Wound Clinic Referrals, Venous, Arterial, DFU's

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Objectives

- Discuss wound healing goal and wound care tips
- Discuss criteria for wound clinic referrals
- Differentiate between Venous Disease, Cellulitis
- Know how to treat Venous Stasis Ulcers, Cellulitis
- Discuss Arterial Wounds
- Discuss Neuropathic/Diabetic Foot Ulcers

Wound Healing Goals:

- Prevent infection
- Pain Free Dressings
- Absorb excess drainage and keep wound bed moist
- Keep intact skin dry

Basic Tips

- Never Dry out an open Wound unless it is stable heel eschars
- Do not clean with alcohol, hydrogen peroxide- plain soap and water
- Whirlpools are no longer used
- Gentian Violet not recommended
- Provide adequate nutrition
- No need to culture every wound
- Wet to Dry – nonspecific debridement – out of date
- Pain management to be addressed

Wound Clinic Referral Guidelines:

- > 1 mo. Non-healing open wound under PCP care
- Non healing surgical wounds
- Pressure Injury related wounds
- Venous Stasis ulcers
- Lymphedema wounds
- Venous HTN/edema wounds
- Trauma related (may need collaboration with Ortho PRN)
- Arterial (collaboration with Vascular)

Do not refer to Wound Clinic for:

- Intact skin
- Foot or ankle wounds – Podiatry consult first
- Footwear, Diabetic shoes- Podiatry consult
- Lymphedema or BLE edema WITHOUT wounds; need compression stockings- Physical Therapy consult or PCP to order compression stockings (may/may not have coverage)
- Cellulitis without open wounds- PT , possible ID involvement
- Lumps and Bumps (e.g cysts) excision- I&D- Refer to General Surgery or Surgical Urgent Care, Dermatology or ENT (refer to KPHC referral guidelines)
- Pain management for the wound
- Rash management – Derm
- Suture removal- Surgical urgent care nurse visit

FRIENDLY REMINDERS:

- We do not manage patient's pain
  - Done by PCP or Pain Clinic referral through PCP

LOWER EXTREMITY VENOUS DISEASE: VENOUS STASIS ULCERS (VSU's)

Prevalence

- Cost of venous leg ulcer treatment = $1.9-3.5 billion/yr US
- Venous ulcers/wounds= 80-90% of ALL leg ulcers
- Recurrence rate – 57%-97% with 26-28% recurring in 12 mo.

WOCN LEVD pg. 1

Venous Insufficiency

WOCN LEVD pg. 2

Risk Factors of LEV leading to Ulceration

- Smoking
- Varicose veins
- Obesity
- Hx VTE/DVT, phlebitis, pulmonary embolus
- Restricted ankle movement
- Reduced calf muscle pump power
- Family hx of venous disease
- Pregnancy
- Older age
- Trauma, Surgery, leg fractures
- Sedentary lifestyle and occupation
- Congestive heart failure

Giugliano, D., Di Serafino, L., Perrino, C., Schiano, V., Laurenzano, E., Cassese, S., & Esposito, G. (2013); Kaminski, J. & Thank, D. (2015); WOCN pg. 1, 4

Labs and Diagnostic Evaluation

- **Ankle Brachial Index (ABI)**
- Presence or absence of pedal DP or PT pulses does not rule out lower extremity arterial disease (LEAD) nor does absence of pulses indicate arterial disease with edema
  - Absence of both the DP artery and PT artery pulses is 72 percent sensitive and 99 percent specific for PVD
- Assess for peripheral sensory neuropathy
- Assess pain

Giugliano, G. et al., (2013); Kaminski, J. & Thank, D. (2015); WOCN LEVD 5-6, 31

Physical Exam for Venous Ulcers

- Physical assessment- Look for:
  - Edema
  - Hemosiderosis (hemosiderin staining, hyperpigmentation)
  - Venous dermatitis (erythematous, scaly pruritic, weepy wounds)
  - Atrophie blanche
  - Varicose veins
  - Ankle flaring (cluster of reticular/spider veins)
  - Scarring from previous wounds
  - Warm to hot skin/elevated temp vs. Cool skin
  - Lipodermatosclerosis

WOCN pg. 5-6, 31

Characteristics of Venous Leg Ulcers

- **Location:** superior to medial malleolus, can be present anywhere on lower leg including posterior calf
- **Wound edges:** irregular
- **Wound bed:** ruddy red, yellow adherent/loose slough, granulation tissue, shallow and No undermining or tunneling
- **Exudate:** varies – mild, mod, large
- **Periwound:** macerated, crusty, scaling, hyperpigmented
- **Odor:** +/-
- **Bleeding:** +/-
- Brownish/black discoloration of the lower extremity
- Non pitting (brawny) edema
- Stasis dermatitis- "Tree bark" skin appearance

Giugliano, G., Di Serafino, L., Perrino, C., Schiano, V., Laurenzano, E., Ciaglia, L., & Esposito, G. (2013). Kontinski, J. & Frank, D. (2015). WOCN pg. 5-6

Which of these are Cellulitis?

Venous Stasis vs. Cellulitis

Symptoms	-Afebrile -Itching -Varicose veins/VTE	-May have fever -Painful -No relevant history
Signs	-Normal body temp -Erythema, inflamed -May be tender -Vesicles crusting -Eczematic lesions may be on other parts other leg -Unilateral or bilateral	-Feverish -Erythema, inflamed -Tender -One or few bullae/no crusting -No lesions elsewhere -Unilateral
Portal of Entry	N/A	Unknown, breaks in skin, ulcers, trauma, tinea pedis, intertrigo
Labs	-WBC normal -Skin swabs S. aureus common	-WBC high -Usually negative except for necrotic tissue

Stasis Dermatitis

Location: medial aspect of lower leg and ankle, superior to medial malleolus

Seldom on foot or above the knee

Venous Ulcers

Edematous leg, Lipodermatosclerosis

Cellulitis

Assess for Barriers to wound healing:

- Comorbidity conditions
- Lack of adherence with prevention/treatment programs
- Medications
- BMI < or = 20 – related to malnutrition
- Malnutrition
- Depression
- Decreased physical activity
- Lack of leg elevation

WOCN pg. 8-9, 18

Refer out for the following:

- Cellulitis that isn't improving
- Increased swelling, tenderness, skin changes
- Intractable pain
- Wound is atypical in appearance/location
- VTE
- Unresponsive Dermatitis
- Variceal bleeds
- Wound is unresponsive after 4 weeks of treatment

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Prevention of Venous Ulcers is key!

- Compression - stockings, garments, wraps, bandages DAILY
- Light compression 20-30mmHg for LEVD and/or those who can't wea garments/higher compression
  - Compression of 40-50mmHg for those with normal arterial blood flow or what can be tolerated
- Tx of varicosities: weight management, physical activity- walking to improve calf muscle strength, and ROM, avoid wearing constricting garments and crossing legs
- Leg elevations

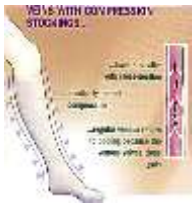
WOCN pg. 31

Treatment and Patient Education

- Smoking cessation
- Wear compression stockings daily
- Healthy nutrition and Weight management
- Avoid trauma to lower leg
- Avoid crossing legs and prolonged standing, avoid high heels
- **Elevate legs** above heart x 30 mins (3-4x a day) when possible
- Physical Activity/Exercise– Brisk walks BID, treadmill on incline
- Resistance calf muscle exercises
- Chair bound patients/non ambulatory- rocking exercise for calf muscles
- Discourage self treatment with OTC meds
- Topical corticosteroid for no more than 2 weeks - Dermatitis

WOCN pg. 11-12, 14, 27

Compression – Gold Standard



- Done throughout lifetime
- ABI:
  - ABI < or = 0.9 = significant arterial disease
  - ABI > 0.5 but < 0.8mmHg = mixed venous and arterial etiology
  - Stockings need to be fitted by trained personnel
- Apply stockings in AM before getting OOB.
- Remove stockings at night prior to sleeping
- Replace stockings Q 3-6 mo.

WOCN pg. 11-12,33

Compression

- **Therapeutic amount= 30-42 mm Hg at the ankle**
- Avoid: Antiembolism or TED hose
- *Inelastic/short stretch wraps* require ambulation to force calf muscle pump contraction (Ex. Unna boot/UBZ kit, Duke boot, Short stretch Comprilan, Coban 2, Farrow Wrap, Rosidal K, CircPlus)
- *Elastic/long stretch* is not dependent on ambulation for compression (Tubigrip (14-17mm Hg), Setopress/Surepress (25-35), Profore 4 layer (35-40mm Hg)
- *Intermittent Pneumatic Compression* (IPC) – immobile pts or those who need higher compression levels (larger legs or intolerant of stockings/wraps)

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Various Compression Stockings

Various Wraps

UBZ/UBC

Stocking clinic guide for compression

- Needs to be measured by certified compression consultant
- Start low compression 20-30mmhg- RX not needed unless want DME coverage
- Activelife- contracted vendor with Kaiser
- If not covered- Compression stocking clinic guide may be available at your wound or vascular clinic
- Covered if lymphedema, burn or venous stasis with ulcer- Medicare age 65+

PLAN

- **Refer to Vascular or Outpatient Wound Clinic**
- Treating prophylactically is not warranted.
- Culture guided antibiotic therapy- do not culture slough, Needs topical not systemic antibiotics
- Deep tissue infection and cellulitis- Warrants Systemic treatment
- Superficial infection – topical antimicrobial/antibiotics or trial antimicrobial dressings (silver, PHMB, or cadoxemer iodine)

WOCN pg. 14-18, 33

Cellulitis

TREATMENT:

- If already on PO ABX but cellulitis is not improved:
  1. Get aerobic culture- Not on slough/necrotic areas
  2. Call Infectious Disease for antibiotic guidance- Doxy or Clinda, Bactrim DS
  3. Send pt to ER/Urgent Care for IV Antibiotics

*** We do not start IV Antibiotics at the Wound clinic - done in Urgent Care/ER**

Other wound care treatments available

- Skin grafting
- Negative Pressure Wound Therapy (NPWT)
- Biologic skin substitutes
- Small intestine submucosa wound matrix (Oasis)
- Whirlpool- no longer used
- Venous- Superficial venous surgery- to prevent recurrence
- Venous- Subendoscopic perforator surgery (SEPS)- improve VLU healing and reduce recurrence since it is for tx of chronic venous insufficiency

WOCN pg. 32

Negative Pressure Wound Therapy (NPWT) (Wound Vac)

- Check DME coverage first before recommending treatment
  - Cost: $17/day with 20% DME base coverage
  - No coverage: $2500 up front through APRIA with credit card
- Order the Machine and also Cannister and Dressing for patient prior to clinic visit.
- Have pt bring dressing, machine and cannister to clinic appointment. We do not carry NPWT supplies
- Refer to Wound Clinic
- May be candidate for Disposable NPWT- PICO

ARTERIAL ULCERS

Lower Extremity Arterial Disease

- US Hospitalization costs LEAD treatment= $4.37-21 billion Medicare pts
- **Marker of systemic atherosclerosis**
- Risk of death inc over time. > 5 years, similar to patients with acute MI or ischemic stroke
- US - LEAD affects 8-12 million adults > 40 y/o
- 80 years +, Prevalence = 40%
- Prevalence lower in women vs. men but severity of disease is higher in women

WOCN, LEAD pg. 10, 13

Risk Factors

- Tobacco use
- DM
- HTN
- Dyslipidemia
- Chronic Renal insufficiency
- Prevalence increases with age
- Hyperhomocysteinemia
- Family hx of cardiovascular disease
- Sedentary lifestyle

WOCN, LEAD pg 1, 14, 20, 21, Mayo Clinic. Peripheral Artery Disease (2012).

Key Points of the Physical Exam

- Check for ischemic skin and nail changes
- Perform vascular assessment
- Check perfusion status
- Auscultate fem/popliteal arteries for bruits
- Check for neuropathy signs
- **Screen feet for loss of protective sensation (monofilament, tuning fork, percussion hammer)- Podiatry**
- **ABI: (Vascular) ;** Normal = > or = 1.00

WOCN, LEAD pg 2

Peripheral Artery Disease

- Parathesia
- Intermittent claudication
- Pain with activity that is relieved by rest
- Leg numbness or weakness
- Coldness in lower leg or foot
- Diminished pulses
- Cyanosis or pallor
- Hair loss
- Dependent rubor
- Thin, shiny skin
- Ulcer/gangrene
- Leg hurts when elevated

Characteristics of Arterial Ulcers

- **Location:** mostly tips of toes, in between toes, can be mid foot or mid leg, lateral foot
- **Wound bed:** Gangrenous- wet or dry
- **Shape:** Punched out
- **Borders**: Wound edges smooth
- **Pain:** more painful than venous ulcers; nocturnal pain relieved by lowering leg

Arterial ulcers

Location: Gangrene mostly at toe tips and in between toes

Arterial Ulcers

Plan

- **Vascular Evaluation**
- Reduce/Eliminate modifiable risk factors for LEAD
- Attain/maintain intact skin
- Reduce pain
- Prevent complications (infection)
- Promptly identify/manage complications
- **Promote limb preservation**
- Improve functional status of symptomatic patients

WOCN, LEAD pg. 33

Treatment

- **Treatment of choice for limb salvage: Revascularization and surgical removal of necrotic tissue from infected wound on ischemic leg**
- Offload heels
- Maintain dry stable eschar/blisters in noninfected ischemic wounds
- **Debridement is contraindicated** especially with stable eschar until perfusion is determined
- LEAD/critical limb ischemia with infection or cellulitis- Culture guided systemic ABX therapy
- Encourage regular exercise if stable with intermittent claudication
- Analgesia for persistent pain – Consider Pain Clinic referral

WOCN, LEAD pg. 4

Compression for Mixed Arterial/Venous Disease

- Manage edema due to venous disease
- Monitor compression for pt with neuropathy
- Compression stockings to manage postop edema post lower extremity bypass surgery- TEDS are contraindicated

WOCN, LEAD pg. 6, 186

Surgery & Adjunctive therapies

- Amputation
- Prophylactic ABX post amputation, revascularization; grafts
- Bypass vs. angioplasty surgery
- Conservative topical therapy
- Low frequency ultrasound
- Electrotherapy
- HBOT – Goal: resolve periwound hypoxia
- Intermittent pneumatic compression- for non surgical candidates

WOCN, LEAD pg. 7-8, 109

Patient Education

- Manage chronic diseases- DM, HTN, cholesterol, weight, medication adherence
- Smoking cessation
- Promote blood flow, maintain intact skin, prevent trauma
- **Avoid leg elevation, use dependent position for legs**
- Routine Daily leg/foot exam for wounds/blisters, nail and foot care
- Protect feet, toes, heels- proper fitting shoes with socks
- Compression therapy precautions
- Increase regular exercise and activity

WOCN, LEAD pg. 8-9

NEUROPATHIC & DIABETIC FOOT ULCERS (DFU's)

Prevalence

- 3x as many pts are admitted to the hospital for neuropathic foot ulcers than with ischemic ulceration
- DM with complications peripheral neuropathy = 50-70% of all non-traumatic amputations
- Diabetic neuropathy wound relapse rate = 66% over 5 years and 12% progress to amputation
- Hospital AKA mortality = 5%, 50-84% subsequent amputation of other limb in 2-3 years. 5 year survival rate bilateral amputations < 50%

WOCN, LEND pg. 1

Lower Extremity Neuropathic Disease

- Diabetes
- Foot ulcers occur because of peripheral neuropathy and PVD

WOCN, LEND pg. 2-3

Risk Factors

- **Modifiable:**
- Prediabetes
- Hypo/hyperthyroidism
- Alcoholism
- Smoking
- HTN, COPD
- Obesity
- Exposure to heavy metals
- Malabsorption syndrome (bariatric surgery)
- Vitamin deficiency
- Abdominal, pelvic, and ortho procedures

- **Non modifiable Risk Factors:**
- Raynaud's disease/ Scleroderma
- Advanced age
- Neuromuscular and spinal cord diseases/injuries (MS, Guillain-Barre)
- HIV, AIDS, related drug therapies
- Familial neuropathy
- Acromegaly
- Celiac Disease

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Key Points of the Physical Exam

- DM pts- Annual comprehensive foot exam
- Check temperature, foot hygiene, shoe wear practices
- Check for calluses:
  - Focal Callus
  - Insensate feet
  - Hemorrhage into a callus
- Check for fissures, moisture, nails, tinea pedis, edema, inflammation
- Erythema + edema indicate inflammation= early sign of impending foot ulceration
- Check for loss of protective sensation

WOCN, LEND pg. 8-9,15

Characteristics of Diabetic Foot Ulcers

- **Location:** Pressure points on plantar surface of forefoot- IPJ of great toe and 1st metatarsal head
- **Shape:** Round, oblong, over bony prominence
- Initially covered with callus tissue. May have blister, puncture, laceration if shearing, heat, and trauma is involved
- **Wound base**: necrotic, pink, pale; varying depths
- **Periwound:** Callus if walking on wound
- **Exudate:** small to moderate amount

WOCN, LEND pg. 10

DFU's

Treatment

- **Refer to Podiatry!**
  - Suspect infection
  - Probes to bone
  - Radiograph shows Charcot osteoarthropathy
- Offloading is key
- Customized footwear/orthotic insoles
  - Total Contact Casting- gold standard
  - Instant total contact cast
- Largest Treatment Barrier- patient adherence to non weight bearing

WOCN, LEND pg. 28-29

Recommend a Knee Scooter

Patient Education

- **Prevention is key:**
- Callus removal - skilled health care professional
- Do not walk barefoot
- Therapeutic footwear – custom molded insole; shoe with depth
- Daily foot checks- Mirror use; family member assistance
- Wash warm water, dry completely
- Dry skin – moisturizer
- MD/NP/PA/WOC RN notification for new ulcers

WOCN, LEND pg. 29

THE END

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