Venous leg ulcers:
importance of early assessment and intervention for long-term success

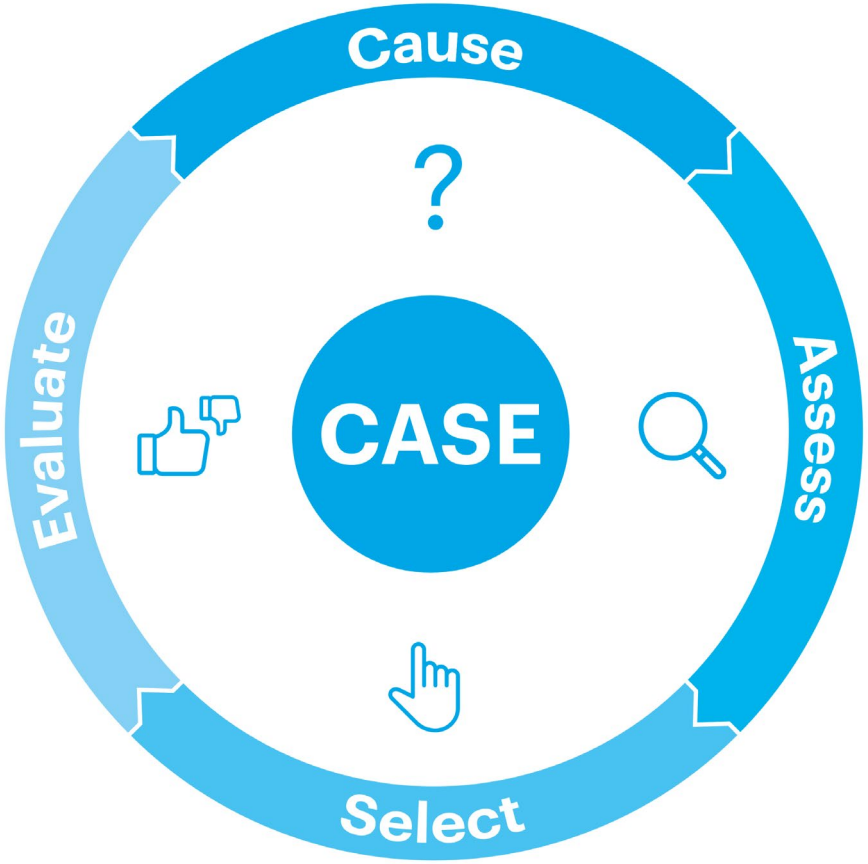
Joy Tickle
Tissue Viability Specialist,
Shropshire Community NHS Trust

JOURNAL OF COMMUNITY NURSING JCN

BSN medical
an Essity company

LIVE

Venous leg ulcers: importance of early assessment and intervention for long-term success



JOURNAL OF COMMUNITY NURSING
JCN

BSN medical
an Essity company

LIVE

Introduction

- A venous leg ulcer (VLU) can be defined as: ‘an open lesion between the knee and ankle joint that occurs in the presence of venous disease and takes more than two weeks to heal’ (National Institute for Health and Care Excellence [NICE], 2013)
- The *Burden of Wounds* study helped to highlight the impact of VLUs on patients and the economy (Guest et al, 2015)

In the UK, 2.2 million wounds are treated each year at a cost of £5.3 billion per year (Guest et al, 2015)

Introduction

- The study estimated that 278,000 people in the UK were diagnosed with a VLU in 2012/13
- Only 16% of patients with a VLU had a record of vascular assessment in their notes
- Results indicated that within the study year, only 53% of patients achieved healing

A non-healing VLU costs £13,500 per year compared with £3,000 for a healed VLU (Guest et al, 2015)

Introduction

The study findings indicated a need for:

- Differential diagnoses
- Shared management plans
- Training on the fundamentals of wound management

These measures will help to overcome problems in clinical practice and achieve better outcomes through early intervention and holistic assessment.

‘Clinical and economic benefits could accrue from improved systems of care and an increased awareness of the impact that wounds impose on patients and the NHS’ (Guest et al, 2015)

Introduction

Various tools exist to aid learning, including:

- Best practice statements, i.e. *Improving holistic assessment of chronic wounds*:
  - Explains the value and importance of holistic wound assessment
  - Describes the principles underlying holistic wound assessment
  - Shows how patients can be empowered to self-care

Introduction

- Legs Matter:
  - Organisation formed to increase awareness, understanding and action on lower leg and foot conditions among the public and healthcare professionals
  - Provides advice and support, including help packs, for healthcare professionals to improve recognition of lower limb problems and how best to manage them

Introduction

- New wound assessment tool: CASE for looking after legs (**C**ause, **A**ssess, **S**elect, **E**valuate)
  - Aims to simplify assessment
  - Takes an holistic approach for better wound healing outcomes

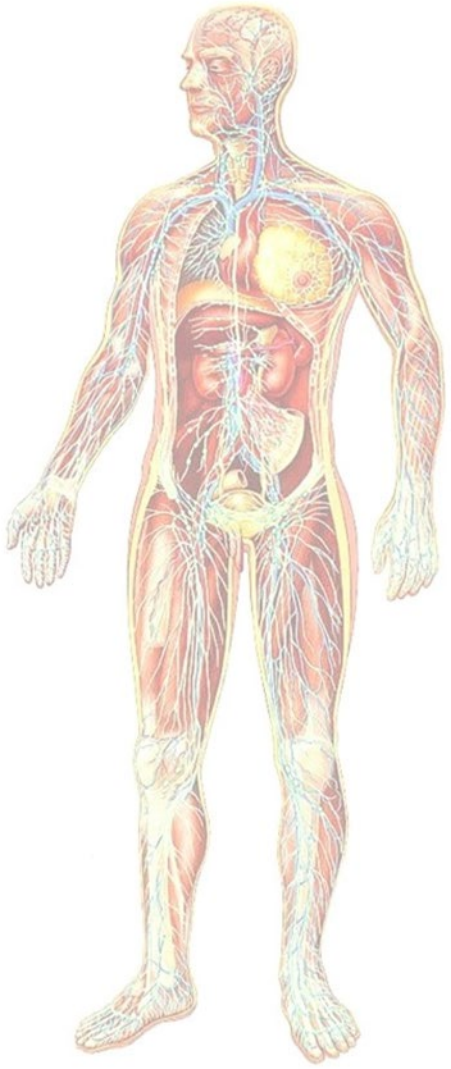
Leg ulcer aetiologies

- Vascular
  - Venous
  - Arterial
  - Mixed aetiology
- Diabetic
- Rheumatoid disease-related

Anatomy and physiology

An understanding of anatomy and physiology of the lower limbs is key to venous leg ulcer management:

- Arteries
- Veins
- Valves
- Calf pump
- Arteriovenous coupling
- Normal venous return



JOURNAL OF COMMUNITY NURSING JCN

BSN medical

an Essity company

LIVE

Anatomy and physiology — arteries

Arteries supply the body with oxygenated blood from the heart. They have thick elastic walls, which can transport blood under high pressure. The following arteries supply blood to the limb:

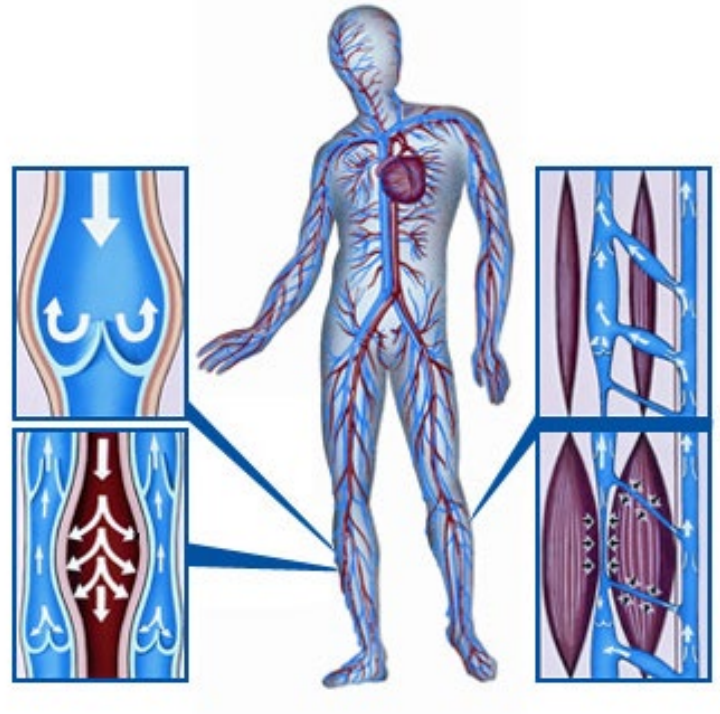
- Femoral
- Anterior tibial
- Posterior tibial
- Peroneal

Damage to, or removal of an artery will result in tissue death. Atherosclerosis deposition and accumulation of fatty material in the walls of the arteries forms plaques/hypoxia/tissue ischaemia.

Anatomy and physiology — veins

Veins carry deoxygenated blood from the body back to the heart.

- It is a low pressure/high volume system, with thinner walls than the arteries
- The venous network comprises:
  - Deep veins
  - Superficial veins
  - Capillaries
  - Perforators



These can be damaged/destroyed/ removed without tissue death.

Anatomy and physiology — capillaries

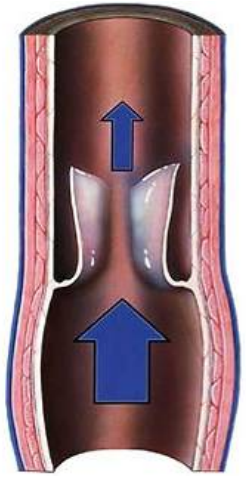
Smallest vessels of the circulatory system that feed into tissues of the body. They exchange oxygen, carbon dioxide, nutrients and waste between the arterial and venous systems:

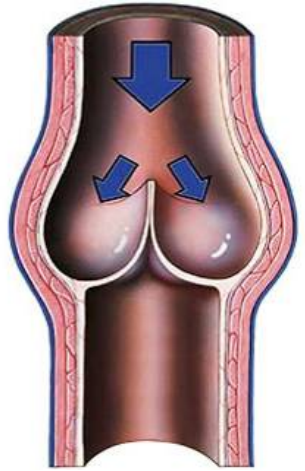
- Oxygen and nutrients to the tissues via the arterial system
- Removal of CO_2 and waste via venous system

Several litres of fluid are filtered by the capillaries each day. The remaining fluid is removed by the lymphatic system and returned to the circulation. Fluid imbalance can lead to oedema, when one or more of the circulatory functions are impaired.

Anatomy and physiology — valve function

The valves in the veins of the lower limbs are operated by the calf-muscle and foot pumps on movement.

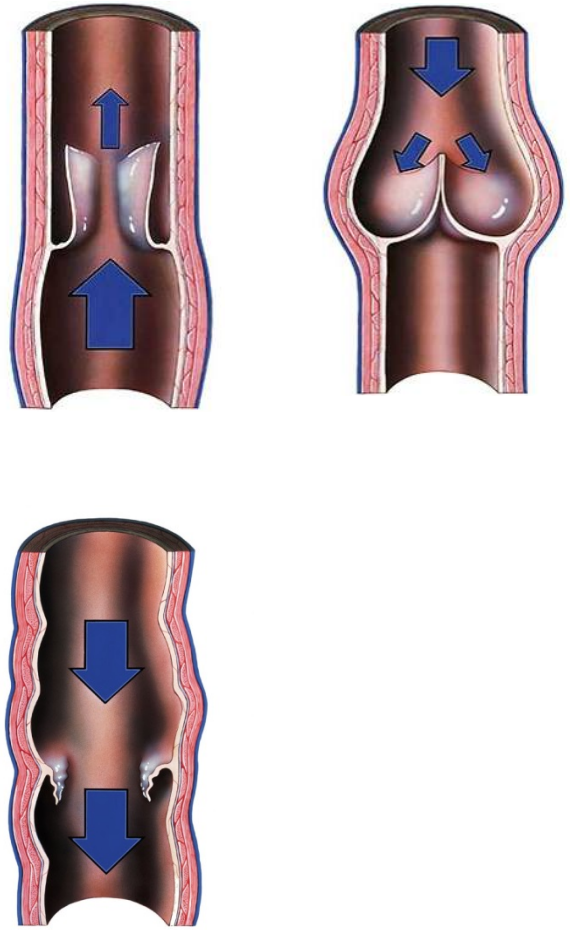




- Opening of the valves
  - Dorsiflexion and plantar flexion of the foot and calf muscle contract
  - Squeezes the veins running through them, increasing the venous blood pressure
  - Forces the valves to open
  - Increased blood flow is pushed forward, proximally

Anatomy and physiology — valve function

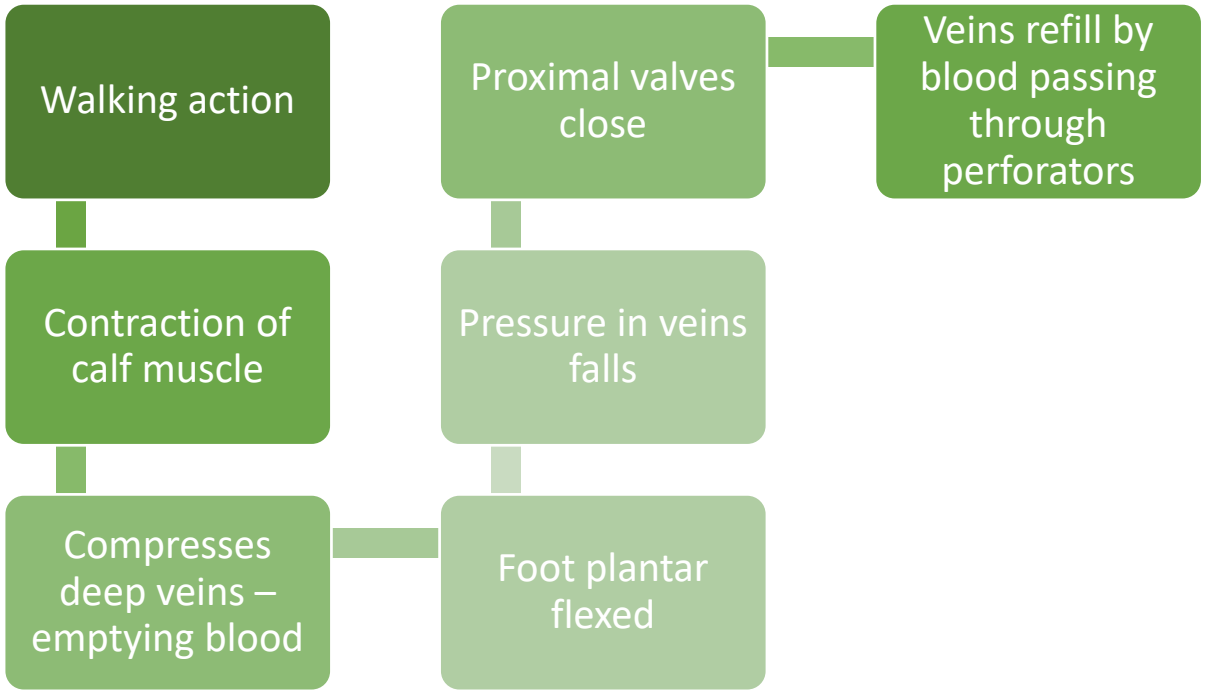
- Closing of the valves:
  - Relaxation of the muscles causes the valves to close
  - When functioning normally, valves within the veins prevent venous backflow
- Prolonged standing, increased immobility, disease or trauma can cause venous hypertension and/or incompetent valves
- Damaged and incompetent valves allow venous backflow

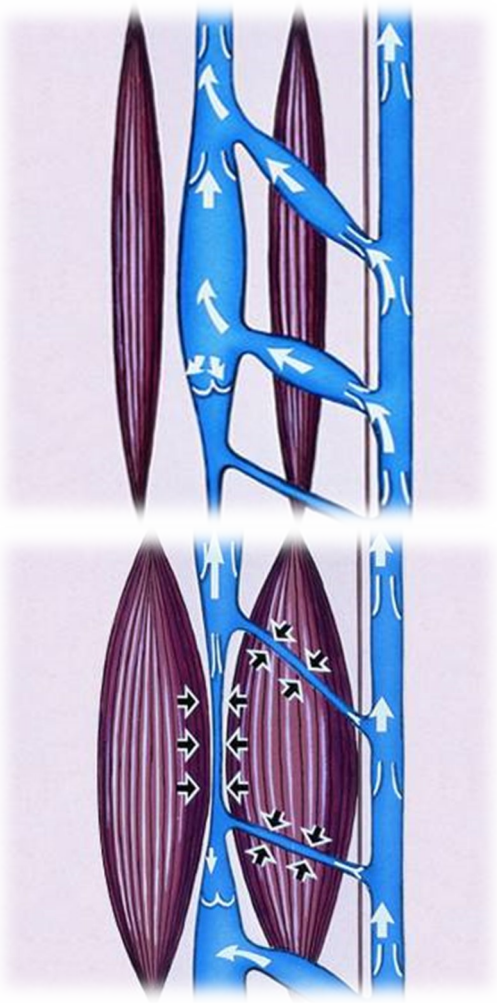


Anatomy and physiology — arteriovenous coupling

- Veins and arteries run in parallel in a perivascular sheath
- Pulse waves cause dilation of the artery, which, in turn, causes a narrowing of the veins, aiding venous return

Anatomy and physiology — calf muscle pump





JOURNAL OF COMMUNITY NURSING JCN

BSN medical
an Essity company

LIVE

CASE for looking after legs

JOURNAL OF COMMUNITY NURSING JCN

BSN medical
an Essity company

LIVE

Treatment aims — venous

Develop a clear and realistic plan of care for this patient group, which can encompass the following:

- Identify and treat underlying cause
- Reverse venous hypertension and encourage reduction of limb oedema
- Treat signs and symptoms, pain relief, effective skin management
- Effective wound bed preparation and wound management
- Support education and advice with the patient to encourage:
  - Involvement and empowerment
  - Self-care
  - Prevention of recurrence

Treatment aims — arterial

- Specialist assessment and referral
- Management of signs and symptoms
- Restoring blood flow

Remember

Strictly no compression therapy!

CASE — identify the Cause

Why is it important to determine the cause?

- Undertaking a thorough holistic assessment is crucial to obtain accurate diagnosis
- Determining wound causality and factors likely to delay healing will help improve treatment outcomes for your patient
- Intrinsic and extrinsic factors can be altered to encourage healing
- When assessing the cause consider:
  - Sustained venous-hypertension
  - Superficial venous incompetence
  - General health, medical history, lifestyle choices, psychosocial factors and QoL
  - Dexterity, mobility, ability/desire to self-care

CASE — identify the Cause

Risk factors

- Hereditary disease
- Occupations involving standing/sitting for long periods
- Age
- Gender
- Contraceptive pill
- Multigravida/pregnancy
- Obesity
- Injury to lower limb
- Varicose veins — treated or untreated
- DVT of affected leg
- Phlebitis of affected leg
- Venous hypertension
- Intravenous (IV) drug use
- Damage to valves through surgery/trauma
- Congenital vein abnormalities

CASE — identify the Cause

Arterial disease — risk factors

- Age
- Smoking
- Hyperlipidaemia
- High blood pressure
- Coronary heart disease
- Diabetes
- Arthritis

CASE — Assess the lower limb

JOURNAL OF COMMUNITY NURSING JCN

BSN medical
an Essity company

LIVE

CASE — Assess the lower limb

Assessment of the lower limb should aim to identify signs of venous and/or arterial disease and consider:

- Vascular status
- Patient
  - Aching, tired and heavy feeling to limbs
- Skin
- Wound/s

CASE — Assess the lower limb

Vascular assessment

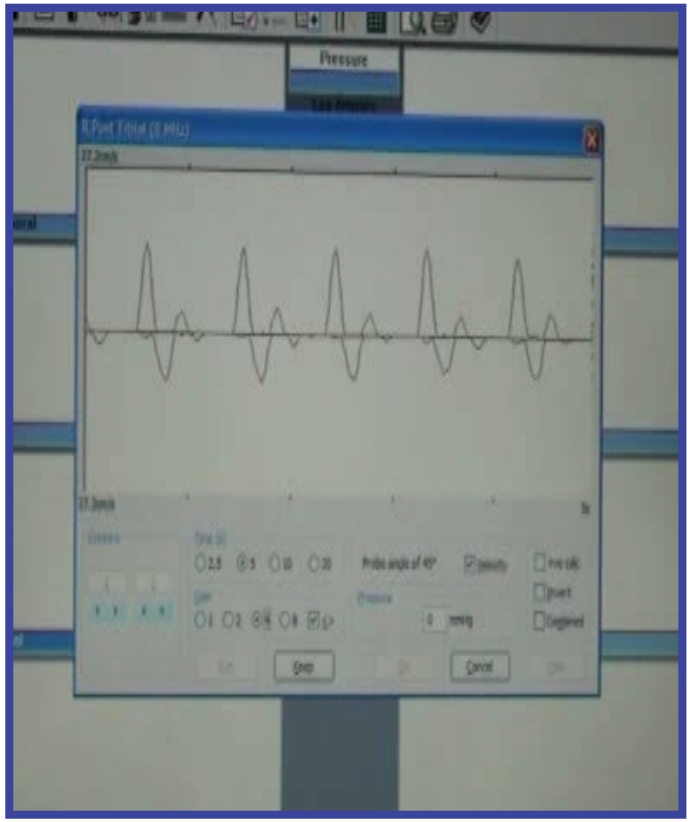
Arterial disease — signs and symptoms

- Loss of hair, perfusion poor, pale bluish pallor
- Ulceration generally located on foot, toes, heel and malleolar
- Intermittent claudication — cramp in leg muscles when walking, normally relieved by rest
- Resting on elevation. Normally relieved by hanging limb out of bed, or resting with foot on the floor
- Dependent rubor or ‘sunset foot’

CASE — Assess the lower limb

Vascular assessment

- Vascular assessment EXCLUDES the presence of significant arterial disease and confirms it is safe to proceed with compression
- Most common method is to determine ankle brachial pressure index (ABPI)
- Must have ability to measure and interpret results, or refer onwards
- Findings might reveal need for further investigation
- Repeat vascular assessment at regular intervals according to local policy



CASE — Assess the lower limb

Classification of venous insufficiency using CEAP

Grade	Description
C0	No evidence of venous disease
C1	Superficial spider veins
C2	Simple varicose veins only
C3	Ankle oedema of venous origin (not foot)
C4	Skin pigmentation in gaiter area
C5	Healed venous ulcer
C6	Open venous ulcer

CASE — Assess the lower limb

- Superficial spider veins
  CEAP grade 1

- Varicose veins/thread veins
  CEAP grade 2

- Oedema and induration CEAP
  CEAP grade 3

JOURNAL OF COMMUNITY NURSING JCN

BSN medical
an Essity company

LIVE

CASE — Assess the lower limb

- Haemosiderin staining/ skin staining
  CEAP grade 4

- Healed leg ulcer
  CEAP grade 5

- Open leg ulcer
  CEAP grade 6

JOURNAL OF COMMUNITY NURSING JCN

BSN medical
an Essity company

LIVE

CASE — Assess the lower limb

- Venous eczema

- Atrophie blanche

CASE — Assess the lower limb

Skin, examine for:

- Redness or inflammation
- Itching or blistering
- Hyperkeratosis or dry skin, lipodermatosclerosis, excoriation or moisture-associated dermatitis
- Presence and distribution of oedema
- Limb size and shape (e.g. reduction or loss of calf muscle, inverted champagne bottle shape)
- Mobility and/or ankle movement
- Colour and temperature of skin, e.g. coldness, pallor

Repeat at regular intervals

JOURNAL OF COMMUNITY NURSING JCN

BSN medical
an Essity company

LIVE

CASE — Assess the lower limb

Wound, examine and assess for using TIME framework:

- **T**issue — tissue types present, quality of tissue
- **I**nfection or inflammation — colonisation is common in VLUs; assess for signs of infection or possible biofilm
- **M**oisture imbalance — any exudate should be assessed in terms of colour and viscosity as well as volume
- **E**dge of wound — assess for signs of over-granulation, encrusted debris, rolled edges
- Repeat assessment at each dressing change
- Assess for progression of improvement

CASE — Select appropriate therapy

JOURNAL OF COMMUNITY NURSING JCN

BSN medical
an Essity company

LIVE

CASE — Select appropriate therapy

Creating a care plan

It is important to involve your patients when building a plan of care.

- Forming a patient partnership is essential to help:
  - Determine appropriate treatment options
  - Determine what will best benefit your patient's lifestyle
  - Provide better patient-clinician communication
  - Set realistic patient expectations

CASE — Select appropriate therapy

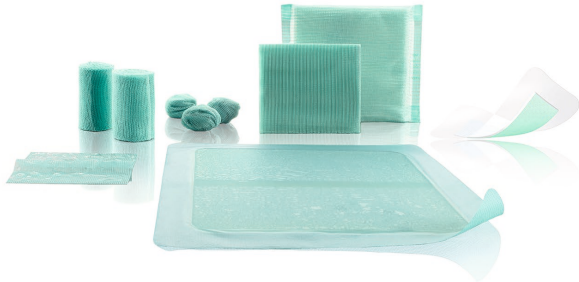
Lower limb:

- Wash legs once a week as a minimum
- Consider using a debridement pad if surrounding skin requires removal of hyperkeratosis or slough is present on the wound bed
- Moisturise the skin using an appropriate emollient
- Treat any other skin conditions appropriately, i.e. eczema

CASE — Select appropriate therapy

Wound care:

- Effective dressing selection to meet the wound's objectives, i.e. moist wound healing, antimicrobial properties, etc. Adhere to local guidelines/formulary
- Debridement — removal of necrotic/sloughy tissue using autolytic/mechanical methods such as dressings (hydrogels/debridement pads)
- Manage exudate volume and viscosity to prevent damage to periwound skin (consider use of foam or superabsorbent dressings)



CASE — Select appropriate therapy

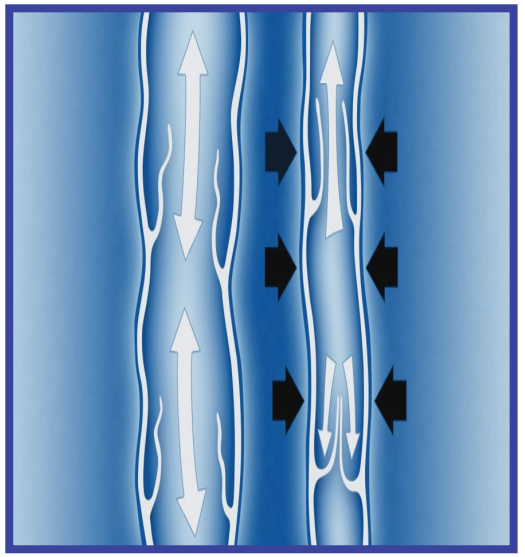
Wound care:

- Observe for clinical signs and symptoms of infection, treat in line with local formulary (consider using antimicrobials or antibiotics for systemic infection):
  - Treat local signs of infection
  - Consider prophylactic treatment for high-risk patient groups

CASE — Select appropriate therapy

Compression therapy:

- Compression therapy is a fundamental pre-requisite to the healing of venous leg ulcers, managing venous hypertension, chronic oedema and lymphoedema (NICE, 2012)
- Compression is a continuous, restoring force by a material that exerts circumferential elastic pressure, expressed in millimetres of mercury (mmHg)
- Aims to reduce blood pressure in superficial venous system and reverse venous hypertension (counteract force of gravity)
- Acts on venous and lymphatic systems to improve venous and lymph return — reduce oedema (Wounds International, 2013)



CASE — Select appropriate therapy

Compression therapy:

- 40mmHg external pressure at the ankle, graduating to 15–20mmHg below the knee
- Compression therapy options include:

With oedema	Without oedema
Inelastic or short-stretch bandages	Multi-layer compression bandaging systems
Wrap compression systems	Two-layer compression hosiery systems

CASE — Select appropriate therapy

Compression therapy:

- Assess limb shape and size
- Whether bandaging below knee or full leg, the leg must have a graduated, conical shape or graduated compression will not be achieved (Laplace's Law)
- Protect bony prominences
- Use extra padding for ankles of less than 18cm diameter, slender calves or legs with a narrow gaiter area ('champagne bottle leg')

CASE — Select appropriate therapy

Compression options

Multi-layer compression bandage systems:

- The aim of multi-layer bandaging is to provide 40mmHg of compression at the ankle, reversing venous hypertension
- Mixed aetiology ulcers may require reduced compression, where three bandage layers will be required applying 23mmHg of compression at the ankle
- This should only be when advised by a clinician/consultant

CASE — Select appropriate therapy

Compression options

Short-stretch bandages:

- The mechanism is different to elastic, multi-layer compression
- The bandages are made from 100% cotton and stretch very little when pulled, maintaining a rigid tube around the leg
- Designed to apply force onto the calf muscle, forcing the bloodflow back up the leg
- Pressure is lowest at rest and highest when the calf changes shape during movement
- If using short-stretch bandaging due to oedema, bandage changes will be more frequent while oedema reduction is achieved

CASE — Select appropriate therapy

Compression options

Two-layer stocking system:

- Comprises a liner and outer stocking
- Two components provide a nominal compression of 40mmHg at the ankle
- Suitable for leg ulcer management and prevention of recurrence
- Encourages patient concordance and self-care, as easy to manage dressing changes, shower/bathe and wear ‘normal’ shoes

CASE — Select appropriate therapy

Compression options

Wrap compression systems:

- A valuable aid in the management of lymphoedema, chronic oedema and venous conditions
- Wrap compression systems can be used as an alternative to
  - Bandaging for vascular conditions to support self-management or non-compliance
  - Bandaging/compression garments to address fluctuating oedema
  - Multi-layer lymphoedema bandaging (MLLB) during phase 1, decongestive lymphatic therapy
- Wrap compression systems consist of bands that replicate short-stretch bandaging, providing effective graduated compression

Case report — leg ulceration with oedema

Empowering patients to self-care with a Velcro wrap compression device

- This 92-year-old lady had a history of bilateral leg oedema and intermittent ulceration
- She was reluctant to wear compression hosiery and finds bandages uncomfortable
- She does not want to become a burden on the NHS and values her independence and freedom from clinic appointments and so self-manages, with her carer changing her dressings as required

Evaluating clinician:
Jane Todhunter,
Vascular Nurse Practitioner, North Cumbria University Hospitals

JOURNAL OF COMMUNITY NURSING JCN

BSN medical
an Essity company

LIVE

Case report — leg ulceration with oedema

Empowering patients to self-care with a Velcro wrap compression device

- At first clinic visit she had bilateral leg oedema with shape distortion, and a large circumferential ulcer to her right gaiter
- Her ankle brachial pressure index (ABPI) was normal and she was known to have deep venous reflux

Evaluating clinician:
Jane Todhunter,
Vascular Nurse Practitioner, North Cumbria University Hospitals

JOURNAL OF COMMUNITY NURSING JCN

BSN medical
an Essity company

LIVE

Case report *continued*

- Due to her poor tolerance of compression in the past, she would only agree to try reduced compression in the form of a two-layer short-stretch system
- Cutimed® Sorbion® Sachet XL (BSN medical, an Essity company) was used as the primary dressing to absorb the exudate
- At her clinic visit the following week, the oedema in her leg had started to reduce and exudate volume had decreased. The ulcer was also smaller

JOURNAL OF COMMUNITY NURSING JCN

BSN medical
an Essity company

LIVE

Case report *continued*

- She was adamant that she did not want to continue with professional input on a weekly basis, and wondered if her carer could be taught how to apply the compression bandages. The concept of a JOBST® FarrowWrap® garment was offered as an alternative
- She was measured for a JOBST® FarrowWrap® Lite due to her low tolerance for compression
- She was reviewed two months after her initial visit. The ulcer had almost healed, there was very little exudate and her skin condition had improved

Case report — leg ulceration without oedema

Treating multiple leg ulceration in a drug abusing patient with a two-layer compression stocking system

- This 36-year-old male patient presented with multiple ulcers to both legs of 14 months' duration
- He had a previous history of IV drug abuse and DVT to both legs
- He had tried compression bandaging but, due to his chaotic lifestyle, had failed to attend follow-up appointments
- Goals of treatment were to reduce volume of exudate and promote healing

Evaluating clinician:
Dr Leanne Atkin
Lecturer practitioner / Vascular Nurse Specialist
Mid Yorkshire NHS Trust

Case report *continued*

- It was agreed to dress the wounds with an antimicrobial hydroFiber dressing plus an adhesive-bordered foam dressing, and a hosiery kit. JOBST® UlcerCARE™ Ready-to-Wear 2 in 1 Compression System was chosen
- At the first and second reviews considerable improvement was seen, with exudate volume and malodour reducing
- At the third and final review, the ulcer to the right medial aspect had completely healed and the others were continuing along the healing trajectory

- Being able to self-care had a considerable impact on the patient's quality of life, as in only two weeks the hosiery had reduced limb volumes, and the lack of bulky bandages allowed him to wear normal clothes and footwear and carry out daily activities, including taking young children to school

Summary

- Venous leg ulcers can have a significant impact on a patient's quality of life, with associated personal, social and psychological effects
- They also incur a considerable financial impact on healthcare providers, as well as a wider social and economic impact (EWMA, 2016)
- Wound chronicity brings with it a risk of increased bioburden, infection and biofilm development
- Early intervention of patients at risk is essential in preventing symptoms worsening
- Using a tool such as **CASE** can optimise your patients' chance of healing
- For healing to progress, the wound and surrounding skin should be managed and the underlying venous disease addressed using compression therapy (Wounds UK, 2015)
- As the burden of chronic wounds continues to grow in the UK (Guest et al, 2015)), it is important that products simplify VLU management for practitioners in order to save time and improve outcomes

JOURNAL OF COMMUNITY NURSING JCN

BSN medical
an Essity company

LIVE

Summary *continued*

- Assessment toolkit from BSN Medical:
    1. Brand new Best Practice Statement (BPS):
    Improving holistic assessment of chronic wounds
    2. Holistic assessment of venous leg ulceration best practice statement
    3. New wound assessment tool: CASE (Cause Assess Select Evaluate)
    4. BSN medical Educational Academies brochure which summarises the free, modular education we can provide on a wide variety of topics

- If you would like to receive the 'CASE for looking after legs Toolkit' then please do contact us at concierge.service@bsnmedical.com with your name and work address and we'll be happy to send this out to you. Or feel free to call our concierge service on: 01482 670177

JOURNAL OF COMMUNITY NURSING JCN

BSN medical
an Essity company

LIVE

Further free education

- Further free education and training is available via BSN medical educational academies

- Modules, including among others:
  - Anatomy and physiology of skin
  - Factors affecting wound healing
  - Infection management
  - Improving the assessment of wounds
  - Leg ulcer management
  - Chronic oedema

JOURNAL OF COMMUNITY NURSING JCN

BSN medical
an Essity company

LIVE

Thank you for watching!

BSN medical
an Essity company

JOURNAL OF COMMUNITY NURSING
JCN

LIVE