Leg Ulcer Management
Let's Go!
Leg Ulcer Management

**Aims**
- Revise the pathophysiology of venous and arterial Ulcers
- Review the process of assessment

**Outcomes**
- Demonstration of Doppler Ultra Sound
- Management of leg ulcers
- Where to from here?
What is a leg Ulcer?

It is a breach in the integrity of the skin in the lower limbs, usually below the knee. Many ulcers can start as a scratch or tear in the skin and due to other contributing factors present, may progress to an ulcer in 6 weeks.
Venous leg ulcers.

- Located in the gaiter area
- Shallow in appearance sometimes with diffuse edges
- Oedema usually present
- Often highly exuding wounds
- 30% of pts suffer with pain
- Accompanied by Varicose Veins
- Pulses can be palpated in the absence of oedema
- You may see ankle flare
- Lipodermatosclerosis
- Ulcers can be multiple or circumferential.
- There can be eczema present, venous or gravitational.
- Haemosidrin staining can be present (looks like rust)
- There may also be atrophy blanche.
- Approximately 50% of ulcers are venous.
Arterial ulcers

- Located on any part of the leg, most common on or below the ankle.
- Small and punched out appearance.
- Oedema is generally localised to the wound.
- Tendency to be dry wounds.
- Slow capillary refill.

- Usually very painful ulcers, mostly at night.
- Leg can be shiny, tight, hairless and cold.
- Pulses are reduced and/or absent.
- You may see trophic changes to the nails
- Rubor
- Approximately 30% of leg ulcers are arterial.
What are the other types of Leg Ulceration?

- **Diabetic** - Poor/compromised peripheral circulation (Necrobiosis Lipoidica)
- **Rheumatic Arthritis** - Calcification of blood vessels usually in the arterial tree
- **Malignancy** - SCC, BCC, Melanoma & CTCL
- **Underlying Disease** – Pyoderma Gangrenosum, Mental Health (Artefact), Eczema Craquele/dependant oedema, Sickle Cell and thalassemia
Holistic Assessment

Holistic assessment is key, accurate identification of the underlying pathophysiology of the ulceration leads to the provision of the optimal treatment.

- Patient history of the wound
- Social history, what was or is the patient's occupation?
- Medical history, get the pts perspective
- Observations
  1. Blood pressure
  2. Temperature
  3. Pulse
  4. Urinalysis or Bm check
  5. Height or weight, might need an MNA
Holistic Assessment.

- Varicosities and or staining (haemosidrin deposits)
- Lipodematosclerosis, fibrosis of the dermis and sub cutis, with induration (hardening)
- Oedema
- Eczema or Hyperkeratosis
- Rubor, redness of the limb when dependant
- Atrophy blanche, avascular areas of white tissue, lace like scarring
- Ankle flare, dilated venuoles and capillaries adjacent to the medial malleolus and extending towards the sole of the foot.
Holistic Assessment

- What are the co-morbidities
- What is the ankle movement like
- Assess the pain, what eases the pain, elevation or lowering of the legs?
- Medication history.
- Lab tests if required (FBC ESR)
- Look at the wound itself and the peri wound skin.
In 1842 Anston Doppler described the ‘Doppler effect’, Where there is a change in the pitch of a note when approaching or receding from the listener. This sound is measured in Hertz and the pitch of the note depends on the number of vibrations that reach the ear in a second.
Doppler Ultra Sound

The holistic assessment should indicate the type of ulcer we are dealing with, Doppler U/S confirms our diagnosis.

Doppler is contra indicated in these cases
- DVT real or suspected
- Where pt is unable to lie flat (COAD)
- Pain on inflation of the cuff.

The Ankle Brachial Pressure index is measured by dividing the arm pressure by the leg pressure, just remember to

Get your leg over
Doppler ultra sound.

The Doppler unit mostly used in the DHB I work in is the Huntleigh hand held unit, It consists of a transducer probe with lead attached to an audio unit. The probes can be changed as you will require a different probe for a specific condition.

- 8mhz for a normal limb
- 5mhz for an oedematous limb.
Doppler ultra sound

The Doppler will detect arterial and venous blood flow but the sounds will be very different, arteries emit a very strong pulsatile sound and veins give a roaring or whooshing sound, we are measuring the systolic blood pressure of the arteries.

An ABPI of
- <0.3 Critical Ischemia (refer immediately)
- <0.7 Moderate Ischemia (Vascular out patients)
- 1.0 – 0.7 Could be mildly ischemic, reduce oedema and recheck Doppler's.
- >1.5 May not be able to occlude the arteries ? Due to calcification, refer to VOPC
Management of leg ulceration.

Management is as holistic as assessment for all types of leg ulcer, the diagnosis and the treatment options available can be specific to the aetiology of the ulcer, but we have to consider other factors which go into holistic management. These other aspects can be as simple as getting the correct dressing product for the wound, and as difficult as referrals for orthotic footwear.
Holistic management.

Enable the patient to exercise, there may be cause for a green prescription, podiatry may be indicated or correct footwear.

It may need a referral to another service, such as the District Nurses, vascular surgeons or dermatology.

Diet is important, weight loss may be indicated, there could be another referral to dietetics.

Health promotion is important, smoking cessation for a client with arterial disease.

Drinking excessive amounts of alcohol will exacerbate skin conditions such as psoriasis, working with a patient to reduce alcohol intake would be very beneficial.
Holistic management.

- A medication review may be necessary as a number of medications impair or suppress healing, such as steroids and cytotoxic drugs.

- The factors which may be uppermost in your patients mind are the social ones such as having to take time off work, the loss of earnings. This may necessitate a referral to WINZ or we can try working around the patients schedule.

- The aesthetic considerations of the look of treatment. Not everyone wants the world to know they have a leg ulcer.
Skin Care

Skin care is of vital importance in the treatment of leg ulcers (and chronic wounds)

Careful choice of wound product, noting patients professed allergies.

Allowing a pt to shower.

Choice of emollient is dependant on peri wound skin condition and pt choice

1. Lotions – these evaporate very quickly and cool the skin, great for inflamed areas
2. Creams – mostly water so help to re establish moisture to the skin, they are easy for pts to wash off
3. Gels – now much more common, cooling and non greasy
4. Ointments – Semi solid grease or oil with very little water, they occlude water loss and re establish the lipid layer in the skin, very good to use when the area is damp
Steroid Use

1. Mild – Hydrocortisone 1 to 2.5 %
2. Moderate – Eumovate
3. Potent – Betnovate, locoid
4. Very potent – Dermovate

Apply using the Finger Tip unit rule!
1FTU = ½ gram
Steroids are meant to be applied sparingly and up to 2 times per day.

Remember
- The skin can atrophy, and become inflamed by over use of steroid
- Steroids can induce acne or rosacea
- Fungal infections can be potentiated
- Allergies exist to steroids
- There is a risk of systemic absorption
- Tachyphylaxis reduced response to steroids
Compression therapy.

Most research on leg ulcer management is from the UK, published by the RCN and SIGN.

Within the UK the NHS spends approximately 1 billion pounds per year on chronic wound care and 400 million of that is for leg ulcer management.

There is very little statistical information from NZ on the health care spend for Leg ulcers.

There is a guideline from the New Zealand guideline group, available on the internet at www.nzgg.org.nz
Compression therapy

- The theory of compression therapy is that it will

1. Counteract the increased pressure in the superficial veins and reduce the distension in these veins.
2. Encourage and enhance blood flow velocity in the veins.
3. Discourage ankle swelling, reducing the pressure differences between the capillaries and the tissues, thus restoring the rate of tissue fluid formation towards normal.
Laplace's Law

Laplace's Law is the mathematics behind compression therapy. It can be explained in the equation:

\[ P = \frac{N \times T}{C \times W} \]

Where:
- \( P \) = Pressure of the bandage
- \( N \) = Number of layers
- \( T \) = Tension of bandages
- \( C \) = Circumference of the limb
- \( W \) = Width of the bandages.

It basically means that sub-bandage pressure is directly proportional to the bandage tension (during application) and the number of layers applied, and inversely proportionate to the curvature of the limb. The pressure lessens as you bandage up from the ankle.
Bandaging

4 Layer compression therapy is still the gold standard in treatment of venous and mixed ulceration. It provides graduated compression, the highest mmHg at the ankle, with approx ½ that at the top of the calf. Compression reduces the venous hypertension within the vascular system by
- Reducing the diameter of major blood vessels, thereby reducing the local blood volume.
- Improving lymph drainage, by reducing lymph in the tissues.
- Reducing venous stasis

There are many different types of compression that we can employ
- 4 layer/multilayer systems
- Inelastic or short stretch
- 3 layer tubigrip and shaped tubigrip
- Highly elastic bandages, tensopress and surepress.

Modified compression is used to achieve compliance and remove oedema when the diagnosis is of mixed aetiology, it also helps to achieve pain control. 3 layer compression is not heavily dependant on ankle size.
Bandaging

3 layer systems
- Sofban, shapes, protects and absorbs.
- Crepe is purely a retention bandage.
- Coban is a 3b classified bandage and gives ~ 23 to 25 mmhg on an ankle that is size 18 to 25 cm, therefore it follows that the compression would be more on a thinner ankle and less on a larger ankle.

4 Layer systems (18–25)
- Sofban, shapes, protects and absorbs.
- Crepe, purely retention.
- Elset or profore # 3, apply in a figure of 8 it provides twice as much compression, 15 to 17 mmhg.
- Coban, spiral toe to knee it provides 23 to 25 mmhg compression. Elset and Coban combined provides 40 mmhg of compression at the ankle, gradually lessening to approx 15 to 20 mmhg at the proximal calf.
Bandaging

- Short stretch bandages are now more common as they can be washed and reused up to 20 times.
- They provide up to 60 mmHg of compression when the patient is active, the bandage creates an antagonist against which the calf muscle pump can work.
- The sub bandage pressures are lower at rest, meaning less pain at night.
- Short stretch bandaging is used to good effect when the shape of the leg requires specific padding for 4 layer compression.
Bandaging

- For arterial ulcers if the ABPI indicates you can use modified compression, 3 layer or a tubular bandage.
- Though you need to be aware that arterial ulcers should, if they are to be bandaged, be padded with a toe to knee layer of sofban and then crepe toe to knee, to prevent the tourniquet effect.
- However the most important thing to remember is that patient concordance is essential, so the treatment must be agreed upon by both the practitioner and the patient.