MANAGING LOWER EXTREMITY EDEMA/VENOUS ULCERATION IN THE PRIMARY CARE SETTING

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Objectives of presentation

- To gain comfort in identifying edema and contributing characteristics
- To understand methods of managing edema either as prevention or until specialty care can be established

Recognizing Edema

When does it occur?

How does its presentation vary?

What conditions exacerbate swelling?

What activities improve it?

How does it impact healing?

What do we do about it?

When does edema occur?

- Whenever limbs are lower than the heart and immobile

- When venous hypertension is greater than external force against the vein (venous hypertension)

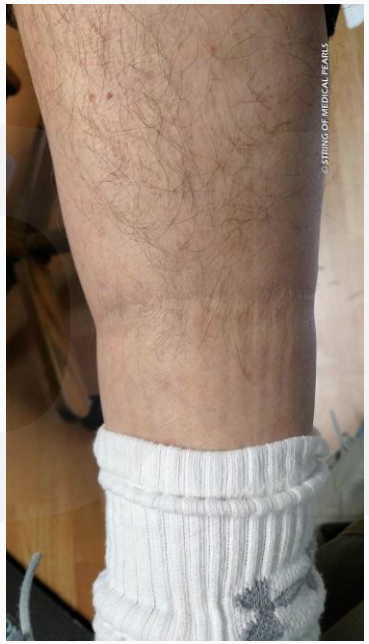
- When vein damage has taken place (venous reflux)

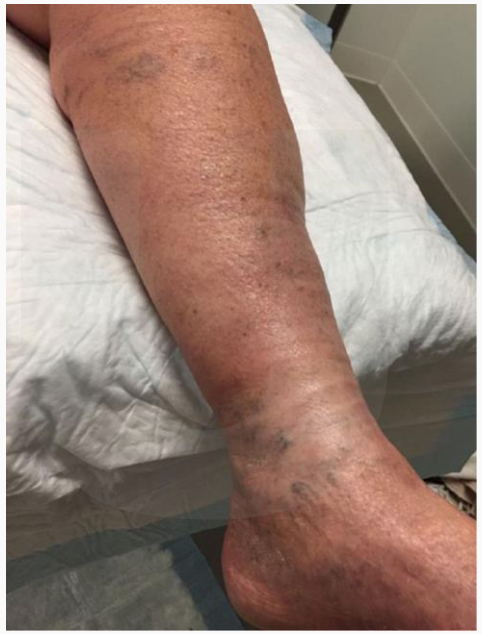
- When increasing pressure causes lymphatic failure

- When circulating volume exceeds the body’s ability to manage it

Limitations of treatment in primary care

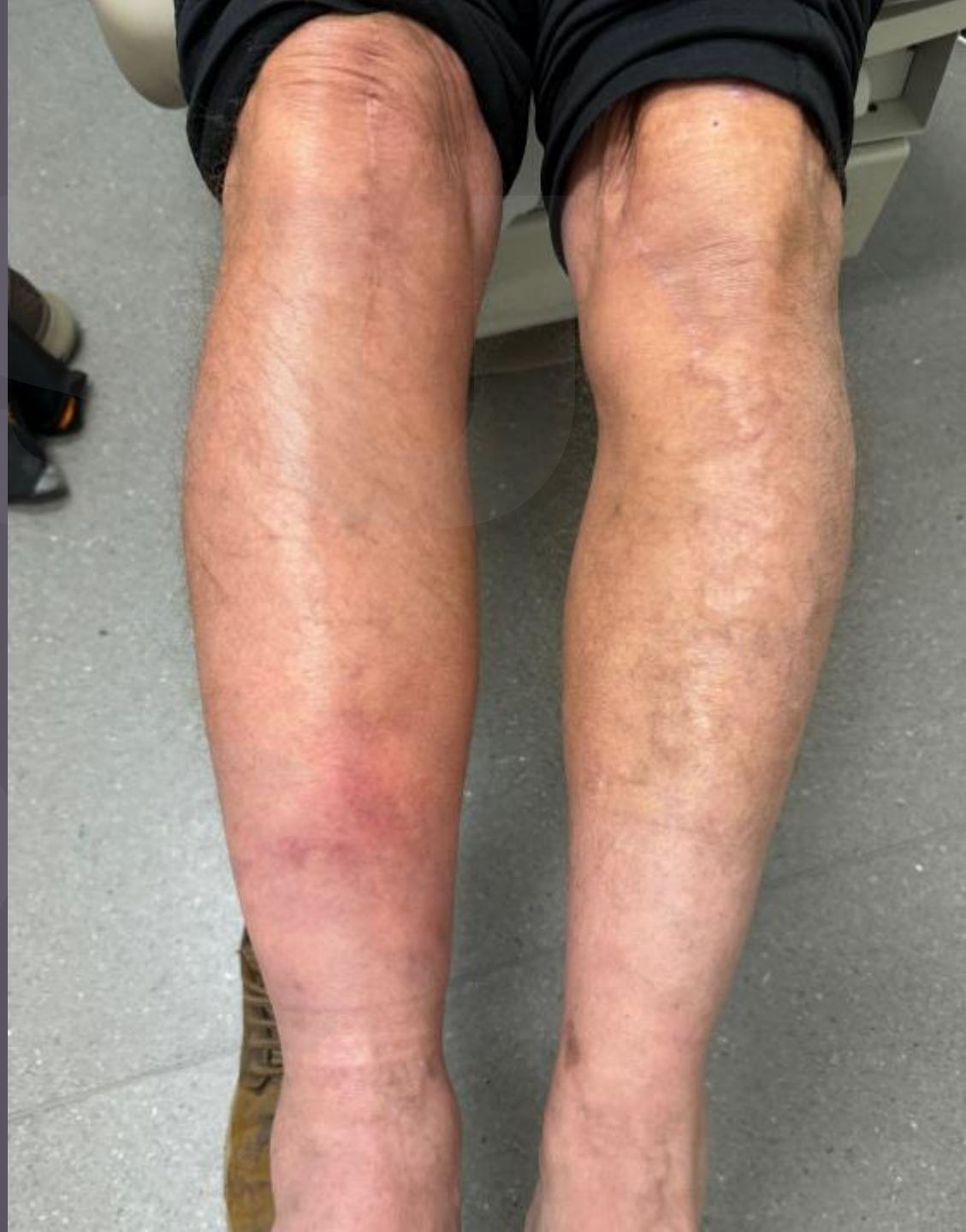
- Lack of access to adequate supplies
- Lack of experience in application of compression
- Lack of comfort in assessing perfusion status



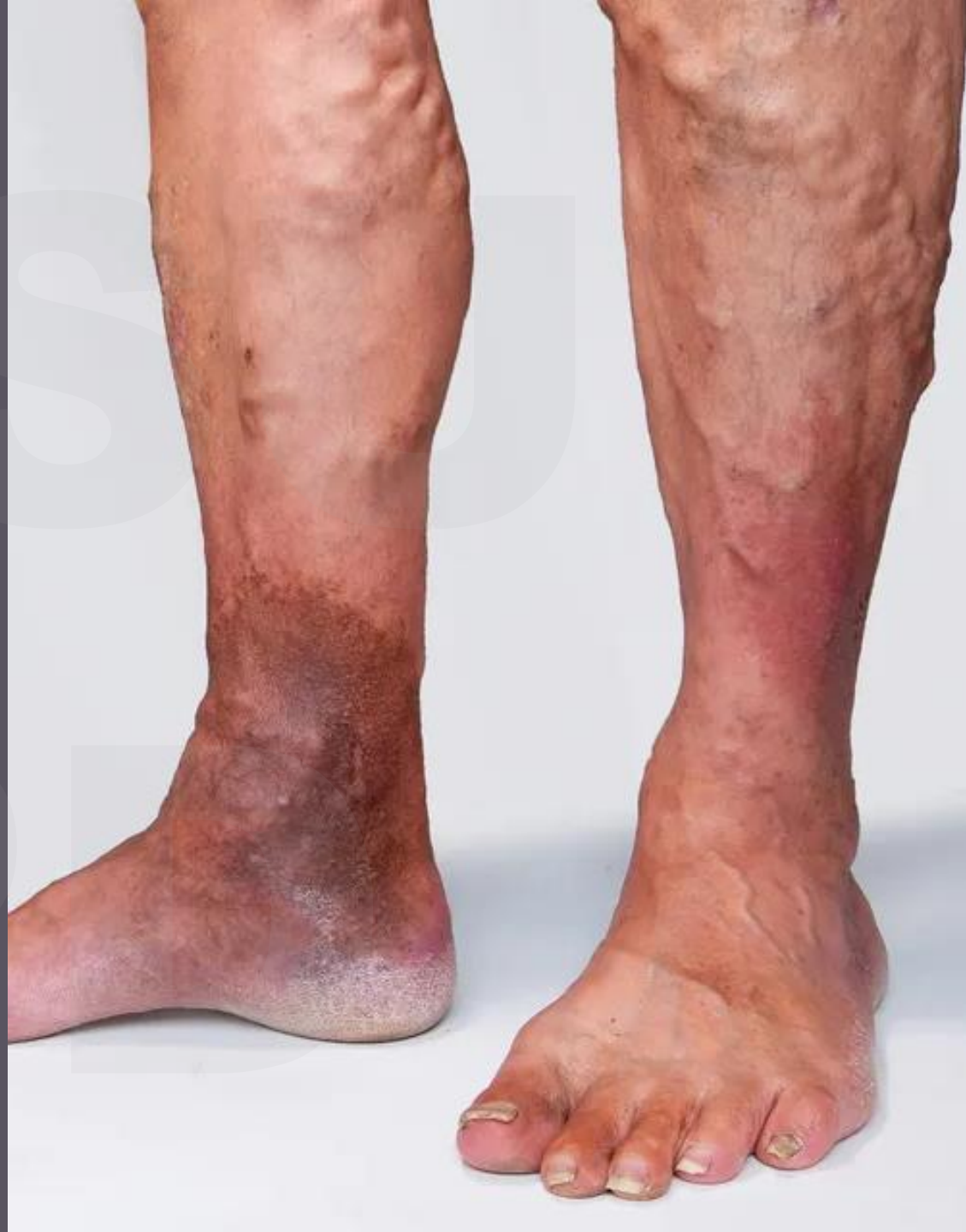


EDEMA OF DEPENDENCE

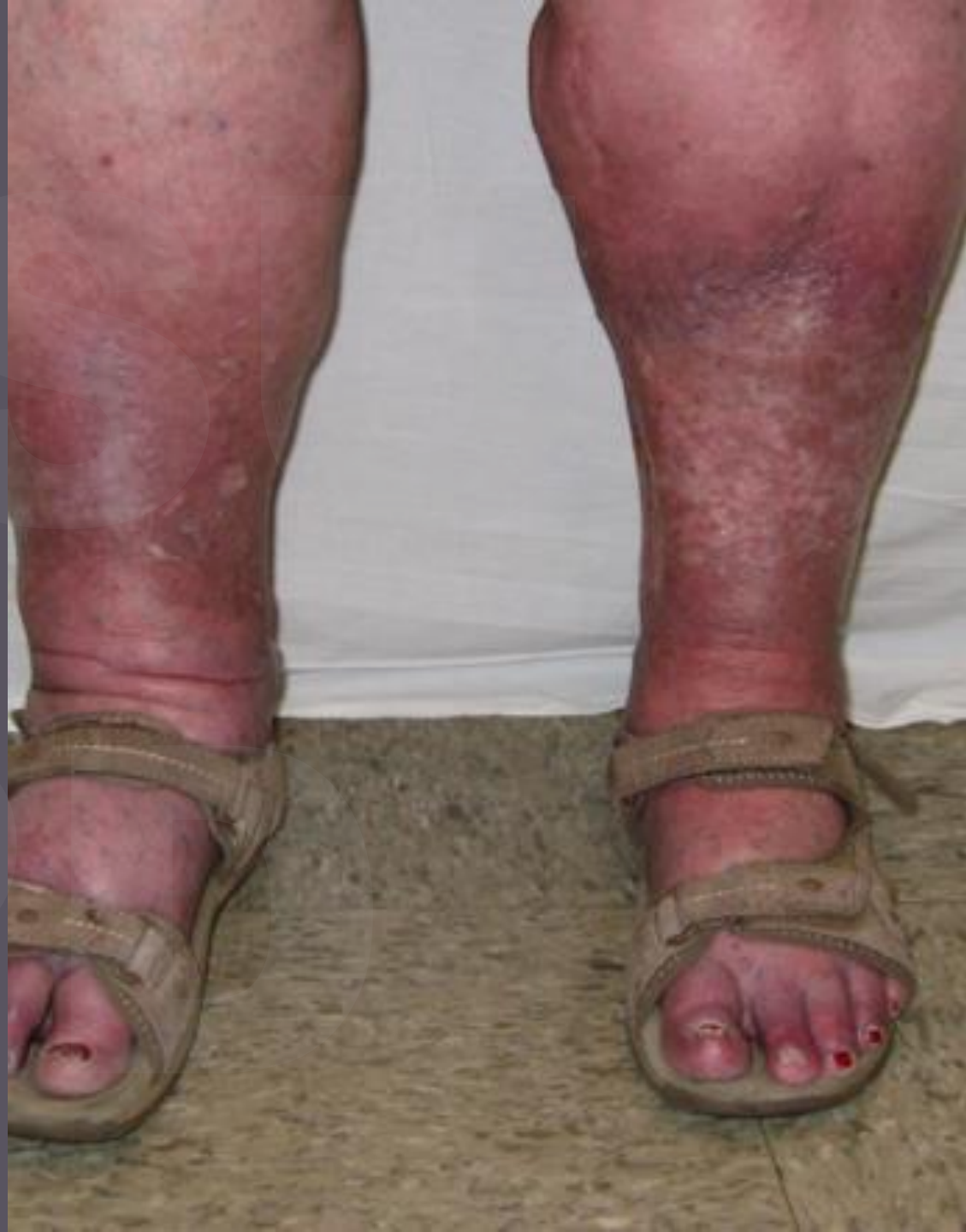
VENOUS HYPERTENSION



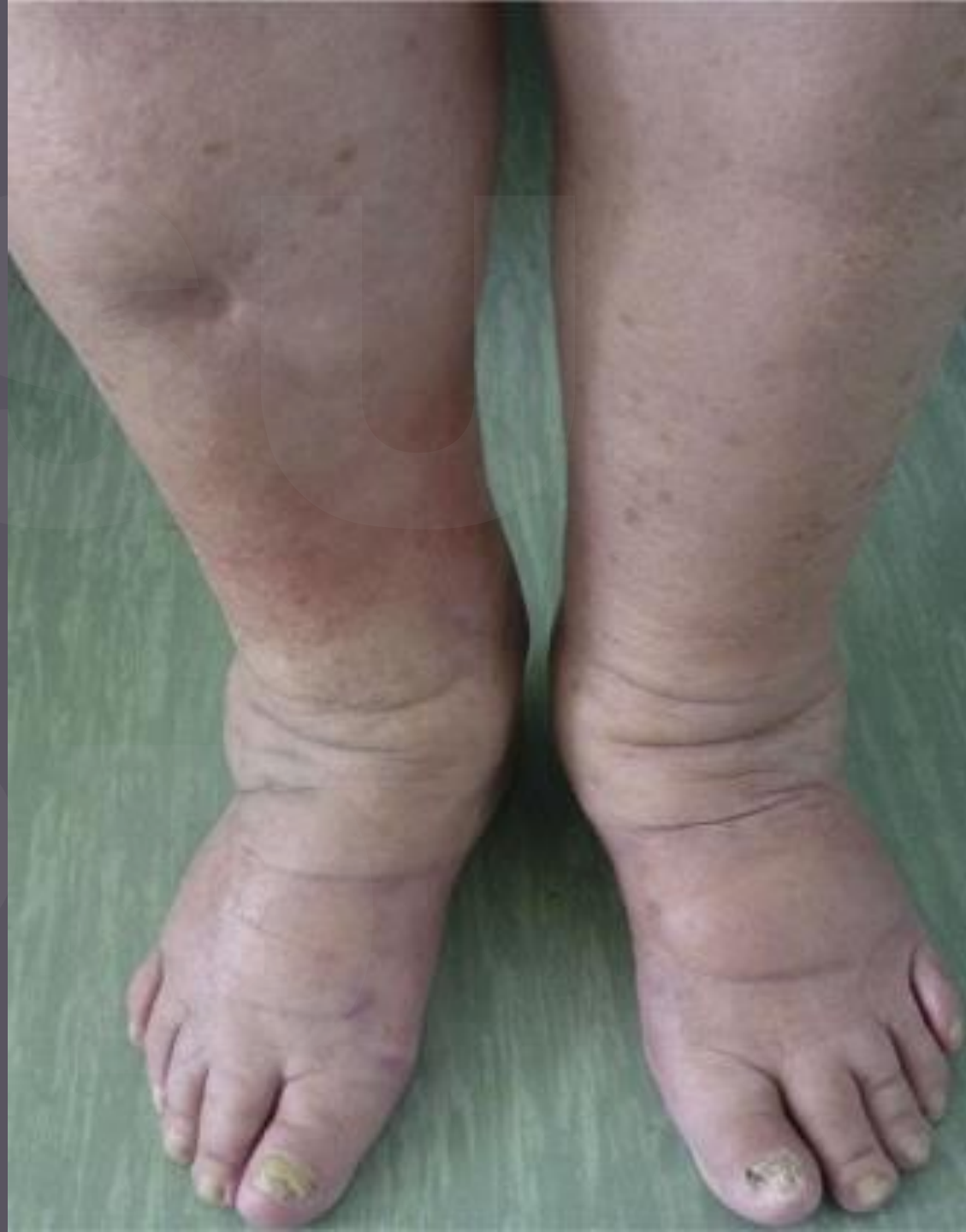
VENOUS REFLUX



PHLEBOLYMPHEDEMA



EXCESSIVE CIRCULATORY VOLUME



Hydrostatic edema

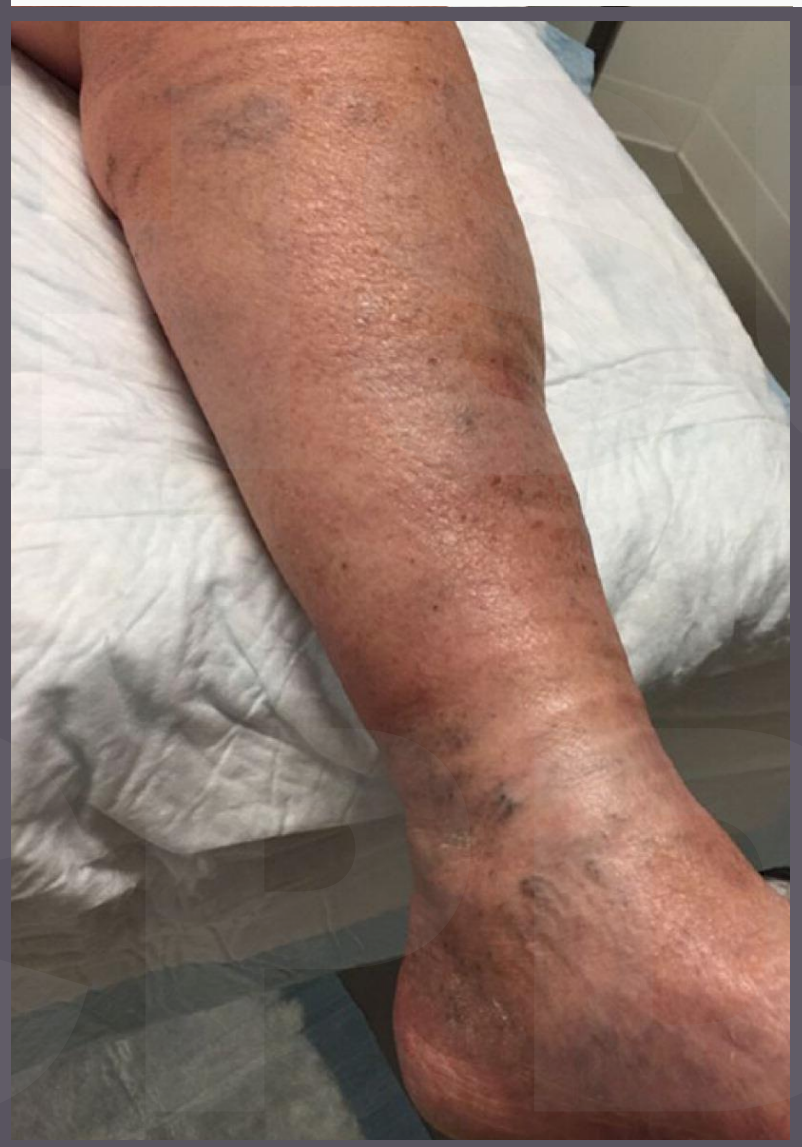
- Edema caused by fluid accumulation within interstitial space
- Greatest collection (generally) at basement membrane (dermal/epidermal junction)
- Easily malleable with external force
- Dorsal foot involvement is rare
- Pits, does not fold
- Edema of dependence, venous hypertension, reflux, CHF
- Reversible with gravity/elevation

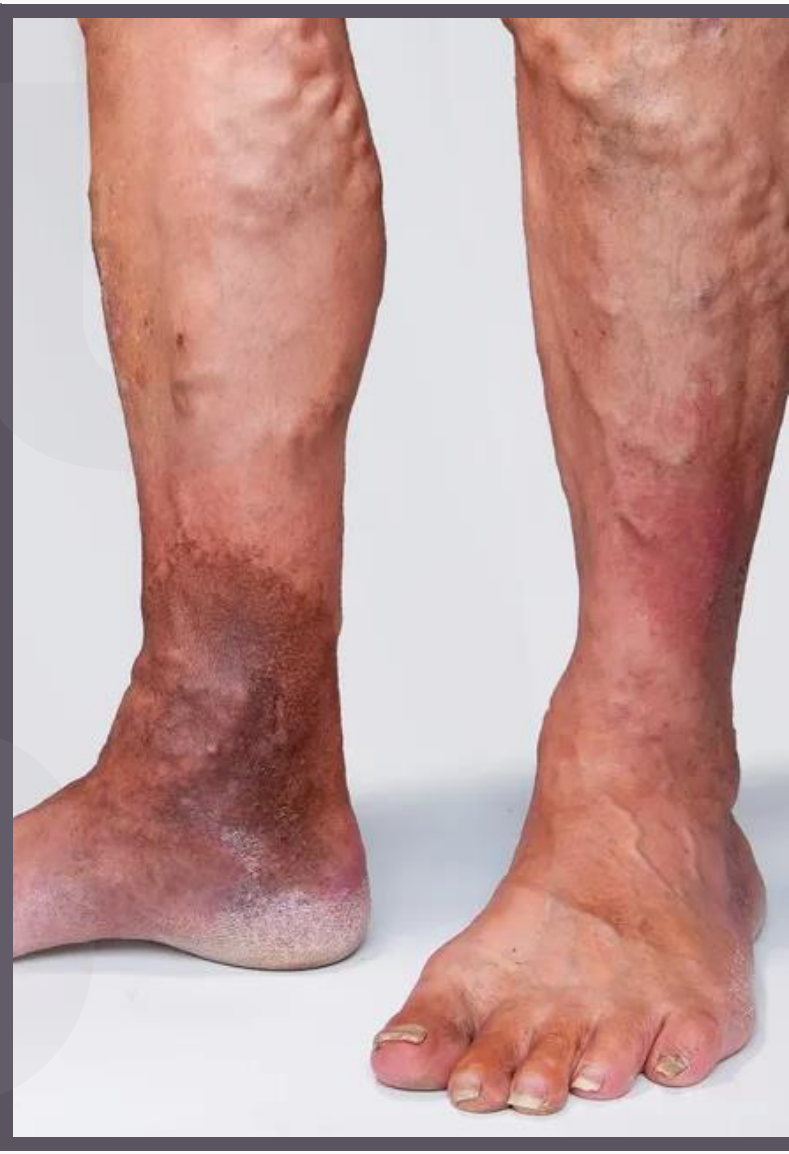
Hydrostatic edema

- Early indications include corona phlebectasia, lower extremity hair loss
- Later skin changes include hemosiderosis, lipodermatosclerosis, atrophie blanche, stasis dermatitis
- Subjective signs include restless leg, neuropathic pain (specifically burning, aching, electrical sensation)
- Does not extend above thigh

Hydrostatis

- Hair loss
- Corona phlebectasia
- Stasis dermatitis
- Hemosiderosis
- Lipodermatosclerosis
- Hypertrophic nails





Lymphedema/phlebolymphedema

- Caused by collection of lymph within tissue
- Fluid is protein-rich, high density
- Not easily manipulated
- Can be caused by damage to lymphatic system or long-standing hydrostatic edema
- May or may not pit, does not fold, forefoot/toe involvement is diagnostic

Lymphedema/Phlebolymphedema

- Brawny tissue quality
- Stemmer’s sign
- Skin changes include dense fibrosis, lipodermatosclerosis, papillomatosis cutis lymphostatica, lymphorrhea
- Often malodorous due to lymph drainage/accumulation
- Very often misdiagnosed (cellulitis, localized infection)
- May not reverse with elevation

Phlebolymphedema

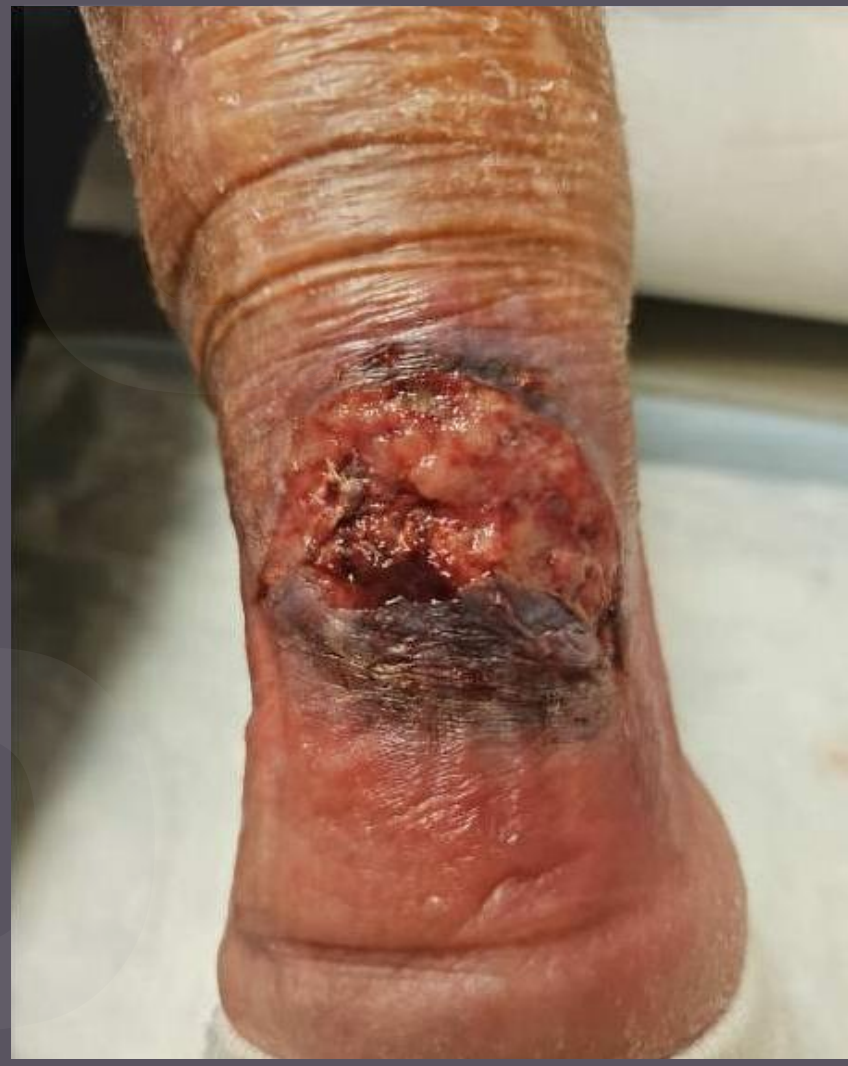
- Papillomatosis cutis
- Forefoot/toe edema (Stemmer’s sign)
- Tissue hypertrophy (lobular deposition)
- Lymphorrhea

How does edema impair healing?

- Physical barrier to perfusion (ischemic pain)
- WBCs can’t access wound
- Slough accumulates
- Colonization more likely than infection
- Ongoing fluid expression damages periwound

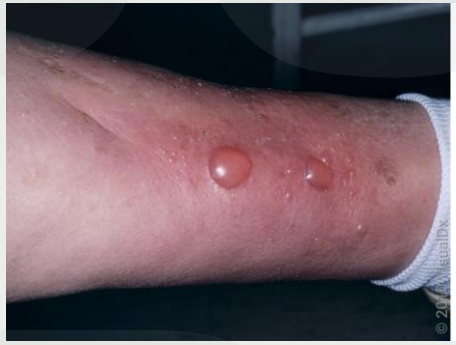
Trauma in the setting of edema

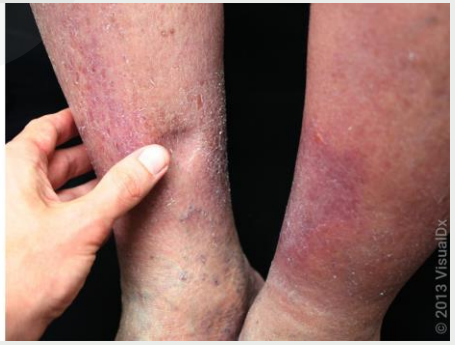
- Cause of injury is tissue insult
- Underlying edema not known to patient or not severe enough to have drawn attention
- Edema worsens because mobility decreases during convalescence
- Injury causes additional edema due to inflammatory effect
- Hypoxia occurs to ulcer base and margins
- Primary closure likely to fail if edema is not also addressed



Edema as cause of ulceration

- Edema can no longer be contained by tissue
- Bullae form and rupture
- Ulcerations fail to heal due to level of edema
- High risk for rebound edema





Methods of management

- Primary means of control is physical activity/flexion at ankle
- More effective if performed while wearing toe-to-ankle compression
- Compression stockings (if adequately fitted)
- Compression garments (if stockings cannot be donned)
- Compression bandaging if active ulcers are present

Considerations

- Appropriate perfusion – order arterial duplex (ABI/TBI) before applying compression
- Venous reflux exam (NOT venous duplex)
- Assess dorsalis pedis/posterior tibial artery, pedal arch with handheld doppler
- Smoking status, hyperlipidemia, uncontrolled type 2 diabetes may lead to calcified small-diameter arteries

Pitfalls of application

- Inadequate placement
- Inadequate product type
- Inadequate strength
- Inadequate patient education

The diuretic dilemma

Diuretics are ineffective if the swelling is secondary to dependent edema or venous reflux

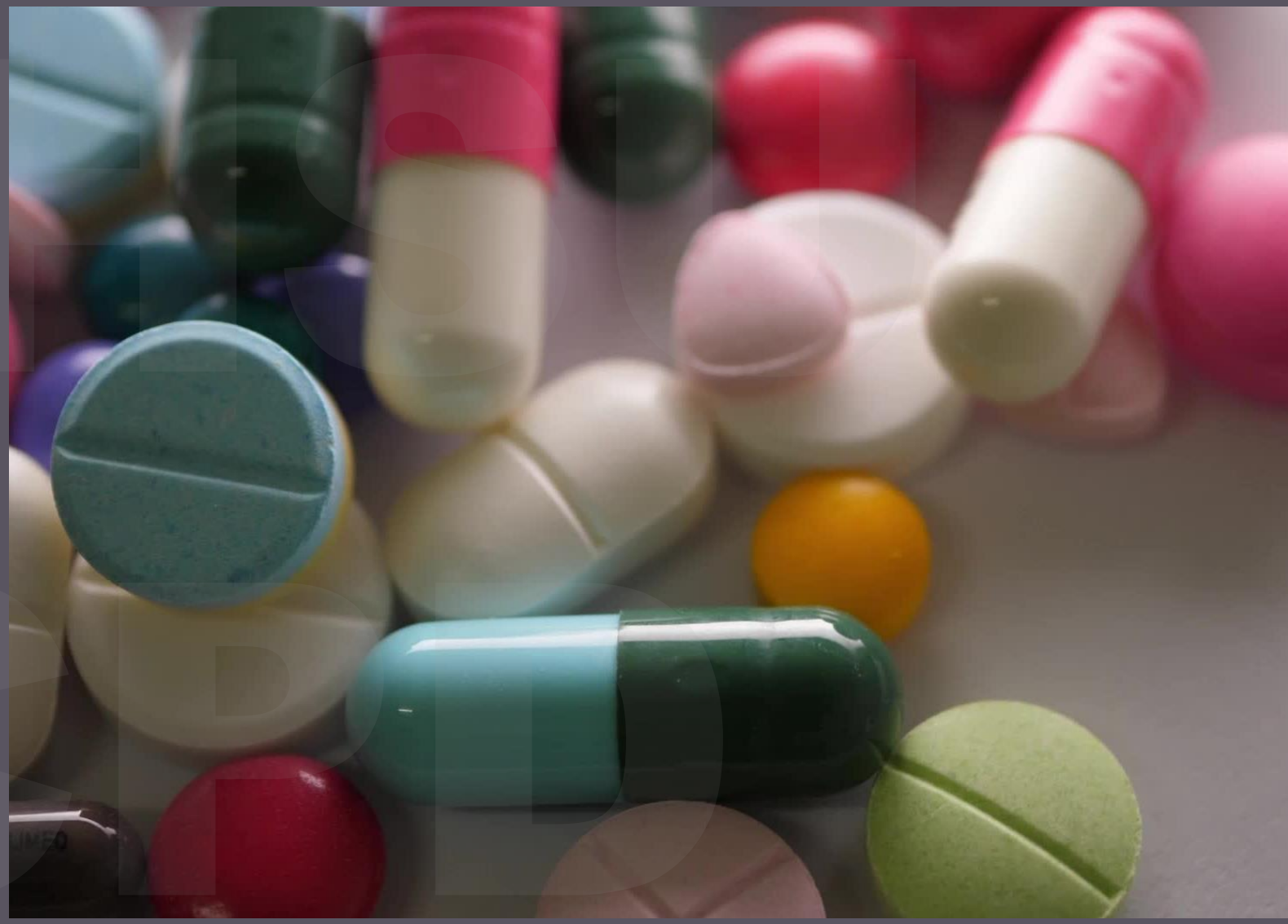
Short course may be indicated if compression is applied and symptoms of fluid volume overload are noted

Consider echocardiogram, use CHF clinical guidelines rather than empiric diuretics

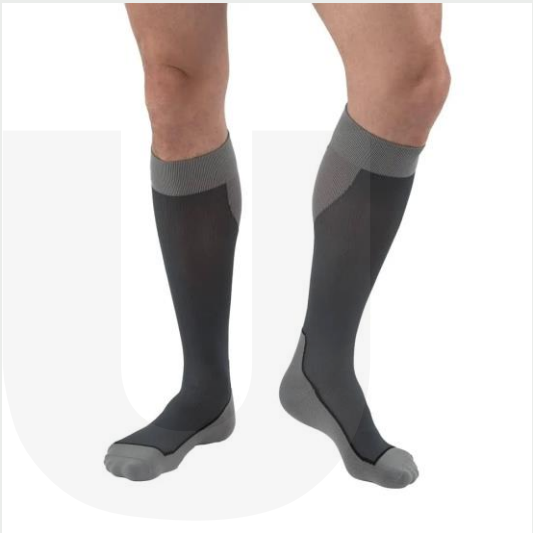
Other medication complications

Calcium channel blockers (amlodipine, nifedipine, felodipine) reduce contractile ability of lymphangion, worsening lymphedema.

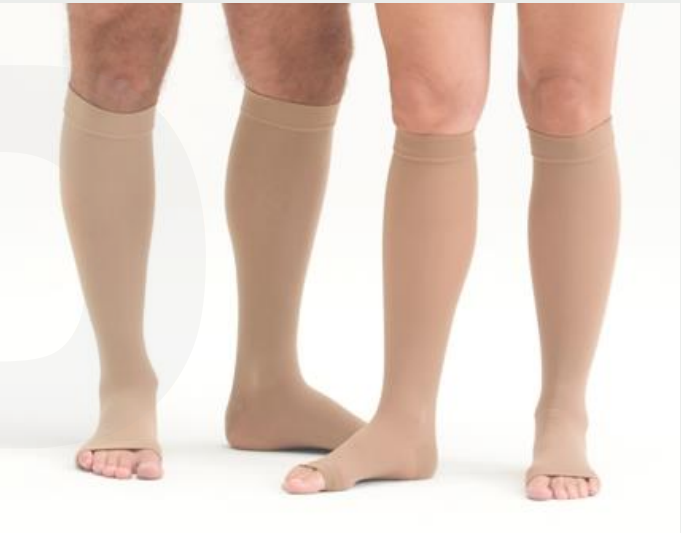
Estrogen-based therapies, corticosteroids aggravate both lymphedema and hydrostatic edema.



Compression systems

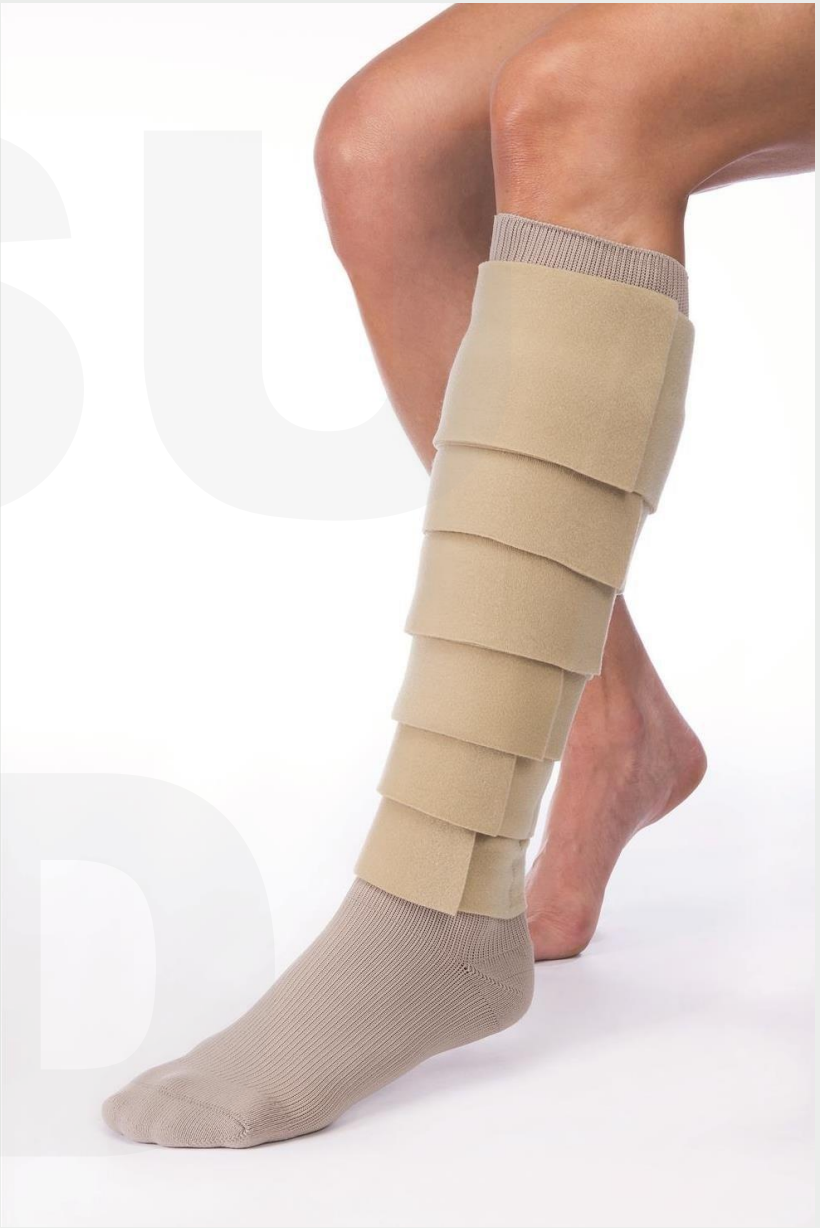


- Fit should be appropriate (measure at widest point of calf and from instep to tibial plateau)
- Should be measured after edema is controlled
- Should be strong enough to leave indentation or patterning in skin
- Band should not constrict



Compression garments

- Easier to apply than stocking
- Easier to apply incorrectly
- Expensive – only covered by insurance if patient has ulcers or lymphedema

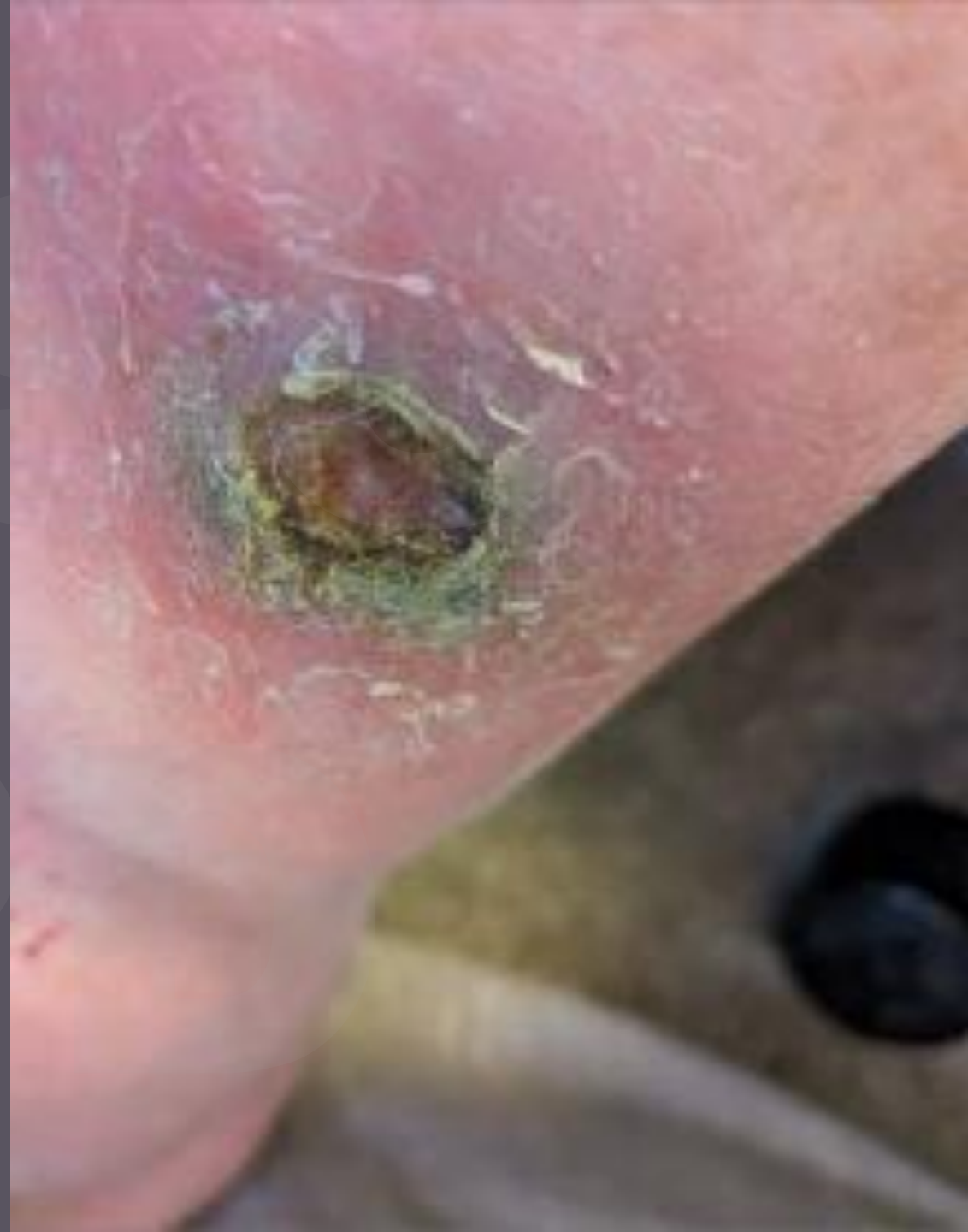


In the setting of active ulcerations

- Bandaging systems apply more consistent compression, can remain in place up to one week (cast cover necessary for showering)
- Stocking/garments are challenging to apply over dressings, damaged by excessive exudate, expensive to obtain/replace
- Exudate from ulcers will increase under compression – this is an expected outcome
- Exudate mismanagement will lead to periwound redness/pain secondary to inflammation/contact dermatitis
- Nerve pain may increase – this is improved with position change, foot flexion

PITFALLS OF WOUND TREATMENT

- Overreliance on systemic antibiotics
- Empiric treatment if abx are used
- Inadequate drainage management
- No compression application
- No photos or measurements, no means of evaluating improvement
- Inadequate follow up



Treatment guidelines

- Assess ulcers weekly
- Take pictures and measurements at every assessment and by the same provider if possible
- Refer early – if ulcer shows little improvement after 2 weeks of care, consider requesting e-consultation or wound care referral
- Compression must remain on whenever limbs are dependent – removal leads to rebound edema/bullae/worsened stasis dermatitis

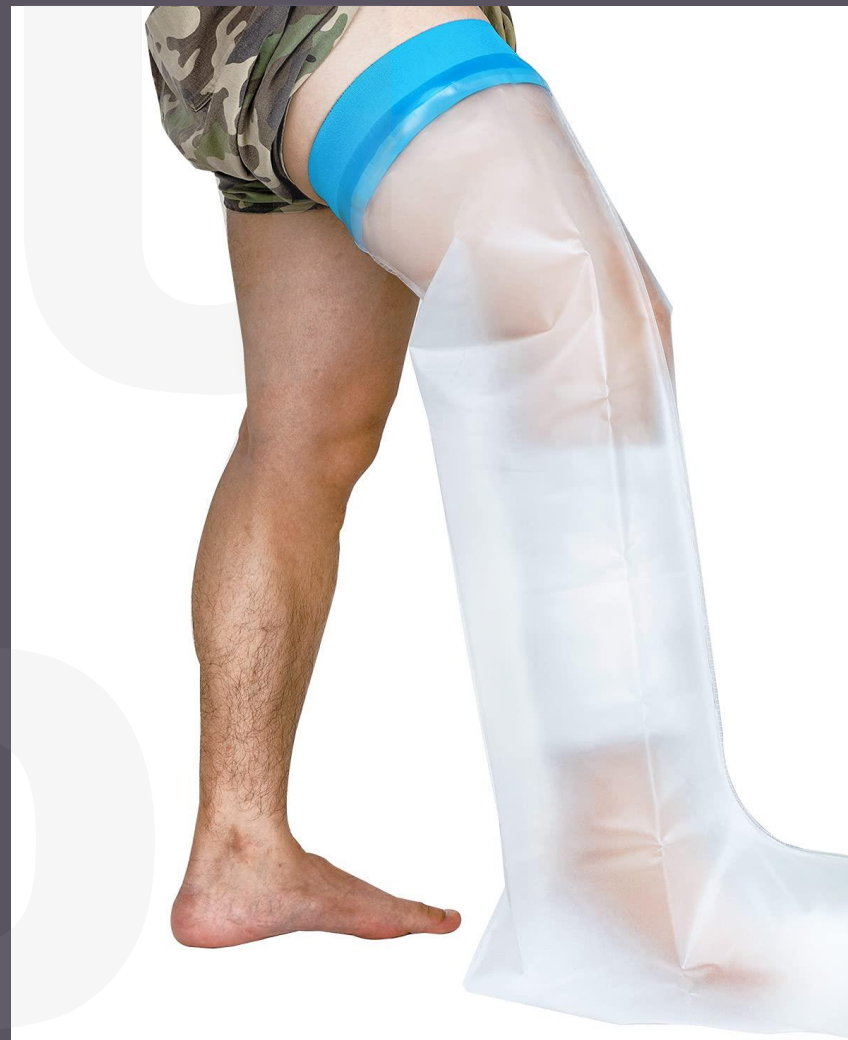
Treatment guidelines

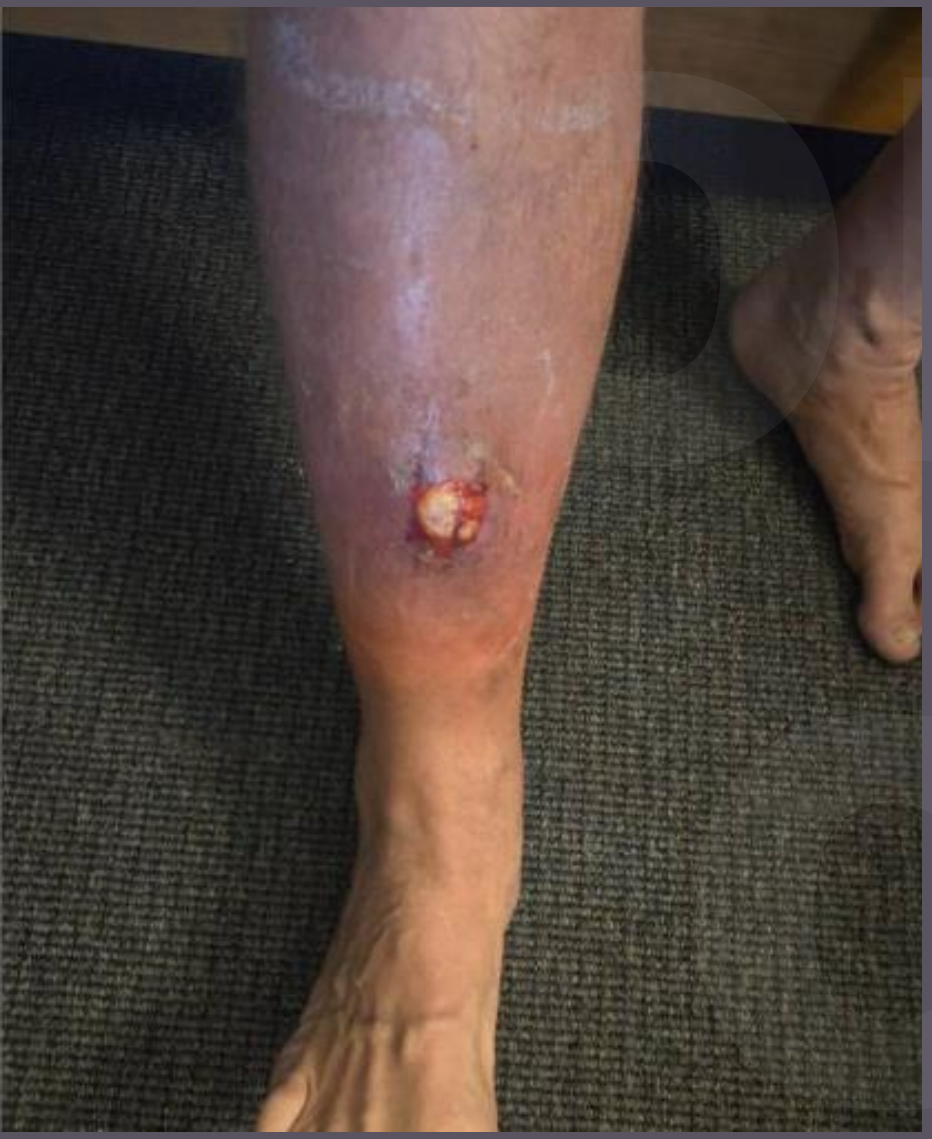
- Culture a wound if possible
- Cleanse wound with gauze/saline, culture deepest or most central aspect only, gram stain
- Systemic abx are not effective if edema isn’t controlled
- Consider topical treatment

Treatment guidelines

Cover the wound area/bandage when showering

- Prevents enteric flora from populating wound
- Reduces time spent out of dressing
- Most bandaging systems can remain in place for several days, up to one week

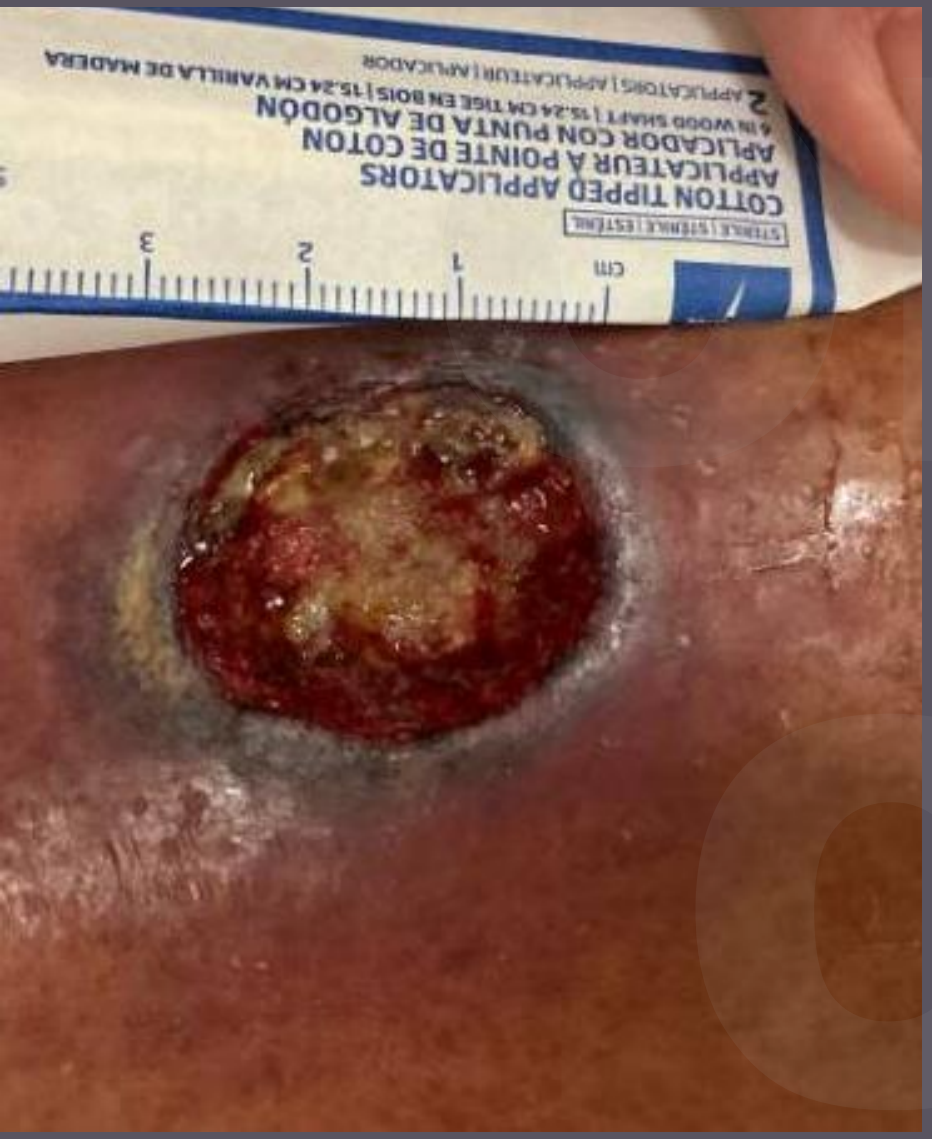




Case 1

61 yo male patient, injury extant 2 months prior to clinic eval. Ulcer started as bruise, gradually worsened. On 8 courses of abx since wound occurred, culture performed once after 5th round.

Non-diabetic, non-smoker, high protein intake, walks at least 10,000 steps daily, plays tennis 3-4 times weekly.



Case 1

Advised by PCP to greatly limit activity, leave ulcer open to air. Ulcer began to worsen significantly after following these recommendations. Pain increased – worsened at end of day, and immediately after changing position.

Had initially been fairly dry, drainage began once activity was limited. Became malodorous.

Case 1

Knowing what you know now regarding lower extremity swelling, what recommendations would you make?

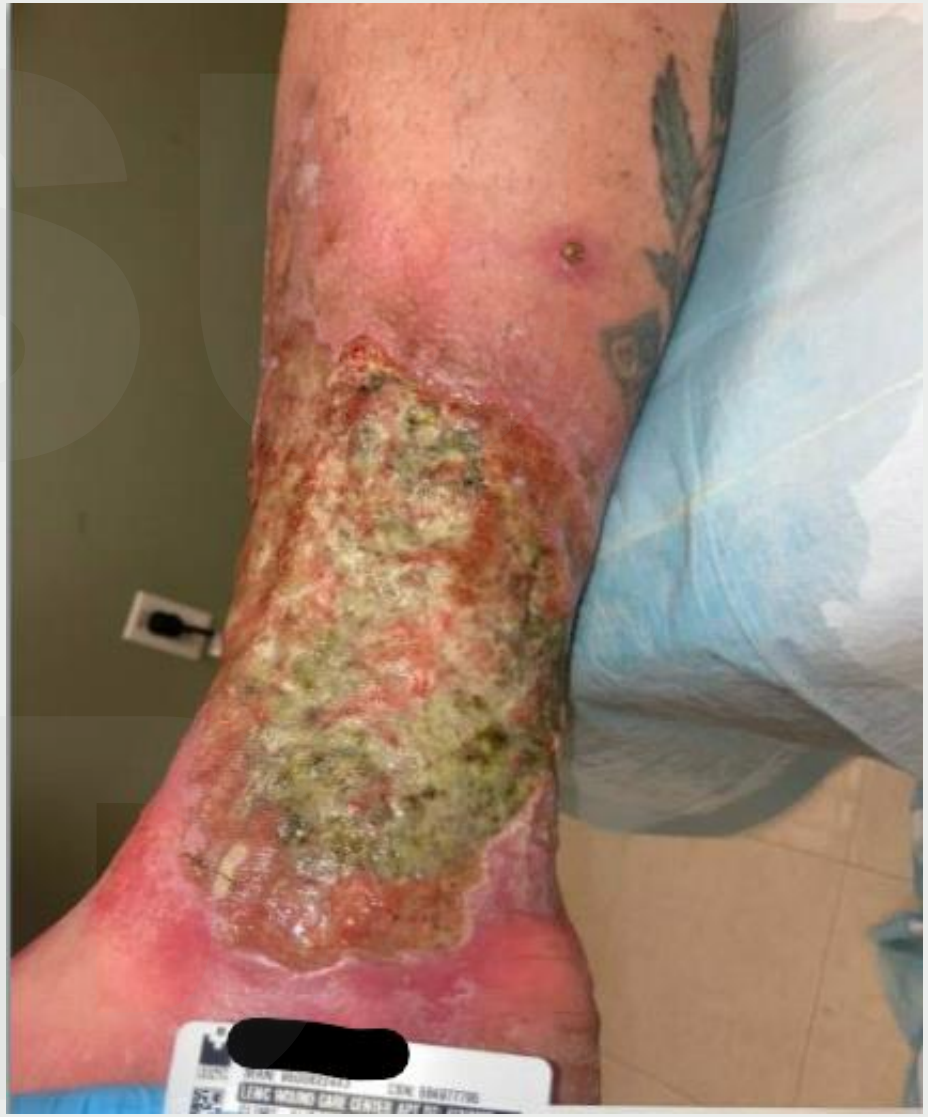
Case 1

Antimicrobial primary dressing, absorbent secondary dressing applied, inelastic compression bandaging for edema control, changed once weekly. ABX stopped. Physical activity encouraged.

Base shows robust granulation, minimal drainage, proliferative epithelium at margins, no hypoxia, no pain.

Case 2

31 yo patient, Hx fentanyl use. Pain 10/10, drainage persistent, copious, ankle fixed due to fibrosis. Presently in stable housing.



Case 2

Is this patient able to be managed in primary care?

What factors need to be addressed?

What referrals should be placed?

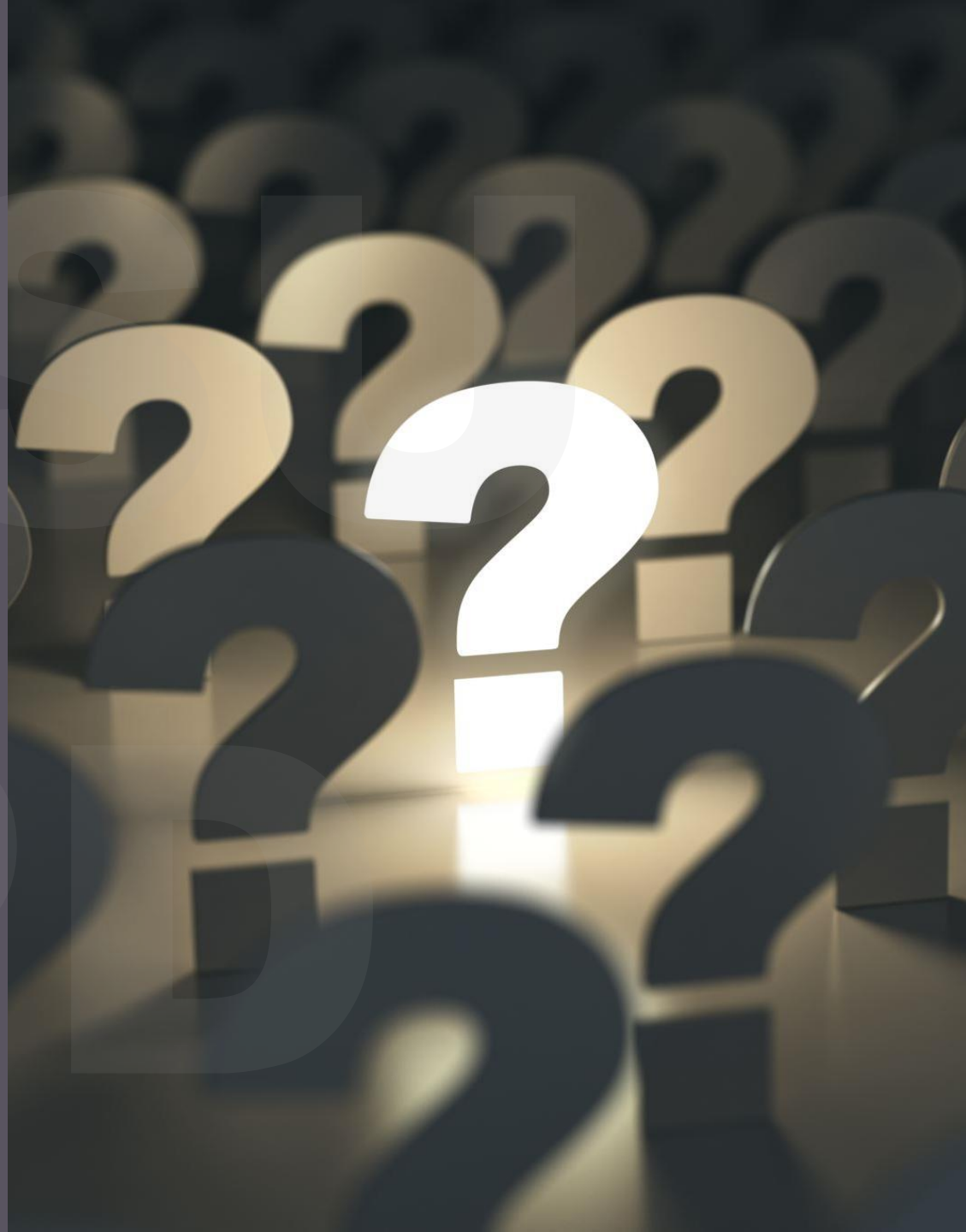
Demonstration

Compression can be applied in a variety of ways.

Numerous layers of any sort of bandaging can apply *some* level of compression.

Communicate to patient that there are many options for compression therapy – if one isn’t effective, other types can be attempted, but it’s a necessary component of care.

QUESTIONS?



THANK YOU

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