

Outpatient Chronic Wound Management

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Objectives

- ❖ State THE most important concept in wound healing
- ❖ Explain how to perform an ABI, interpret the results, and make treatment recommendations based on the results
- ❖ Identify 4 types of chronic wounds and characteristics that help define wound type
- ❖ Identify treatment strategies for each type of wound

Basics of Wound Healing

- In order to heal a wound, you MUST treat the underlying cause(s).
- Check Ankle Brachial Index (ABI) to evaluate for blood flow in all wound patients
- Need adequate nutrition (protein/caloric intake); can follow prealbumin, albumin, serum protein
- Glucose control is imperative for both wound healing and infection prevention
- Basic principle of dressing choice: If wound is too moist, dry it. If wound is too dry, add moisture. Wound healing occurs best with a neutral, moist environment. (exception: advanced PAD)



Ankle Brachial Index (ABI)

- Billable Service ICD-10 Z13.6 CPT 93922
- Ratio between systolic pressure of the distal lower extremity and upper extremity

Procedure:

1. Lie supine for 10 minutes
2. Check systolic blood pressure in brachial artery manually (cuff and stethoscope or doppler)
3. Check systolic pressure in both dorsalis pedis and posterior tibial arteries manually (using doppler)
4. Divide Ankle pressure by brachial pressure (calculate BOTH DPA and PTA)

- Normal: 0.9- 1.4
- High: > 1.4, usually vessel stiffening
- Low: <0.9, narrowing of vessels
- Borderline: 0.6-0.8
- Severe ischemia: <0.5
- Non-compressible: unable to occlude the vessel at 300mmHg

(McClary & Massey, 2019; WOCNS, 2019)

4 Types of Chronic Wounds

- Arterial Ulcers
- Venous Stasis Ulcers
- Neuropathic Ulcers (Diabetic Foot Ulcers)
- Pressure Ulcers

Note: Often times, patients will have a combination of underlying etiologies.

Arterial Ulcers

Subjective

- Hx: tobacco use, DM, HLD, CRI
- Typically very painful
- Claudication common
- Smoking hx very common



Objective

- Location: typically on shin, lateral malleolus, dorsal foot, toes
- “punched out” appearance
- Often have pale wound base (due to lack of blood flow)
- Minimal exudate
- Surrounding skin may be shiny, pale, cool, cyanotic, or have dependent rubor, elevation pallor
- May have hair loss on leg/foot



(WOCNS, 2019)

Arterial Ulcer Workup & Treatment

- Arterial Duplex
- Vascular surgery Referral
- Tobacco cessation counseling
- Increase physical activity
- May need to consider admission to hospital for more rapid treatment/revascularization
- Best to keep these wounds dry until blood flow restored; the added moisture can increase risk of infection
- Hyperbaric Oxygen Treatment (wound center) (WOCNS, 2019)



Venous Stasis Ulcer

Venous Stasis

- Venous insufficiency is a disease of the venous system due to incompetent valves
- The incompetent veins can result from trauma, DVT, or from genetics
- Edema is common but not imperative for this diagnosis

(Dynamed, 2018)



Venous Stasis Ulcer

Subjective

- Hx: obesity, female (common), DVT
- May work standing on feet for extended periods of time
- Painless or mild-moderately painful ulcer
- May report increased drainage
- Swelling
- Changes in skin texture

Objective

- Edema (common); Check pretibial area
- Hemosiderin staining on LE
- Typically shallow ulcer with irregular borders
- May be weeping with serous fluid
- Typically around the medial lower leg or medial malleolar area



(Apligraf, 2020; Dynamed, 2018; Nursekey, 2019)



Venous Stasis Ulcer Workup & Treatment

- Can order venous reflux study; refer for surgical intervention (IR or vascular surgeon)
- If suspicion for bone infection, can order imaging
- Dressing choices will typically be absorbent due to drainage
- Static compression (acutely and long term) if it can be used safely
- Leg Elevation
- Walking is good (this activates the calf muscle or “pump”)
- Glucose control in DM
- May need venous duplex to r/o DVT



(Dynamed, 2018; WOCSN, 2018)

Compression Therapy

- Compression increases preload. May need diuretic as adjunctive tx
- Amount of compression can range from 10mmHg to 40-50mmHg in the form of stockings or wraps
- ABI >0.8 , can safely use 30-40mmHg (standard)
- ABI 0.6-0.7, can try 20-30mmHg but monitor closely for tolerance. If intractable pain or wound appears worse, d/c wrap.
- ABI <0.5 , do not use compression. Refer to vascular surgery first
- Stockings
 - most often used for patients who do not have the means for obtaining wraps.
 - Must be fitted/sized correctly for the patient once the edema is optimized
 - last about 3-6 months if worn daily; wash and hang dry
- Wraps
 - give a more uniform compression than stockings. Wraps MUST be placed by a trained professional and changed 1-2 times per week.
 - You can order wraps and have home health change if pt is a candidate for HH
- Contraindications:
 - Uncompensated Heart Failure (compression increases preload)
 - Clinically significant arterial disease
 - Note: DVT is NOT a contraindication

(WOCNS, 2019)

Compression Options



Neuropathic Ulcers (Diabetic Foot Ulcers)

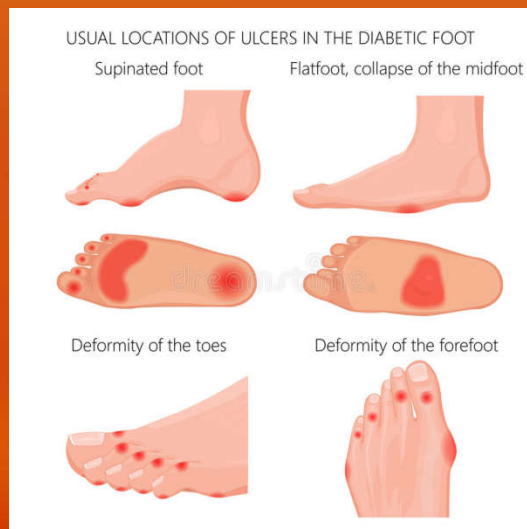
Ulcers that occur on pressure/friction points of the foot due to loss of protective sensation from diabetic neuropathy



Neuropathic Foot Ulcers

Subjective

- Hx: DM, tobacco use, h/o calluses or ulcers
- Elevated blood sugar
- Changes in the structure/shape of foot
- Numbness, tingling, “pins and needles”



Objective

- Calluses
- Open wound on friction surface; most often the plantar surface of foot; shape can vary but typically round
- May have other arthropathies (charcot deformity, hammer toes, rocker bottom foot)
- Probe the wound with forceps when examining for accurate depth
- Normal skin color
- Fissures
- Tinea pedis (look b/t toes)
- Abnormal monofilament test

(WOCNS, 2019)



Neuropathic Foot Ulcer Workup & Treatment



- Pare calluses to evaluate if there is a wound beneath
- A1C or review of FSBS log; needs glucose control
- Offloading is the KEY
- Note: often times diabetic wounds co-exist with arterial disease, so will need to follow the arterial pathway also

- If concern for bone infection, can order Xray first. If xray negative, will need MRI with contrast or Bone scan
- May need direct admission for treatment of osteomyelitis/progressive infection
- Dressing choice: typically an antimicrobial (especially for uncontrolled diabetics)
- Can benefit from podiatrist or ortho surgery if arthropathies exist
- May need referral for orthotic (AFO, CRO walker)
- Long-term prevention: Diabetic Shoes with Custom Inserts

Removeable Offloading

- DH shoe \$50



- Darco Wedge shoe \$25



- Heel Wedge Shoe \$18



- CAM walker \$40



- Inexpensive option: purchase thick foam, off-the-shelf shoe insert and cut hole just beneath wound (Amazon, 2020)

Non-removable Offloading (Total contact cast)



- “Gold standard”
- Most effective at healing
- Expensive
- Labor Intensive

(Messenger, Masoetsa, & Hussain, 2018)

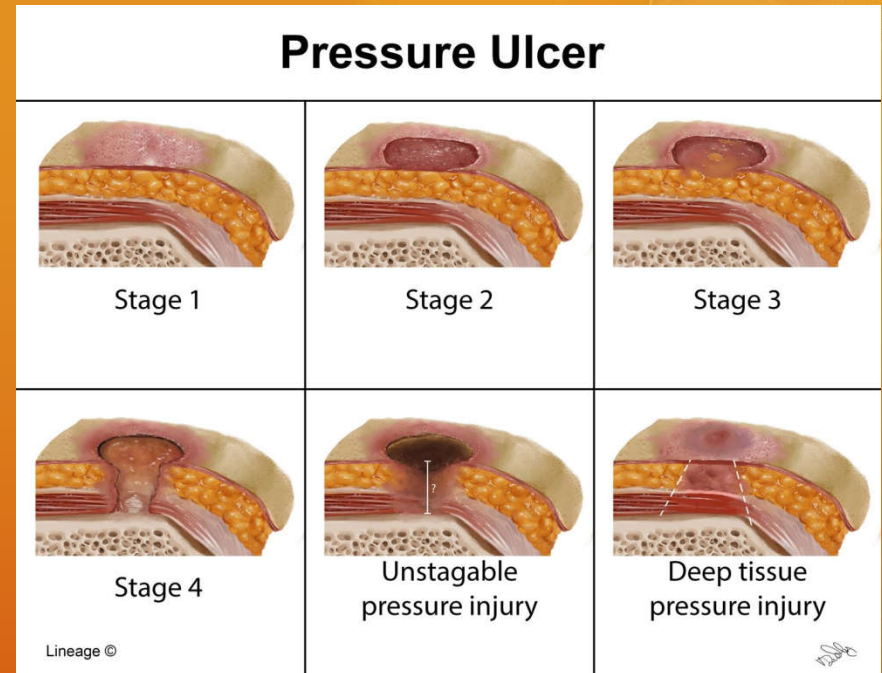
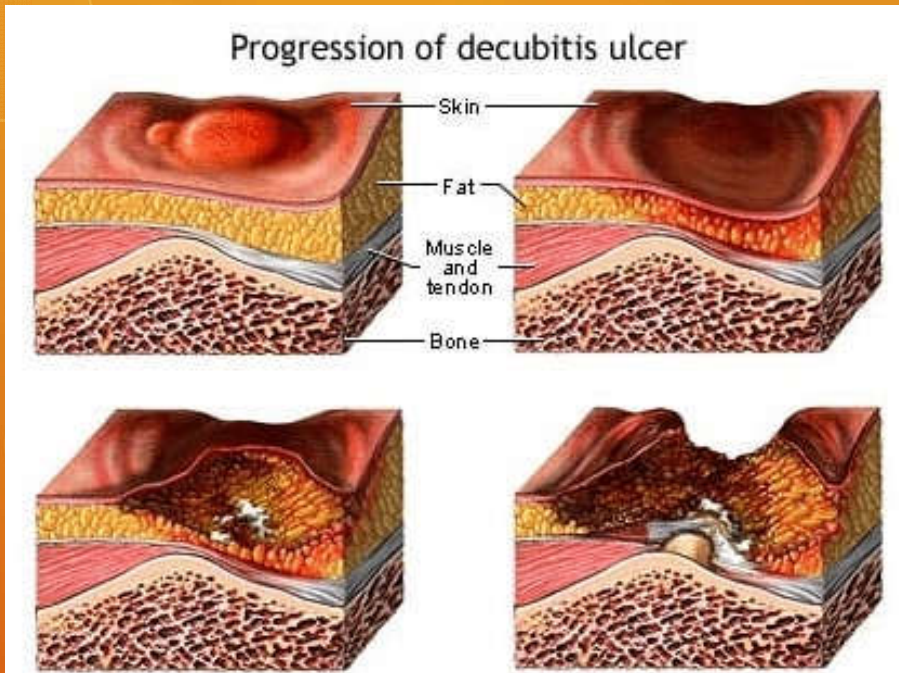
Pressure Ulcers

“External pressure and shear forces applied to soft tissue, usually over a bony prominence, with enough duration and intensity to cause tissue ischemia”

“Effects of hypoxia and risk of tissue damage initially greatest in muscle, followed by subcutaneous tissue, and then skin based on tissue-specific metabolic demands”

(Dynamemed, 2018)

Pressure Ulcers



Stage I: A reddened, painful area that does not turn white when pressed (non-blanchable). This is an indicator that a pressure ulcer is forming. Skin may be warm or cool, firm or soft.

Stage II: Skin blisters or forms an open sore. The area around the sore may be red and irritated.

Stage III: The skin now develops an open, sunken hole called a crater. The tissue below the skin is damaged. Down to subcutaneous layer

Stage IV: The pressure ulcer has become so deep that there is damage to the muscle and bone, and sometimes to tendons and joints.

Pressure Ulcers

- Risk factors: diabetes (type 2 or type 1), PAD, edema, renal disease, bowel or bladder incontinence, poor PO intake, immobility from any diagnosis (MS, SCI, Neuromuscular, CVA, debility)
- Ulcers occur over bony prominences, such as sacrum, heels, hips, elbows, ankles
- Sacral and lower extremity ulcers are at very high risk of infection due to fecal flora that exists in these areas

PREVENTION IS KEY! DON'T DELAY OFFLOADING
UNTIL THE WOUND APPEARS!



(Medetech, 2020; RCNi, 2020)

Braden Scale

| Braden scale for predicting pressure sore risk | | | | | | Write score 1-4 |
|--|--|--|--|---|---|----------------------|
| A | Sensory perception Ability to respond meaningfully to pressure-related discomfort. | 1. Completely Limited Unresponsive (bites not mean, flinch, or grasp) to painful stimuli, due to diminished level of consciousness or sedation. OR limited ability to feel pain over most of body. | 2. Very Limited Responds only to painful stimuli. Cannot communicate discomfort except by moaning or restlessness. OR has a sensory impairment which limits the ability to feel pain or discomfort over 2 of body. | 3. Slightly Limited Responds to verbal commands, but cannot always communicate discomfort or the need to be turned. OR has some sensory impairment which limits ability to feel pain or discomfort in 1 or 2 extremities. | 4. No Impairment Responds to verbal commands. Has no sensory deficit which would limit ability to feel or voice pain or discomfort. | |
| B | Moisture Degree to which skin is exposed to moisture. | 1. Constantly Moist Skin is kept moist almost constantly by perspiration, urine, etc. Dampness is detected every time patient is moved or turned. | 2. Very Moist Skin is often, but not always moist. Linen must be changed at least once a shift. | 3. Occasionally Moist Skin is occasionally moist, requiring an extra linen change approximately once a day. | 4. Rarely Moist Skin is usually dry, linen only requires changing at routine intervals. | |
| C | Activity Degree of physical activity. | 1. Bedfast Confined to bed. | 2. Chairfast Ability to walk severely limited or non-existent. Cannot bear own weight and/or must be assisted into chair or wheelchair. | 3. Walks Occasionally Walks occasionally during day, but for very short distances, with or without assistance. Spends majority of each shift in bed or chair. | 4. Walks Frequently Walks outside room at least twice a day and inside room at least once every two hours during waking hours. | |
| D | Mobility Ability to change and control body position. | 1. Completely Immobile Does not make even slight changes in body or extremity position without assistance. | 2. Very Limited Makes occasional slight changes in body or extremity position but unable to make frequent or significant changes independently. | 3. Slightly Limited Makes frequent though slight changes in body or extremity position independently. | 4. No Limitation Makes major and frequent changes in position without assistance. | |
| E | Nutrition Usual food intake pattern. | 1. Very Poor Never eats a complete meal. Rarely eats more than a of any food offered. Eats 2 servings or less of protein (meat or dairy products) per day. Takes fluids poorly. Does not take a liquid dietary supplement OR is NPO and/or maintained on clear liquids or N-s for more than 5 days. | 2. Probably Inadequate Rarely eats a complete meal and generally eats only about 2 of any food offered. Protein intake includes only 3 servings of meat or dairy products per day. Occasionally will take a dietary supplement. OR receives less than optimum amount of liquid diet or tube feeding. | 3. Adequate Eats over half of most meals. Eats a total of 4 servings of protein (meat, dairy products) per day. Occasionally will refuse a meal, but will usually take a supplement when offered OR is on a tube feeding or TPN regimen which probably meets most of nutritional needs. | 4. Excellent Eats most of every meal. Never refuses a meal. Usually eats a total of 4 or more servings of meat and dairy products. Occasionally eats between meals. Does not require supplementation. | |
| F | Friction & shear | 1. Problem Requires moderate to maximum assistance in moving. Complete lifting without sliding against sheets is impossible. Frequent slides down in bed or chair, requiring frequent repositioning with maximum assistance. Specificity, contractures or agitation leads to almost constant friction. | 2. Potential Problem Moves freely or requires minimum assistance. During a move skin probably slides to some extent against sheets, chair, restraints or other devices. Maintains relatively good position in chair or bed most of the time but occasionally slides down. | 3. No Apparent Problem Moves in bed and in chair independently and has sufficient muscle strength to lift up completely during move. Maintains good position in bed or chair. | | |
| A + B + C + D + E + F = Total score: | | | | | | |
| Pressure sore risk | | | | | | |
| Xtra high risk: | | | | | | = 9 Point |
| High risk: | | | | | | = 10-12 Point |
| Medium risk: | | | | | | = 13-14 Point |
| Low risk: | | | | | | = 15-16 Point |
| Patient's Name: _____ | | Evaluator's Name: _____ | | Date: _____ | | |

Pressure Ulcer Prevention & Treatment

- If no wound exists, but patient is at high risk, order better support surfaces.
- Hip or sacral ulcer: Upgraded mattress (group 2 –memory foam or low airloss; can also try gel or memory foam overlay)

- Heels: Offloading boots and foams



- Ischial Ulcer (sitting wound):

- Gel seat cushion for patients who are at risk
- All paraplegics should get a ROHO seat cushion (made of air); needs to be fitted properly by physical therapy
- Refer for seating/wheelchair evaluation with physical therapy



(Allevyn, 2020; Amazon, 2020; Prevalon, 2020)

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