FUNDAMENTALS OF LOWER LIMB MANAGEMENT

Martha Williams
Joint Tissue Viability Lead
Fran Russell
Senior Tissue Viability Nurse

DAY 1 AIMS AND OBJECTIVES

- To understand the anatomy and physiology of the vascular and lymphatic systems in order to determine underlying aetiology and disease progression.
- To identify risk factors for leg ulcers and oedema and understand how to modify these.
- To be able to conduct a holistic assessment.
- To identify reasons for delayed healing and poor outcomes and develop an effective care plan to support timely healing.
- Exploration of patient experiences and clinician attitudes and how this may affect care.
- Identify management options.
- To carry out a holistic lower limb assessment in order to diagnose aetiology

DAY 2 AIMS AND OBJECTIVES

- Introduction to local pathways.
- Learn how to undertake a manual doppler assessment, identify pedal pulse types and calculate ankle brachial pressure index.
- Understand the theory of graduated compression, La Place's Law and Pascal's Law
- Exploration of the benefits of compression therapy and overcoming barriers to implementation
- Introduction to effective application technique of Actico, K2 and Ko-Flex with an opportunity to practice under supervision
- Practice effective application technique of below knee Actico, K-Two and Ko-Flex bandaging for venous leg ulceration and thigh high Actico bandaging for chronic, including stump bandaging to toes

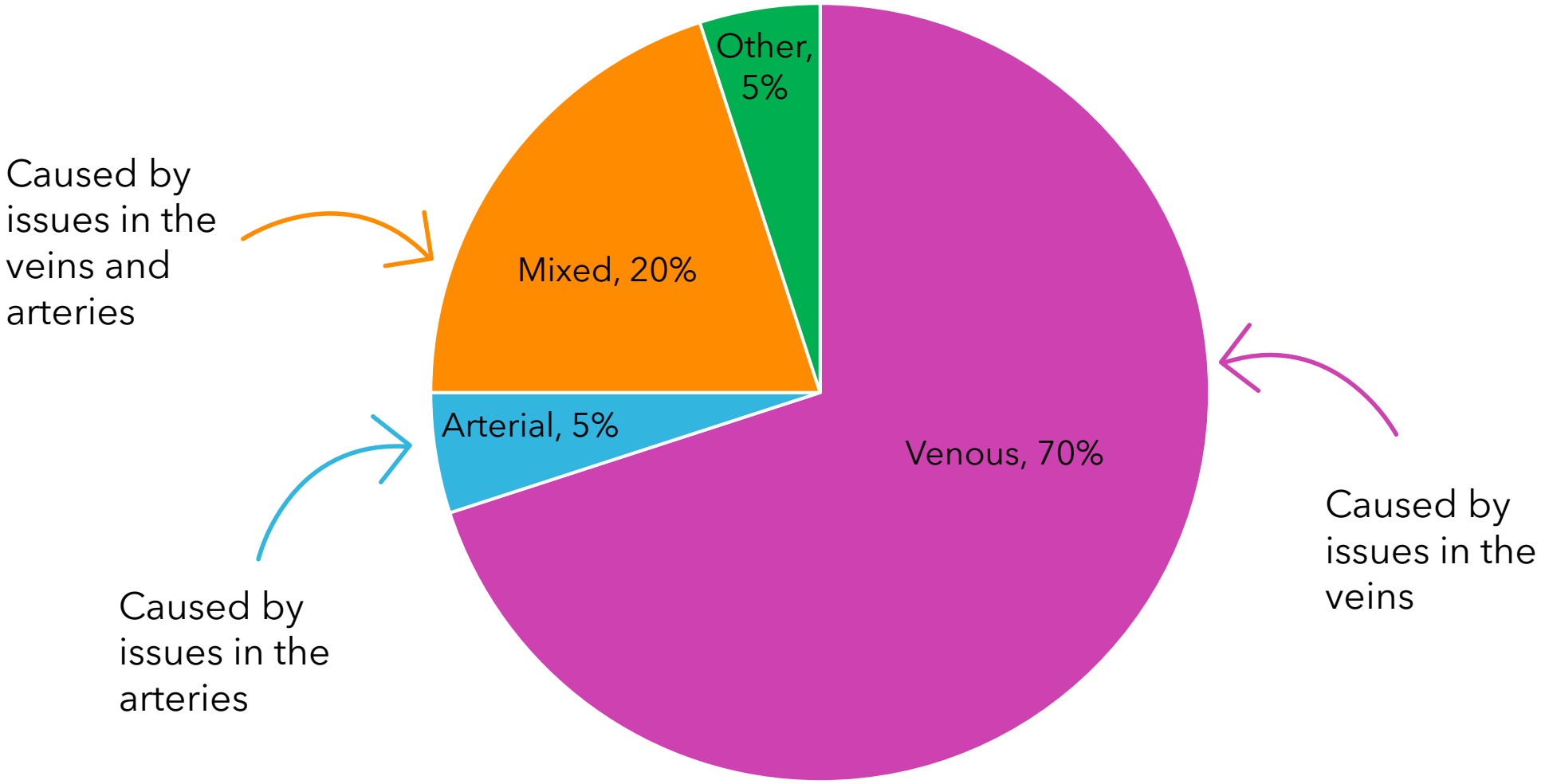
PLEASE BRING MANUAL DOPPLER AND SPHYG TO DAY 2!

QUESTION:

Why do we see lots of wounds and oedema in the legs but not in the arms?

95% of all leg ulcers are associated with circulatory disease

(Probst et al, 2023)

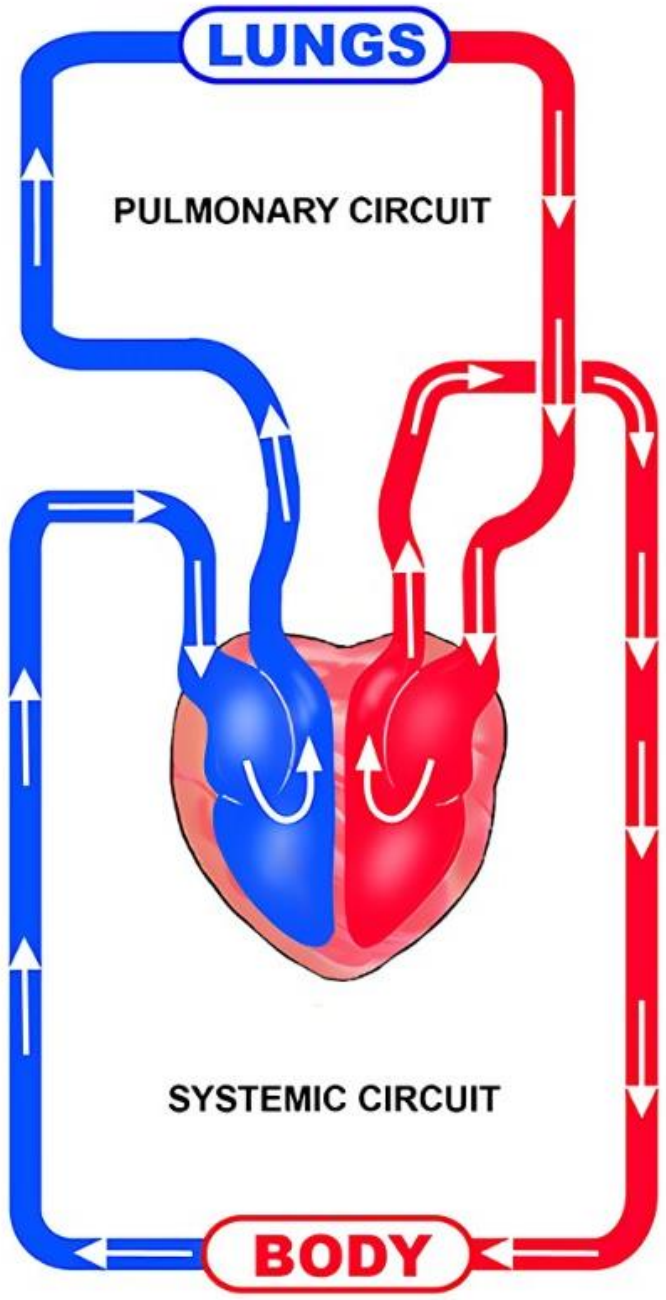


CAUSES & PREVELANCE OF LEG ULCERS

THE CIRCULATORY SYSTEM

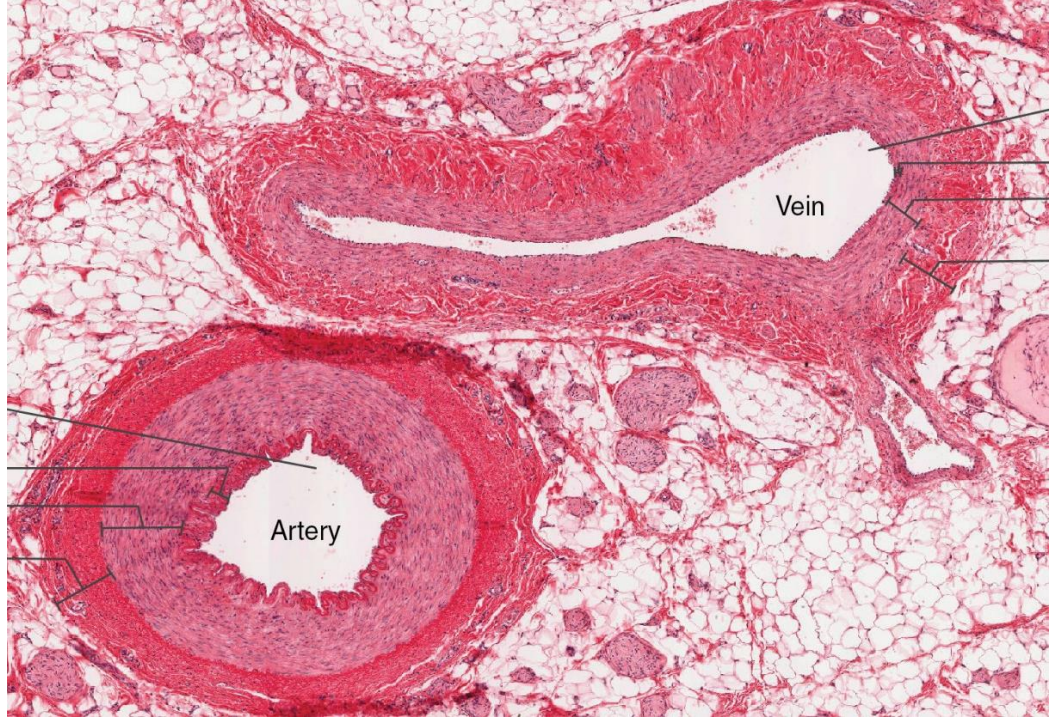
Veins carry deoxygenated blood and waste products

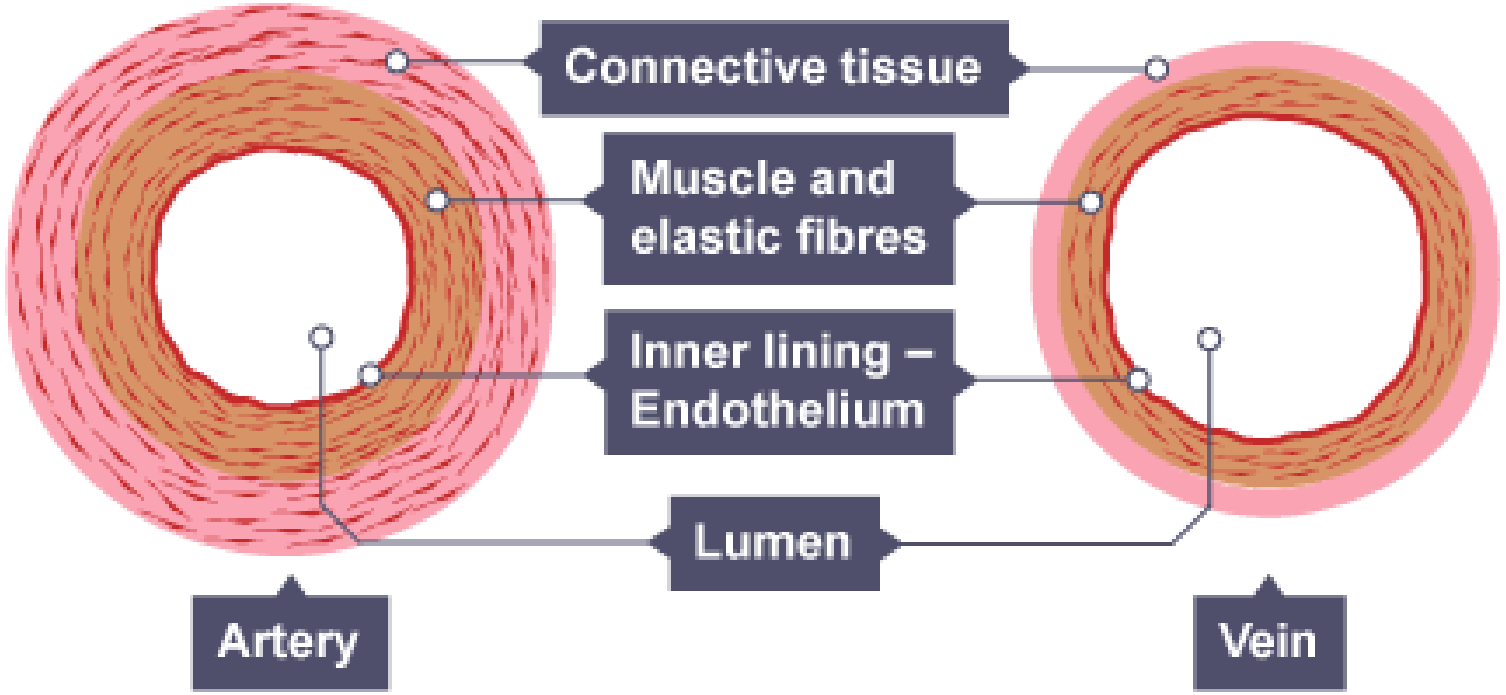
Tissues → Capillaries → Venules → Veins → Heart



Arteries carry oxygenated blood and nutrients

Heart → Arteries → Arterioles → Capillaries → Tissues





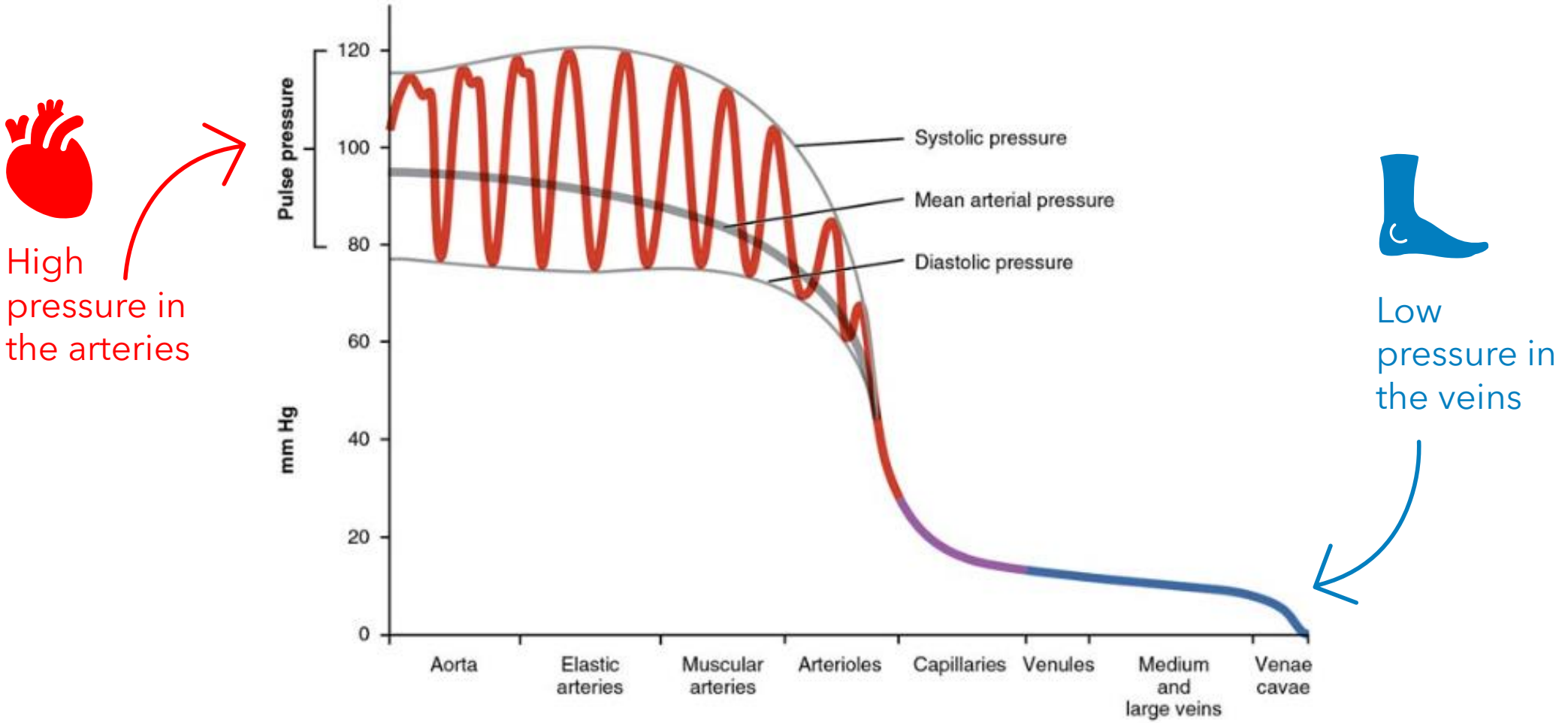
STRUCTURAL CHARACTERISTICS OF BLOODS VESSELS

ARTERIES

- High pressure
- Thick walls
- Small lumen

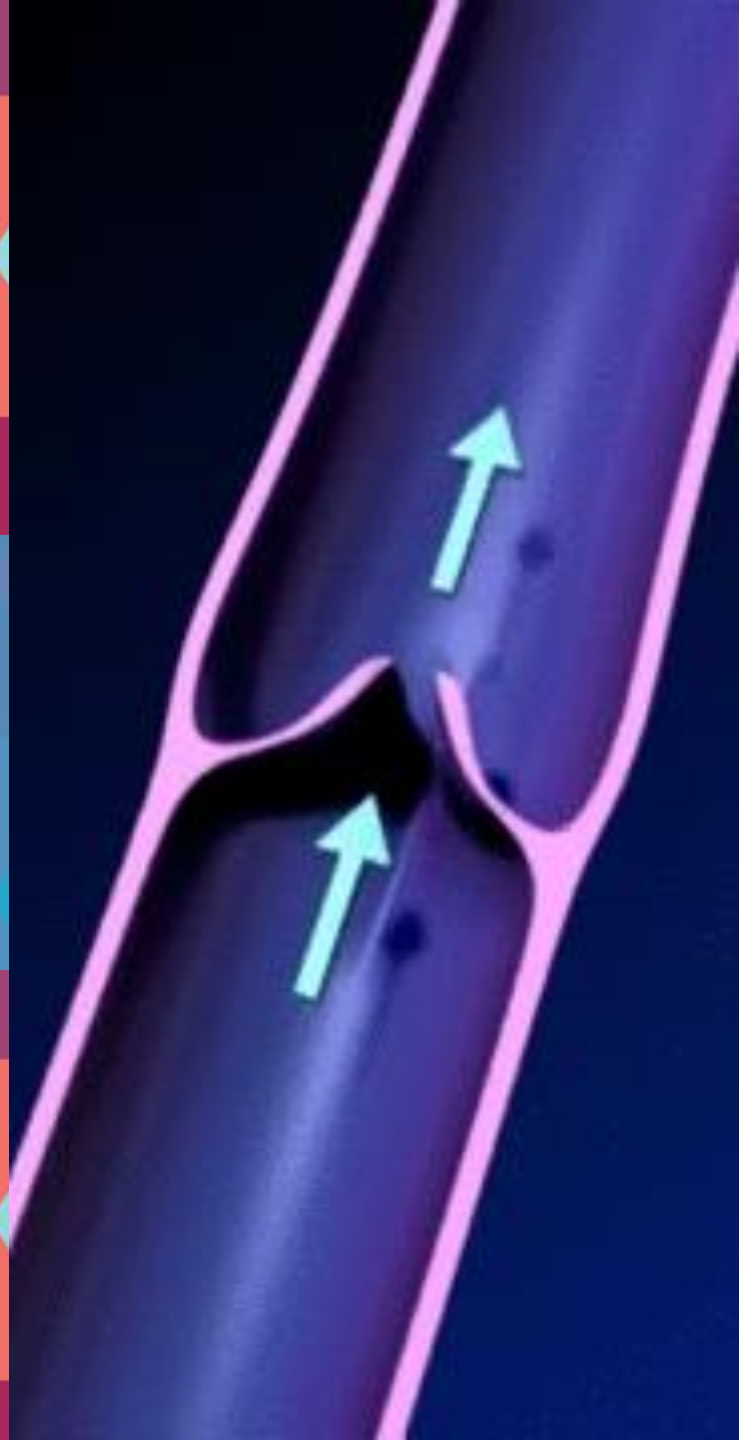
VEINS

- Low pressure
- Thinner walls
- Large lumen



WHAT CAN GO WRONG IN THE VEINS?

VALVES IN THE VEINS

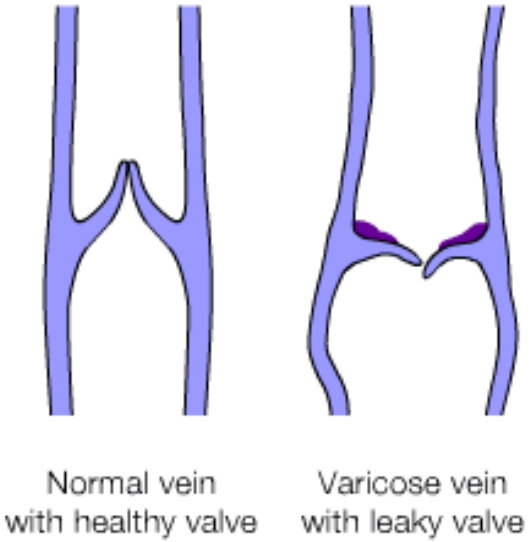


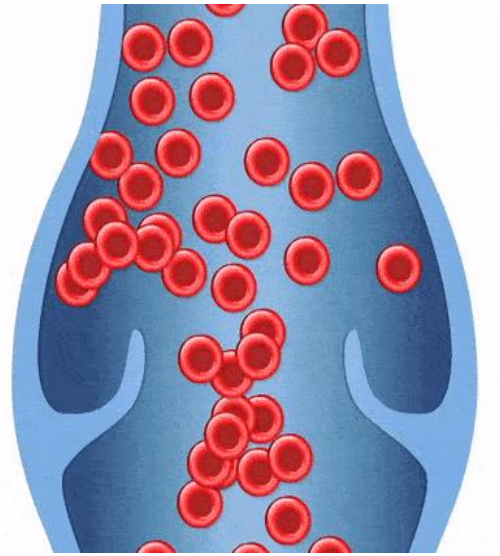
- Most veins in the lower limbs contain valves that rhythmically open and close to prevent backflow of blood, also known as reflux.

- The valves open in one direction only to prevent blood pooling in the lower limb.

- Valves are critical because blood flow becomes sluggish in the lower extremities due to low pressure and gravity

ABNORMAL VENOUS FUNCTION
CHRONIC VENOUS INSUFFICIENCY (CVI)





Faulty valves
- (+ poor calf/foot muscle pump)
- Impaired venous blood flow - CVI

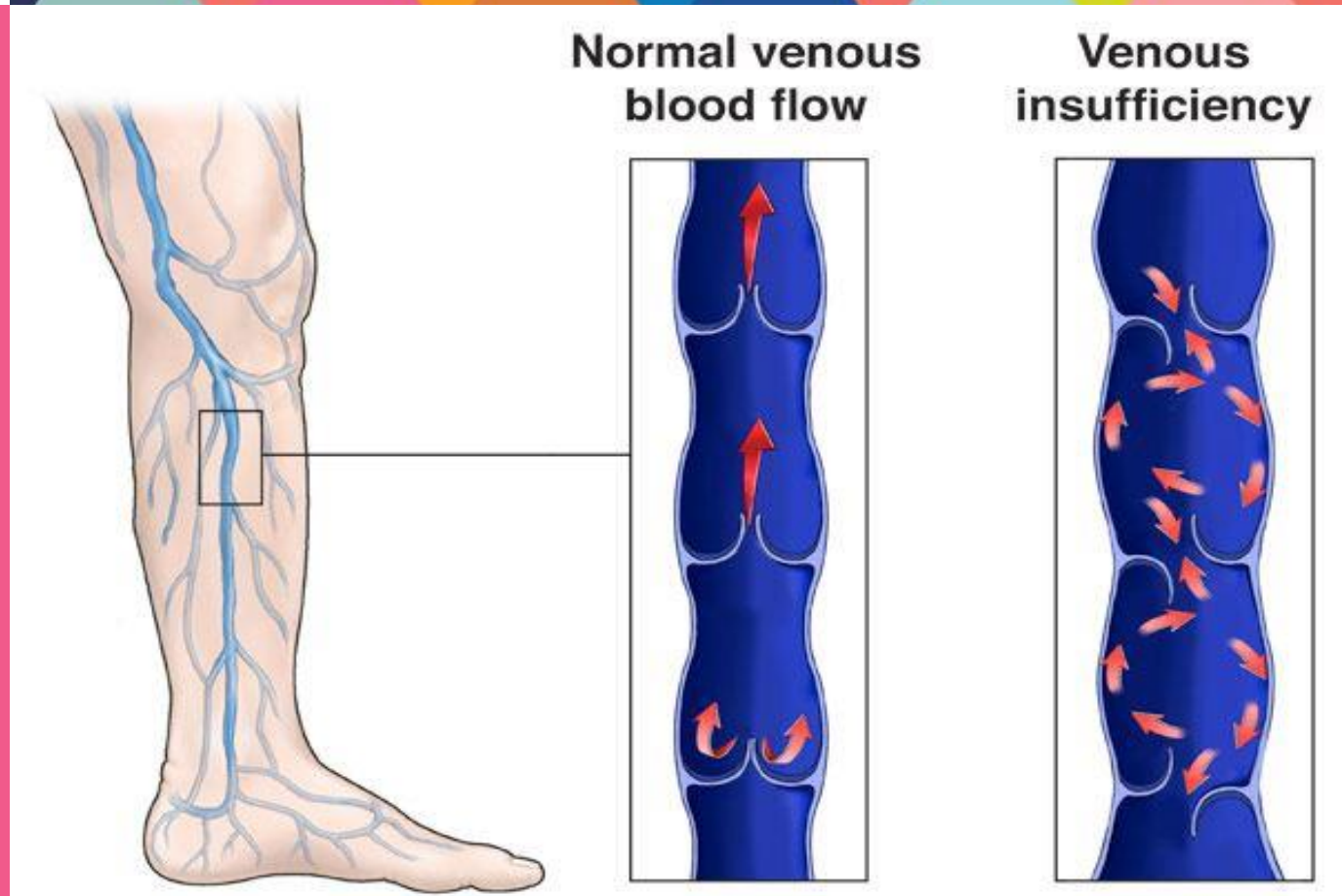
Venous stasis
- Backflow of blood
- Increased blood filling in the vessel
- Pooling of blood

Venous hypertension
- High blood pressure in the veins

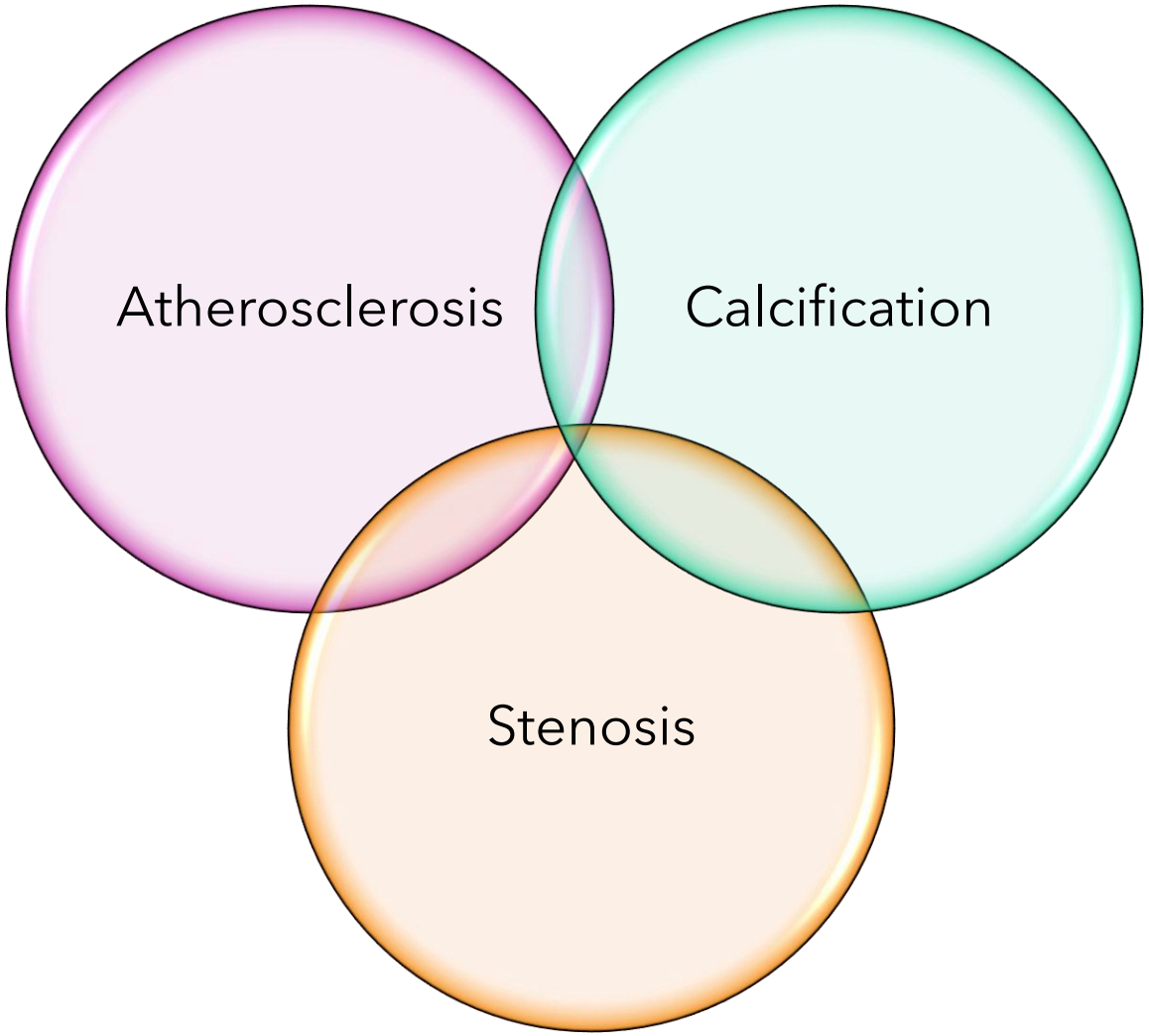
Venous dilation
- Overstretched vessels
- Valves move further apart
- Varicose veins

Tissue flooding
- High pressure leads to leakage of toxic waste products (protein)
- Skin changes – fibrosis, inflammation

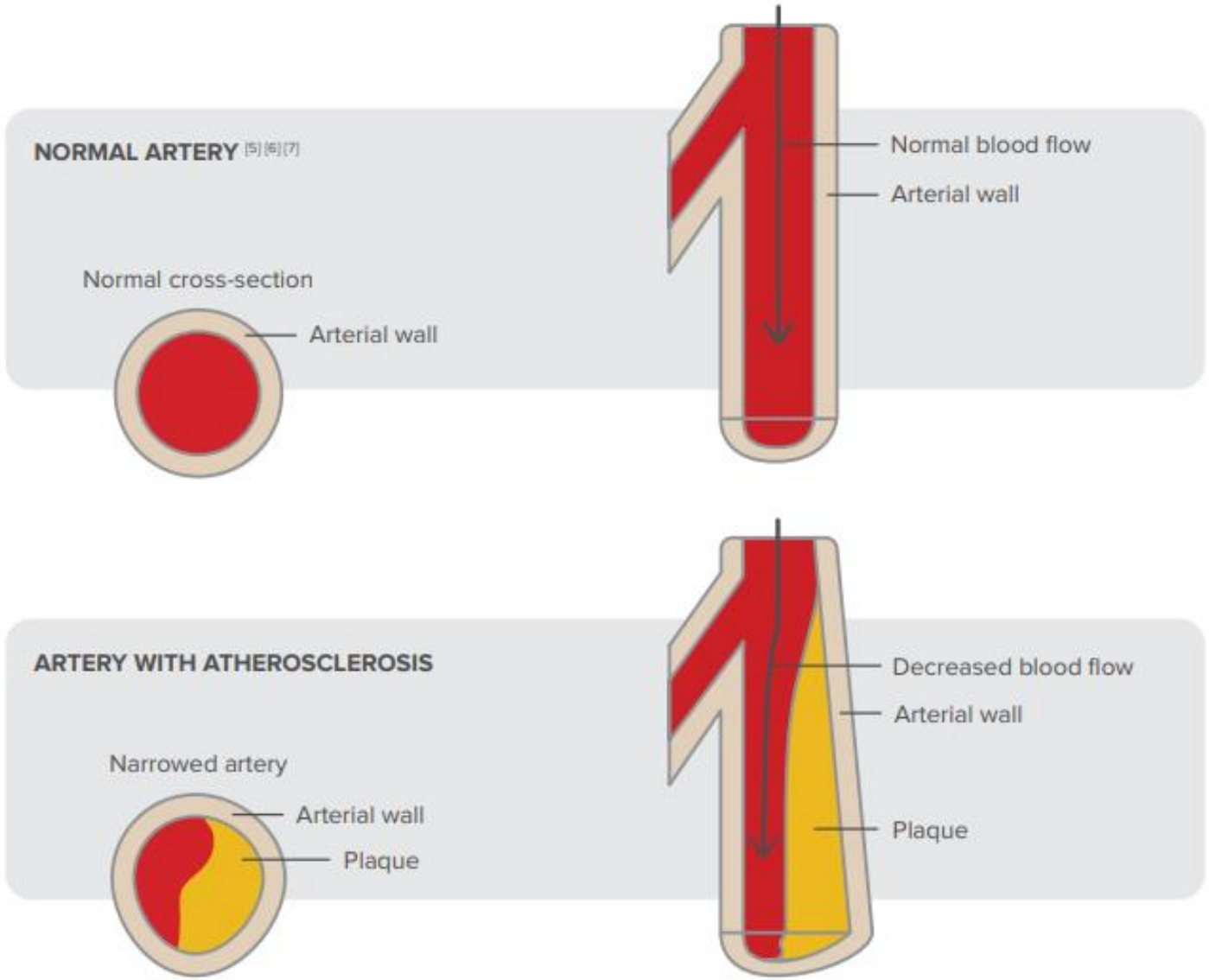
Chronic venous insufficiency affects **1 in 20** adults and is **progressive** so will not resolve if left untreated and can lead to venous leg ulcers

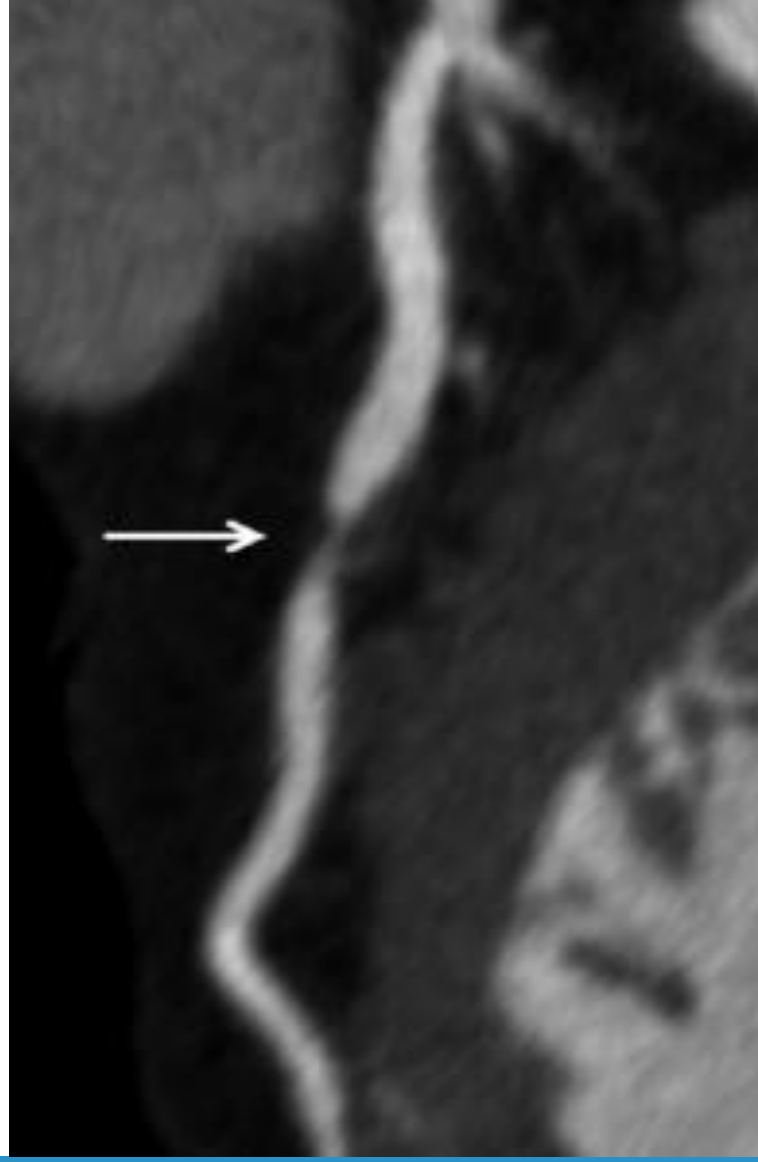


(Patel and Surowlec, 2024)



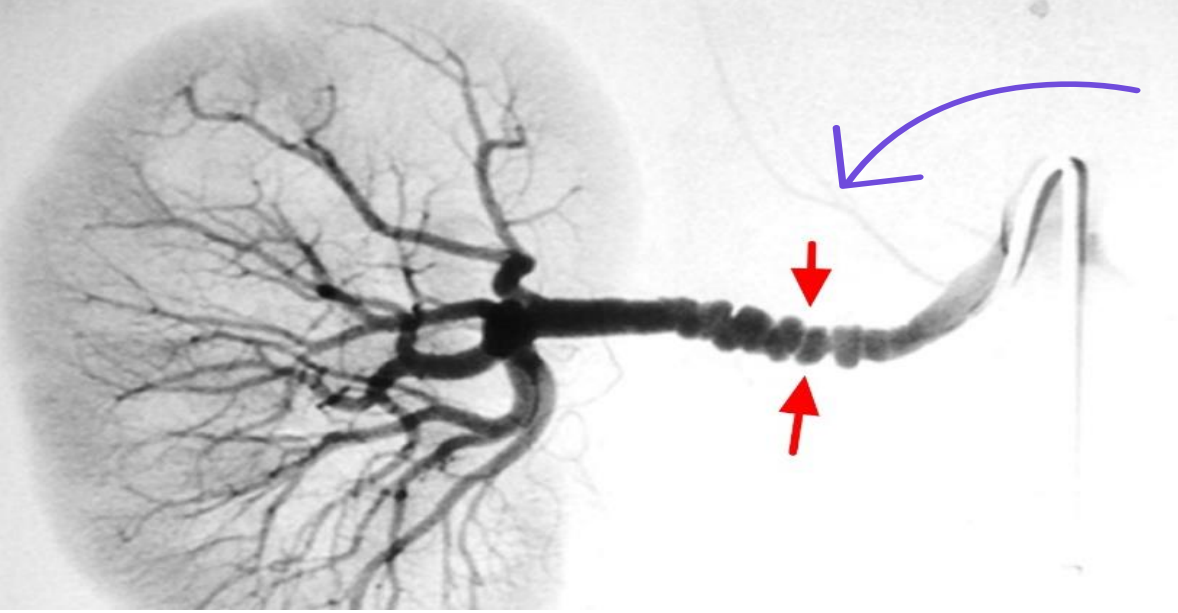
WHAT CAN GO WRONG IN THE ARTERIES?





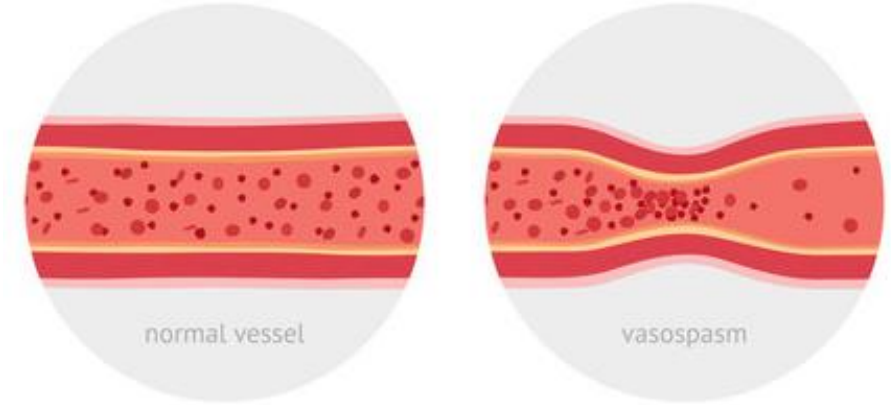
ATHEROSCLEROSIS

BUILD-UP OF FATS, CHOLESTEROL. FIBRIN, CELLULAR WASTE PRODUCTS AND OTHER SUBSTANCES WITHIN THE WALLS OF THE ARTERY



Fibromuscular dysphagia *(congenital anomaly)* – abnormal cell development and irregular thickening of muscle wall of renal artery

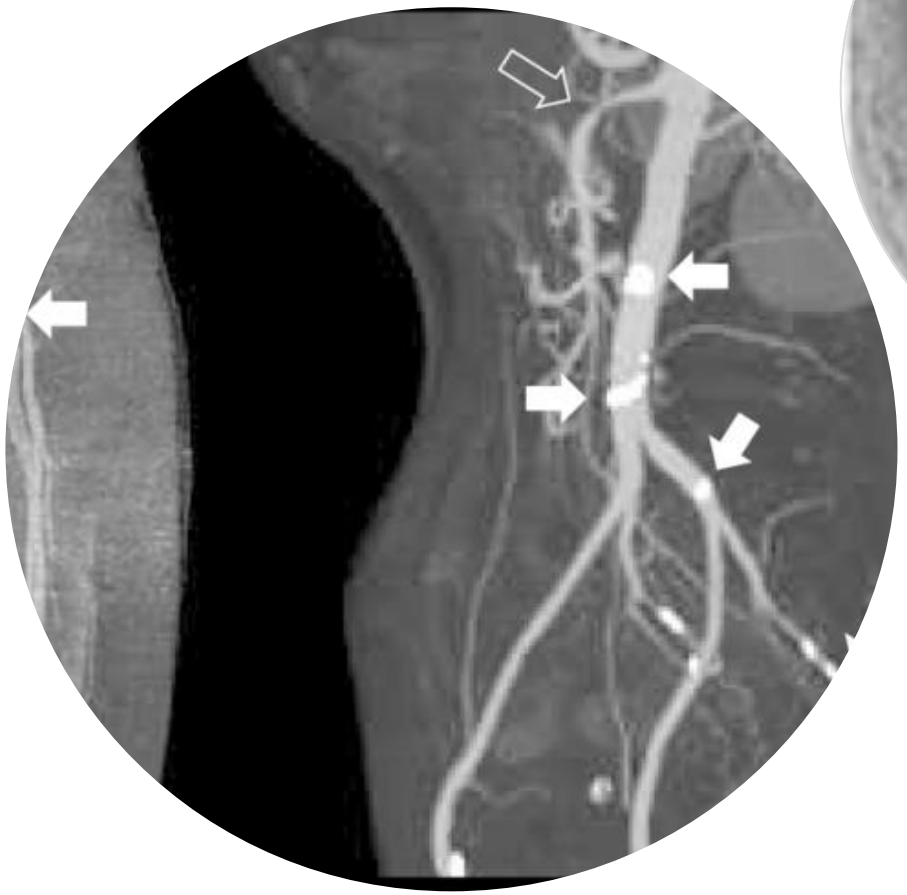
- Blood vessel infection/ inflammation
- Limb injury
- Changes in the ligaments or muscles
- Non-infection inflammation (e.g. vasculitis)
- Congenital anomalies (e.g. fibromuscular dysphagia)
- Spasms (e.g. angina – coronary artery spasm)
- Radiation exposure

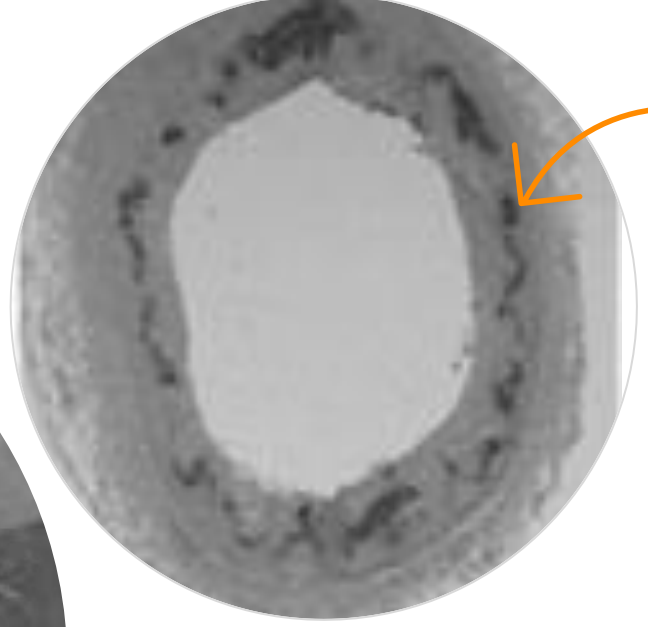


Angina *(coronary artery spasm)* – contraction of the muscular layer of the artery

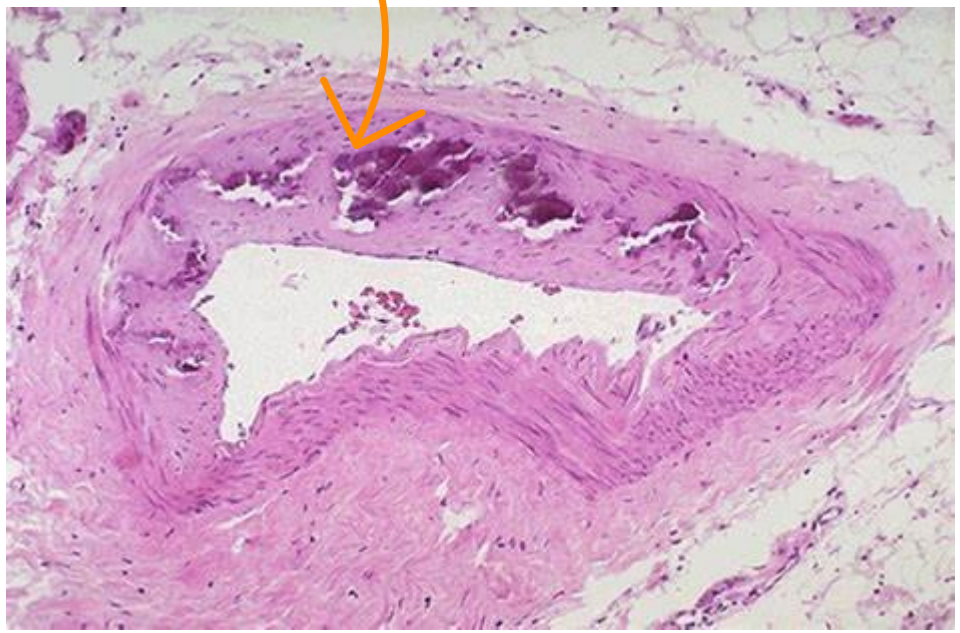
STENOSIS

NARROWING/OCCLUSION OF ARTERIES





Calcium deposits



MEDIAL WALL CALCIFICATION

STIFFENING OF THE ARTERY WALLS & BUILD UP OF CALCIUM DEPOSITS WITHIN THE MEDIAL WALLS

DEVELOPMENT OF PERIPHERAL ARTERIAL DISEASE (PAD)

Atherosclerosis, plaque builds up

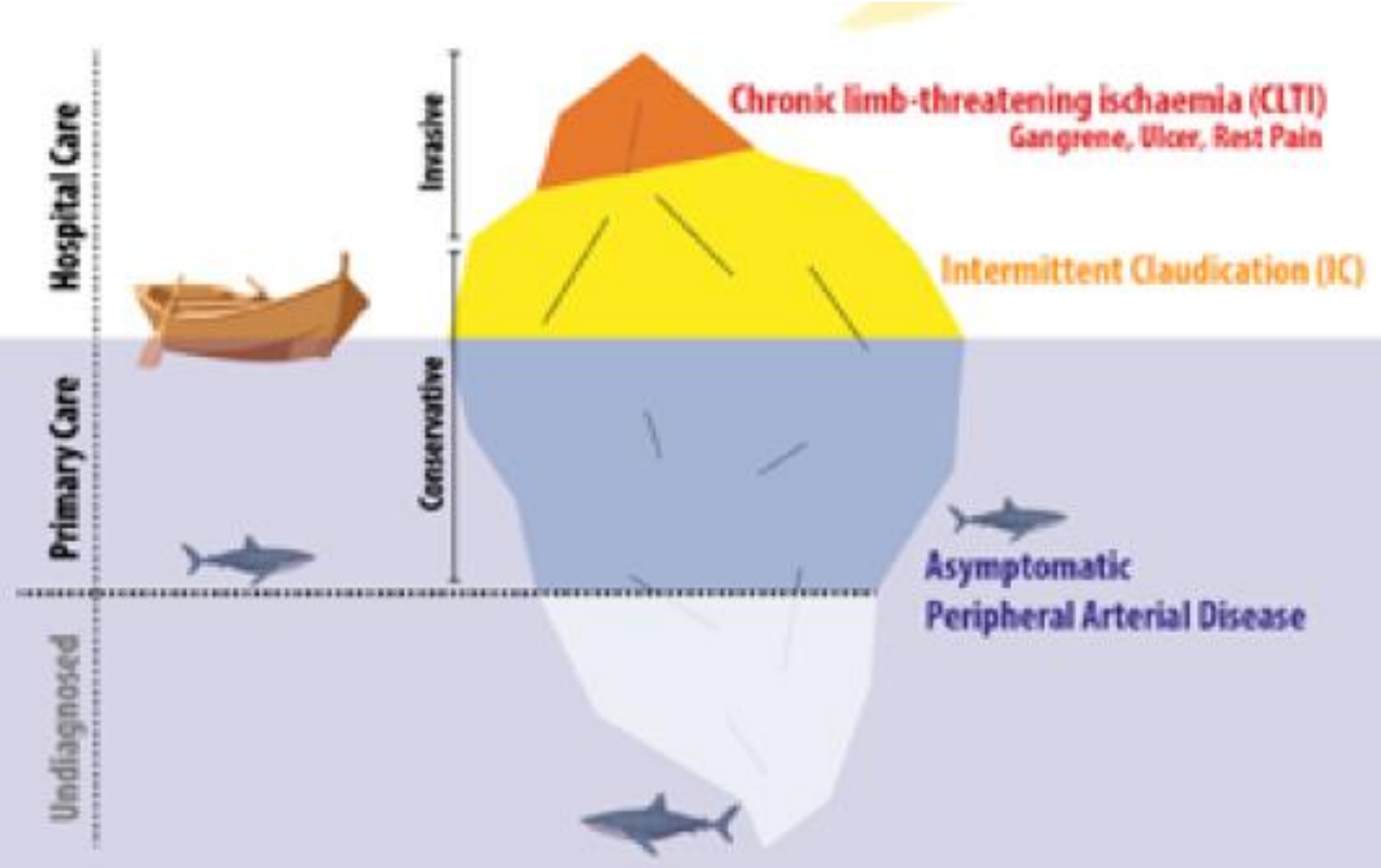
Plaque narrows the arterial lumen flow (inner space in the artery)

Artery compensates by dilating to preserve flow (arterial hypertension)

Blood flow shifts to smaller arteries (collateral flow) – carries less blood than main artery.

Reduced blood flow to tissues, leading to tissue damage, and ischaemia.

PERIPHERAL ARTERIAL DISEASE (PAD) ICEBERG



WHAT IS A LEG ULCER?

An open wound between the knee and just above the malleolus (ankle joint), which has been present for at least two weeks.

Ulceration in the breakdown of the skin, often caused by trauma or surgery.

LEG ULCER FACTS

- 1.5% of the UK adult population (730,000 people) have leg ulcers.
- 1 in 500 adults have venous leg ulcers (1 in 50 in those over 80 years old)
- 33-60% of all ulcers are chronic and persist for more than 6 weeks
- 40-60% of community nurses' clinical time is spent on wound care.
- Leg ulcer care costs the NHS £3.1 billion every year

WHAT IS THE PREVALENCE AND BURDEN OF CHRONIC OEDEMA?

Study by Moffat et al (2019) reported a prevalence of 3.93 per 1000.

However, data from referrals to the national lymphoedema service in Wales reveals a prevalence of 6 per 1000.

This data suggests that lymphoedema affects between 200,000 and 420,000 people of all ages in the UK.

However, Lymphoedema is not recognised and diagnosed by many, therefore these figures may not be an accurate representation of the problem…

A study by Gaskin (2017) found that the Leicester GP database showed 10% of patients requiring leg care also had oedema. DN audit revealed 59%.

WHAT SYSTEMS ARE INVOLVED WITH LYMPHOEDEMA?

The Circulatory System

For pumping blood around the body

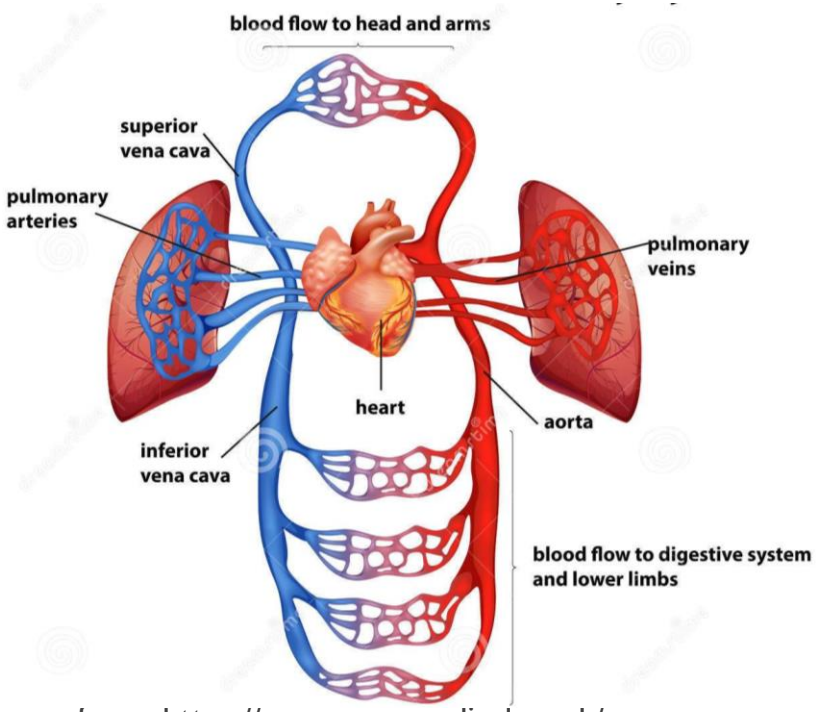


Image from: https://www.urgomedical.co.uk/

- Forms a continuous circuit
- Has a pump for moving fluid around the body
- A network of specialised vessels and organs

The Lymphatic system

For draining lymphatic fluid into the bloodstream

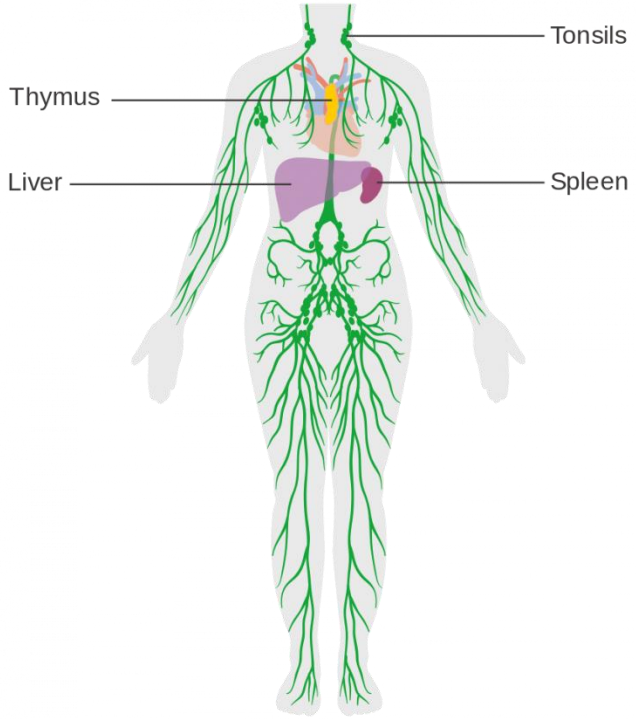
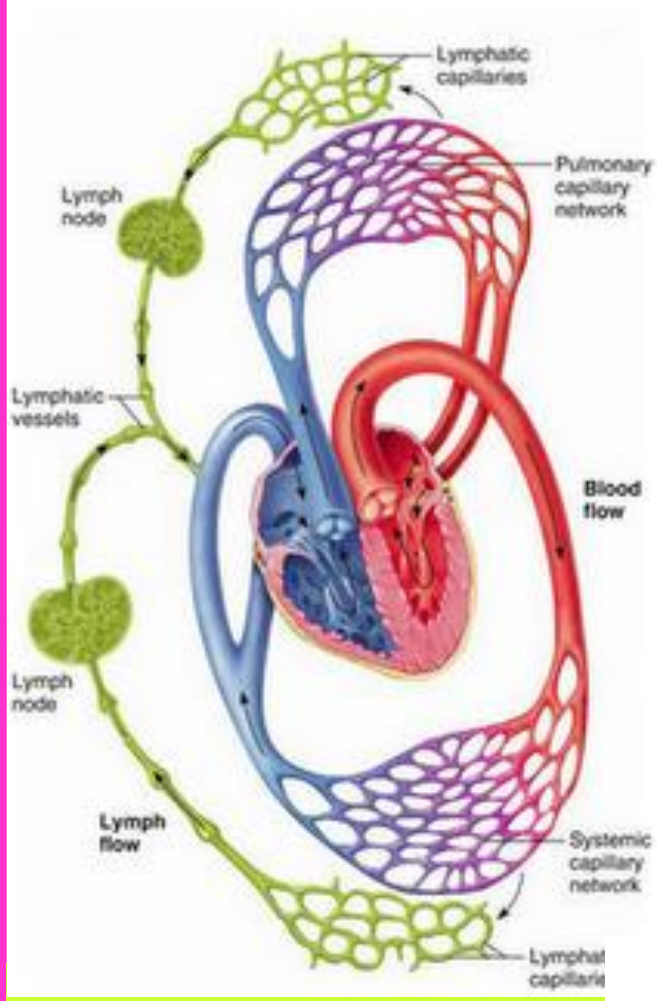
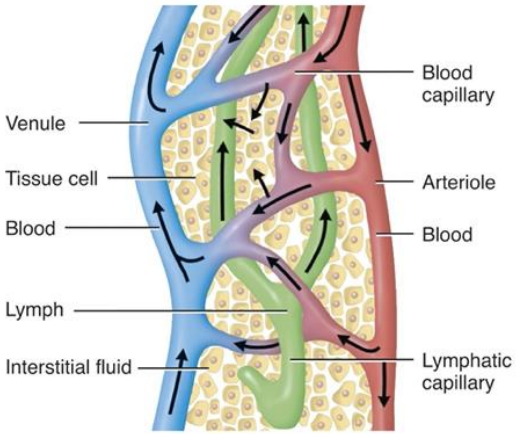


Image from: https://www.drlizcarter.com

- Only a semi-circuit
- No pump, relies on several transport mechanisms
- A network of vessels, glands and organs

PUT THESE TWO SYSTEMS TOGETHER AND WHAT HAVE YOU GOT?

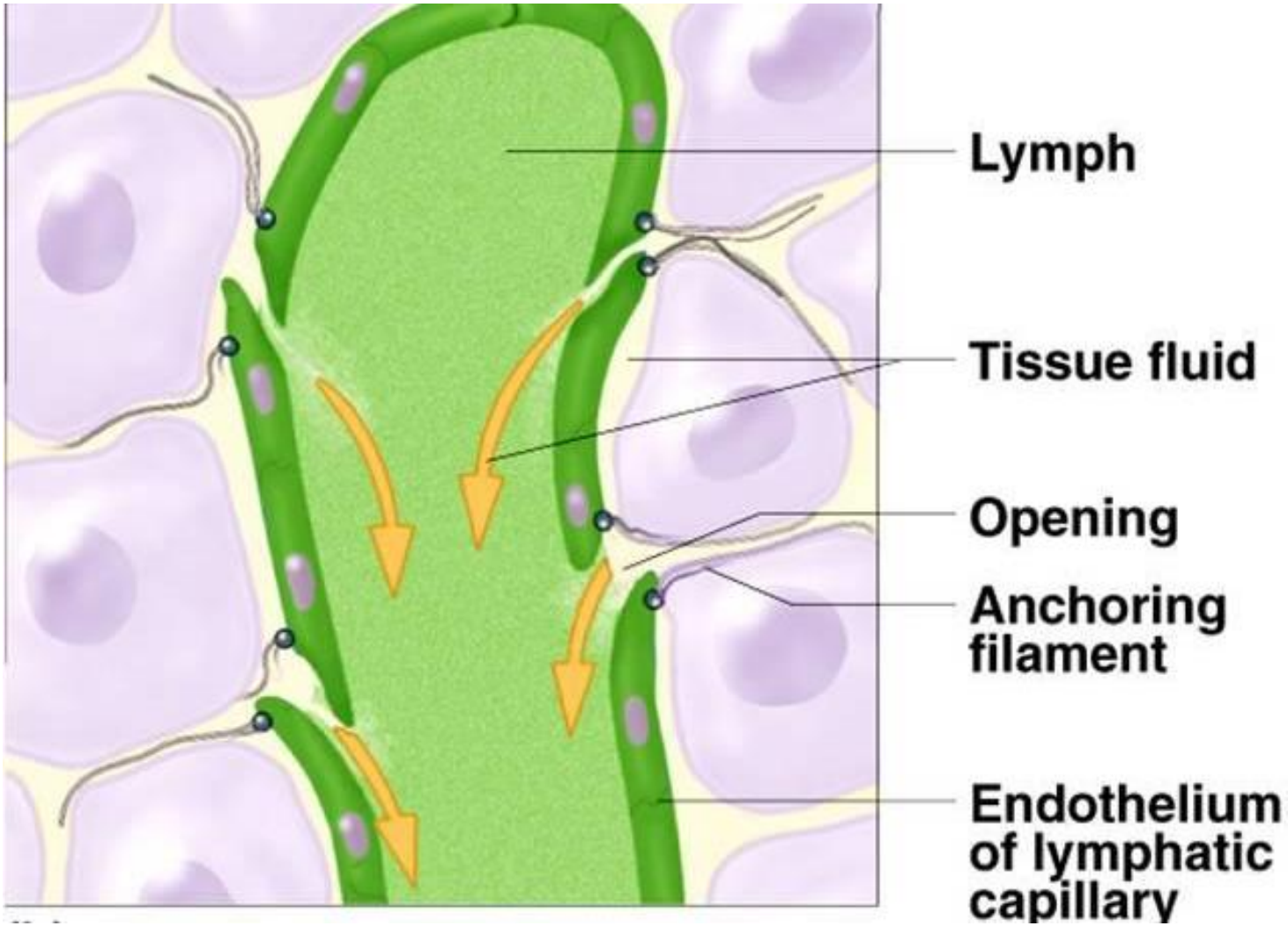




(a) Relationship of lymphatic capillaries to tissue cells and blood capillaries

Images from: https://drsangita.blogspot.com and https://quizlet.com/583794029

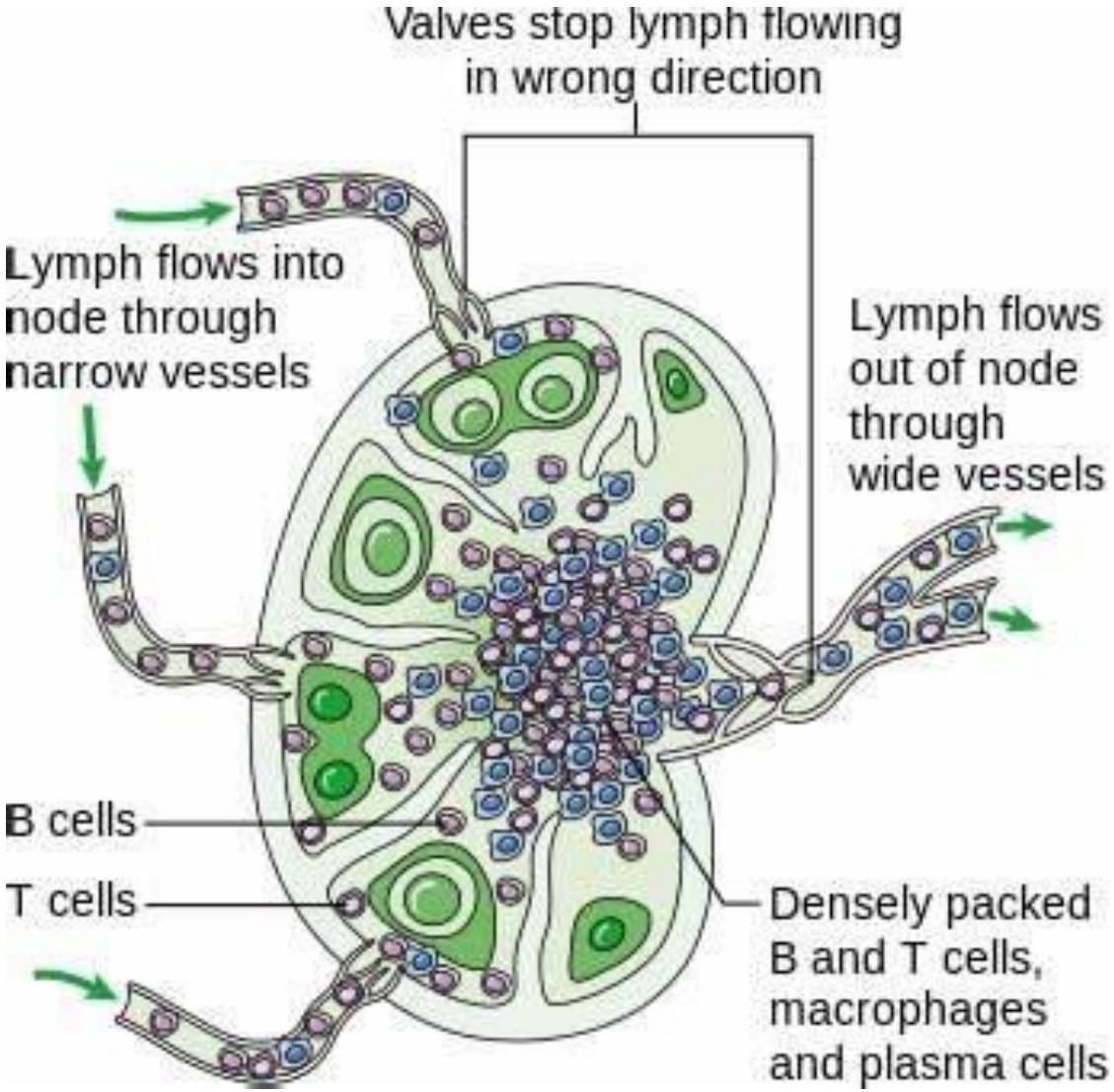
THE LYMPHATIC SYSTEM



- Blind-ended tubes
- Single layer epithelium
- No muscle – passively collapsed when empty
- No muscle – attached to surrounding structures by anchoring filaments
- Opens and takes in fluid in response to movement of surrounding tissues
- One-way valves prevent backflow of lymph fluid
- No smooth muscle
- No flow when limb at rest

Image from: https://biologystudent.weebly.com/the-lymphatic-system

THE LYMPHATIC SYSTEM (CONTINUED)



Lymph nodes are present in groups/chains along the vessels

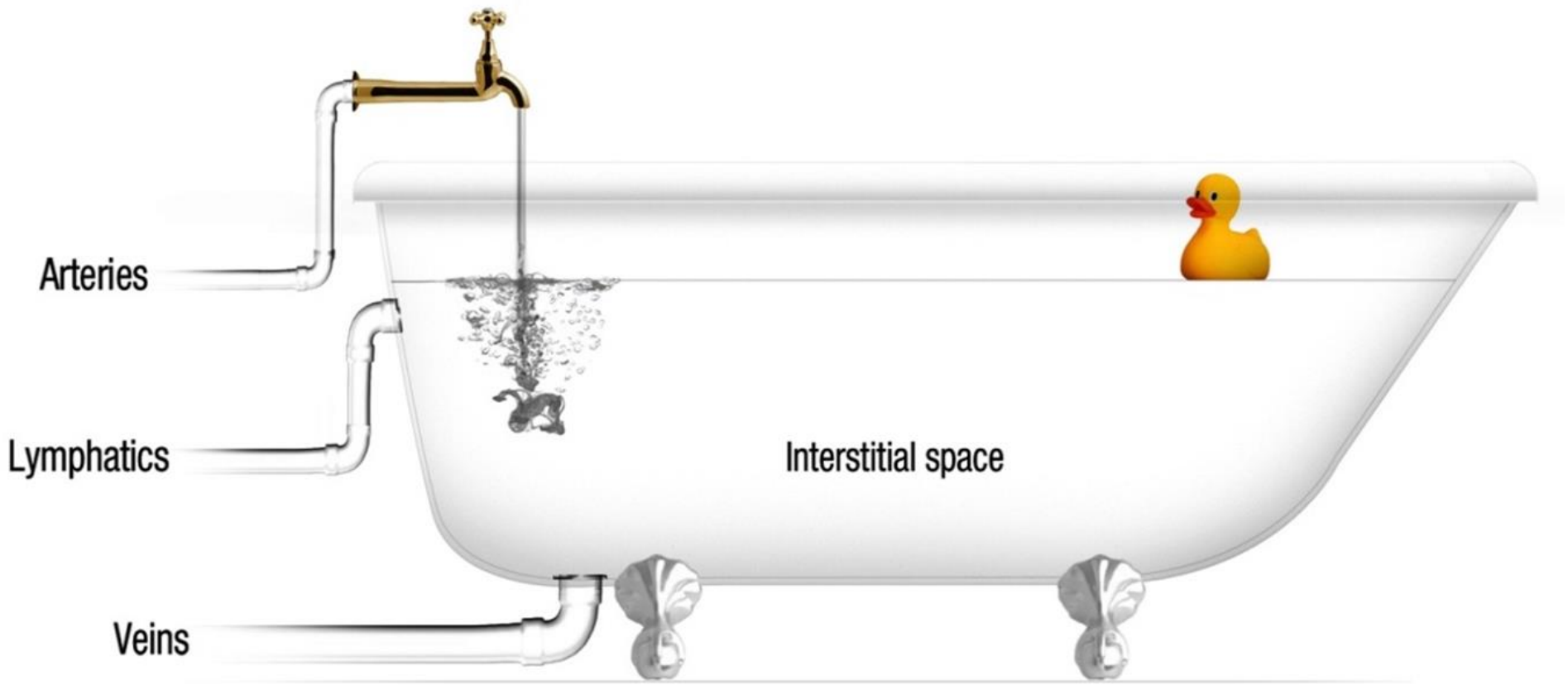
There are between 500-700 lymph nodes throughout the body

When infection is present you may be able to palpate these nodes

Main roles:

- Fluid balance
- Fat absorption
- Immunity and defense

Image from: https://www.jaypeedigital.com/eReader/chapter



WHAT HAPPENS WHEN THINGS GO WRONG?

WHAT HAPPENS WHEN THINGS GO WRONG?

Oedema is the presence of palpable swelling resulting from increased interstitial fluid in the tissues.

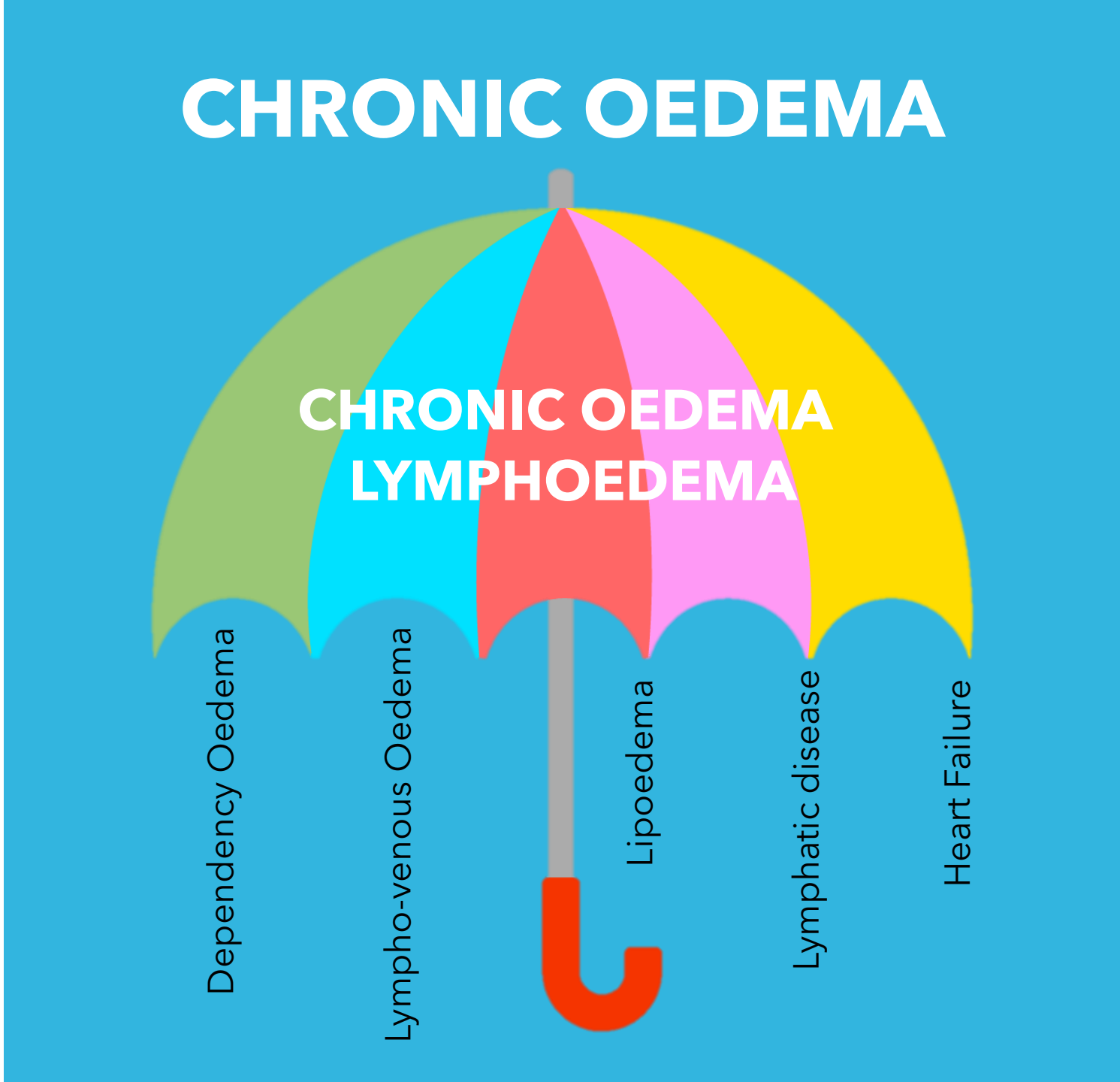
BMJ, 2009

ACUTE OEDEMA

- Often oedema is soft & pitting.
- Temporary swelling responds to elevation & exercise.
- Associated with strains & sprains – inflammatory response leads to increased permeability of vessels.
- Venous reflux & standing/ sitting for long periods.
- Without treatment it may become chronic.

- ‘Chronic Oedema’ is a term used to describe a group of conditions
- Characterised by the presence of swelling within tissues of the body, caused by the accumulation of excess fluid
- Present for more than 3 months
- Not resolved by elevation or diuretics
- Used interchangeably with the term ‘Lymphoedema’ - in every case of chronic oedema there will be some impairment of lymphatic drainage.

BLS Statement



Lympho-venous Oedema

Venous hypertension leads to increased fluid in the tissue spaces. Over time leads to lymphatic overload and damage

<u>Causes:</u>

DVT/post thrombotic syndrome

Severe varicose veins

Phlebitis

Trauma (E.g. damage to veins)

Chronic venous insufficiency

Obesity

Immobility

Lymphatic disease

A chronic swelling of the limbs due to a failure of the lymph drainage system to remove interstitial fluid.

Primary Lymphoedema – congenital deficiencies (born with a defect to lymphatics)

Secondary Lymphoedema (as a result of damage to the lymphatics). For example:

- Radiotherapy
- Surgery – orthopedic, removal of lymph nodes
- Extensive burns
- Tumour blockage
- Infection – Filariasis, cellulitis, insect bites
- Inflamatory conditions E.g. rheumatoid arthritis, dermatitis, eczema
- Skin grafts

Lipoedema

Most commonly females affected

Inherited condition

Develops around time of hormonal changes

Abnormal laying down of fat cells

Bi-lateral

Cannot be exercised/dieted away

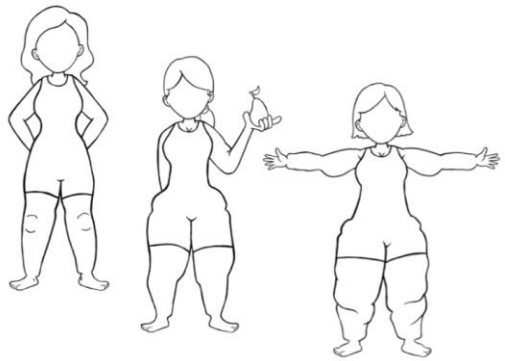
Typical ‘bracelet effect’ with no/minimal oedema in feet and hands

Lipo-lymphoedema may develop due to long term impact on lymphatics

Tissues are often very tender, bruise easily

Lipoedema UK
Charity No 1181312

What is Lipoedema?



Lipoedema
An Adipose Tissue Disorder

RCGPLearning
Essential CPD for primary care

LipoedemaUK
Charity No 1181312

1 CPD hour

Lipoedema UK's Big Survey 2014 revealed that only 5% of women completing the survey had been diagnosed by their GP and led to the development of the RCGPs e learning course on Lipoedema.

Edited by Dr Dirk Pilat, contributors to the course included Professor Peter Mortimer, Dr Sarah Pledger, Lipoedema UK's Suzanne Evans, Sharie Fetzer and Nurse Consultants Chris Wise and Denise Hardy.

For anyone who feels they have Lipoedema but are unsure on how to approach their GP, Lipoedema UK's Membership pack includes a GP Information pack with information on the course, benefits of a

HEART FAILURE & CHRONIC OEDEMA

How Does Heart Failure cause oedema

In patients with heart failure, the heart is unable to pump enough blood out through the arteries with enough force to bring it back through the veins efficiently. Without medications or devices to improve the strength of the heart muscle, this can cause blood to pool, especially in your legs and feet.

The veins require a certain amount of force from the heart to keep blood flowing up to the heart and lungs, where it receives oxygen and other nutrients. If blood doesn't circulate properly, excess blood and other fluids in the capillaries can leak out into bodily tissues, causing oedema.

Oedema can sometimes be the first noticeable sign of heart failure.

Once heart failure is diagnosed, it becomes important to monitor increases in body weight that may result from increased fluid retention.

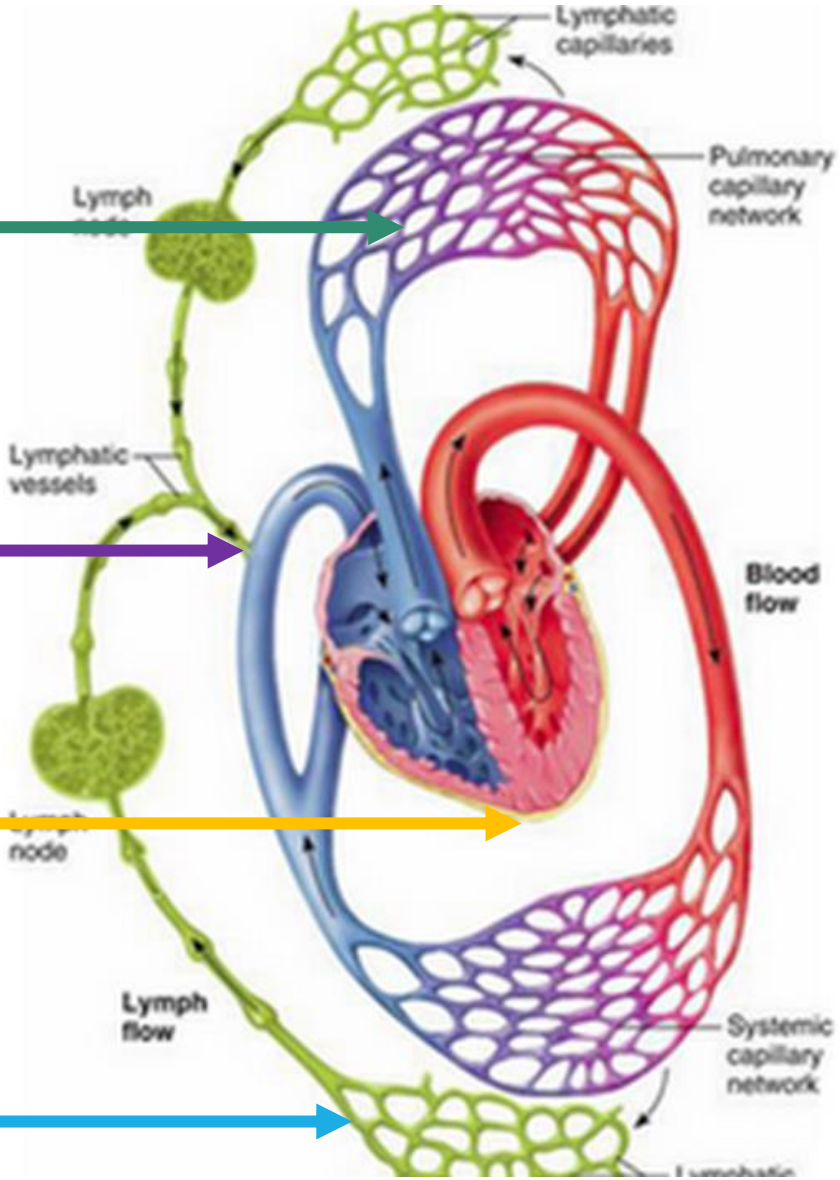
A 2021 review of research suggests that increases in oedema can also predict worsening heart failure.

As the heart is not pushing this volume round efficiently, it can lead to an accumulation of fluid in the lungs and peripheries

This fluid moves up the lymphatic system and is dumped back into the superior vena cava (the main vein)

The heart must manage this additional fluid, which is challenging when the heart is already not working effectively

When we apply compression therapy, we are pushing the excess interstitial fluid into the lymphatic system



All types of chronic oedema can result in…

Protein rich oedema causing non-pitting tissue which becomes fibrotic

Skin changes (some reversible, some irreversible)

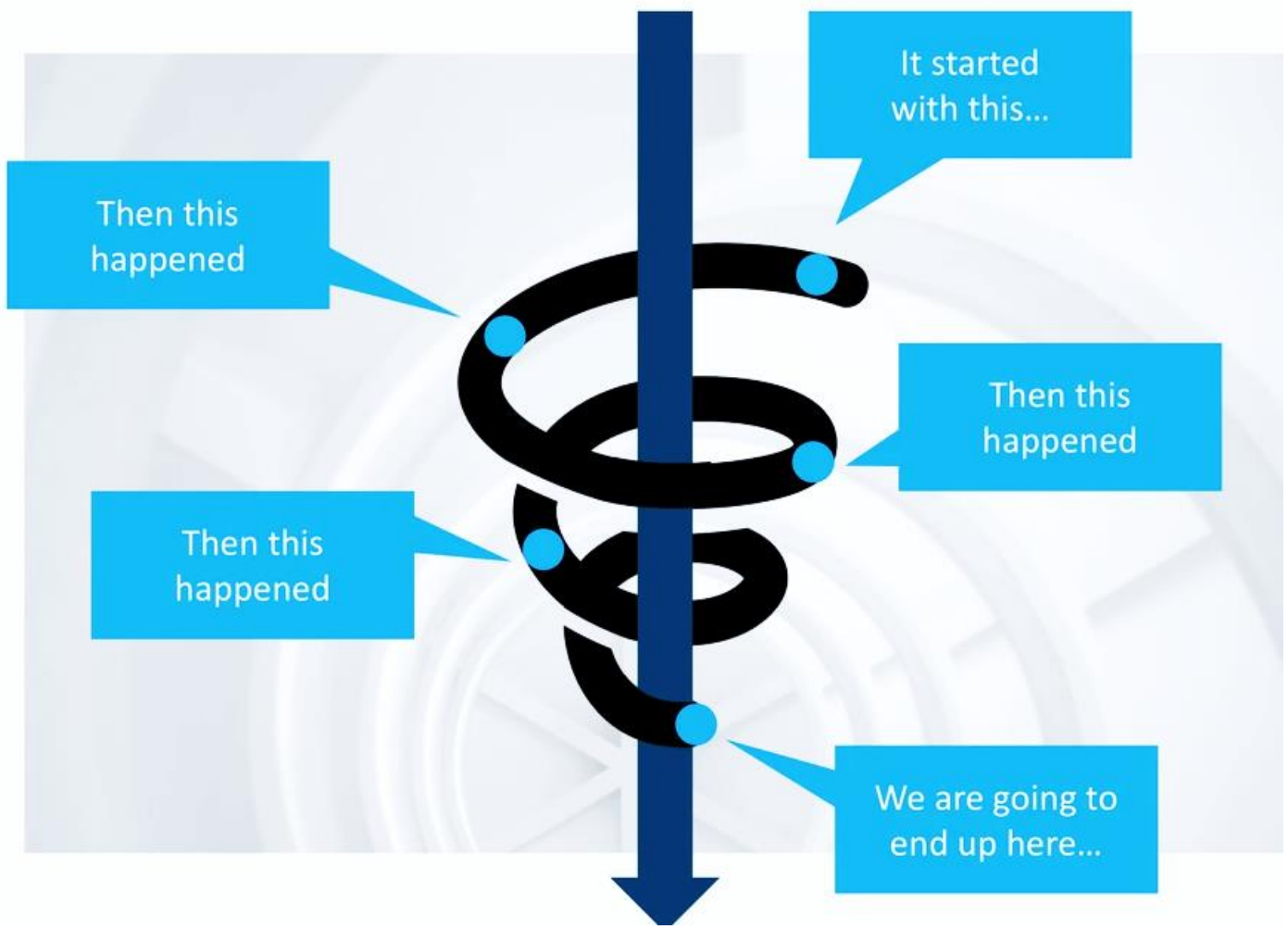
Can be managed / maintained – not cured

DISEASE PROGRESSION

If left untreated chronic venous and lympho-venous disease will progress along a continuum of increased swelling and chronic inflammatory skin changes

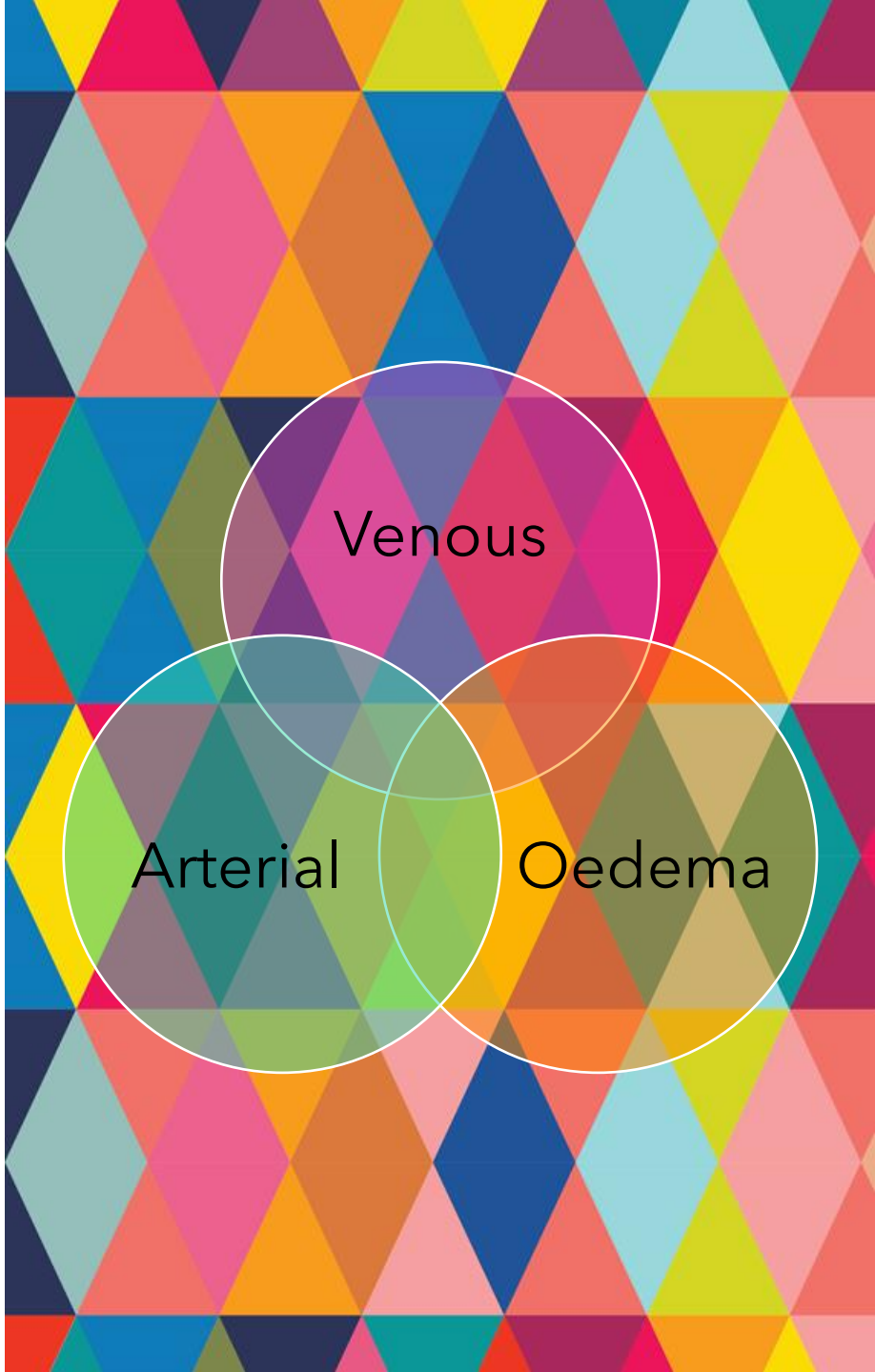
It is essential that early venous and lympho-venous disease is recognised and appropriate treatment is initiated, to slow and control progression

- (John Timmons, Janice Bianchi Wounds UK, 2008, Vol. 4, No 3)

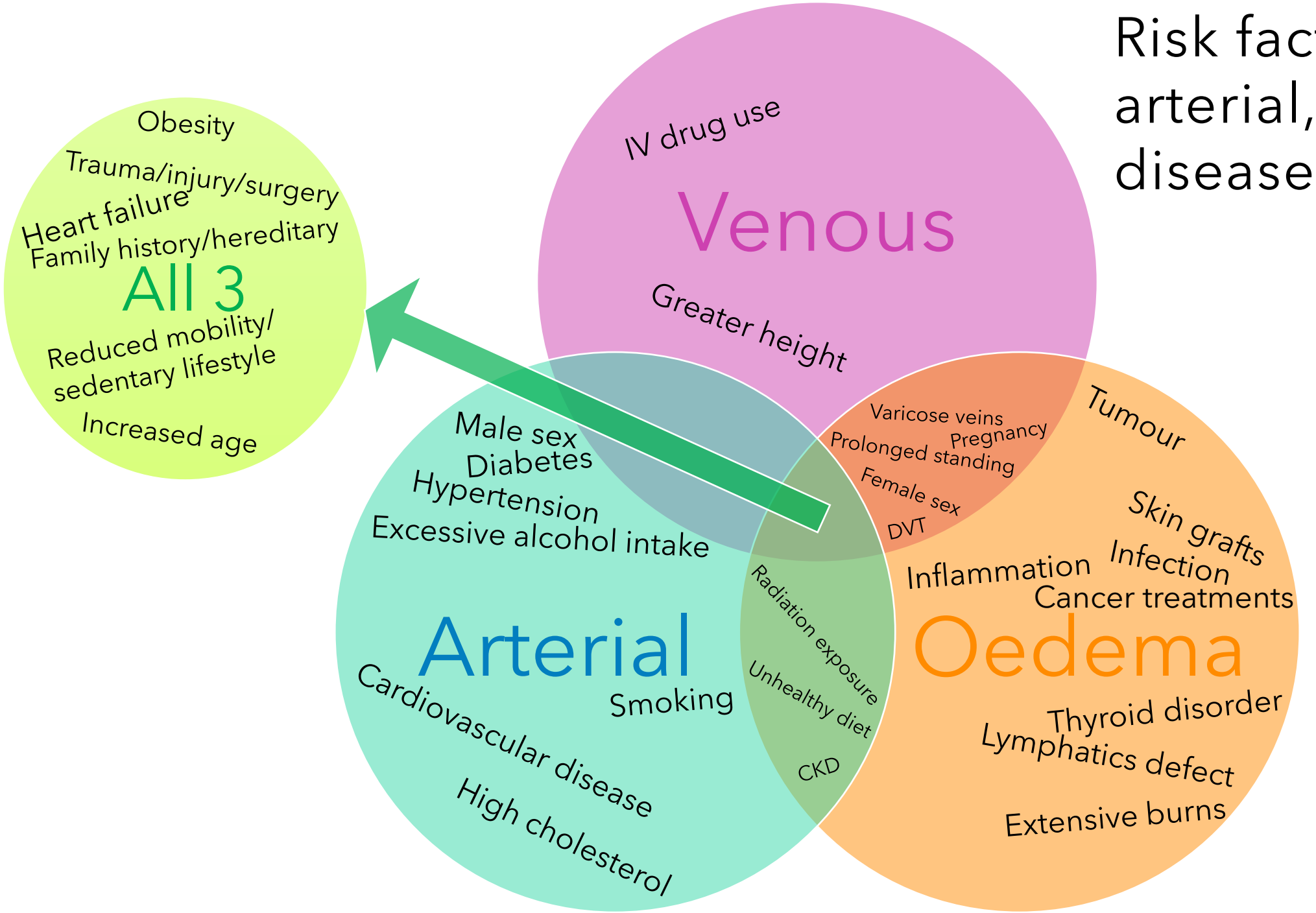


ACTIVITY: Risk factors for arterial, venous disease & oedema

- Pregnancy
- High cholesterol
- Inflammation
- Unhealthy diet
- Lymphatics defect
- Cardiovascular disease
- Chronic kidney disease
- Hypertension
- Infection
- Greater height
- Skin grafts
- Trauma/surgery
- Excessive alcohol intake
- Prolonged standing
- Diabetes
- Smoking
- Obesity
- Heart failure
- Female sex
- Male sex
- Reduced mobility/sedentary lifestyle
- Varicose veins
- IV drug use
- DVT
- Tumour
- Radiation exposure



Risk factors for arterial, venous disease & oedema



WHICH RISK FACTORS COULD WE POTENTIALLY MODIFY/MANAGE?

PREDICTIONS FOR THE FUTURE

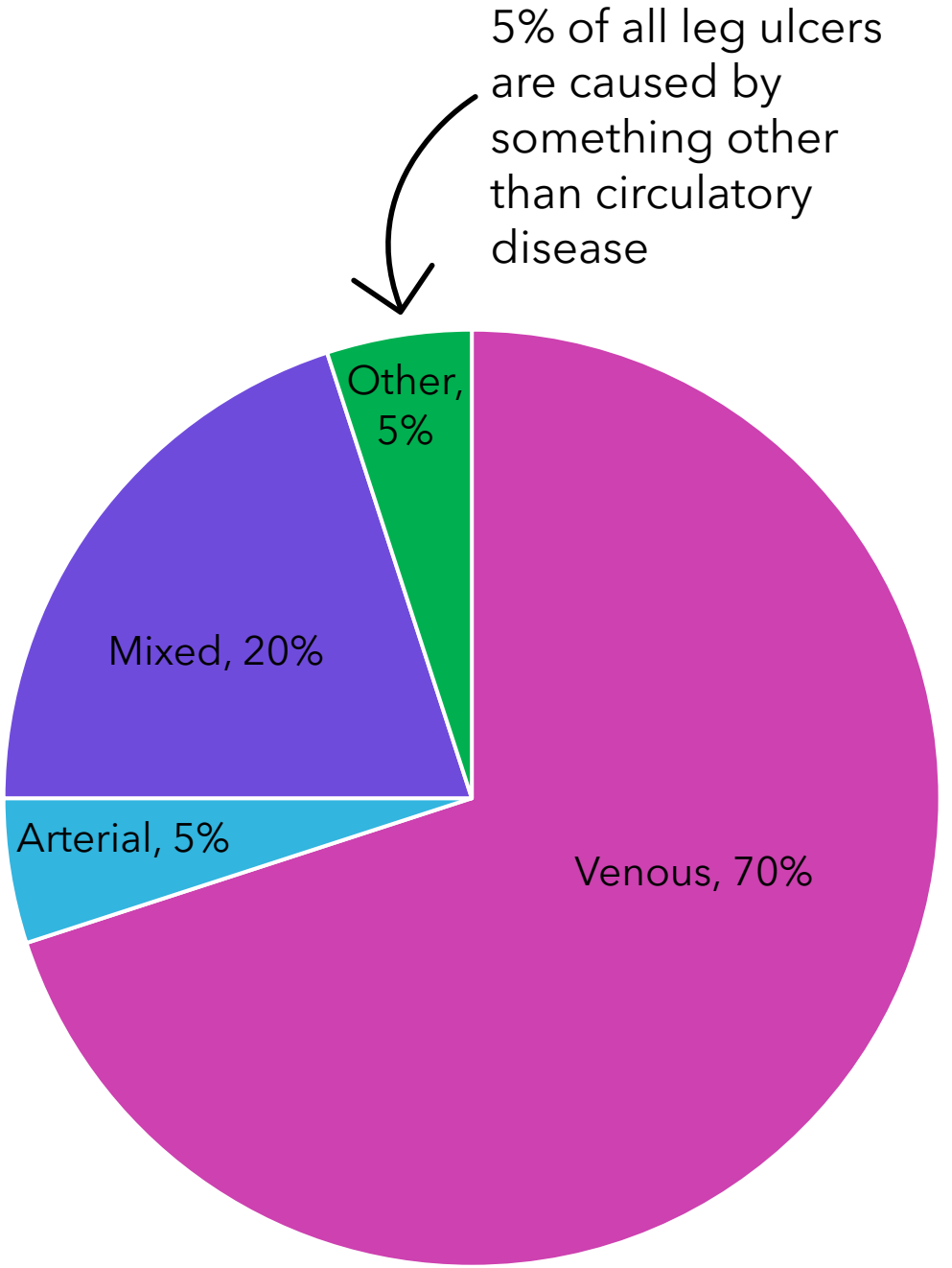
No. of people with chronic oedema:	2014	2026
Under 65	2,026	2,434
Over 65	1,186	1,526
Over 85	457	686
TOTAL	3,669	4,646

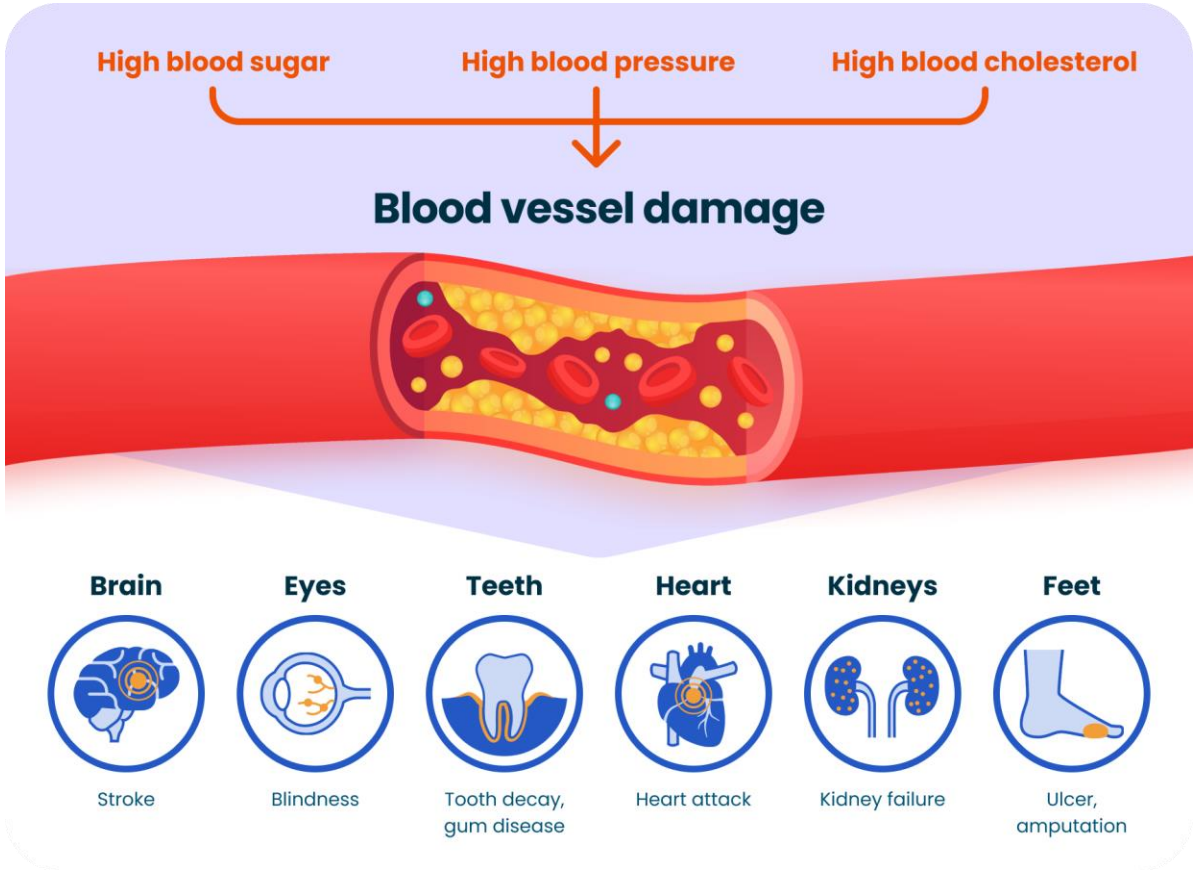
- An ageing and growing population

- More obesity, long term conditions
E.g. heart failure, reduced mobility, cancer survivors

- The evidence is clear: there is going to be a significant increase in the incidence of chronic oedema in the population of Oxfordshire

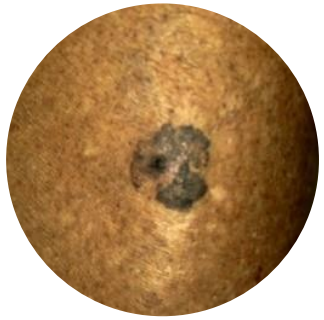
OTHER TYPES OF LEG ULCERS AND SKIN CONDITIONS





- Occurs in 25% of people with diabetes
- Caused by reduced blood flow and nerve damage.
- Hyperglycaemia lowers HDL (good) cholesterol) and raises LDL (bad cholesterol), leading to atherosclerosis build-up, narrowing blood vessels and leading to peripheral arterial disease (PAD).
- Blood flow and nutrients/oxygen delivery is reduced, resulting in ischaemia (tissue death) and leg ulcer development.
- Hyperglycaemia also causes a reduction in red/white blood cell function, reducing efficiency to fight infection.
- Diabetic neuropathy (nerve damage) can make it harder to feel pain or other symptom of ulcers or infections, preventing early treatment and worsening the ulcer.

DIABETIC LEG ULCERS

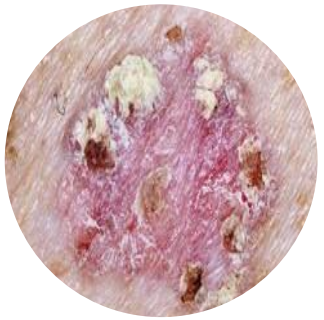


A

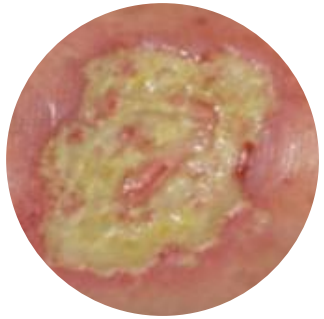
B

C

D

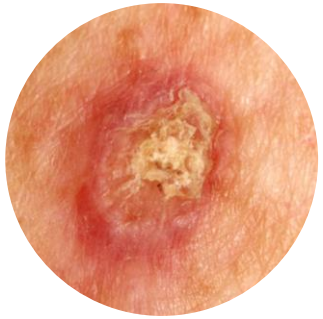


E



F

G



H

I

J

WHICH OF THESE LOOKS ABNORMAL AND WHY?

BOWEN'S DISEASE

Early form of squamous cell cancer, easily curable as very slow growing. Can developed into SCC if left untreated.

Can be red, pink, brown, scaly, raised, flat or itchy.

Caused by long-term exposure to sun/sunbeds, weak immune system or radiotherapy, HPV.

Treatment includes watchful waiting, cryotherapy, local excision, photodynamic cream, surgery.

CUTANEOUS SQUAMOUS CELL CARCINOMA

Cancer of the squamous cell, second most common form of skin cancer, most common in areas exposed to the sun

Can be scaly, rough, crusty, flat, indented, varies in size, colour and texture, may bleed, often misdiagnosed as hypergranulation

Caused by UV light, sunlight, tanning beds

Treatment depends on where the cancer is and general health , usually surgery, radiotherapy or chemotherapy

MARJOLIN'S ULCER

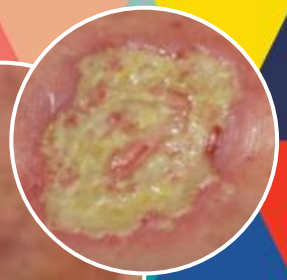
Development of a SCC in the site of a scar/ulcer 10-25 years after trauma. Common in 40-60-year-olds. More common in men than women. 40% occur in the leg.

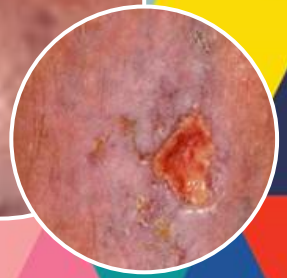
Non-healing, steadily increases in size, excessive granulation tissue, bleeds easily, may be malodorous, painful, and purulent exudate

Unknown cause, but theories suggest injury leads to destruction of blood/lymphatic vessels and malignant degeneration of the skin, chronic inflammation

Treatment includes local excision, lymph node biopsy and amputation. Radiotherapy and chemotherapy are not effective. 3-year survival rate = 65-75%, 10-year survival rate = 34%

MARTORELL ULCER





Ulcer that occurs in patients with longstanding and often poorly controlled high blood pressure, most common in 50-60-year-olds, more common in women, CRP bloods may be elevated

Normally occur over the Achilles tendon, extreme pain out of proportion to the size of the ulcer, irregular shape, sudden enlargement

Cause by narrowing of small bloods vessels in the skin, leading to increased resistance to blood flow and lack of blood flow

Treatment includes better control of blood pressure

SICKLE CELL ULCER

Ulcers that occur in people with Sickle Cell Disease, most common in 20-30-year-olds, more common in men and those with anaemia

Appears around the malleolus or base of toes and occur in both legs at once, neuropathic pain and hypersensitivity may be extreme, can deteriorate during a sickle crisis

Sickled red blood cells cause obstruction to the small blood vessels, reducing oxygen to the skin and venous incompetence

Haematologist to manage sickle cell disease, neuropathic analgesia and compression therapy, review of walking and footwear

VASCULITIS

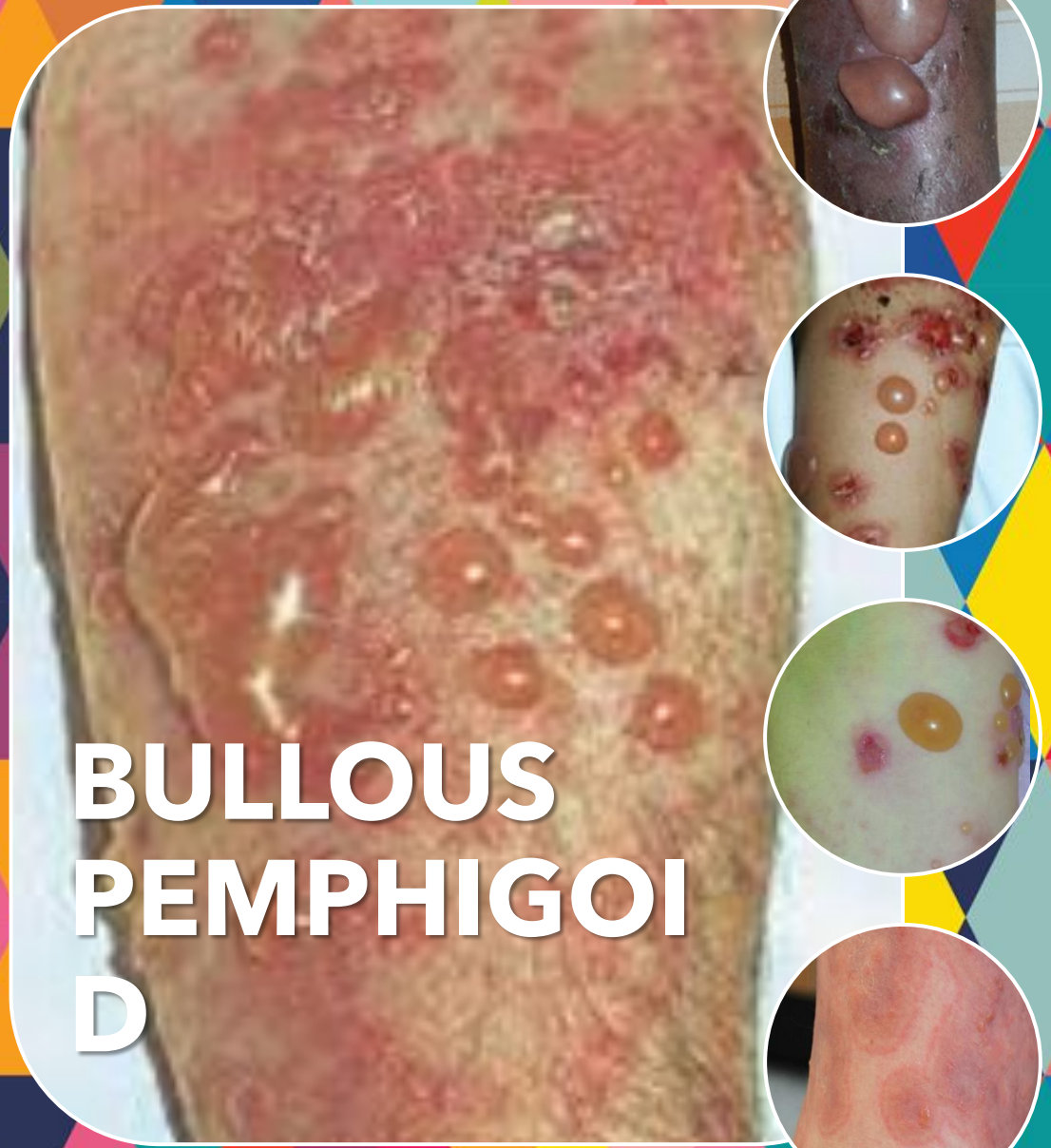
A group of conditions characterise by inflammation of bloods vessels and reduced blood flow

Presents as capillaritis (reddish-brown patches caused by leaky capillaries), petechiae (small red/purple spots), purpuric (purple discolouration of the skin caused by bleeding vessels) rash, coagulation defects, bruising and necrosis

Unknown cause but may be triggered by an infection, another underlying condition or medicine. The immune system attacks healthy bloods vessels causing them to become swollen and narrow

Treatment includes remission induction therapy – immunosuppressive drugs to control inflammation and high dose steroids. Remission maintenance – less toxic low-dose steroids

BULLOUS PEMPHIGOID



A rare autoimmune condition that mainly affects those over 60 years old

Starts with an itchy, raised rash. Blisters may form on the skin and may contain blood

Caused by a problem with the immune system, has been linked to skin damage, such as sunburn, or taking certain medicines

Treatment includes steroid creams or tablets, antibiotics and immunosuppressants but often resolves on its own

PYODERMA GANGRENOSUM

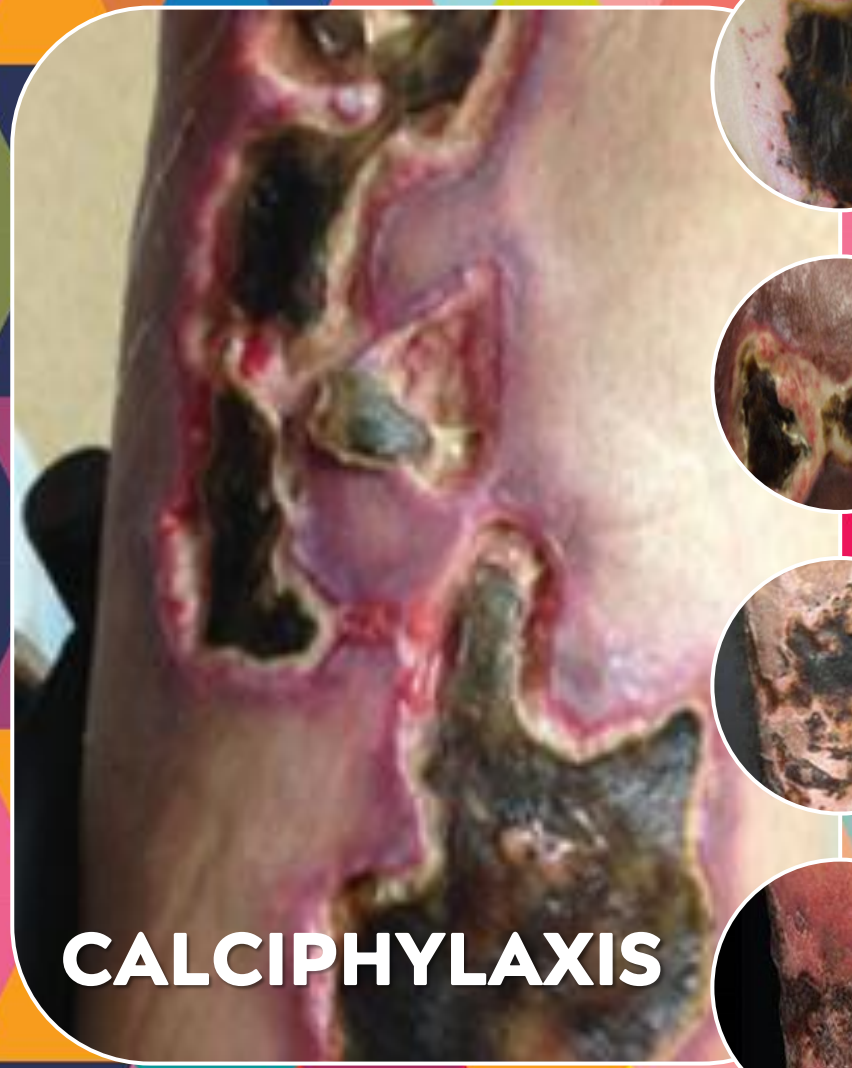
A rare skin condition that causes painful ulcers that sometimes develops around an injury, trauma, insect bite or surgical wound

Distinctive purple/blue edge, starts as a small spot, red lump or blood blister that may ooze and increases in size rapidly

Cause not often known but may be related to overactivity of the immune system

Treatment includes steroid ointment/injection, antibiotics and immunosuppressants, usually treatable but can take some time to heal and may leave some scarring

CALCIPHYLAXIS



A disease in which calcium accumulates in small blood vessels

Large, purple net-like patterns on the skin, sometimes white shards of calcium can be seen within the wound bed

Caused by an imbalance in the metabolism of calcium. People with this disease usually have kidney failure, are on dialysis or have had a kidney transplant. Abnormalities in blood-clotting factors will also be present

No treatment, palliative management, mortality rate is 60-80% often due to ulcer/sepsis

You do not need to know all of these different type of abnormal ulcers!

You just need to be able to identify when something isn't following a normal healing trajectory.

‘A leg ulcer **should** heal in 6-12 weeks’

‘Epithelialisation **should** be reached within 4 weeks’

‘Leg ulcers **should** reduce in size by 40% following 4 weeks of optimal therapy’

‘Chronic wounds **normally** start off small’

“SIMPLE” LEG ULCERS

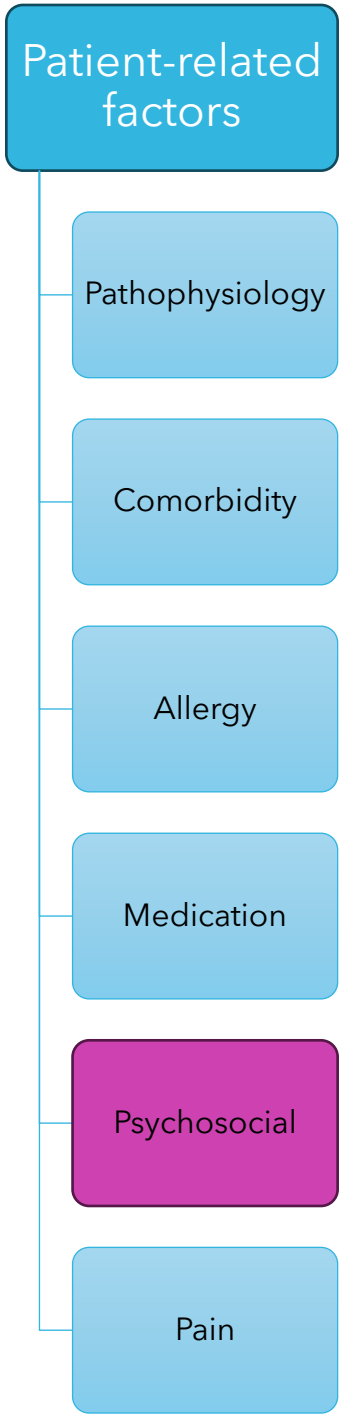
Vowden and Vowden (2016), Leaper and Durani (2008), Gwilym et al. (2022)

HOWEVER, NOT ALL LEG ULCERS ARE “SIMPLE”

- However, when there is an underlying problem, the skin does not heal and the area of breakdown can increase in size, this is a chronic ulcer.
- Underlying disease of the vascular system and existing risk factors mean the healing process for ulcerated skin is challenging.

WHAT FACTORS MAKES A LEG ULCER COMPLEX?

1. Patient-related factors
2. Wound-related factors
3. Skill and knowledge of the HCP
4. Resources and treatment-related factors



PATIENT-RELATED FACTORS

5. PSYCHOSOCIAL

PATIENT-RELATED PSYCHOSOCIAL FACTORS

Major life stressors/ Life events

- Divorce
- Death of spouse, friend or family member
- Resilience
- Ill-health
- Being unable to work due to ulcer
- Job

Occupation

- Prolonged standing – nurse, teacher, shop assistant, security, chef
- Prolonged sitting/ sedentary – desk job, driver

Lifestyle choices

- Alcohol – excessive intake
- Recreational drugs – Marijuana, Cocaine
- IV drug user
- Unhealthy eating

Economic status

- Income
- Housing
- Access to necessity
- Financial stability/ instability

Social support & relationships

- Friends
- Family dynamics
- Mentors
- Roles
- Rules
- Communication styles

Environment

- Hoarding
- Physical conditions
- Infection control

Education and literacy

- Learning
- Resources
- Cognitive abilities
- Problem-solving skills

PAT'S STORY

LET'S STEP INTO SOMEONE ELSE'S SHOES FOR A MOMENT...

Imagine these are your legs.

- How do they feel?
- How do they look?
- How easy is it to move around with them?
- How easy is it to clean them?
- Are they painful?

Take a minute to imagine how they would impact on:

- Your life at home
- Your relationships – partner, children
- Your job
- Your recreational activities
- How you feel about yourself?

A VOLUNTEER PLEASE!

PATIENT-RELATED PSYCHOSOCIAL FACTORS

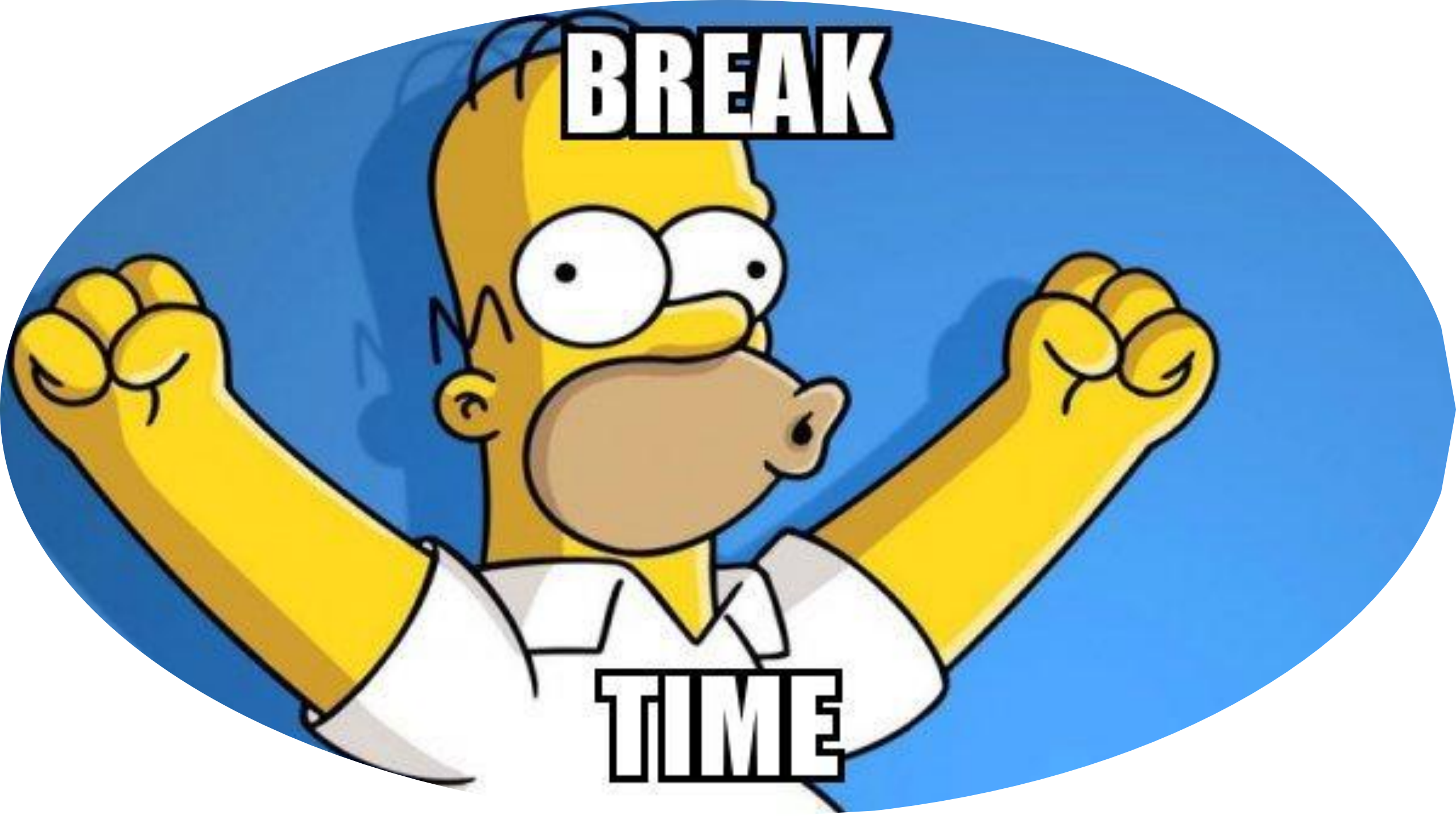
Patients who scored in the top 50% of GAD-7 and PHQ-9 scores were four times more likely to have delayed healing than those scoring in the bottom 50% (Cole-King and Harding, 2001)

Engage

Encourage

Empathise.

Educate


BREAK
TIME

ASSESSMENT

‘Look at the **WHOLE** patient, not only the **HOLE** in the patient’

Dressings alone do **not** heal leg ulcers.

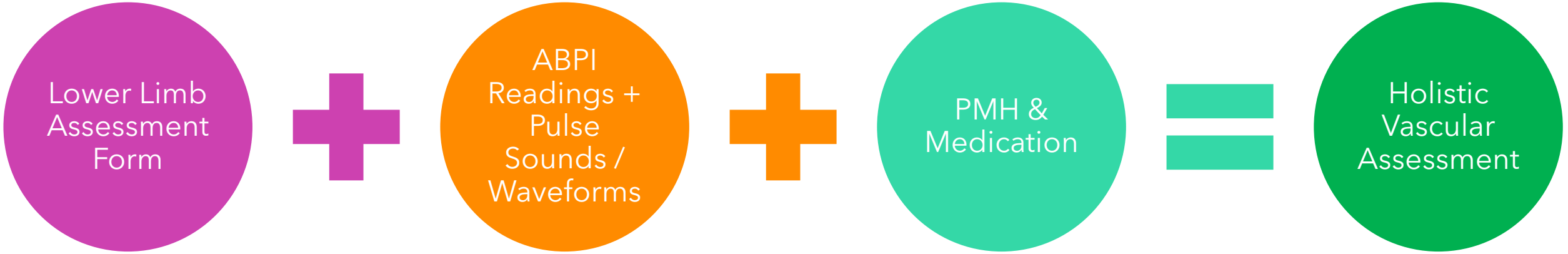
Diagnosing and treating the **underlying cause** is the key to successful treatment.

WHY DO WE NEED TO UNDERTAKE A HOLISTIC ASSESSMENT?

- To diagnose aetiology, and therefore create an effective plan of care.
- A leg ulcer = symptom of another condition (e.g. CVI) and therefore it is important for clinicians to ascertain the cause (Meyer et al. 2011)
- All wounds sit on a spectrum of likelihood of healing depending on intrinsic and extrinsic factors. Recognising, understanding, and addressing the factors that contribute to non-healing will help set the direction of treatment.
- It is also important to consider which factors can be easily modified, are slow to be modified or cannot be modified, to set both patient and clinician expectations.

The building blocks of a holistic assessment

- PMH
- Medications
- Vascular assessment
-



HOLISTIC VASCULAR ASSESSMENT

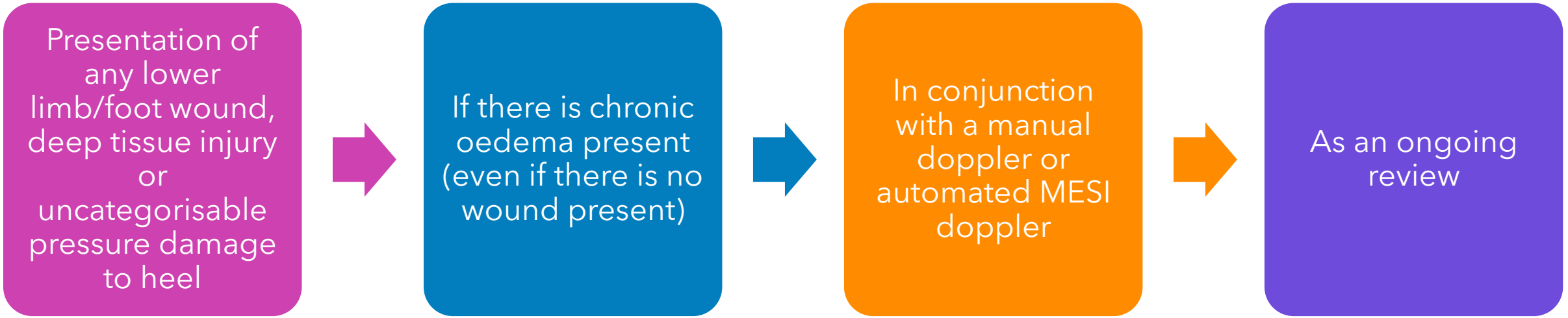
WHAT DO WE USE THE LOWER LIMB ASSESSMENT FORM FOR?

To identify signs and symptoms of arterial disease, venous disease and chronic oedema.

To assess patients effectively and safely

To establish whether it is safe to apply compression therapy

To decide whether it is safe to debride wounds



WHEN DOES A LOWER LIMB ASSESSMENT NEED TO BE COMPLETED?

30% of wounds lack a proper diagnosis, preventing the identification of a suitable treatment plan

(Guest et al, 2015)

- Arterial
- Venous
- Chronic Oedema

Who is responsible for diagnosing?

- Exercised-induced ischaemic leg pain.
- The muscles require a higher blood supply and more oxygen when walking to remove toxins.
- 'Window shopping' – resting for 2-3 minutes relieves pain enabling further walking.

INTERMITTENT CLAUDICATION

Early stage:

Pain in the calf, thigh or buttock muscles on walking

Occurs at quite a long distance, such as half a mile

Established stage:

Narrowing of arteries worsen

Pain occurs at shorter distances, such as 100 yards

Advanced stage:

Eventually, some patients can only walk a few yards before they are stopped by the pain in the legs.

INTERMITTENT CLAUDICATION

WHAT IS REST PAIN?

When the arteries are severely narrowed/blocked, even at rest the arteries cannot supply enough blood to the legs – progressive arterial occlusion.

The part of the body furthest away from the heart is affected first (e.g. the toes and feet).

Rest pain progression

Initially the feet may only be painful at night, when the legs are placed horizontally in bed, losing the help of gravity to supply blood to the feet.

Some people find that dangling the legs out of the bed or sleeping in an armchair with legs dependent helps relieve the pain temporarily.

Eventually the feet are painful all through the day and sleeping is very difficult due to the pain

IS IT REST PAIN?

Night cramps

- Occurs in the calf muscle overnight
- Awakens the patient from sleep
- Relieved by massaging the muscle, by walking or antispasmodic agents

Restless legs syndrome

- Causes an unpleasant crawling/creeping sensation in the feet, calves and thighs
- Often worse in the evening and at night
- Women are twice as likely to develop this
- Overwhelming urge to move the legs
- Magnesium supplements can reduce symptoms

Arthritis (particularly of the metatarsal bones)

- Pain in the foot often experienced at night
- Relieved by standing
- Usually occurs intermittently and at sporadic intervals
- Not relieved by recumbency

Diabetic neuropathy

- Often associated with diminished pedal pulse sounds and trophic skin changes
- Decreased vibratory sense

(Jamie et al, 1999)

Be a detective, investigate the pain
Don’t take answers at face value, ask questions
Consider arthritis, spinal stenosis
NICE (2022). Peripheral arterial disease - What else might it be?

USEFUL RESOURCES

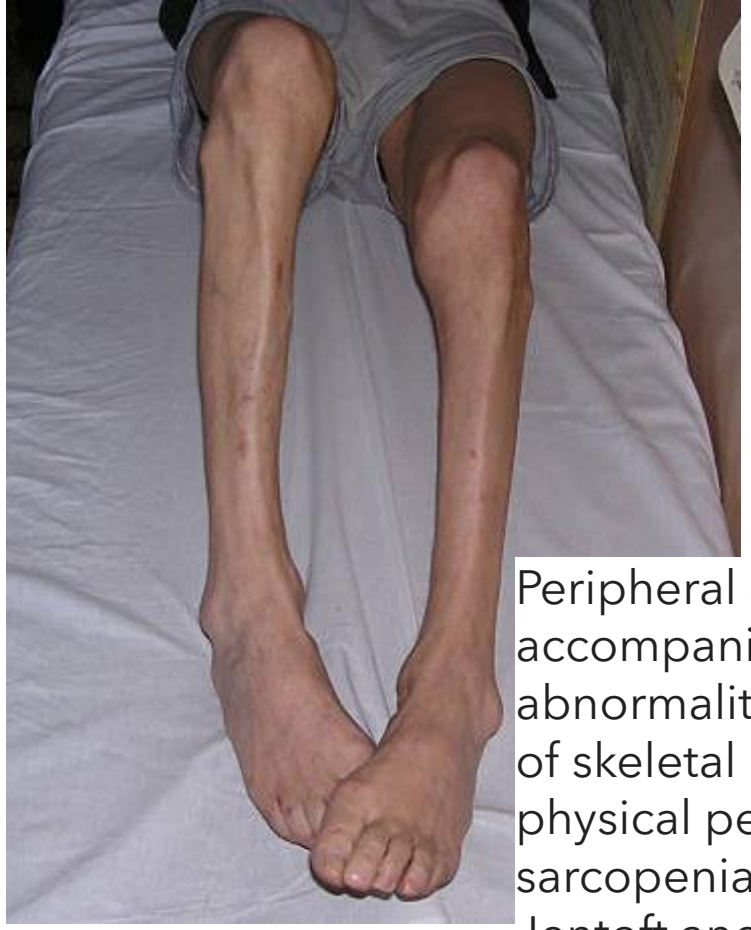
SKIN NECROSIS (GANGRENE)

- Death of the tissue caused by lack of blood flow and oxygen.
- Can also be caused by infection.
- Can be removed but is irreversible.

NECROSIS/ESCHAR OR ANAEROBE INFECTION?

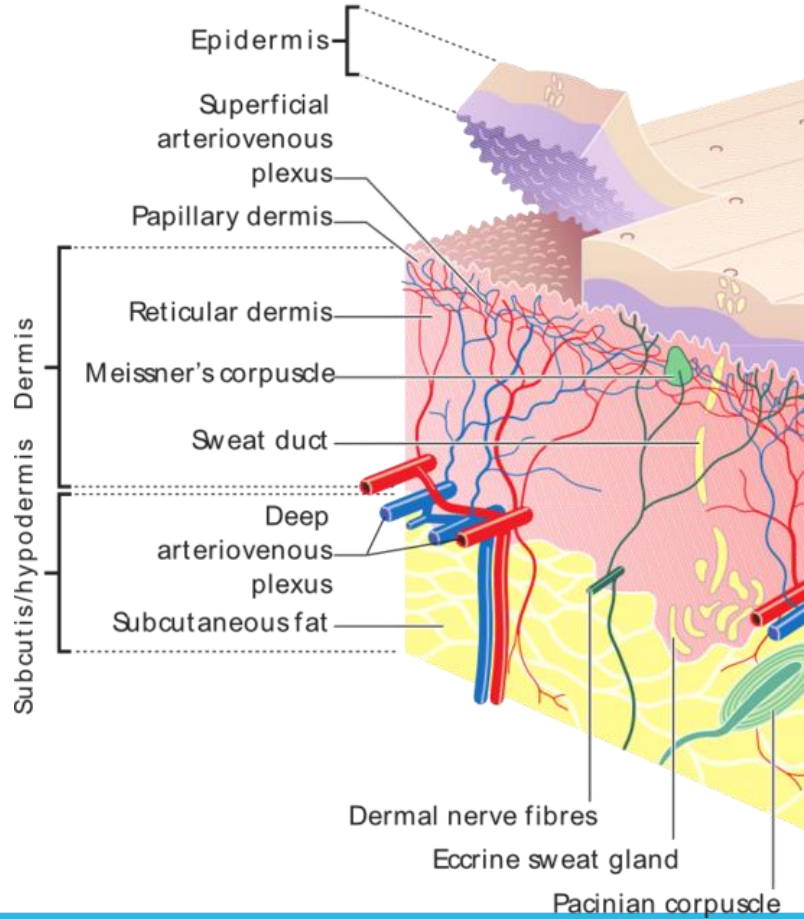
- **Pallor upon elevation** – arterial pressure in the lower leg/foot is insufficient to overcome the forces of gravity. The skin is not receiving enough oxygen-rich blood.
- **Dependent rubor** – the colour of the skin changes from white/blue/brown to red/black as the blood becomes deoxygenated as it travels through ischaemic tissue (post-hypoxic vasodilation)

POSITIVE BUERGER'S SIGN



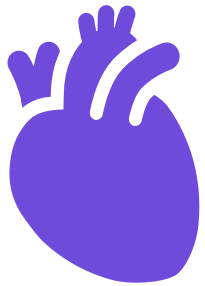
Peripheral arterial disease is commonly accompanied by musculoskeletal abnormalities including generalised loss of skeletal muscle mass, strength, and physical performance—also called sarcopenia (McDermott et al (2007); Cruz-Jentoft and Saya (2019).

ATROPHY OF THE SUBCUTANEOUS TISSUES



SCALING

- Blood vessels in the papillary layer of the skin provide nutrients and remove cellular waste products
- Arterial disease = insufficient blood supply, reduced regeneration of skin cells and buildup of waste products



Capillary Refill

Apply pressure to the tip of the big toe whilst the patient is supine for 5 secs.

Good cardiac output and digital perfusion = <3 secs.

>5 secs = abnormal, poor peripheral perfusion.

Capillary Refill

Apply pressure to the tip of the big toe whilst the patient is supine for 5 secs.

Good cardiac output and digital perfusion = <3 secs.

>5 secs = abnormal, poor peripheral perfusion.

Skin Temperature

Use the back of your hands to assess both limbs.

Both limbs should be warm and similar in temperature.

Blood circulation warms the body. If PAD is present, the feet/toes might feel cold.

Gradual or abrupt change in temperature?

Consider the environment!

Sensory Neuropathy

Check sensation – is the limb/foot numb?

Non-ischaemic reasons for loss of sensation need ruling out such as diabetic neuropathy, spinal cord injury.

Motor Neuropathy

Assess ankle movement – check flexion and extension of the foot and toes.

Muscle function may be reduced by a compromised arterial blood supply.

Non-ischaemic reasons for poor movement need ruling out such as arthritis, oedema, previous surgery, and lack of use.

Smoothy or Shiny Skin

Skin that looks smoothy or glossy may be a sign that skin cells aren't getting enough nutrients due to PAD.

Consider if these skin changes are due to oedema.

THICKENED TOENAILS AND HAIR LOSS

SIGNS AND SYMPTOMS OF VENOUS DISEASE

LYMPHOVENOUS DISEASE IS PROGRESSIVE

Early Lymphovenous disease

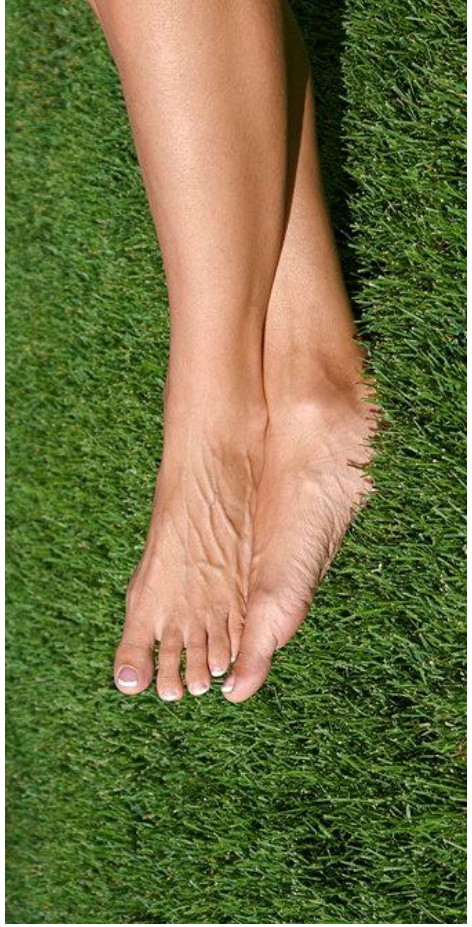
- Requires preventative treatment
- The aim is to slow down or control venous disease from getting worse over time

Established Lymphovenous disease

- More established signs and symptoms
- The aim is to alleviate the deterioration of venous disease symptoms and to provide more effective support for venous failure

Advanced Lymphovenous disease

- Patients present with severe venous disease signs and symptoms
- The aim is intensive management of the underlying skin condition and skin care

TIRED, HEAVY, ACHY LEGS




SPIDER VEINS

CORONA PHLEBECTATICA

(ANKLE FLARE, CUPS AND STASIS SPOTS)

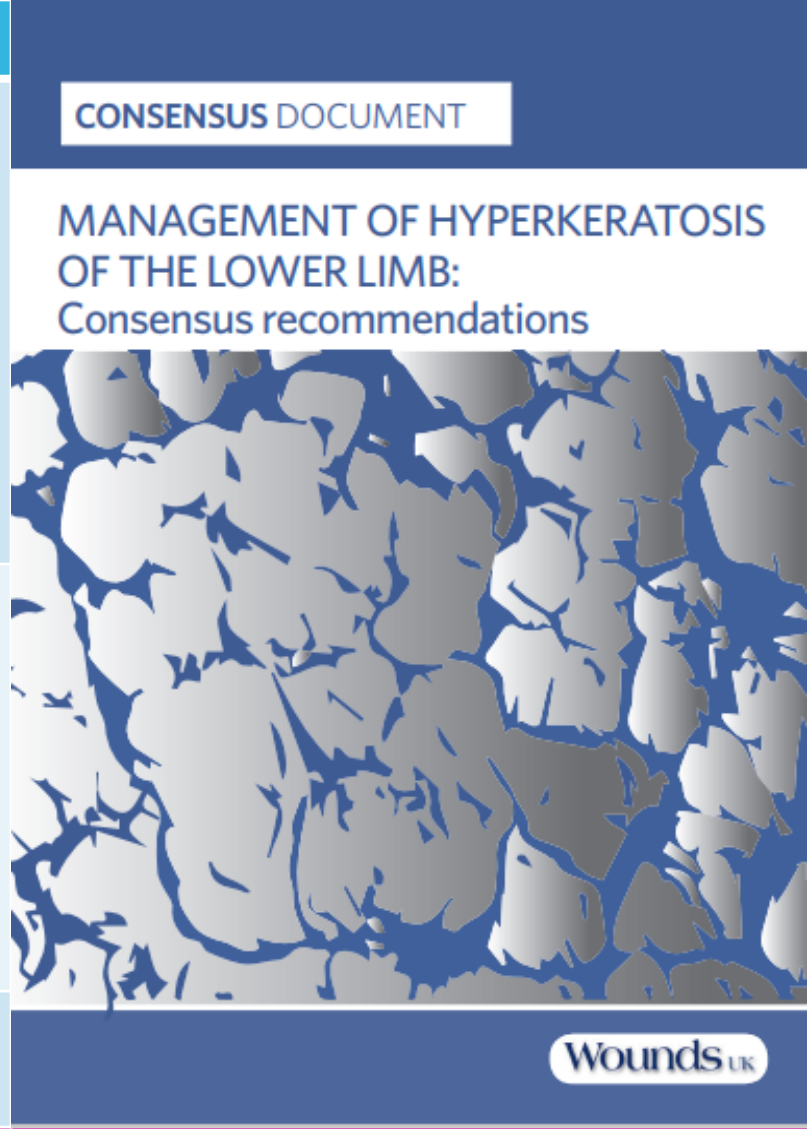



MILD TO MODERATE VARICOSE VEINS




MILD/MODERATE HYPERKERATOSIS

Condition	Signs/Symptoms
Hyperkeratosis	• May present as red, dry, skin with brown or grey scaly patches that do not flake away when the skin is brushed. • May cover small, isolated areas or the entire circumference of the lower leg. • Scales can be lifted easily without causing bleeding after soaking and regular emollient use. • Can be associated with odour due to the presence of bacteria and fungi.
Dry skin / crust / scaling	• Crust is normally secondary to leakage from the skin or a wound that has dried out, or a build up of dried skin or wound care products. • Dry skin flakes without multiple layers. • Associated with excessive exudate on the skin; crusts dissolve on washing and do not recur when the exudate is under control
Varicose eczema	• Red, inflamed, itchy, and mat weep



IS IT HYPERKERATOSIS OR SCALING?

IS IT HYPERKERATOSIS OR SCALING?

HAEMOSIDERIN STAINING / HYPERPIGMENTATION

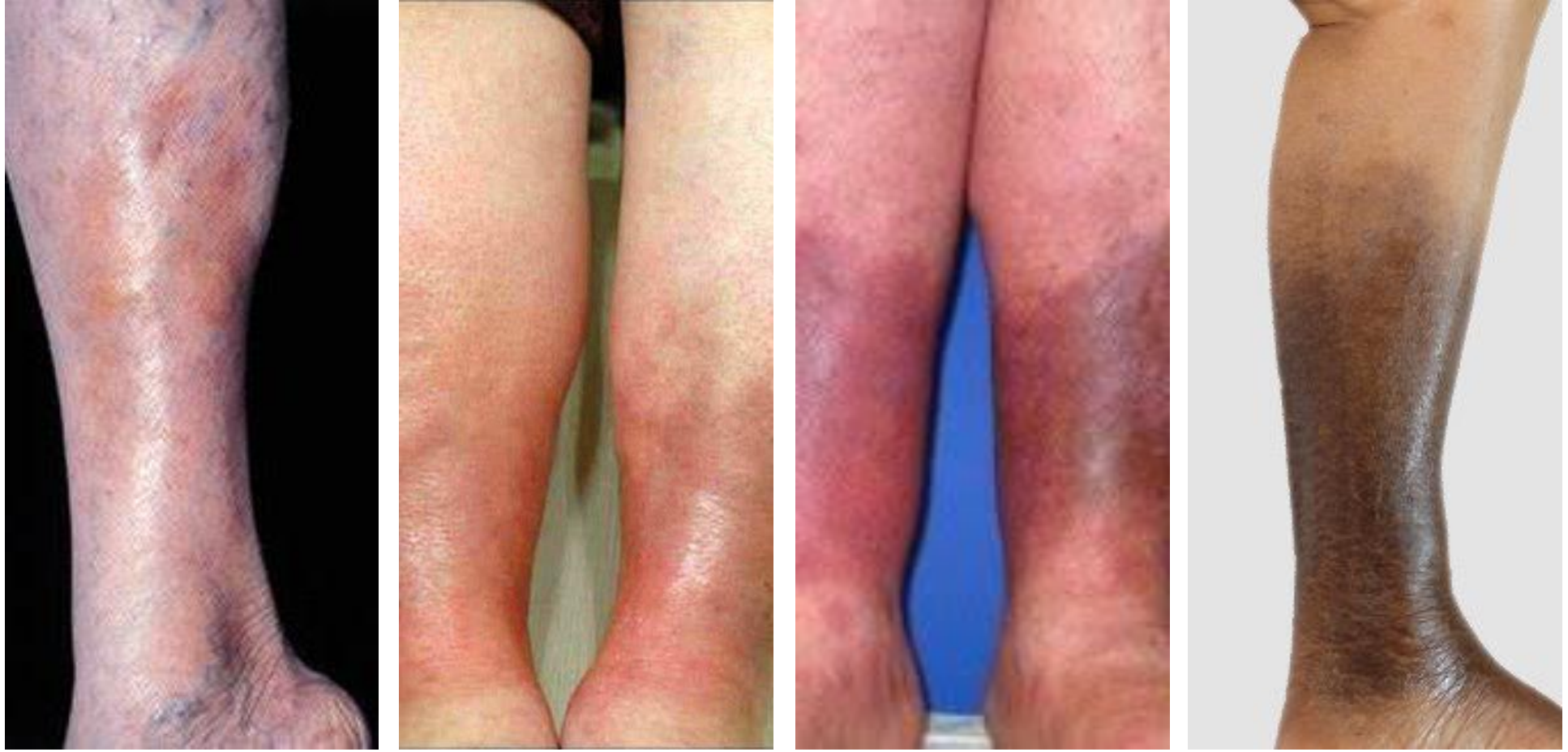
Moderate to severe varicose veins




VARICOSE ECZEMA / VENOUS DERMATITIS




ATROPHIE BLANCHE



INDURATION

Moderate to severe varicose veins

Moderate to severe hyperkeratosis

Healed ulcer

Recurring/open ulcer

‘INFLMMATORY LEGS’ OR CELLULITIS?

28% of 425 patients with confirmed cellulitis has a concurrent skin disease, commonly varicose eczema. If the varicose eczema had been identified and treated in a timely manner, this could have prevented cellulitis from occurring

(Levell, Wingfield and Garioch, 2011)

‘IMFLAMMATORY LEGS’ OR CELLULITIS?

The Lymphoedema Support Network (2022)

Symptom	Red Legs	Cellulitis
Definition	Chronic inflammatory response to venous insufficiency often misdiagnosed as cellulitis.	Acute and potentially serious Infection of the skin and subcutaneous tissue, most commonly caused by bacteria
Both legs are the same	Very common	Very rare
Temperature/ Fever	No	Yes
Feeling Unwell/ General Malaise	No	Yes
Pain	May be tender	Yes
Spreading erythema (>2cm from wound border if wound present)	No – redness throughout both legs, normally below the knee but does not spread. Appears purple/grey in darker skin tones so is more difficult to identify	Yes
Hot to the touch	May feel warmer	Yes
Treatment	Good skin care and emollient therapy, exercise, leg elevation and compression. Will **NOT** resolve with antibiotic therapy	Antibiotic therapy

‘INFLAMMATORY LEGS’ OR CELLULITIS?

Cellulitis in patients with Chronic Oedema

Patient's with chronic oedema are at a far greater risk of developing cellulitis

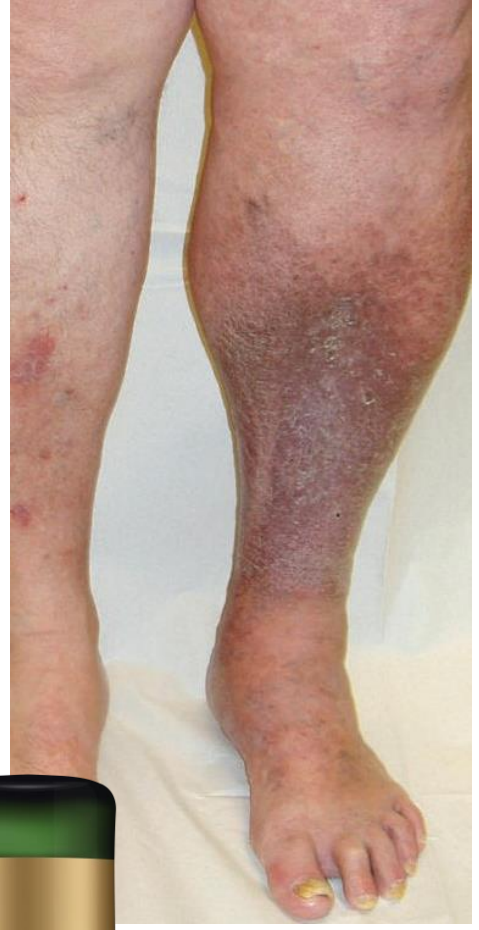
Impaired local immune surveillance/response

Protein-rich lymphatic fluid is thought to facilliate bacterial growth

Patients may present atypically from those without chronic oedema - may have normal white blood cell count, C-reactive protein level and may not have a temperature.

How do we diagnose cellulitis in this group of patients?

What shapes our care for patients with chronic oedema with cellulitis?



LIPODERMATOSCLEROSIS

Upside-down champagne bottle




OEDEMA / LYMPHOEDEMA

LISTEN

- When did it start?
- Medical history?
- Medication?
- Family history?
- Unresolved by elevation or diuretics?

LOOK

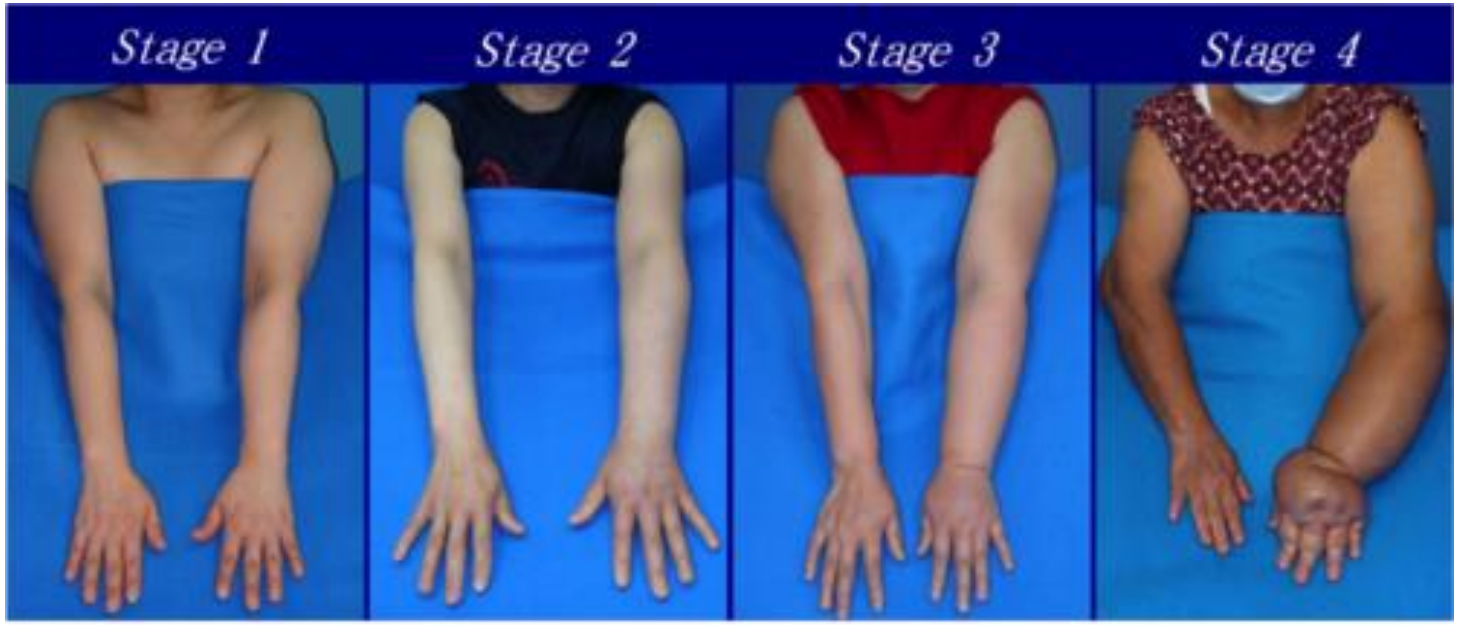
- Where does the oedema start?
- Where does it stop?
- Toes? Ankles? Knees? Thighs? Waist?
- Bilateral or unilateral?

FEEL

- How does it feel?
- Soft and pitting?
- Firm and fibrotic?
- Positive Stemmer sign?

ASSESSING FOR SIGNS OF CHRONIC OEDEMA

WHAT DO THE DIFFERENT STAGES OF LYMPHOEDEMA LOOK LIKE?




Stage 1
Stage 2
Stage 3
Stage 4

PITTING OEDEMA

Positive stemmer

Positive stemmer

Negative stemmer

STEMMER'S TEST – OEDEMATOUS TOES

STEMMER'S SIGN

baseline limb measurements

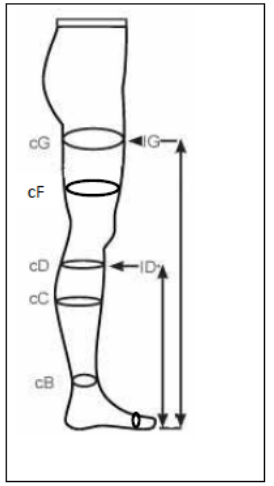
Misshapen legs with skin folds - Take photograph of leg and mark on photograph where to measure

Patient label

NHS
Oxford Health
NHS Foundation Trust

Please measure the limb before each application of compression bandaging - **LEFT / RIGHT LEG** (delete as appropriate)

DATE									
cG									
cF									
cD									
cC									
cB									
Circumference around base of toes									



Lower Limb measurement form/Tissue Viability/V3/Nov2019




SKIN FOLDS

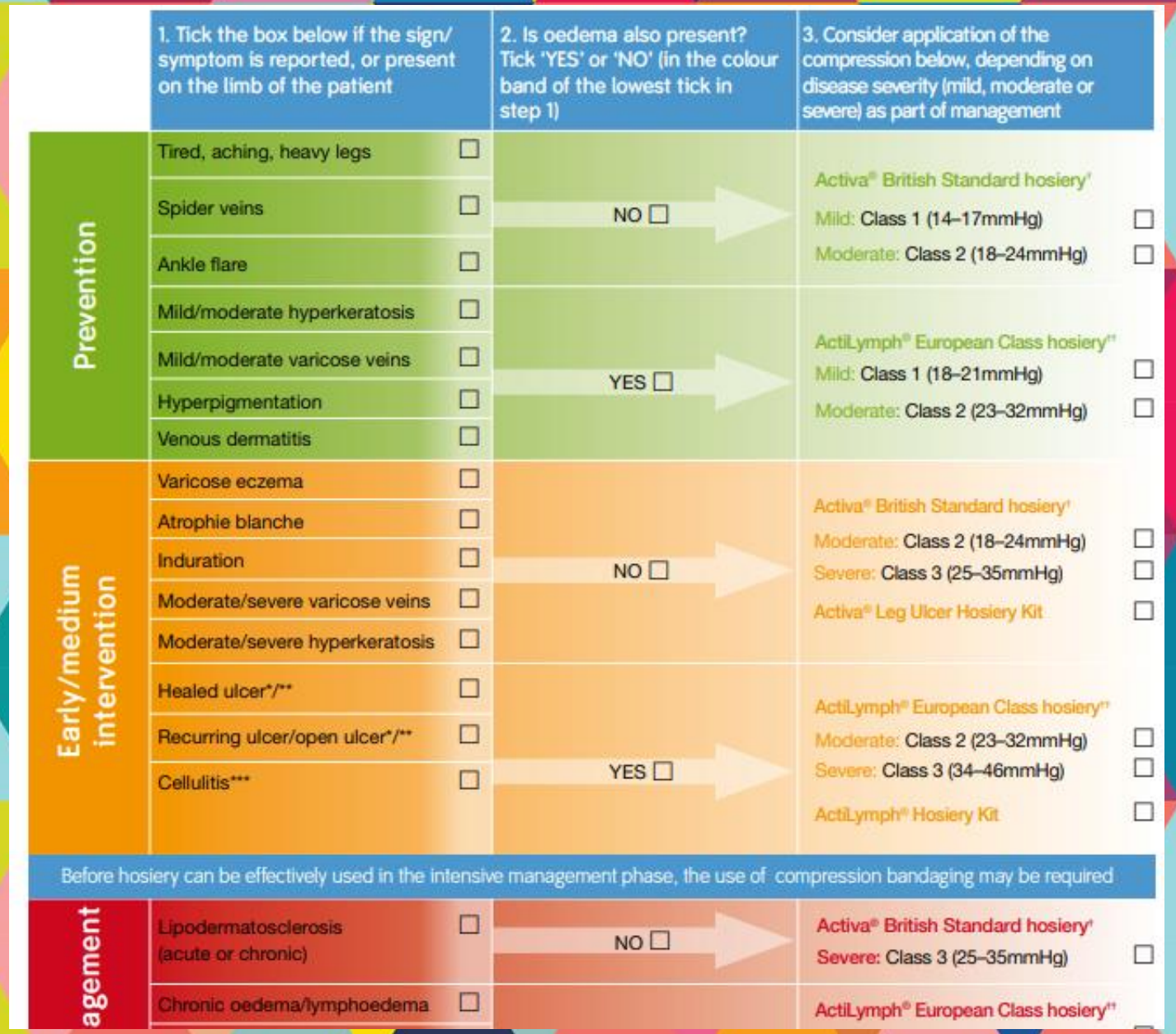



PAPILLOMATOSIS

LYMPHANGIOMATA

LYMPHORRHOEA

CHROSS CHECKER TOOL

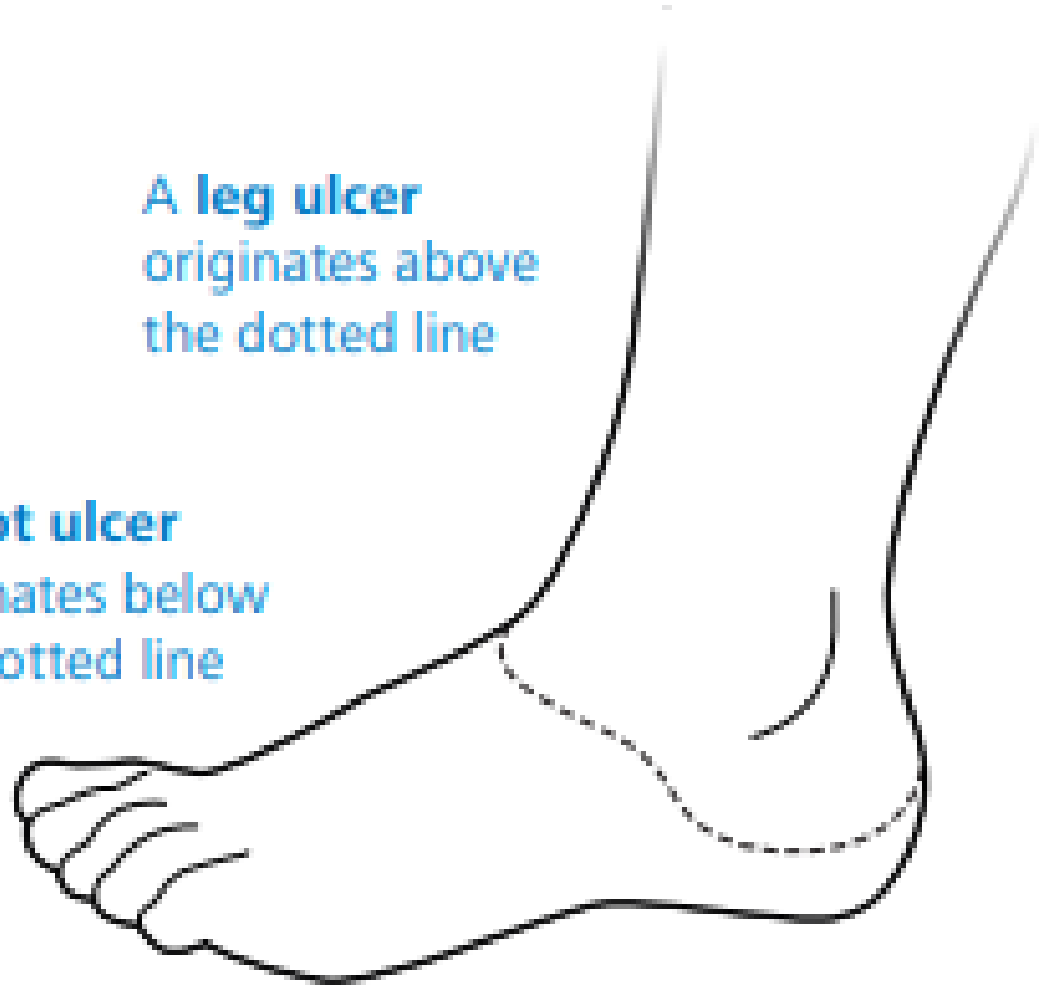


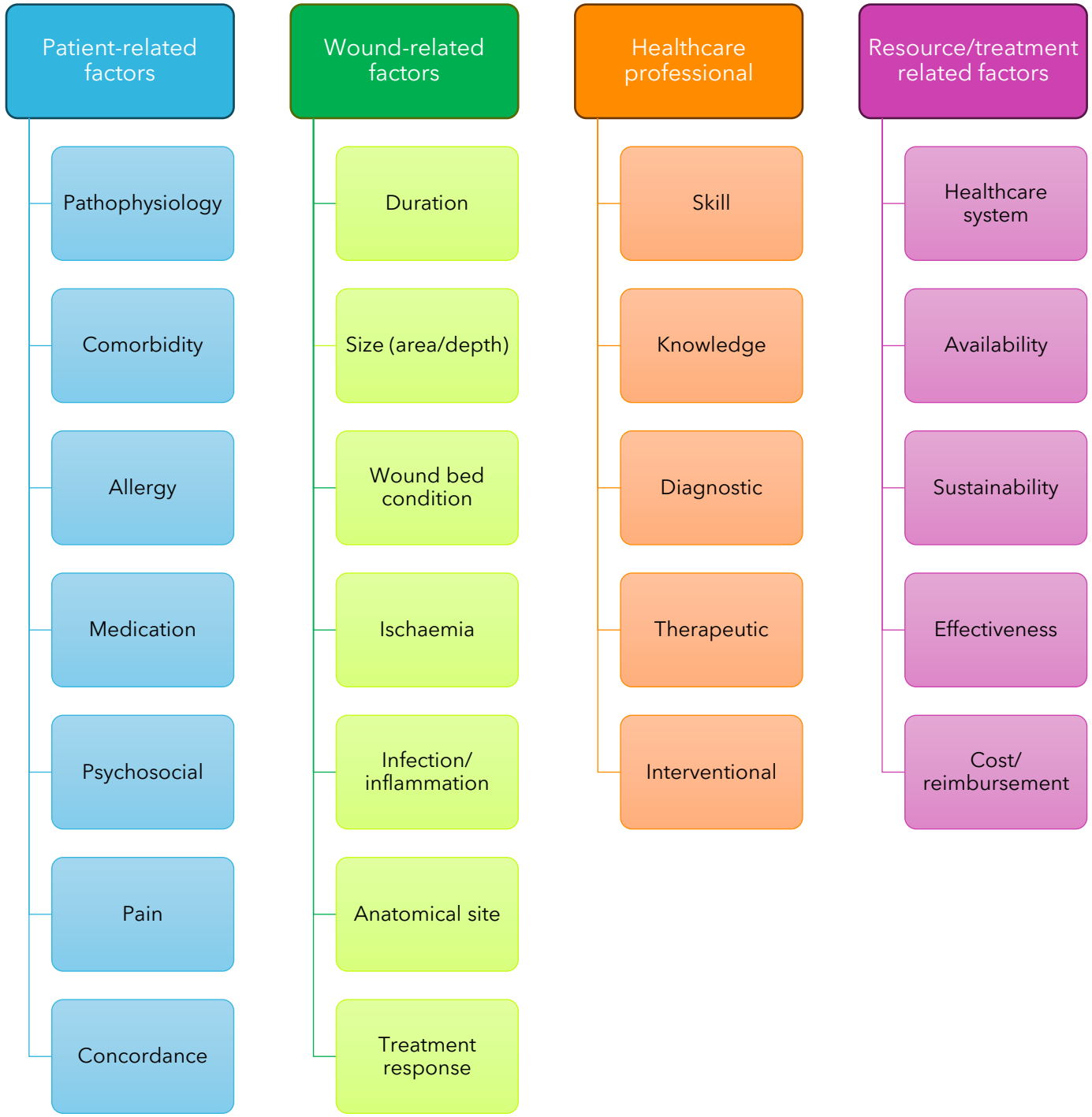
	1. Tick the box below if the sign/ symptom is reported, or present on the limb of the patient	2. Is oedema also present? Tick 'YES' or 'NO' (in the colour band of the lowest tick in step 1)	3. Consider application of the compression below, depending on disease severity (mild, moderate or severe) as part of management
Prevention	☐ Tired, aching, heavy legs ☐ Spider veins ☐ Ankle flare	NO ☐	Activa® British Standard hosiery† Mild: Class 1 (14–17mmHg) ☐ Moderate: Class 2 (18–24mmHg) ☐
	☐ Mild/moderate hyperkeratosis ☐ Mild/moderate varicose veins ☐ Hyperpigmentation ☐ Venous dermatitis	YES ☐	ActiLymph® European Class hosiery†† Mild: Class 1 (18–21mmHg) ☐ Moderate: Class 2 (23–32mmHg) ☐
Early/medium intervention	☐ Varicose eczema ☐ Atrophie blanche ☐ Induration ☐ Moderate/severe varicose veins ☐ Moderate/severe hyperkeratosis	NO ☐	Activa® British Standard hosiery† Moderate: Class 2 (18–24mmHg) ☐ Severe: Class 3 (25–35mmHg) ☐ Activa® Leg Ulcer Hosiery Kit ☐
	☐ Healed ulcer*/** ☐ Recurring ulcer/open ulcer*/** ☐ Cellulitis***	YES ☐	ActiLymph® European Class hosiery†† Moderate: Class 2 (23–32mmHg) ☐ Severe: Class 3 (34–46mmHg) ☐ ActiLymph® Hosiery Kit ☐
Before hosiery can be effectively used in the intensive management phase, the use of compression bandaging may be required			
agement	☐ Lipodermatosclerosis (acute or chronic)	NO ☐	Activa® British Standard hosiery† Severe: Class 3 (25–35mmHg) ☐
	☐ Chronic oedema/lymphoedema		ActiLymph® European Class hosiery††

Where does a leg ulcer end and a foot ulcer begin?

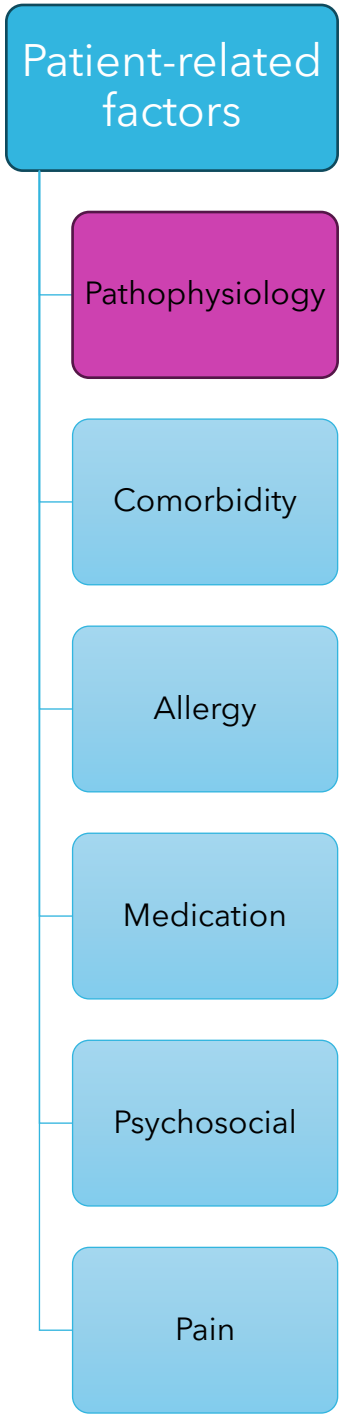
A **leg ulcer**
originates above
the dotted line

A **foot ulcer**
originates below
the dotted line





FACTORS THAT MAY AFFECT COMPLEXITY AND HARD-TO-HEAL-STATUS

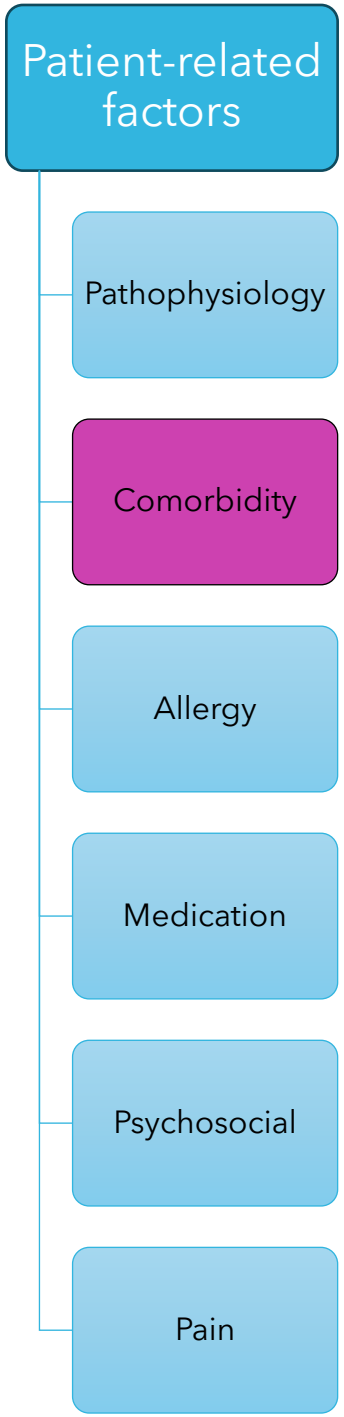


PATIENT-RELATED FACTORS

1. PATHOPHYSIOLOGY

IMPORTANT BLOODS

Hb (Anaemia)	eGFR (Kidney function)	Albumin (Overall health status)	HbA1c (Diabetes)	CRP (Infection/ inflammation)	NT-ProBNP (Heart failure)	WCC (Infection/ inflammation)	Platelet Count (blood disorders)
>130 = normal	>90 = normal 60-80 = CKD 1 45-59 = CKD 2	32-50 = normal	<6.5 = normal	<5 = normal	<400 = normal	4,000-11,000 = normal	150-450 = normal
<130 = anaemia	**30-44 = CKD 3** **15-29 = CKD 4** **<15 = CKD 5 (kidney failure)**	**<32 = kidney/ liver disease/ poor overall health**	**>6.5 = hyperglycaemia/ unmanaged diabetes**	**>5 = infection/ inflammation**	**>400 = heart failure**	**<4,000 = low white blood cell count** **>11,000 high white blood cell count**	**>450 = thrombocytosis** **<150 = thrombocytopenia**

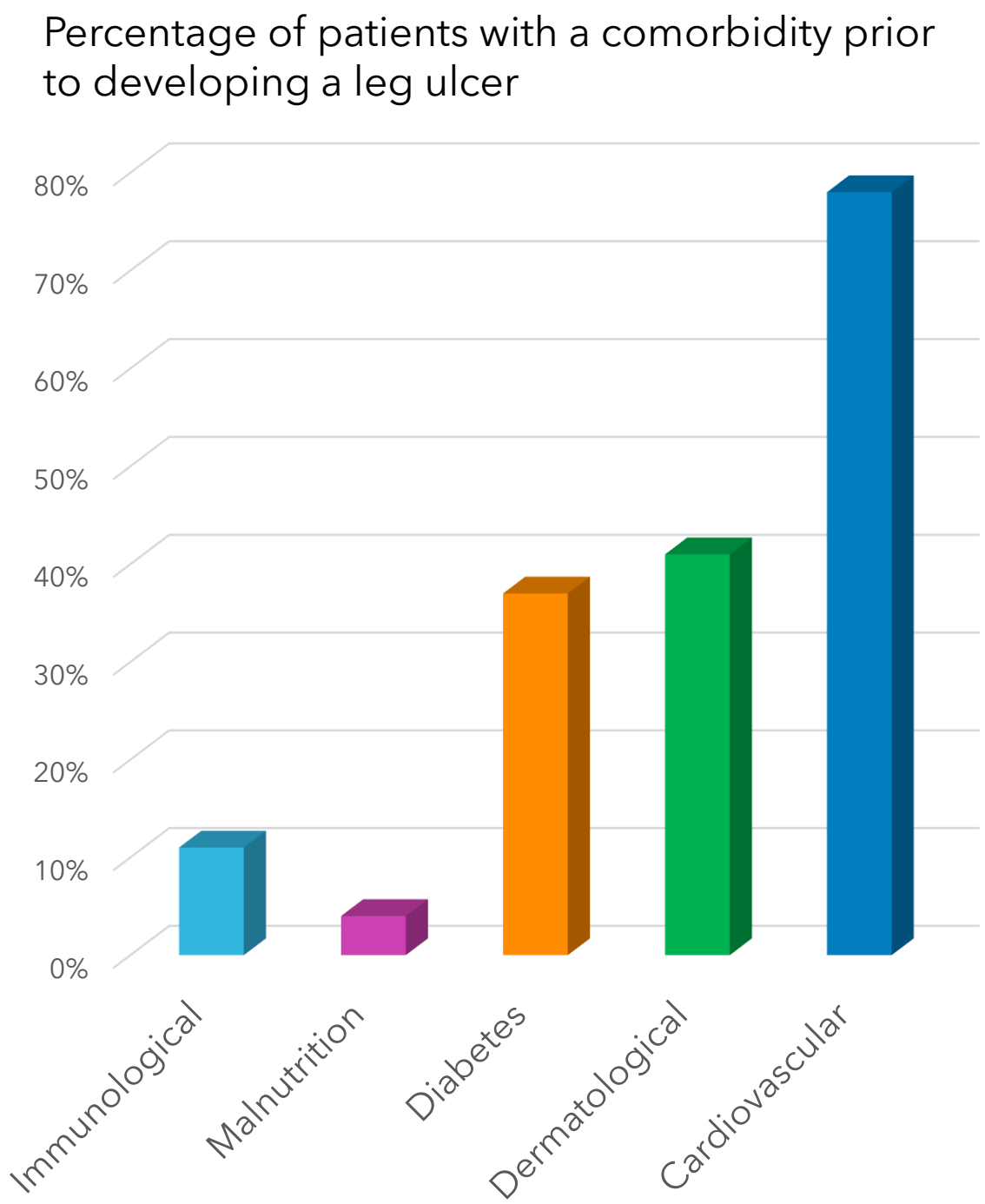


PATIENT-RELATED FACTORS

2. COMORBIDITY

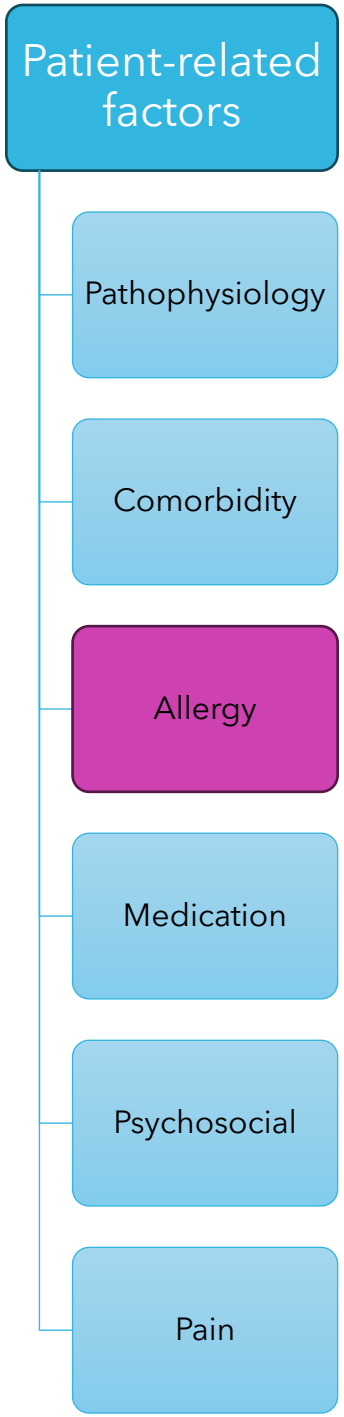
Activity:
Join at menti.com and use code 4256-4964 or scan QR code

Comorbidities for wound healing - Mentimeter



COMORBIDITIES

- Physical factors, such as diabetes, obesity, malnutrition, increased age (60+), and even reduced mobility, have an impact on healing.
- Correcting, where possible, the underlying wound pathology and any comorbidities is a central feature of wound management.
- If the underlying disease cannot be corrected or is difficult to manage, wound healing can be delayed.



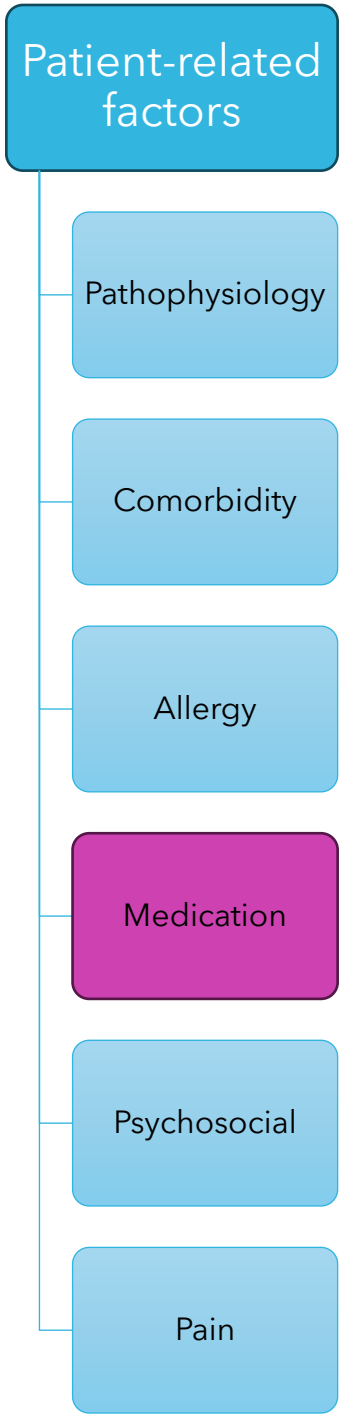
PATIENT-RELATED FACTORS

3. ALLERGY

ALLERGIES

- Do you ask your patients if they suffer from hayfever? Hay fever affects 26% of adults in the UK (Scadding et al 2017).

- Gelatine in ichthopaste.
- Iodine allergy – no inadine, iodosorb or iodoflex, thyroid disorders.
- Latex – latex-free gloves, latex-free compression bandaging.
- Adhesive dressing allergy (plasters) - Acrylates



PATIENT-RELATED FACTORS

4. MEDICATION

MEDICATION

Delays healing

- Anticoagulants (e.g. Apixaban, Edoxaban, Warfarin, Rivaroxaba)
- Cytotoxic agents (e.g. Methotrexate, Capecitabine)
- Antiplatelets(e.g. Aspirin, Clopidogrel)
- Antipsychotics (e.g. Clozapine, Aripiprazole)
- Immunosupressive agents (e.g. Rituximab, Azathioprine, Cyclosporine)
- Corticosteroids (e.g. Prednisolone)
- Cox-2 Inhibitors *(Reduces pain/inflammation, e.g.* Celecoxib, Valdecoxib

Increases oedema

- Calcium channel blockers (reduced hypertension, e.g. Amlodipine)
- NSAIDs (e.g. Ibuprofen, Naproxen)
- Diabetics (e.g. Pioglitazone, Pyroglitizide)
- Antiepileptics/neuropathic analgesia (e.g. Pregabalin, Gabapentin)
- Parkinson's medications

Affects surrounding skin

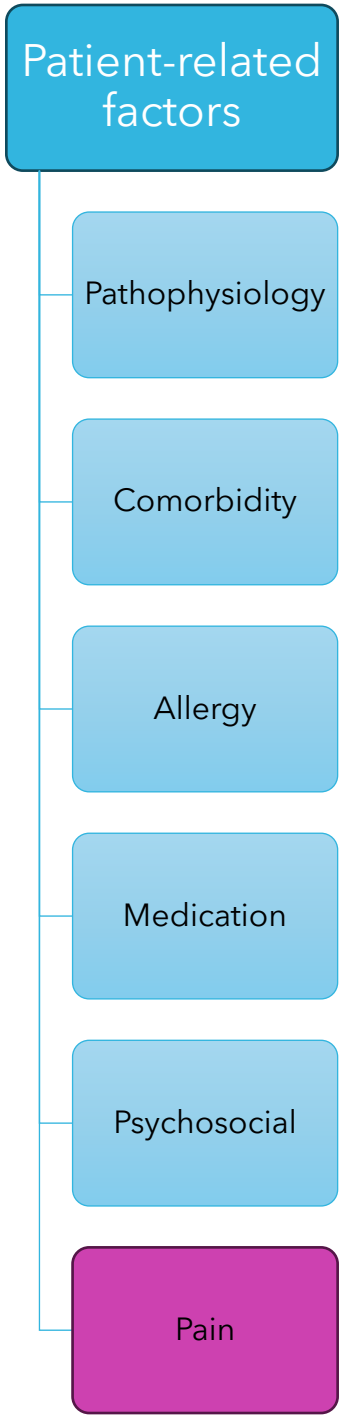
- Topical steroids (e.g. Betamethasone, Mometasone)
- Systemic steroids (e.g. Prednisolone)

Causes ulceration

- Potassium channel blockers (reduces hypertension, e.g. Nicorandil)
- Cytotoxic agents (e.g. Hydroxycarbamide, hydroxyurea)

PATIENT BELIEFS

- Has the patient received any explanation about the cause of their ulcer and the method of its treatment?
- Is the patient aware of the importance of compression in healing?
- Does the patient have confidence in their treatment?
- Veganism
- Different generations
- Religion
- Patient centered-care vs paternalistic care



PATIENT-RELATED FACTORS

6. PAIN

‘PAIN IS WHATEVER THE EXPERIENCING PERSON SAYS IT IS, EXISTING WHENEVER THE EXPERIENCING PERSON SAYS IT DOES.’

(MCCAFFERY, 1989)

Ow, that hurts!

(But I haven't even touched your leg!)

No, I don't want a doppler – it hurts too much!

It's painful when you wash my wound, can you just soak it?

I don't want compression bandaging, it hurts

The air is making my wound hurt!

Please no honey, it stings!

DO THESE SOUND FAMILIAR?

TYPES OF PAIN

Nociceptive

Usually arising from direct damage to tissue. Signals are picked up by sensory receptors which are then transmitted to the spinal cord and then the brain where they are interpreted as pain.

Neuropathic

Caused by lesions, damage to or dysfunction of the nervous system which causes an abnormally strong response.

It is important to determine which type of pain the patient is experiencing as they require different treatments (Brown, 2015).

PAIN DESCRIPTORS

Nociceptive

Usually arising from direct damage to tissue. Signals are picked up by sensory receptors which are then transmitted to the spinal cord and then the brain where they are interpreted as pain.

- Aching
- Cramping
- Nagging
- Gnawing
- Cutting
- Sharp
- Piercing
- Pinching
- Pounding
- Pulsing
- Throbbing
- Pressing
- Squeezing
- Crushing
- Pulling
- Tugging
- Tender
- Dull
- Lacerating
- Wrenching

Neuropathic

Caused by lesions, damage to or dysfunction of the nervous system which causes an abnormally strong response.

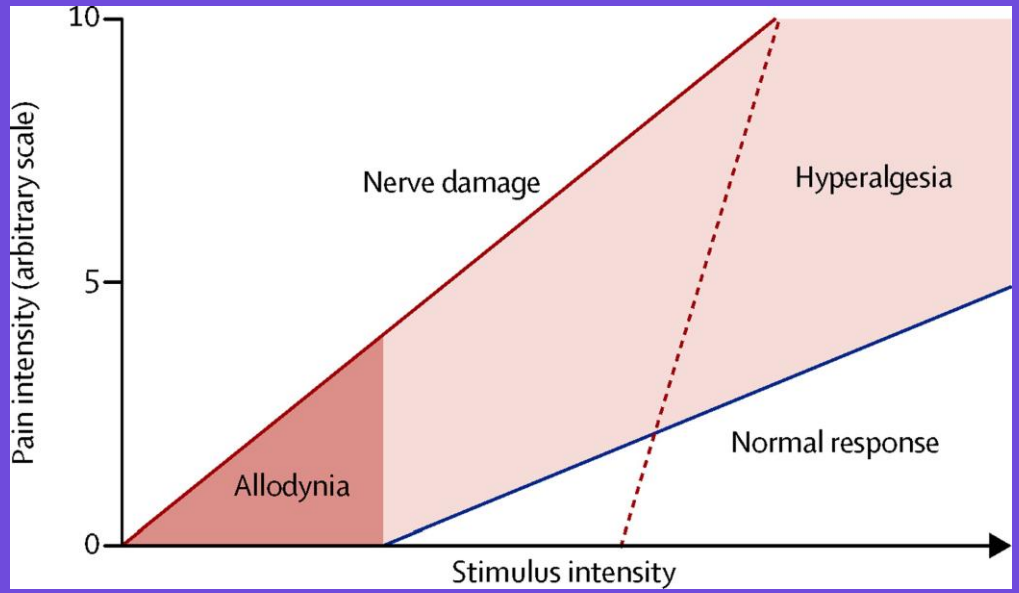
- Burning
- Hot
- Scalding
- Cold
- Cool
- Freezing
- Drilling
- Electric shocks
- Flashing
- Itchy
- Numb
- Penetrating
- Pins & needles
- Pricking
- Shooting
- Smarting
- Stabbing
- Stinging
- Tingling
- Flickering

Hyperalgesia

- Neuropathic
- Arises when nociceptive pain and psychological impact is not managed
- Leads to prolonged inflammatory response
- Heightened sensitivity to pain
- Pain is disproportionate to injury
- e.g. excruciating pain when touching a bruise

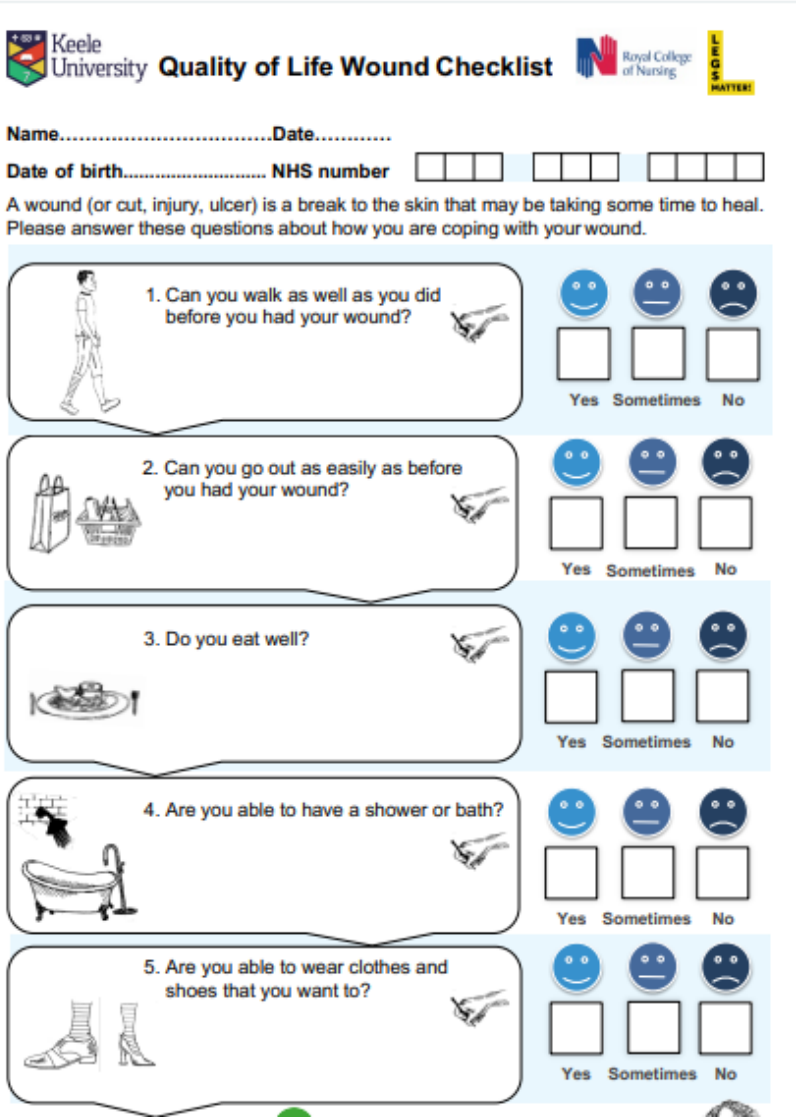
Allodynia

- Neuropathic
- Arises when there is an issue between how the nerves send and receive messages within the nervous system
- When something that shouldn't hurt is extremely painful
- e.g. feeling pain from clothing touching the skin



HYPERALGESIA AND ALLODYNIA

When the skin is broken and the epidermal-dermal junction is exposed to the air, pain can be experienced, even without touch.



Keele University **Quality of Life Wound Checklist** Royal College of Nursing LEGS MATTER!

Name.....**Date**.....

Date of birth..... **NHS number**

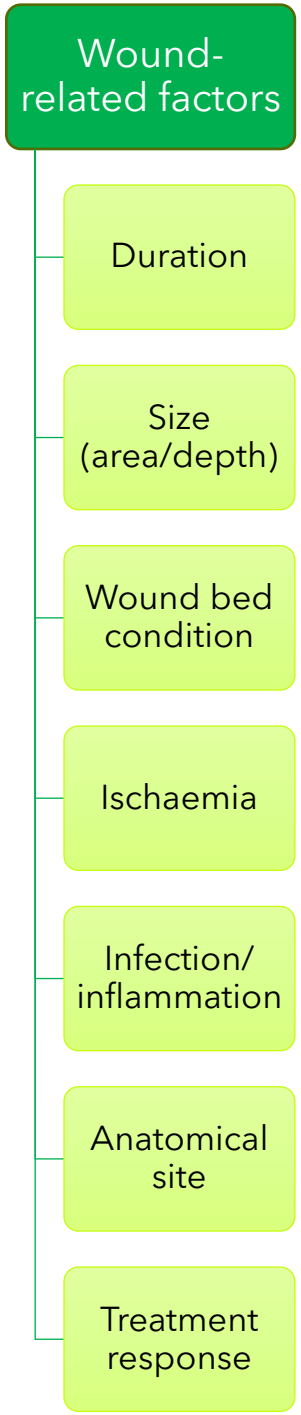
A wound (or cut, injury, ulcer) is a break to the skin that may be taking some time to heal. Please answer these questions about how you are coping with your wound.

1. Can you walk as well as you did before you had your wound?
2. Can you go out as easily as before you had your wound?
3. Do you eat well?
4. Are you able to have a shower or bath?
5. Are you able to wear clothes and shoes that you want to?

Yes Sometimes No

- **O** Onset/Cause
- **L** Location
- **D** Duration
- **C** Characteristics
- **A** Aggravating & Alleviating Factors
- **R** Radiating
- **T** Timing/Severity

PAIN ASSESSMENT



WOUND-RELATED FACTORS

WOUND-RELATED FACTORS

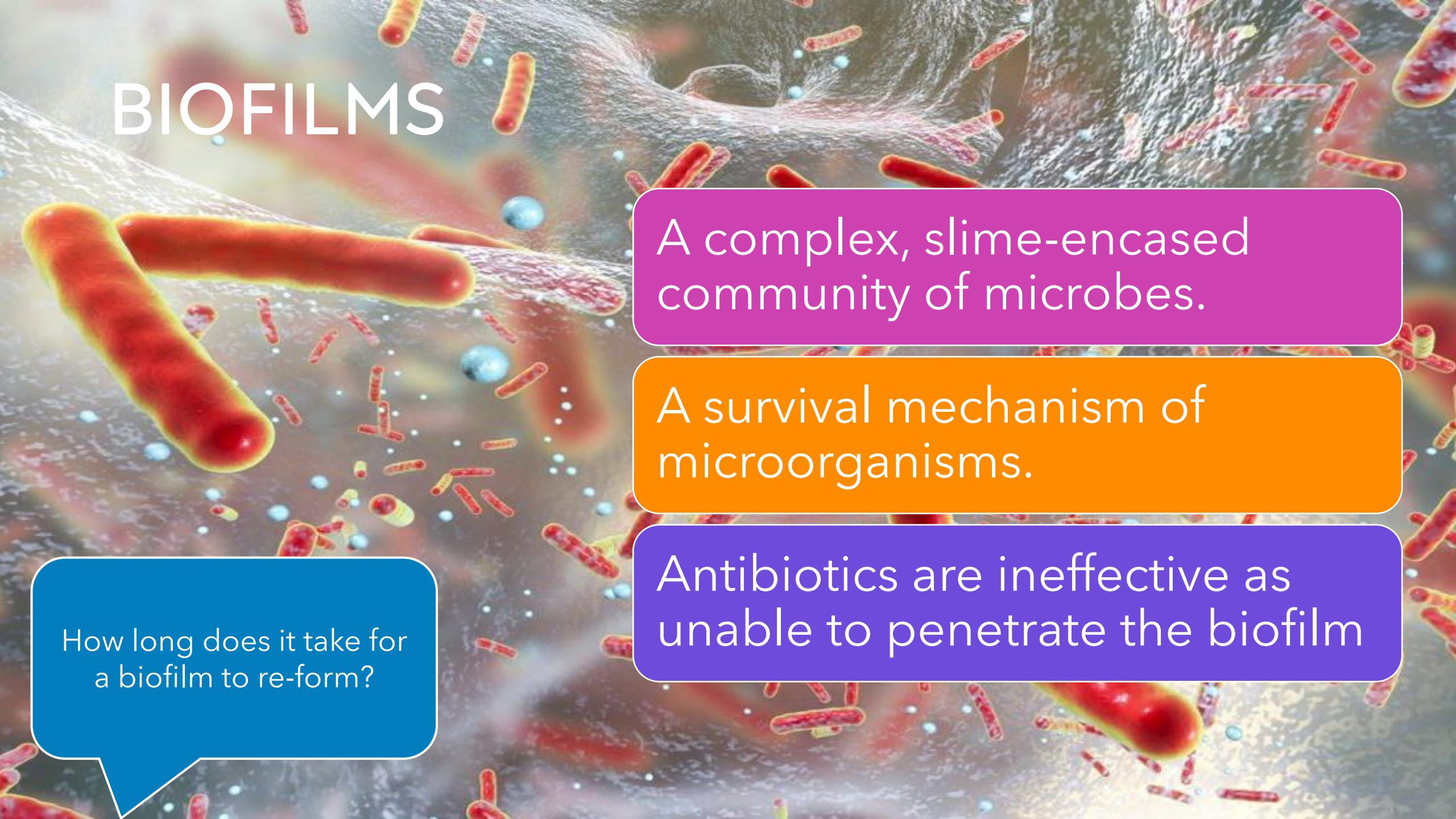
Infection/Inflammation	• Chronic wounds are characteristed by a high bacterial load. • Bacteria stimulate chronic inflammation
Wound Size	• Patients that have greater wound size, duration and depth only have a 22% chance of healing by 20 weeks. • Larger wounds take longer to heal than smaller wounds.
Wound Bed Condition	• Necrotic tissue is a barrier to assessment, a factor for delayed healing and a locus for infection.
Ischaemia	• The most common cause of wound failing to heal. • Poor perfusion deprives tissue of oxygen and nutrients needed for healing.
Wound Duration	• Chronic wounds have more senescent cells (cannot replicate) and so are at greater risk of complications.
Anatomical Location	○ A wound on a pressure-bearing surface or mobile area (e.g. joint), the dressing choice and method of fixation are critical to preserve limb function, dressing performance and avoid secondary pressure-related problems.
Treatment Response	○ The initial response to treatment can be a reliable predictor of subsequent healing time. ○ A reduction in wound surface area of around 15% within one to two weeks is an indication that the wound is likely to continue to make a good progress – this observation can be used as a justification to continue treatment.

WHICH OF THE FOLLOWING ARE NOT SIGNS OR SYMPTOMS OF AN INFECTION?

Friable granulation/ hypergranulation	Fever/ pyrexia	Static wound	Swollen lymph glands
Loss of appetite	Increasing exudate	Skin blistering / breakdown	Erythema <2cm to wound margin
Oedema	New / Increasing pain	Necrosis / Slough present	Deteriorating wound
Purulent exudate with malodour	Malaise	Spreading erythema	Wound breakdown / Dehiscence

DOES MARY NEED ANTIBIOTICS?

Mary has a leg ulcer which is deteriorating, there is slough and necrosis, purulent exudate, erythema <2cm to the wound margin and is malodorous. You take a set of observations and Mary has a NEWS score of 0 and reports she is feeling well.



BIOFILMS

A complex, slime-encased community of microbes.

A survival mechanism of microorganisms.

Antibiotics are ineffective as unable to penetrate the biofilm

How long does it take for a biofilm to re-form?

WHAT PREVENTS YOU FROM PROVIDING THE HIGHEST STANDARD OF CARE WITHIN YOUR TEAM?

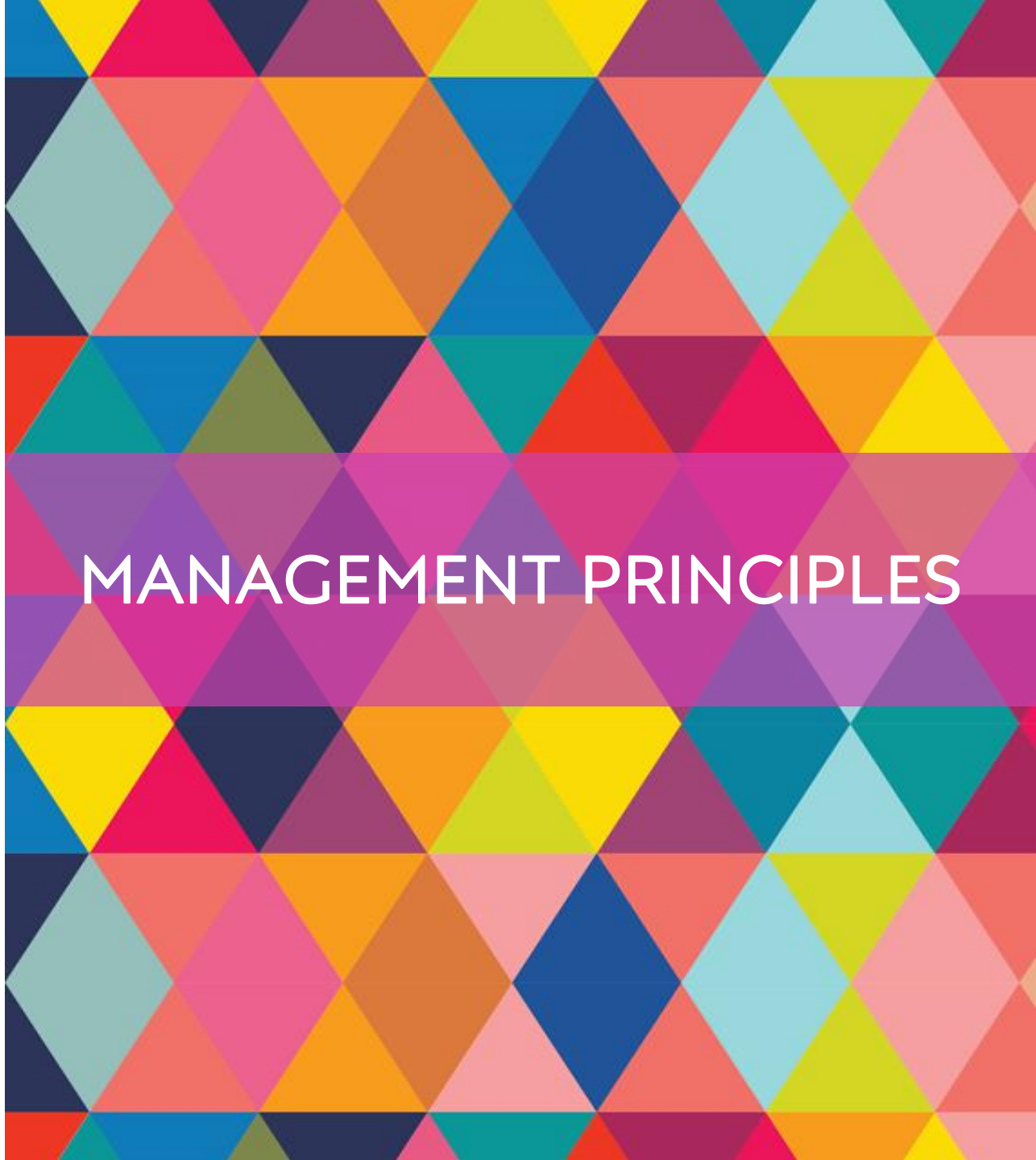
If we didn't have humor at work, what would we have?

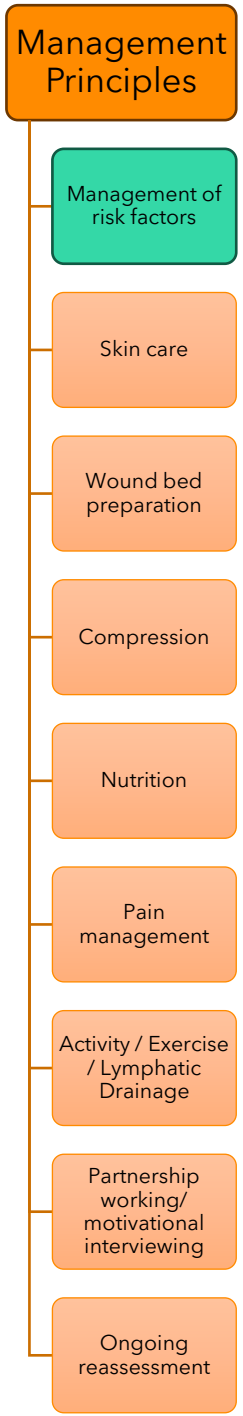
Ulcers. We'd have ulcers.


AND THAT'S HOW YOU IMPROVE
MORALE.


Break Time!

- Management Principles
  - Management of risk factors
  - Skin care
  - Wound bed preparation
  - Compression
  - Nutrition
  - Pain management
  - Activity / Exercise / Lymphatic Drainage
  - Partnership working/ motivational interviewing
  - Ongoing reassessment





MANAGEMENT PRINCIPLES

1. Management of risk factors

- Alcohol
- Allergies
- Age
- Diabetes
- Obesity
- Smoking
- Malnutrition
- Dehydration
- Autoimmune disorders
- Cardiovascular disorders
- Dementia
- Immobility
- Incontinence
- Blood disorders
- Depression/anxiety
- Peripheral neuropathy
- Respiratory disorders
- Neurological conditions
- Peripheral arterial disease

Activity:
Join at menti.com
Use code 8379 9815 or
scan QR code

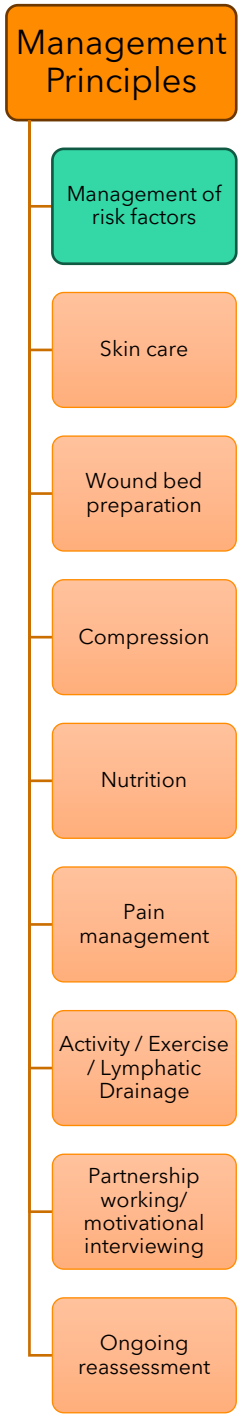
[Which wound risk factors can we modify and how? - Mentimeter]

WHICH RISK FACTORS FOR DELAYED WOUND HEALING CAN WE MODIFY AND HOW?

MANAGEMENT OF ARTERIAL LEG ULCERS

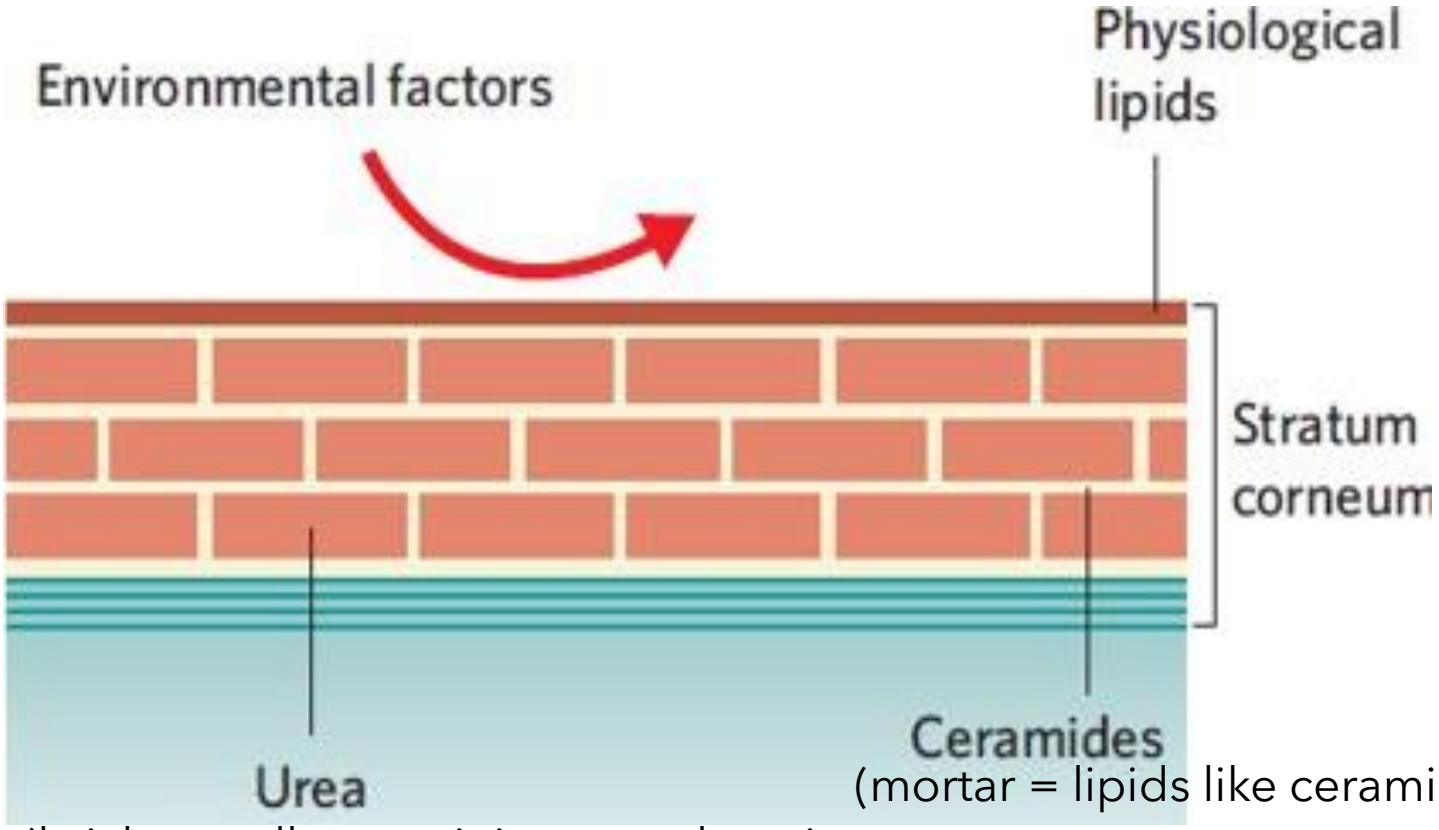
‘Improving blood supply, if possible, to the arterial ulcer is more effective than any dressing’.

(Vascular Society, 2022)



MANAGEMENT PRINCIPLES

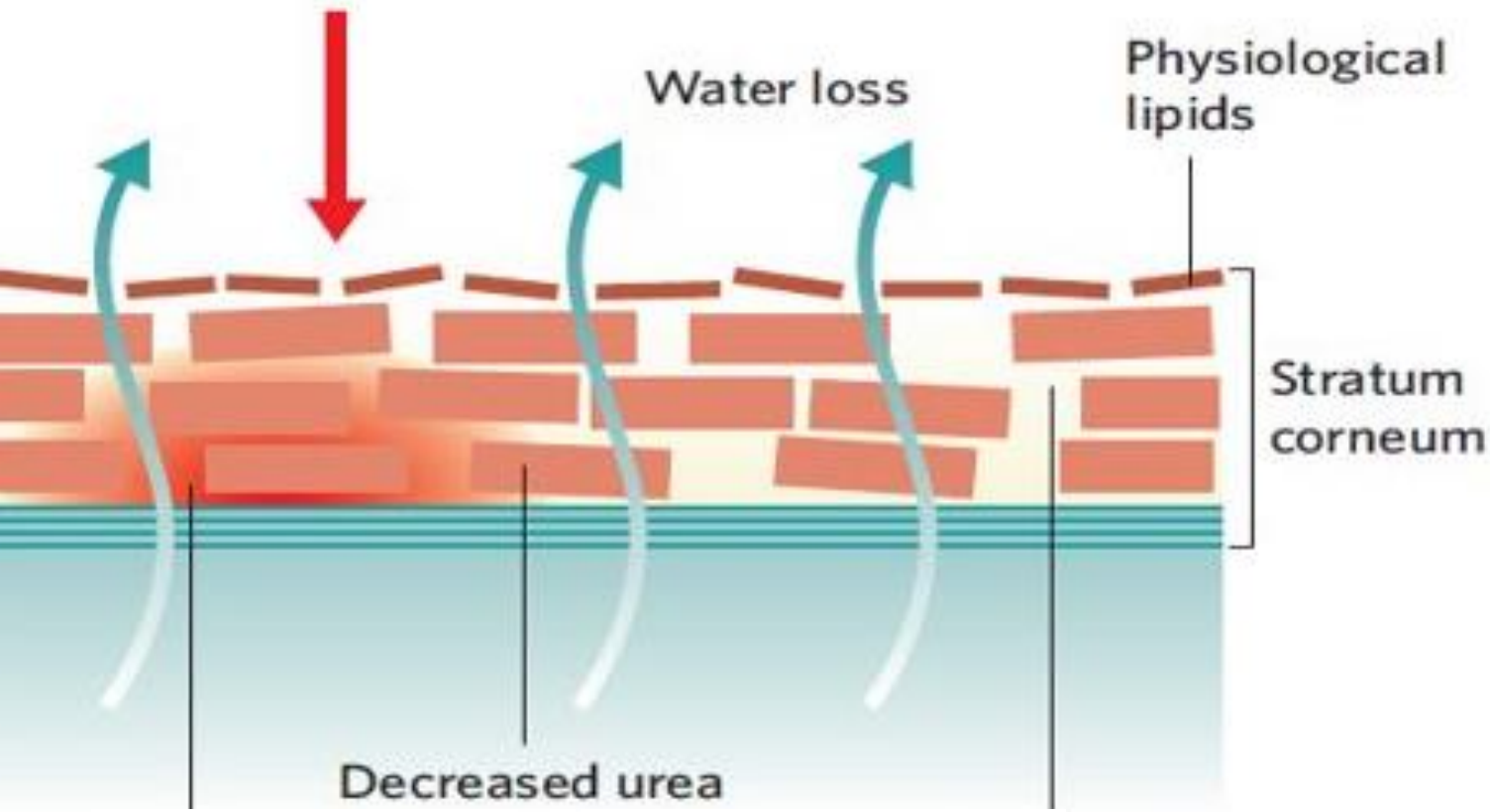
2. Skin Care



(bricks = cells containing urea, keratin and other natural moisturisers)

- Skin = largest organ of the body.
- Physically protects against external threads (pathogens, chemicals, allergens, irritants) which might cause an immune response if permitted to pass through.
- Helps to maintain homeostasis (balance) within the body by preventing water from escaping and evaporating, leading to dehydration.
- The skin barrier is essential for overall health and needs to be protected to help the body function properly.

SKIN BARRIER FUNCTION

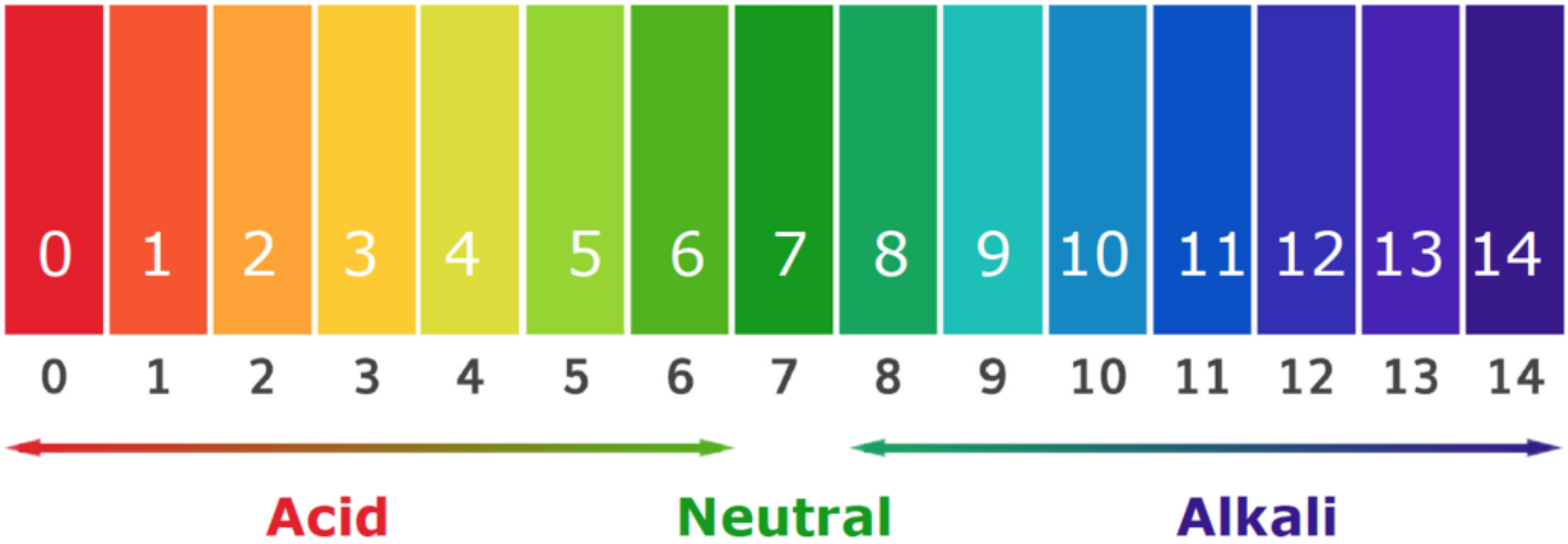


- When the skin is dehydrated, the cells within the skin shrivel so there are gaps in-between.
- This leads to an impaired skin barrier and increase in skin permeability of the stratum corneum
- This results in external environmental factors entering the body through the skin and water loss through the epidermis.
- Transepidermal water loss = TEWL.

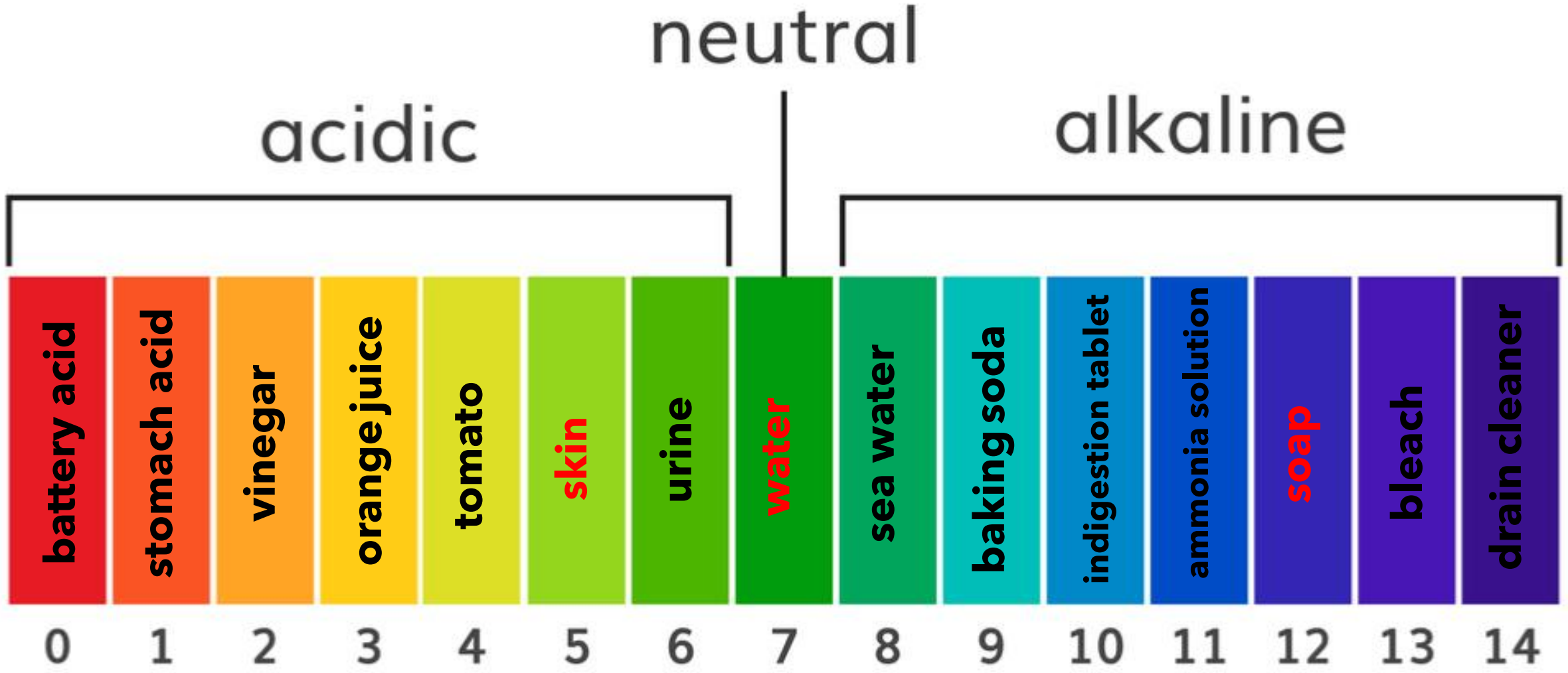
IMPAIRED SKIN BARRIER FUNCTION

WASHING AND SKIN CARE

- Legs and wounds should be washed at **EVERY** dressing change.
- Use a bowl lined with a clean bin liner (one bin liner and clean water per leg).
- Epimax Ointment should be used as a first-line soap substitute (**NOT** soap).
- Apply the Epimax Ointment to the entire lower limb and foot before placing in water and allow it to soak off.
- Use a clean flannel to surrounding in-tact skin. Use circular motions to remove hyperkeratosis.
- Use sterile gauze and warm tap water to cleanse the wound bed.
- Dry surrounding skin with a clean towel or gauze – thoroughly into skin folds & between toes.
- Apply a leave-on emollient in downward strokes (direction of hair growth), not in between toes).

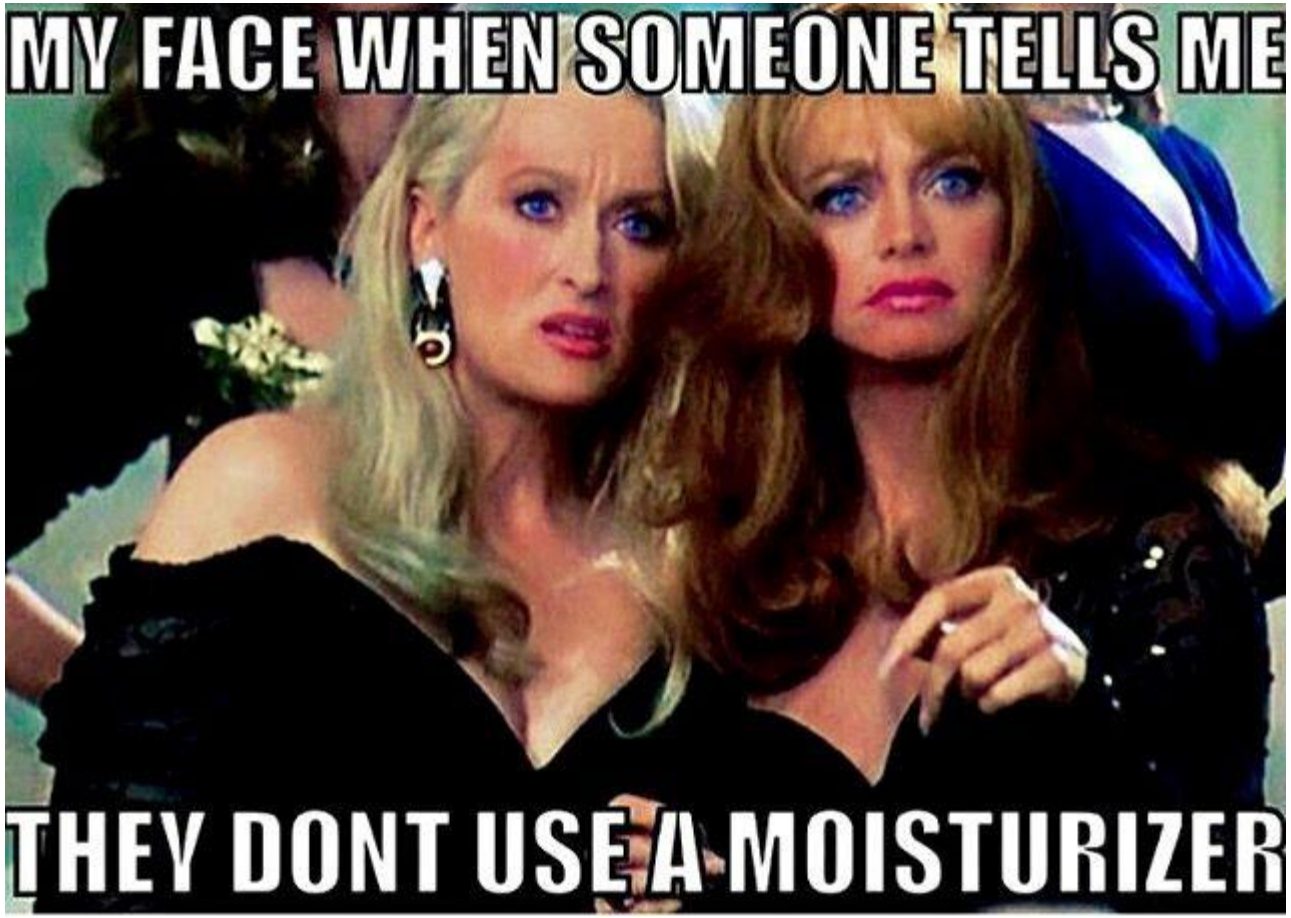


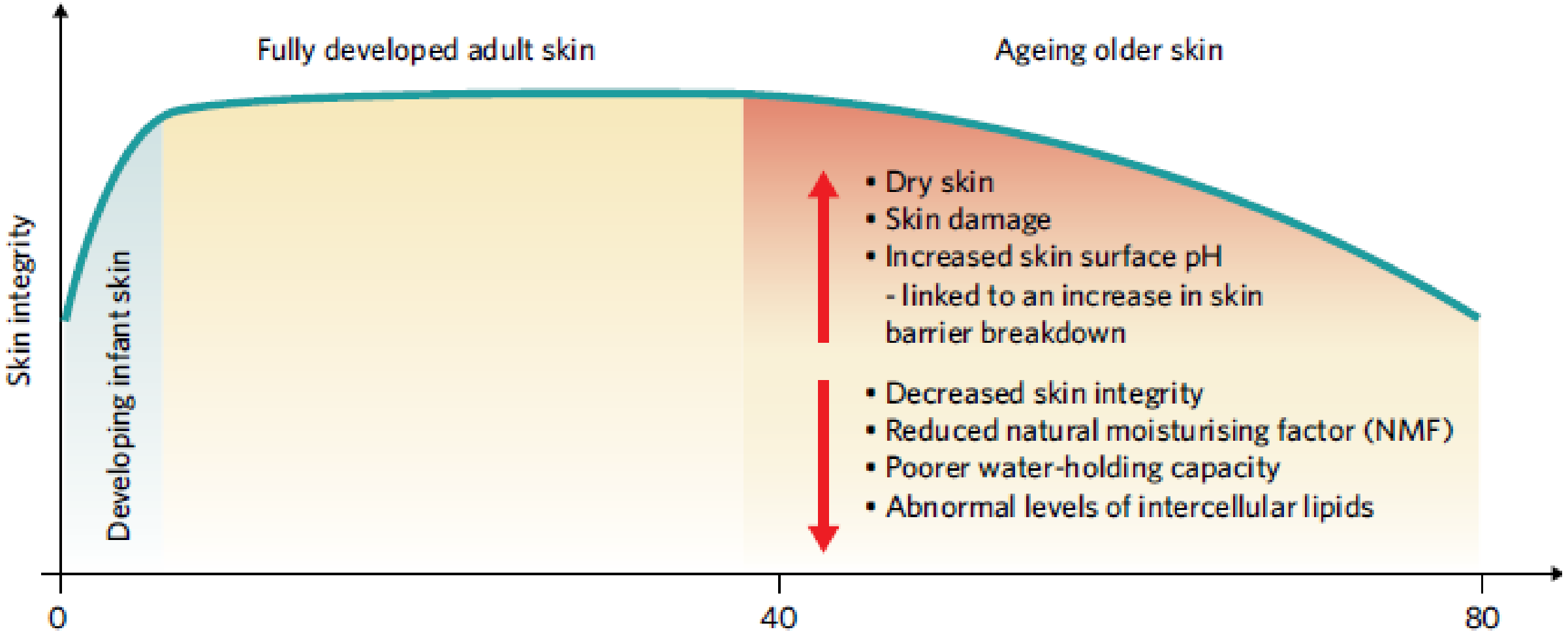
WHAT IS THE PH OF SKIN AND SOAP?



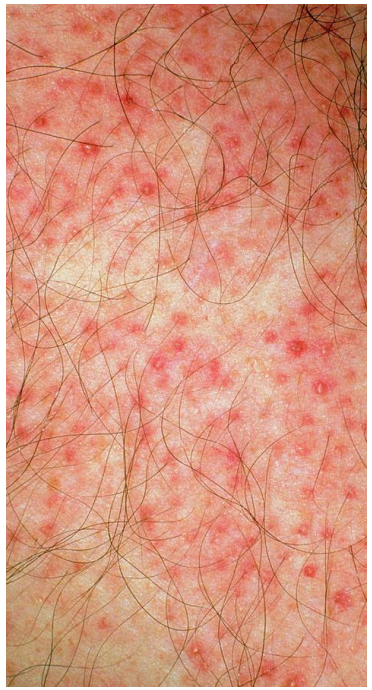
THE PH OF SKIN AND SOAP

AT WHAT AGE DO YOU NEED TO START USING A UREA-BASED EMOLLIENT?

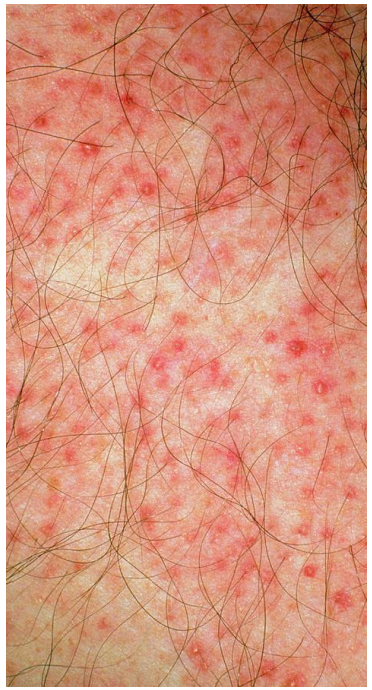



Fully developed adult skin
Ageing older skin
Skin integrity
Developing infant skin
• Dry skin
• Skin damage
• Increased skin surface pH
- linked to an increase in skin barrier breakdown
• Decreased skin integrity
• Reduced natural moisturising factor (NMF)
• Poorer water-holding capacity
• Abnormal levels of intercellular lipids
0
40
80

40 YEARS OLD!



WHAT IS THIS SKIN CONDITION?



FOLICULITIS

- A common skin condition that occurs when hair follicles become inflamed and infected by bacteria.
- Presents a small pimples/spots around the fair follicles that can be itchy or sore.
- Prevention/Treatment – applying a leave-on emollient in long/downward strokes in the direction of hair growth

FUNGAL INFECTIONS TO TOES

- **Prevention** – soak feet in warm water with 2 drops of tea tree oil – (LSN factsheet- Skincare for People with Lymphoedema).
- **Treatment** - Terbinafine cream daily for 2 weeks.
- **Maintenance** – if skin is unbroken, use alcohol wipes daily (BLS Cellulitis document)

OXFORD HEALTH FORMULARY EMOLLIENTS

1

Epimax Ointment

- First-line soap substitute
- Contains no urea
- Can be used on broken skin
- Not suitable under hosiery as a leave-on emollient – too greasy/ occlusive
- Suitable for children of all ages

2

Oilatum

- Contains no urea
- Standard leave-on emollient
- Needs to be applied 4x daily to be effective
- Not suitable for older skin
- Suitable for children of all ages
- Contains Glycerol, an anti-itching agent

3

Imuderm

- Contains 5% urea
- Suitable for older skin
- Do not use on broken skin
- Not suitable for children
- Cheaper than Balneum Intensiv

4

Balneum Intensiv

- Contains 5% urea
- Particularly indicated for aging, dry problem skin with hyperkeratosis
- Does not contin Paraffin
- Not to be used on broken skin
- Contains 0.1% ceramide
- Suitable for children over the age of 12

5

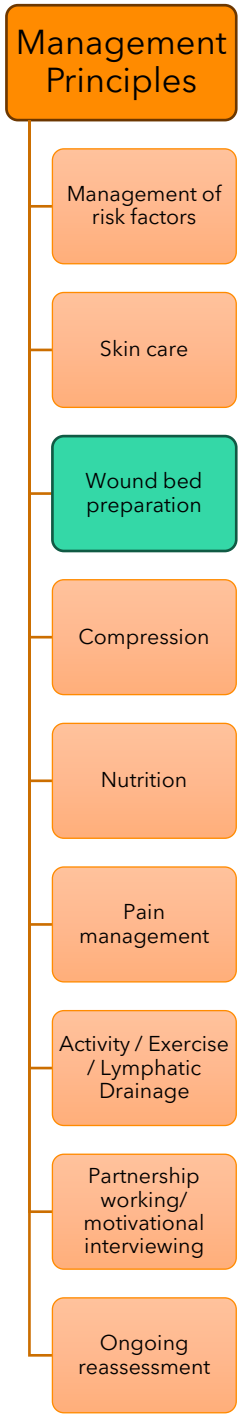
Hydromol Intensive

- For very problematic dry skin with hard, stubborn keratotic plaques (e.g. heels)
- Contains 10% urea
- Not to be used on broken skin
- Can take 2-4 weeks to take effect
- Suitable for children over the age of 1 month

Before emollient use (22/02)

Ongoing emollient use (08/03)

THE PROOF!

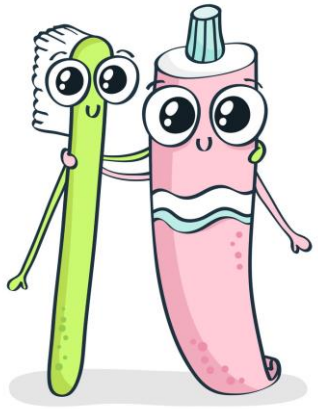


MANAGEMENT PRINCIPLES

3. Wound Bed Preparation

WOUND BED AND EDGE CLEANING

- Maturation = final stage of wound healing – epidermal cells migrate across wound bed from edges.
- If a wound edge is not prepared (i.e. debris, callus, devitalised tissue etc present), the epithelial cells won't migrate, and a dressing won't be effective as it's not in direct contact with the base of the wound bed.
- Thorough cleansing and mechanical debridement of both the wound bed and edge are required for healing.



- Debridement of an ulcer in the absence of adequate arterial blood flow will enlarge the ulcer and may lead to infection.
- When the resources for healing (blood, oxygen and nutrients) are not available, debriding the wound may worsen ischaemia by increasing ametabolic demand.
- A doppler and lower limb assessment need to be completed prior to applying a debridement dressing.

ESTABLISH HOW GOOD ARTERIAL BLOOD FLOW IS BEFORE DEBRIDING AN ULCER!

Often mistaken for slough or exudate.

Nourishment by blood vessels and nutrients from synovial fluid is disrupted when tendon is exposed.

Maintain tendon viability.

Prevent infection and desiccation.

Tendons heal in the same manner as other wounds – cells migrate to the area of injury and synthesise collagen – slow process

Determine whether cause was infection or PAD

MANAGEMENT OF TENDON EXPOSURE

Do not bowl wash

Cleanse with saline

Ring out gauze so it is damp and not soaked

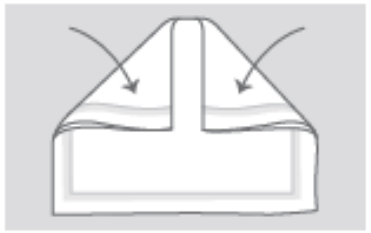
Do not use Octenilin – not licenced to use on tendon

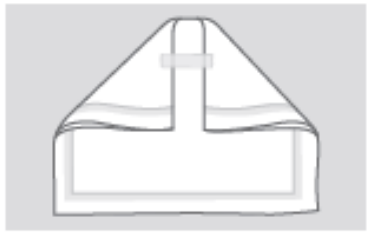
Do not use Potassium Permanganate – not licenced to use on tendon

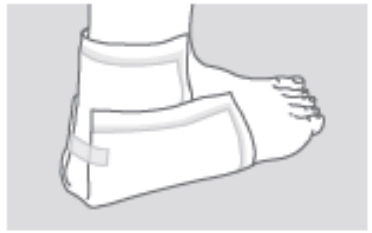
Use a non-adherent moisture donating dressing to keep the tendon moist

MANAGEMENT OF EXPOSED TENDON

Zetuvit

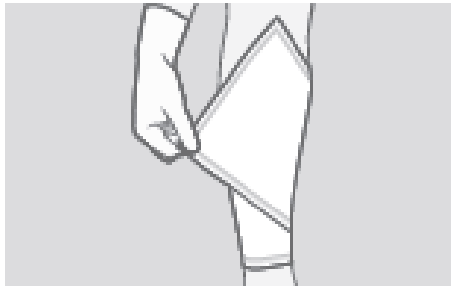


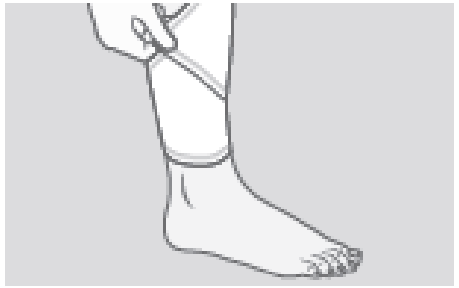


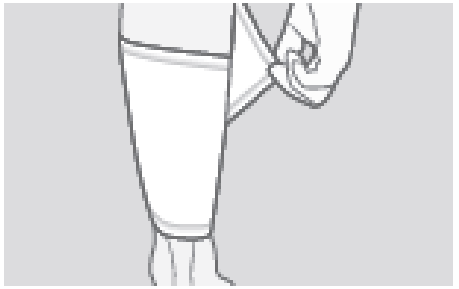


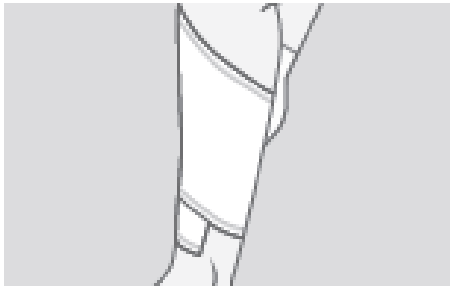
1. Fold a 10cm x 20cm dressing in half
2. Fold each corner inwards
3. Place tape to hold folded corners in place
4. Open out folded dressing
5. Place on heel

Kliniderm Superabsorbent





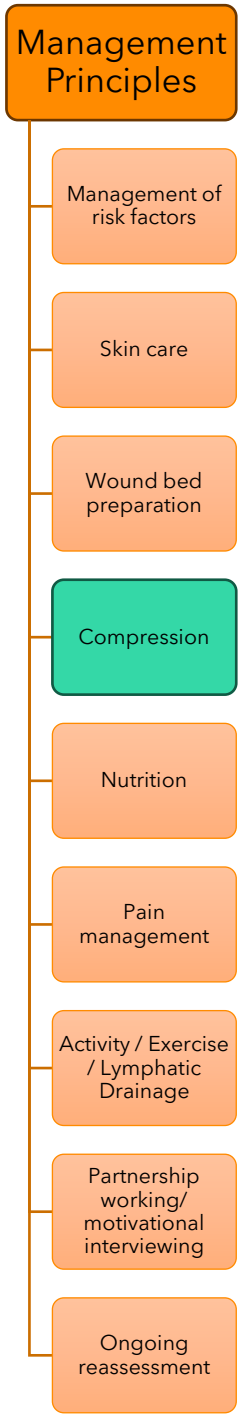




Sorbion

1. Place 20cm x 40cm dressing on the base of the leg
2. Wrap the dressing around the leg at an angle
3. Overlap the dressing to ensure there are no gaps
4. Secure dressing with sub-bandage wadding (e.g. K-Soft0

EXUDATE & ABSORBENT DRESSINGS

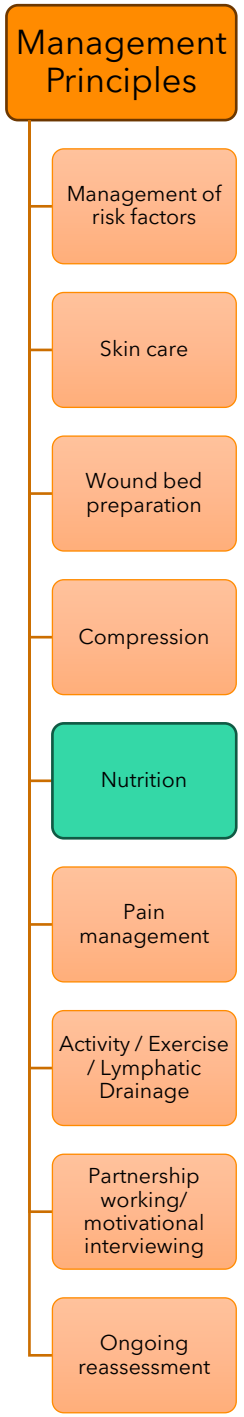


MANAGEMENT PRINCIPLES

4. Compression

INTRODUCTION TO COMPRESSION THERAPY

- Reverses venous hypertension in the superficial veins
- Manages oedema
- Addresses a leg ulcer that is trapped in the inflammatory phase
- Reduces distension to veins
- Increases calf muscle pump
- Restores valve function
- Increases velocity of venous blood flow
- Improves symptoms of lipodermatosclerosis and papillomatosis



MANAGEMENT PRINCIPLES

5. Nutrition

NUTRITION

Wound care nutrition – a resource for **patients**

NHS BOB Buckinghamshire, Oxfordshire and Berkshire West Integrated Care System

Some people are at higher risk of developing pressure sores or wounds due to

- Reduced or limited mobility
- More time spent sitting or lying
- Traumatic injury or post-surgery
- Poor nut
- Overn
- Incontinence
- Medical conditions that affect blood circulation or reduce movement e.g, Dia disease and multiple sclerosis, and many more.

Aims of treatment: If you have a wound, your nutritional requirements clotting, tissue repair and collagen formation; if sufficient protein ar body will have to break down fat and protein stores, which can le weakness.

You should try to maintain your weight during this process could affect wound healing. If you are underweight, ask yo food fortification and high calorie drinks and snacks.

PROTEIN is key to promoting wound healing. Prote wound so inadequate protein intake can delay he

We recommended to aim for 1.2-1.5 gram For example if you weigh 60 kilograms, protein per kilogram of body weight each da

Protein-rich snacks

You may have been given this leaflet if you have been advised to follow a high protein diet, for example if you are physically active or have muscle wastage, burns, an injury or a wound. You can find these high protein options in most supermarkets. If a supermarket is not stated, the product is available to buy in various shops and/or online. If you need either a lower calorie or energy-dense diet, ask your Dietitian for the best options.

If you have renal disease or have been advised to limit your protein intake, please consult your Dietitian or Doctor before following a high protein diet.

NHS BOB Buckinghamshire, Oxfordshire and Berkshire West Integrated Care System

Yoghurts and Milkshakes:

(nutrition per pot/bottle unless otherwise stated e.g. per 100g/ml).

These products are suitable for vegetarians.

Arla Protein: 142kcal, 20g protein

Arla Skyr: 111kcal, 14g protein

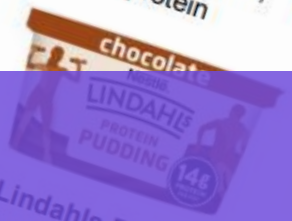
Graham's: 158kcal, 25g protein

Lindahls PRO+ Kvarg: 92kcal, 18g protein

Lindahls Kvarg: 81kcal, 15g protein

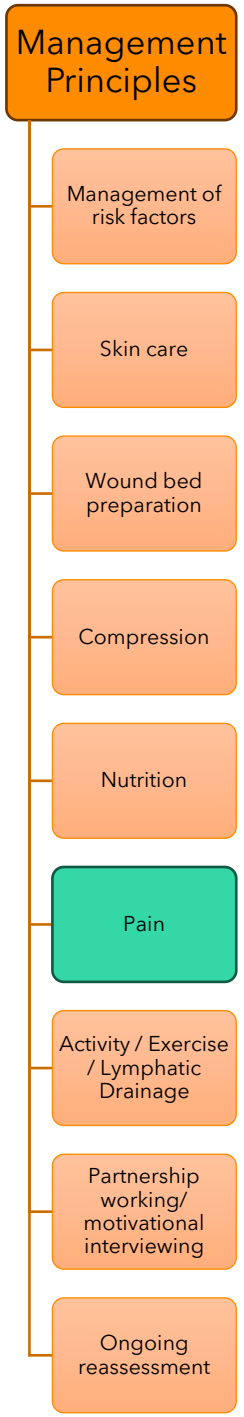
Light & Free Skyr: 81kcal, 14g protein

Fage Total 5% 150g: 140kcal, 13.5g protein (also available in 0% fat)



Lindahls Protein Pudding: 104kcal, 14g protein

Sainsburys Skyr: 106kcal, 14g protein

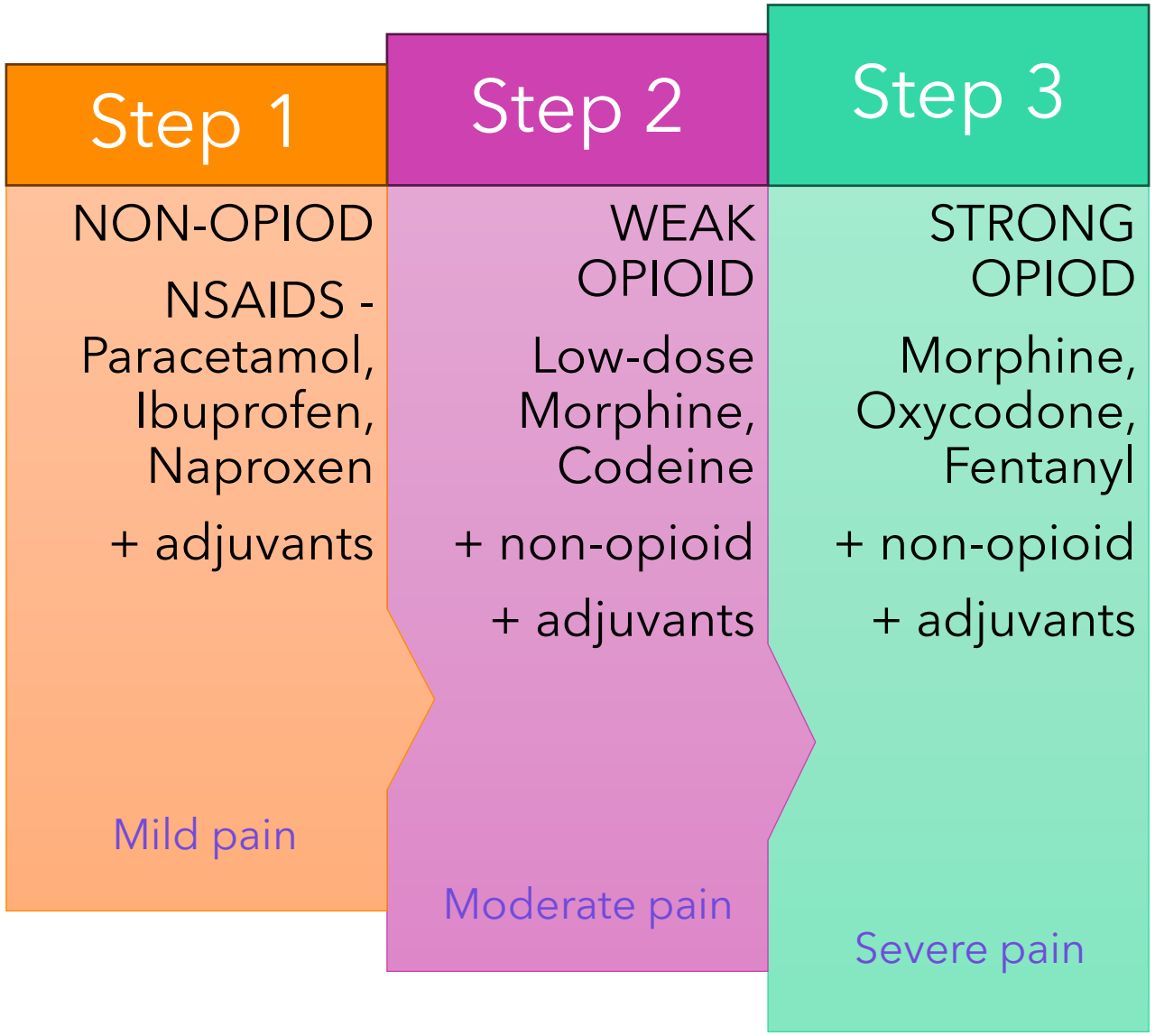


MANAGEMENT PRINCIPLES

6. Pain

NOCICPETIVE PAIN MANAGEMENT

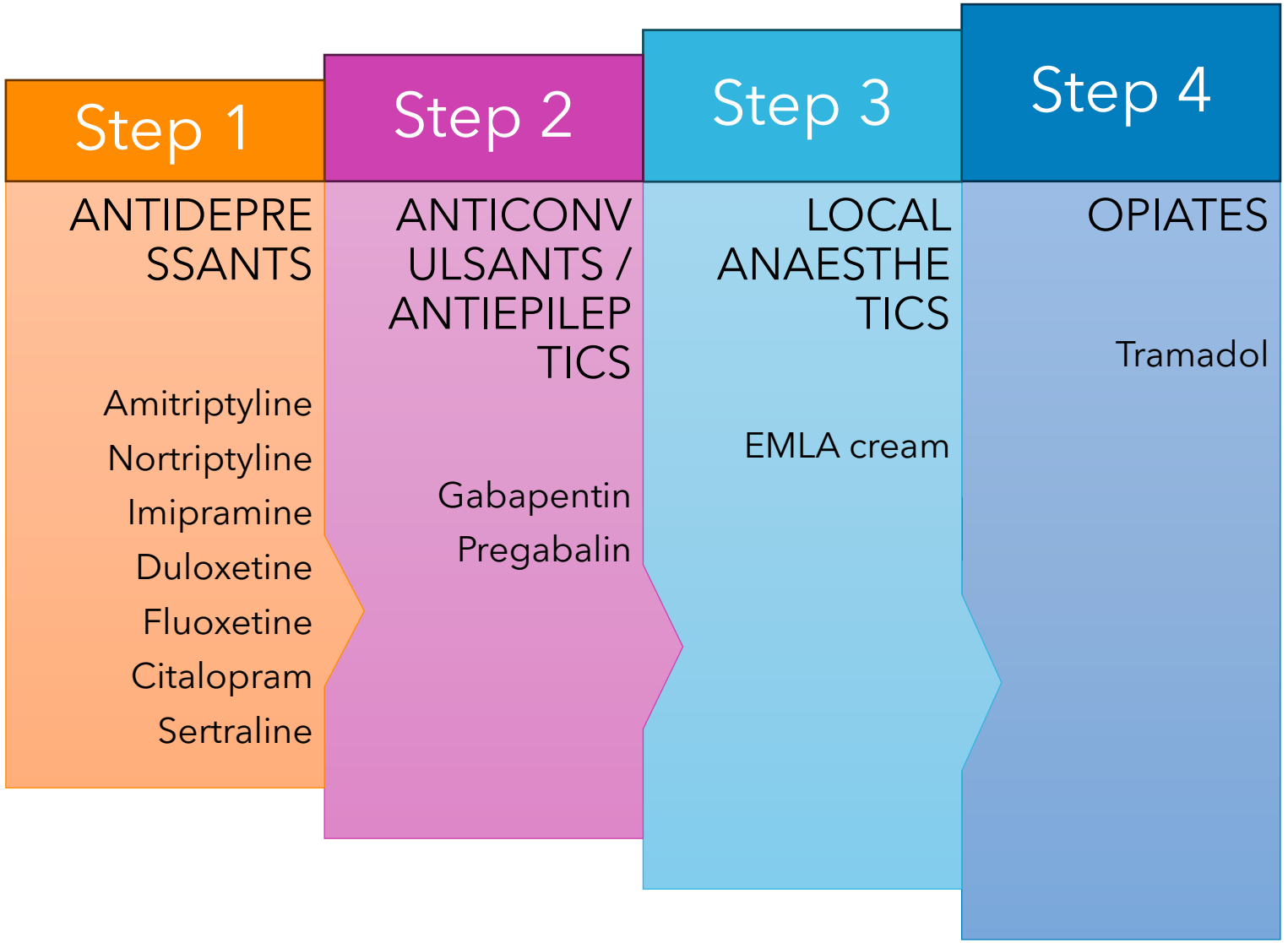
- WHO Analgesic Ladder can be used to support assessment.
- Individualised treatment plan required – different causes and experiences of pain.
- Set realistic targets.
- Manage patient expectations.
- Provide verbal and written information.
- Encourage an active role in pain management.
- Reassess pain regularly.
- Consider specialist pain service referral.



WHO Analgesic Ladder (2018)

NEUROPATHIC PAIN MANAGEMENT

- Does not get better with common painkillers, such as Paracetamol.
- Currently no drugs exist that is singularly beneficial for call cases of neuropathic pain.
- Adjuvant analgesics (or con-analgesics) are drugs with a primary indication other than pain, that have analgesic properties (Mitra and Jones, 2012).
- Tricyclic antidepressants are not well tolerated by older patients and should be avoided in those with cardiac arrythmias, HF, orthostatic hypotension, urinary retention and glaucoma.



WOUND PAIN & BREAK THROUGH PAIN MANAGEMENT

- Breakthrough pain - occurs either due to a predictable event (incident pain) e.g. on movement, or spontaneously without precipitating factors.
- A dose of immediate-release strong opioid (such as morphine) should be given at least 30 minutes before the precipitant of the pain.

Avoid applying products that can cause pain, such as gauze, knitted viscose, film dressings and paraffin tulle, as these tend to stick to the wound (Bethel, 2003)

Avoid any unnecessary stimulus to the wound, such as draughts from open windows, prodding and poking

Handle wounds very gently, being aware that any slight touch can cause extreme pain

Avoid using adhesive dressings; if possible, choose a non-adherent wound product designed to minimise pain on removal, such as silicone-coated dressings

Treat any wound infection appropriately and ensure that exudate is managed effectively

Do not allow dressings to dry out

Change as per manufacturer's instructions and according to exudate levels

Protect the surrounding skin using skin barrier creams/films. Excoriated wound margins caused by poor exudate management can cause considerable pain

Allow patients to remove their own dressings if appropriate

Reassure patients that you will stop the procedure if the pain is severe and allow "time-out" sessions if patients indicate they need it (Hollinworth and Hawkins, 2002)

Non-pharmacological therapies are often not explored but can be very effective when used alongside pharmacological methods (Brown, 2014)

Activity: Join at menti.com, use code 8130 4989 or scan QR code

Non-pharmacological pain management methods - Mentimeter

Reduce anxiety	Distraction therapy	Aromatherapy	Transcutaneous electrical nerve stimulation (TENS)	Massage	Mild exercise
Acupuncture	Mindfulness	Meditation	Talking therapy	Pet/animal therapy	Physiotherapy
Gentle exercise	Osteopathy	Positioning	Hypnosis	Guided imagery	Breathing techniques
Companionship	Heat/cold application	Aquatherapy	Music	Occupational therapy	Therapeutic ultrasound
Yoga	Pilates	Tai Chi	Chiropractic	Relaxation techniques	Stress ball

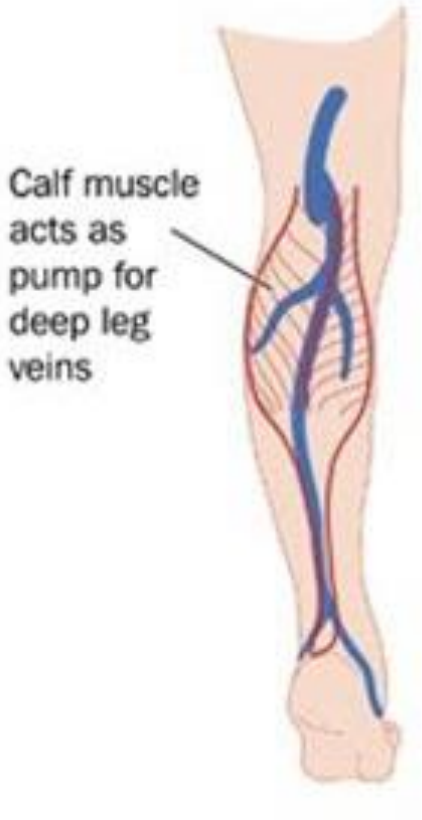
- Management Principles
  - Management of risk factors
  - Skin care
  - Wound bed preparation
  - Compression
  - Nutrition
  - Pain
  - Activity / Exercise / Lymphatic Drainage
  - Partnership working/ motivational interviewing
  - Ongoing reassessment

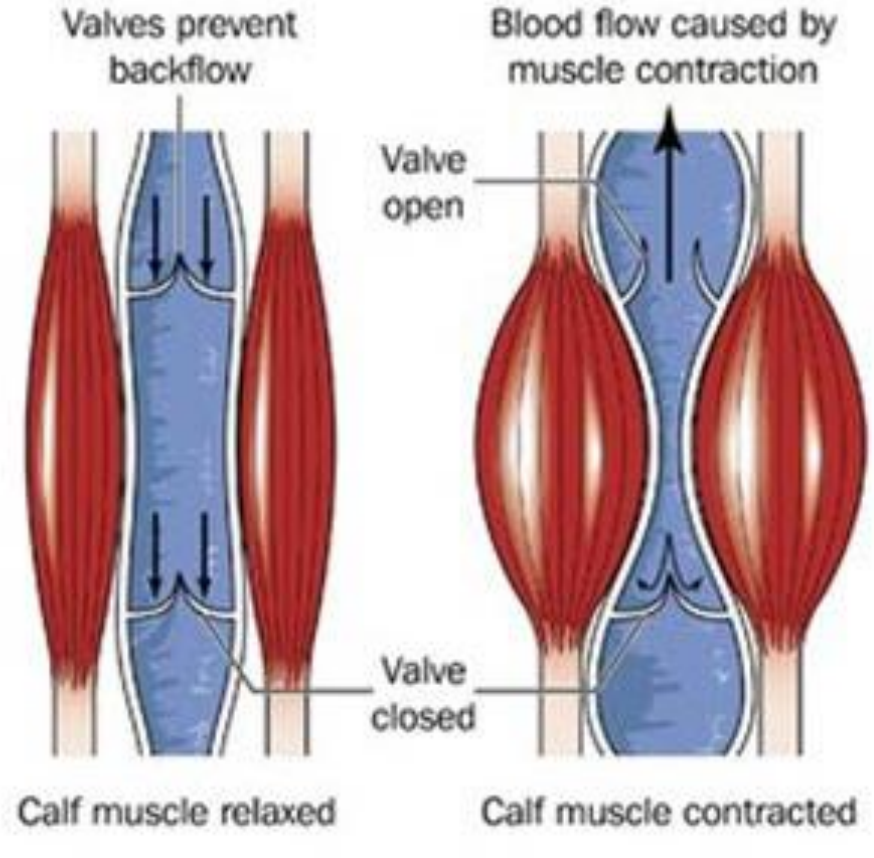
MANAGEMENT PRINCIPLES

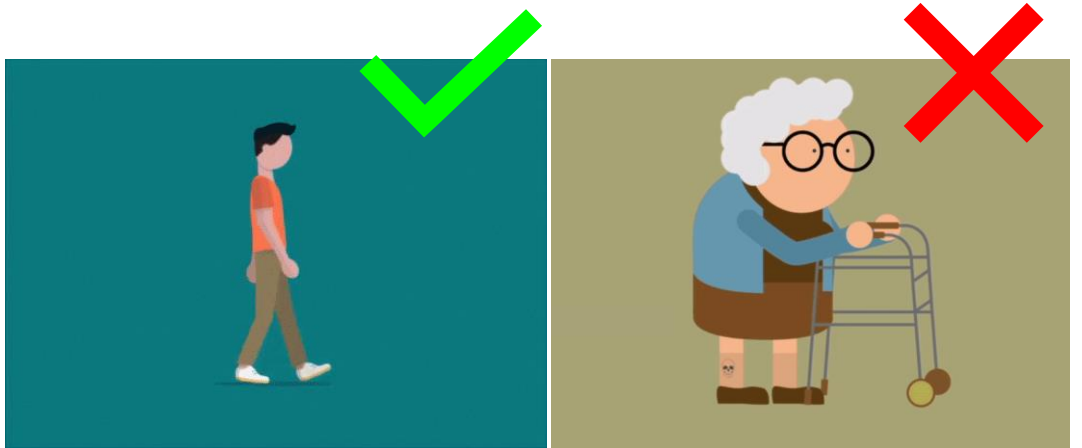
7. Activity, Exercise and Lymphatic Drainage

CALF AND FOOT MUSCLE PUMPS

- Helps move blood in the deep veins from lower limb to the heart, preventing pooling due to gravity.
- Deep veins are responsible for 90% of venous return through action of pumps (Messiner, 2005)
- When the calf muscle contracts, blood pressure increases due to one-way valves, driving blood towards the heart.







Age UK

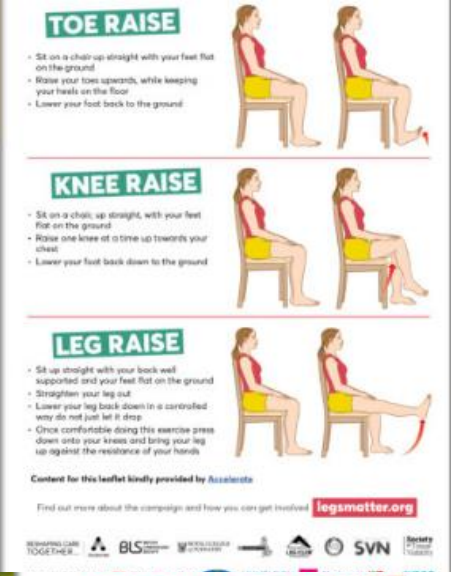
In person/online classes

- Seated exercises
- Mind & Body – Tai Chi, Yoga & Pilates
- Stay Strong & Steady – risk of falls
- Big, Bold & Balance – Parkinson's
- Videos on YouTube, free DVC

Legs Matter

Online simple exercise videos

- How to use a TheraBand for fixed ankles
- Lower Limb exercise leaflet
- Lower leg wound/ lymphoedema exercise records



Exercise for intermittent claudication (NICE, 2020)

PHYSICAL ACTIVITY & EXERCISE

LYMPHATIC MASSAGE & SIMPLE LYMPHATIC DRAINAGE

The aim of applying manual lymphatic drainage is to stimulate lymph drainage through collateral pathways and remove protein from the interstitial spaces (Foldi, 1985; Casely-Smith and Casely-Smith, 1997).

Used in conjunction with skin care, manual lymphatic drainage and a modified version known as simple lymphatic drainage, can help minimise acute inflammatory episodes (Badger, 1996b).

You can teach patients simple lymphatic massage techniques to incorporate into their daily routines

Self-Management Videos - Lymphoedema Support Network - LSN

FLUOROSCOPY GUIDED LYMPHATIC MASSAGE

Exciting technological development is enabling us to physically see the movement of lymph through the lymphatic vessels with use of fluoroscopy.

Watch this short video to see the importance of lymphatic massage!

MLA Fluoroscopy in film - YouTube

LEG ELEVATION

- When not exercising, elevate legs as much as practical to help reduce oedema and aid venous drainage from the limb.
- Sitting with legs dependent might cause swelling and make compression bandaging feel tight and uncomfortable.
- Sitting in a chair with legs on a foot stool will not help as there will continue to be venous hypertension in the foot, and the position puts additional pressure on the sacrum and buttocks, increasing the risk of pressure ulceration.
- Leg elevation will need to be at the same level as the head in order to facilitate blood circulation.


DID SOMEONE SAY
LUNCH???

MANAGEMENT OF ARTERIAL LEG ULCERS

Aim: Enhance arterial blood flow & maintain an effective healing environment

Refer to Vascular for arterial duplex scan

Use a contact layer dressing. (debridement dressings contraindicated)

Do not bowl wash severe arterial ulcers (aim to keep necrosis clean and dry)

Apply a barrier product to peri-wound skin (e.g. Medi Derma-S film barrier foam applicator)

Many arterial ulcers are prone to infection - Zorflex is a suitable antimicrobial contact layer dressing!

PAD MANAGEMENT

Lifestyle changes

- Smoking cessation
- A heart-healthy diet
- Achieving and maintaining a healthy weight
- Regular physical activity (individually adapted)
- Stress management for improved emotional and physical health

Exercise programmes

- Supervised exercise programmes to enhance circulation and alleviate symptoms (e.g. treadmill walking, upper body exercises)
- Home exercise programmes with coaching or actively monitoring (usually includes walking)

Medications

- Antiplatelet medications (e.g. Aspirin, Clopidogrel) to prevent bloods clots and reduce the risk of major CVD events
- Statins to lower cholesterol and slow down plaque buildup
- ACE inhibitors, angiotensin II receptor blockers (ARBs) or similar for bloods pressure management and prevention of vessel narrowing

Surgical and other procedures

- Angioplasty – widening of narrowed arteries with a balloon. This may also involve inserting a stent (a tube that prevents the artery from narrowing again)
- Bypass surgery – creating a new path for blood flow around a blocked artery by using another piece of another blood vessel or an artificial vessel
- Partial and full leg amputations

Treatment aim: As per venous ulcers, to increase venous return and maintain an effective healing environment

The degree of arterial insufficiency will dictate whether it is safe to apply compression

Vascular will determine the arterial element and what interventions are required (during duplex scans)

Mild 20mmHg compression may be appropriate for the venous element with supervision from Tissue Viability.

MANAGEMENT OF ARTERIOVENOUS LEG ULCERS

WHEN IS A WOUND PALLIATIVE? WHEN IS IT APPROPRIATE TO HAVE A PALLIATIVE CARE PLAN IN PLACE?

PALLIATIVE MANAGEMENT

Ask what matters to the patient the most and create a palliative care plan focusing on symptom management

Manage pain, malodour, skin care, exudate and infection

Continue to implement elements of pathways in a palliative manner to prevent sepsis and to reduce the chance of infection.

Reassess following intervention to evaluate effectiveness and consider healing potential

Be honest. If wound healing is unlikely due to palliative status, let the patient know.

Refer to tissue viability for advice and support

PATIENT INFORMATION LEAFLETS

VENOUS AND
OEDEMA SIGNS AND
SYMPTOMS ACTIVITY

VENOUS VS ARTERIAL ULCER CHARACTERISTICS

Venous	Arterial
Variable size	Small and deep wound bed
Irregular, sloping margins	Punched out, sharply demarcated edges
Fibrinous, granulating base	Necrosis may be present
Usually around the gaiter area	Usually around the malleolus, feet or toes
High levels of exudate	Dry/low levels of exudate
May be painful	Pain when walking or at rest

PUNCHED OUT, SHARPLY DEMARCATED EDGES

DO YOU SUSPECT VENOUS, ARTERIAL OR MIXED DISEASE?

Arterial signs		Venous signs	
Rest pain	Nil	**Spider veins**	Yes
Intermittent claudication	Nil	**Ankle flare**	Yes
Necrosis	Nil	**Varicose veins**	Yes
Capillary refill time	2 seconds	**Hyperkeratosis**	Yes
Positive Buerger's sign	Nil	**Atrophie blanche**	Nil
Skin temperature	Warm, equal and no sudden changes	**Haemosiderin staining**	Yes
Motor/sensory neuropathy	Nil	**Induration**	Nil
Hair loss	Yes	**Varicose eczema**	Nil
Scaling	Nil		
Atrophy of the subcutaneous tissue	Nil		
Thickening of toenails	Yes		

DO YOU SUSPECT VENOUS, ARTERIAL OR MIXED DISEASE?

Arterial signs		Venous signs	
Rest pain	Yes	**Spider veins**	Nil
Intermittent claudication	Yes	**Ankle flare**	Nil
Necrosis	Yes	**Varicose veins**	Nil
Capillary refill time	6 seconds	**Hyperkeratosis**	Nil
Positive Buerger's sign	Yes	**Atrophie blanche**	Nil
Skin temperature	Cold, shiny	**Haemosiderin staining**	Nil
Motor/sensory neuropathy	Nil	**Induration**	Nil
Hair loss	Yes	**Varicose eczema**	Nil
Scaling	Nil		
Atrophy of the subcutaneous tissue	Yes		
Thickening of toenails	Nil		

DO YOU SUSPECT VENOUS, ARTERIAL OR MIXED DISEASE?

Arterial signs		Venous signs	
Rest pain	Nil	**Spider veins**	No
Intermittent claudication	Nil	**Ankle flare**	Yes
Necrosis	Nil	**Varicose veins**	Yes
Capillary refill time	5 seconds	**Hyperkeratosis**	Nil
Positive Buerger's sign	Nil	**Atrophie blanche**	Nil
Skin temperature	Cold, shiny legs	**Haemosiderin staining**	Yes
Motor/sensory neuropathy	Yes	**Induration**	Nil
Hair loss	Nil	**Varicose eczema**	Yes
Scaling	Yes		
Atrophy of the subcutaneous tissue	Nil		
Thickening of toenails	Yes		

DO YOU SUSPECT VENOUS, ARTERIAL OR MIXED DISEASE?

SYMPTOMS OF VENOUS DISEASE

DO YOU SUSPECT VENOUS, ARTERIAL OR MIXED DISEASE?

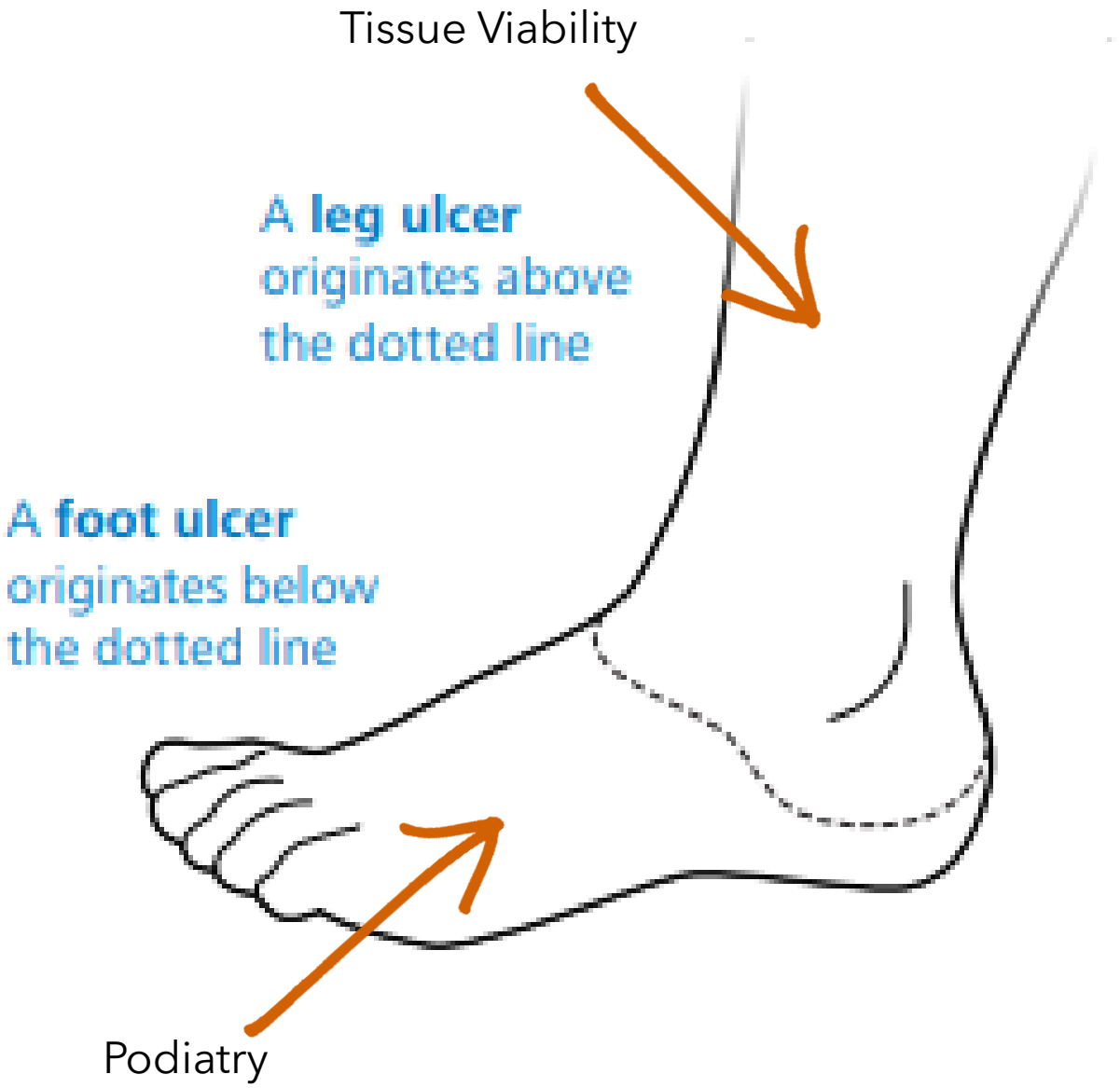
SYMPTOMS OF ARTERIAL DISEASE

DO YOU SUSPECT VENOUS, ARTERIAL OR MIXED DISEASE?

SYMPTOMS OF VENOUS DISEASE

DO YOU SUSPECT VENOUS, ARTERIAL OR MIXED DISEASE?

SYMPTOMS OF ARTERIAL DISEASE



JOINT WORKING WITH PODIATRY

- Podiatry are foot specialists and so tend to lead care on foot ulcers (any wound below the malleolus)
- Shared care between Podiatry and nurses
- Documents available: Guidelines for patient shared care plan, Patient shared care plan, SOP for patient share care plan and Podiatry abbreviations
- Diabetic patients with foot ulcers should be urgently referred to Podiatry
- If a patient has wet, oedematous toes, a referral to TV may be required for stump bandaging and potassium permanganate soak


BREAK TIME!!!!

WHO WANTS TO BE A **MILLIONAIRE?**

Start!

PLEASE BRING DOPPLER AND SPHYG TO DAY 2!

TISSUE VIABILITY RESOURCES

www.oxfordhealth.nhs.uk/tissue-viability
tissueviability@oxfordhealth.nhs.uk
francesca.Russell@oxfordhealth.nhs.uk

Tissue Viability

Overview | Contact | Referrals | Equipment | Training | Videos

The Tissue Viability service provides specialist advice and support to healthcare professionals who are managing complex wounds within the community of Oxfordshire.

The nurse-led team works in partnership with patients, their carers and healthcare professionals to provide expert wound care advice, specialist healthcare equipment and education that is aimed at preventing needless skin breakdown.

The team aims to improve and support high standards of practice through clinical consultations, regular audits, development of guidelines and polices and by delivering formal educational training to healthcare professionals.

Top left to bottom right: Helen, Penny, Ana-Faye, Fran, Kay, Martha, Lauren, Ger

BEFORE YOU LEAVE:

1. PLEASE SCAN THIS QR CODE TO GIVE US FEEDBACK (GOOD AND BAD!) – THE QUESTIONS ARE MULTIPLE CHOICE!

2. PLEASE PUT YOUR CHAIR AND TABLE AWAY.

3. ENSURE ALL RUBBISH IS PUT IN THE BINS.

4. PLEASE WASH UP ANY MUGS AND CUTLERY YOU USED.

5. PLEASE TAKE ANY BISCUITS LEFT!