4S” evolution of services for finding current best evidence *BMJ Evidence-Based Medicine* 2001;6:36-38.



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