FOOT AND WOUND CARE IN STREET MEDICINE: ADDRESSING CHALLENGES IN VULNERABLE POPULATIONS

Allison Bauer, MD

a.bauer@bmh2h.org

Clinical Director, Blue Mountain Heart to Heart

Unhoused of Southeast Washington

- Point in Time Walla Walla County: 218
- 30% increase in unsheltered homelessness since 2022 (WA Dept of Commerce)
- Social Determinants of Health have a monumental impact on health outcomes
- Nutritional deficiencies, Alcohol and tobacco abuse, Mental health disorders, issues with management of chronic and infectious disease

Photo: Walla Walla Alliance for the Homeless

Medicaid's Role in Addressing Social Determinants of Health. Robert Wood Johnson Foundation. Published February 1, 2019.

Disclosures

- No conflicts of interests or relationships to disclose
- All Derm photos courtesy of VisualDX

Learning Objectives

- Review the biopsychosocial considerations for wound care in a mobile medical setting
- Discuss wound prevention
- Define approach to basic wound care in the field
- Identify common wound and skin conditions in street medicine
- Review treatment for common wound and skin conditions
- Learn when to escalate to a higher level of care.

BIOPSYCHOSOCIAL CONSIDERATIONS

Biopsychosocial Considerations

- **Barriers to care**: trust issues, mobility, mental health, and substance use.
- **Impact of homelessness**: poor hygiene, prolonged standing or walking, exposure to the elements, lack of resources.
- **Substance use**: complicates wound healing, pain management, and adherence to treatment plans.
- **Mental health**: depression and trauma often lead to neglect of foot/wound care.

Chcf.org

Figgatt MC, Salazar ZR, Vincent L, Carden-Glenn D, Link K, Kestner L, Yates T, Schranz A, Joniak-Grant E, Dasgupta N. Treatment experiences for skin and soft tissue infections among participants of syringe service programs in North Carolina. Harm Reduct J. 2021 Jul 30;18(1):80. doi: 10.1186/s12954-021-00528-x. PMID: 34330297; PMCID: PMC8324443.

Provider Challenges in a Mobile Setting

- **Practicing Standard of Care**
  - Cytotoxic Cleansing Agents (Hydrogen Peroxide, Bleach) vs. Infection Risk
  - Readily Available and low cost supplies: Abd pads, menstrual pads.
  - Repeated Clinic appointments feasible?
- **Evidence Based Medicine**
  - New and emerging trends in drug contaminants (Xylazine, BTMPS)
  - Generalizability of research to unhoused population.
- **Harm Reduction**
  - How to meet people where they are at when other systems have failed them.

PREVENTION

Prevention: Exposure

Protection from Elements:

- Providing clean socks, proper footwear, and educational materials.

Hygiene:

- offering foot washing stations or sanitizing supplies.

Offloading devices very helpful for chronic wound management

Image Courtesy of CNN.

Prevention: Safe Injection Use

Intention and Setting

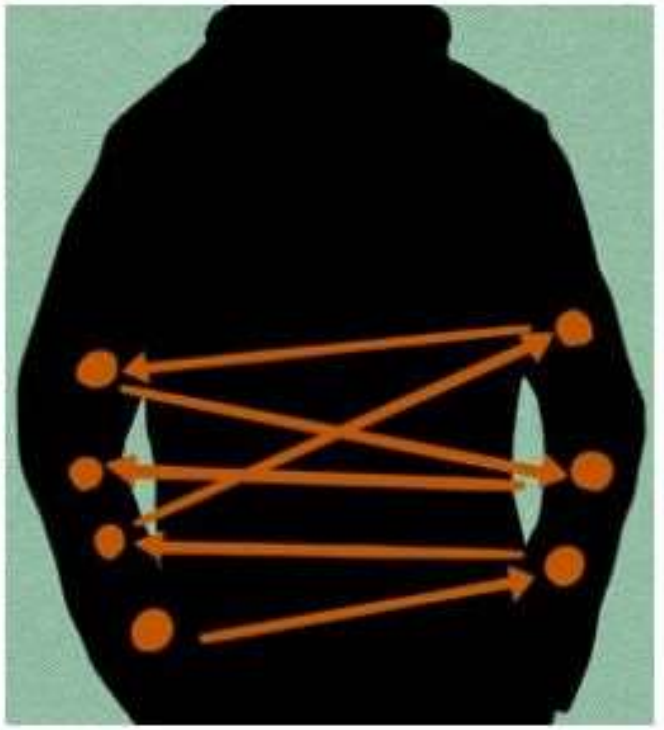
Overdose Prevention

Routes of Administration and Vein Care:

- Rotate injection site
- Femoral injection risk
- IM and SQ injection riskier for soft tissue infection than IV

Safer Supply and Infection Prevention:

- Clean supplies
- Avoid sharing and reusing.
- Avoid injecting into infected tissue.



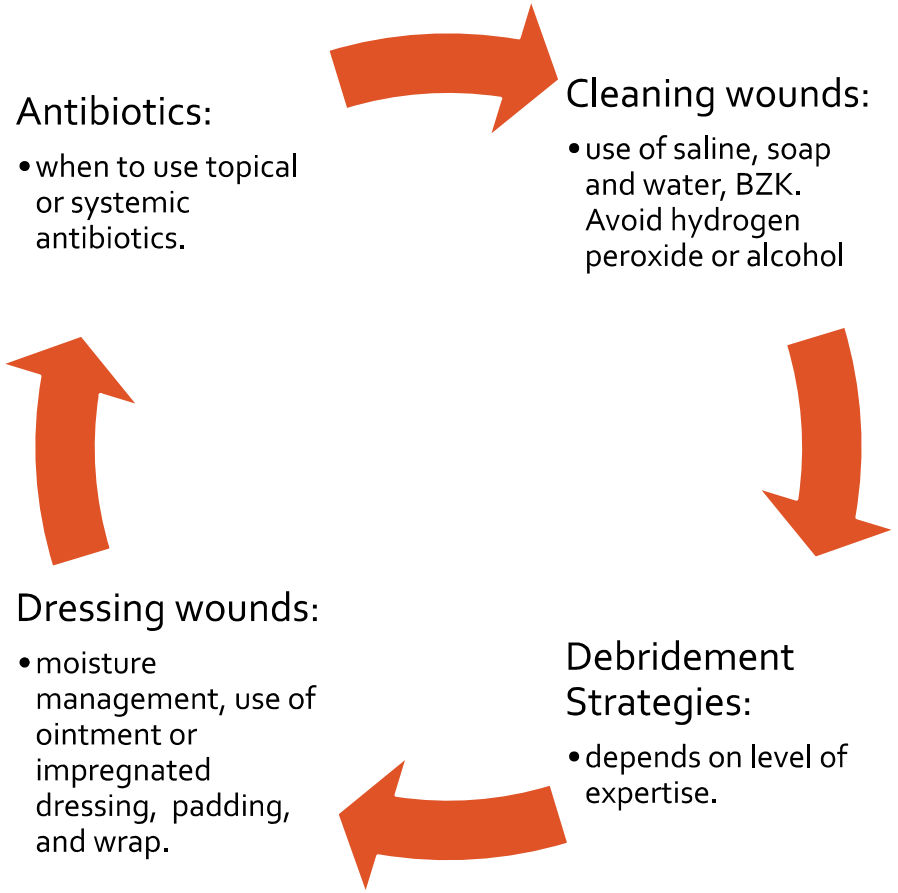
Portland Steet Medicine, " First Aid For Wounds and other Skin Infections"
Hagan, H. 1994. Risk for human immunodeficiency virus and hepatitis B virus in users of the Tacoma syringe exchange program. National Research Council and Institute of Medicine. Washington, DC

BASIC PRINCIPLES OF WOUND CARE

Basic Approach to Wound Care

- **History**
  - How did the wound start? How long has it been there? Is it getting better, worse, or staying about the same? Are you worried about it today? Have you had medical care for this wound before? What were the recommendations? Do you have any other health problems? How have you been managing this wound? When would you go to ER for this wound?
- **Initial assessment**:
  - Wound type, size, location, depth, drainage, infection status, and systemic signs or symptoms (e.g., fever, hypotension).
  - Other tests to perform: Pedal pulse, lower extremity swelling, ABI/TBI
- **Identify Goals of Care**

Wound Management



Wound Management: Level of Care

Self care

- Stable to improving, Patient Education

Primary care

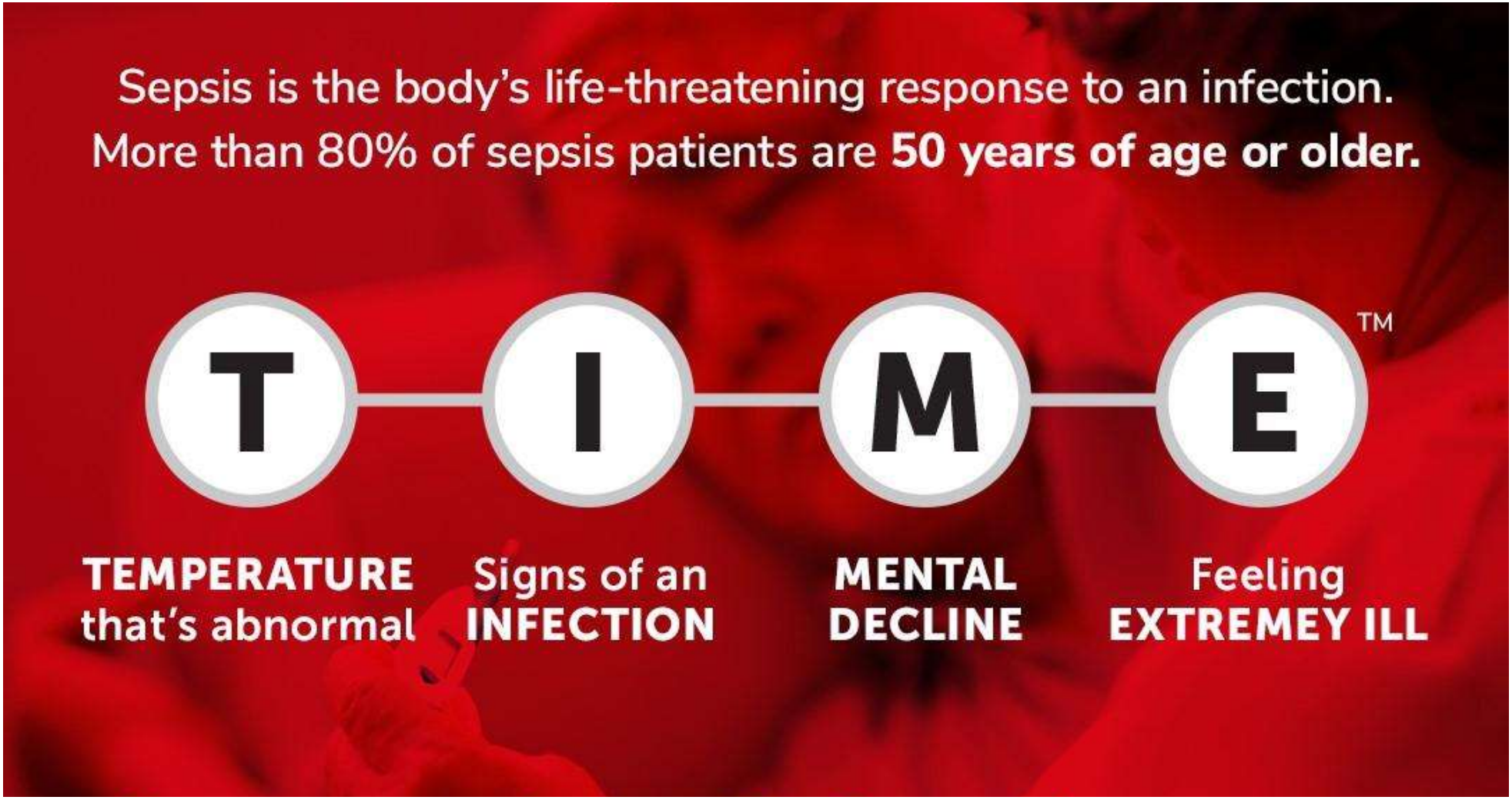
- Minimal improvement, comorbid condition treatment (diabetes, venous problems, immunocompromised, etc.)

Urgent care

- requires prompt, same day evaluation but not hospital level care.

Emergency department

- needs immediate intervention to prevent life or limb threatening outcome or resources only available at hospital (labs, imaging, surgery)


Sepsis is the body's life-threatening response to an infection.
More than 80% of sepsis patients are 50 years of age or older.
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TEMPERATURE that's abnormal
Signs of an INFECTION
MENTAL DECLINE
Feeling EXTREMEY ILL

COMMON WOUNDS AND SKIN CONDITIONS

Common Wounds

- Prevalence of foot and wound problems: due to poor hygiene, ill-fitting shoes, prolonged walking/standing, and harsh environmental conditions.
- Common wound etiologies include
  - exposure injury
  - trauma (animal bites)
  - Fungal infections
  - injection drug use
  - infestations,
  - chronic disease manifestations.

- Disclaimer: Goal is to show conditions on different skin types. Dark skin historically underrepresented.

(Gishen F.,Lokugamage A. Diversifying the Medical Curriculum,BMJ 2019; 364:1300); Louie, P. · Wilkes, R. Representations of race and skin tone in medical textbook imagery, Soc Sci Med. 2018; 202:38-42

COMMON WOUNDS: EXPOSURE INJURY

Frostbite Features

- At -2°C (28.4°F), cellular metabolism stops, proteins and enzymes are destroyed, and ice crystals form in the extracellular space
- Frostnip: the earliest sign of cold injury; presents with pain and pallor of the affected area, followed by numbness
- Continued exposure □ complete anesthesia. Classified Superficial vs Deep
- Pain and pruritus up to 8 weeks after resolution.

Sheridan RL, Goverman JM, Walker TG. Diagnosis and treatment of frostbite. *N Engl J Med*. 2022 06 09;386(23):2213-2220. PubMed ID: 35675178


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Frostbite Treatment

- Rapid rewarming, water temperature of 37°-39°C (99°-102°F). AVOID FREEZE/THAW
- Analgesics or narcotics for pain management during rewarming.
- Less than 24 hours of injury: consider tissue plasminogen activator to decrease amputation risk
- Avoid Frictions
- Worth a trip to the Emergency Department, risk of freeze/thaw cycle if unhoused

Sheridan RL, Goverman JM, Walker TG. Diagnosis and treatment of frostbite. *N Engl J Med*. 2022 06 09;386(23):2213-2220. PubMed ID:

Immersion Foot (Trench Foot) Features

- Extended exposure to the cold = lower extremity vasoconstriction
- Early, vasoconstricted phase: the soles of the feet appear cool, mottled, and whitish-yellow, delayed capillary refill and diminished peripheral pulses. Patient complains of NUMBNESS
- Late, vasodilated phase: sharply demarcated erythema. Cracking between the toes and delayed capillary refill may also be present, as well as petechiae due to damaged vasculature. Patient complains of PAIN

Zafren K. Nonfreezing cold injury (trench foot). *Int J Environ Res Public Health*. 2021 Oct 6;18(19). PubMed ID:


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Immersion Foot (Trench Foot) Treatment

- Keep feet DRY. Socks during day, bare feet at night if possible.
- Gentle rewarming
- NSAIDS for pain management
- Warm packs no longer than 5 minutes at a time.

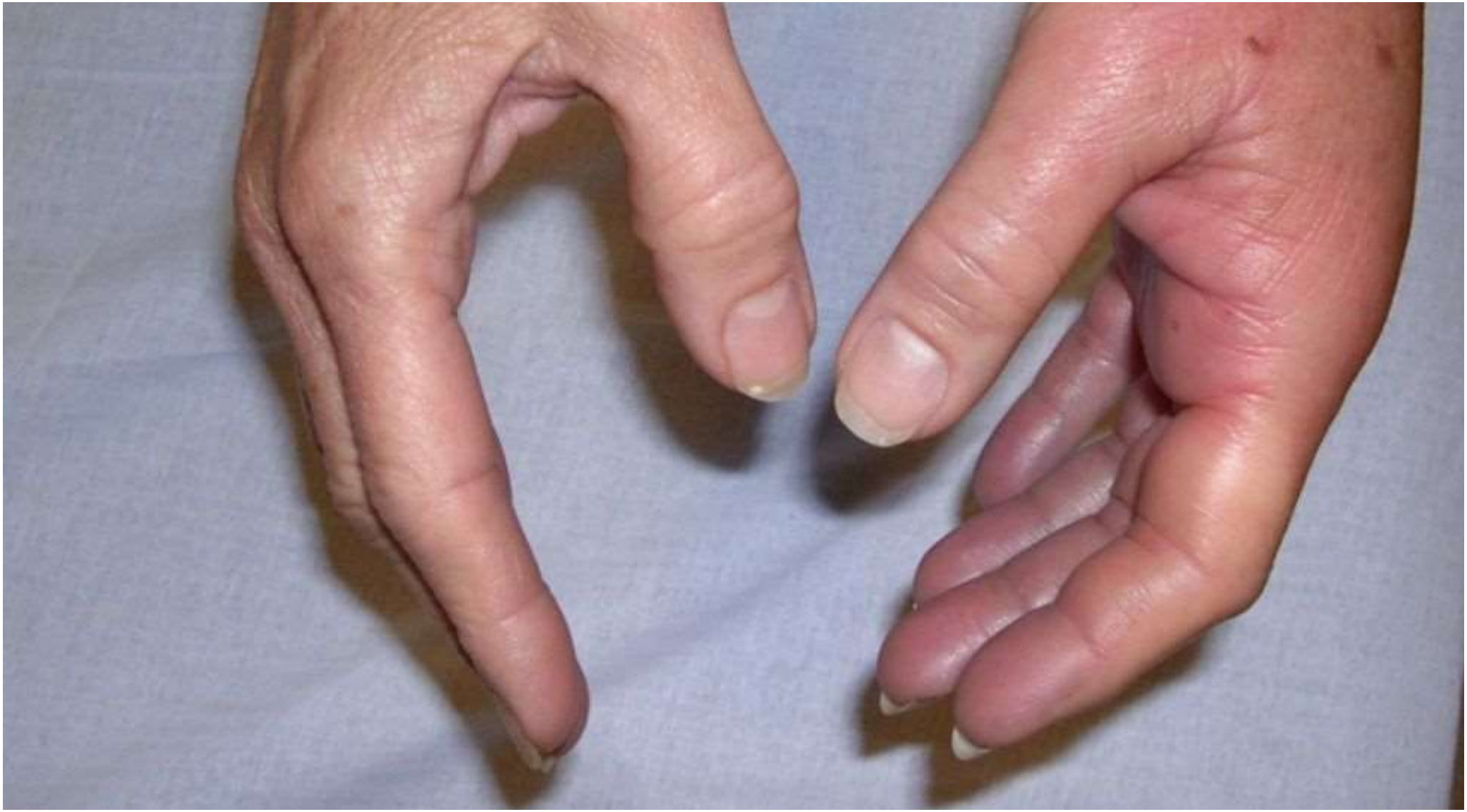
Sheridan RL, Goverman JM, Walker TG. Diagnosis and treatment of frostbite. *N Engl J Med*. 2022 06 09;386(23):2213-2220. PubMed ID: 35675178

COMMON WOUNDS: TRAUMA

Animal/Human Bites Features

- 3%-18% of animal bites become infected
- IMPORTANT HISTORY: provoked or unprovoked, animal up to date on rabies vaccine, can animal be captured.
- Mouth bacteria depends on species: Pasteurella multicocida (cat), Capnocytophaga canimorsus (dog), Prevotella/Strep (Human)
- Plain radiograph to rule out retained tooth or nail product
-

Stevens DL, Bisno AL, Chambers HF, Dellinger EP, Goldstein EJC, et al. Practice guidelines for the diagnosis and management of skin and soft tissue infections: 2014 update by the Infectious Diseases Society of America. Infectious Diseases Society of America. https://www.idsociety.org/practice-guideline/skin-and-soft-tissue-infections

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Animal Bite Treatment

- Oral Antibiotics if any of these features present:
  - Deep puncture wounds
  - Moderate to severe wounds with crush injury
  - Wounds in hands or close proximity to bone
  - immunocompromised hosts
  - s/p surgical repair
- ORAL REGIMEN: Augmentin BID x 10-14 days, Consider Clindamycin, Doxycycline, or Moxifloxacin for penicillin allergy.
- Td/Ig based on CDC Guidelines
- Rabies vaccine if high risk animal or unable to evaluate
- Hand surgery referral if closed fist injury

Jubbal SS, Pereyra F, Madoff LC. Infectious complications of bites. In: Jameson J, Fauci AS, Kasper DL, Hauser SL, Longo DL, Loscalzo J., eds. *Harrison's Principles of Internal Medicine*. 20th ed. New York, NY: McGraw-Hill; 2018

COMMON WOUNDS: FUNGAL INFECTIONS

Tinea Pedis Features

- Interdigital Maceration of the Feet
- May also involve the whole sole of foot in " moccasin distribution"

Leung AK, Barankin B, Lam JM, Leong KF, Hon KL. Tinea pedis: an updated review. *Drugs Context*. 2023;12. **PubMed ID: 37415917**


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Tinea Pedis Treatment

- **Use topical antifungals for 1-6 weeks, based on clinical response:**
  - Terbinafine 1% cream – apply twice daily
  - Clotrimazole 1% cream – apply twice daily
- Cotton Socks, limit occlusive footwear

Intertrigo Features

- Opposing or approximating body parts
- Exacerbated by heat, wetness, friction
- Erythematous patch at fold with pink/red popular satellite lesions


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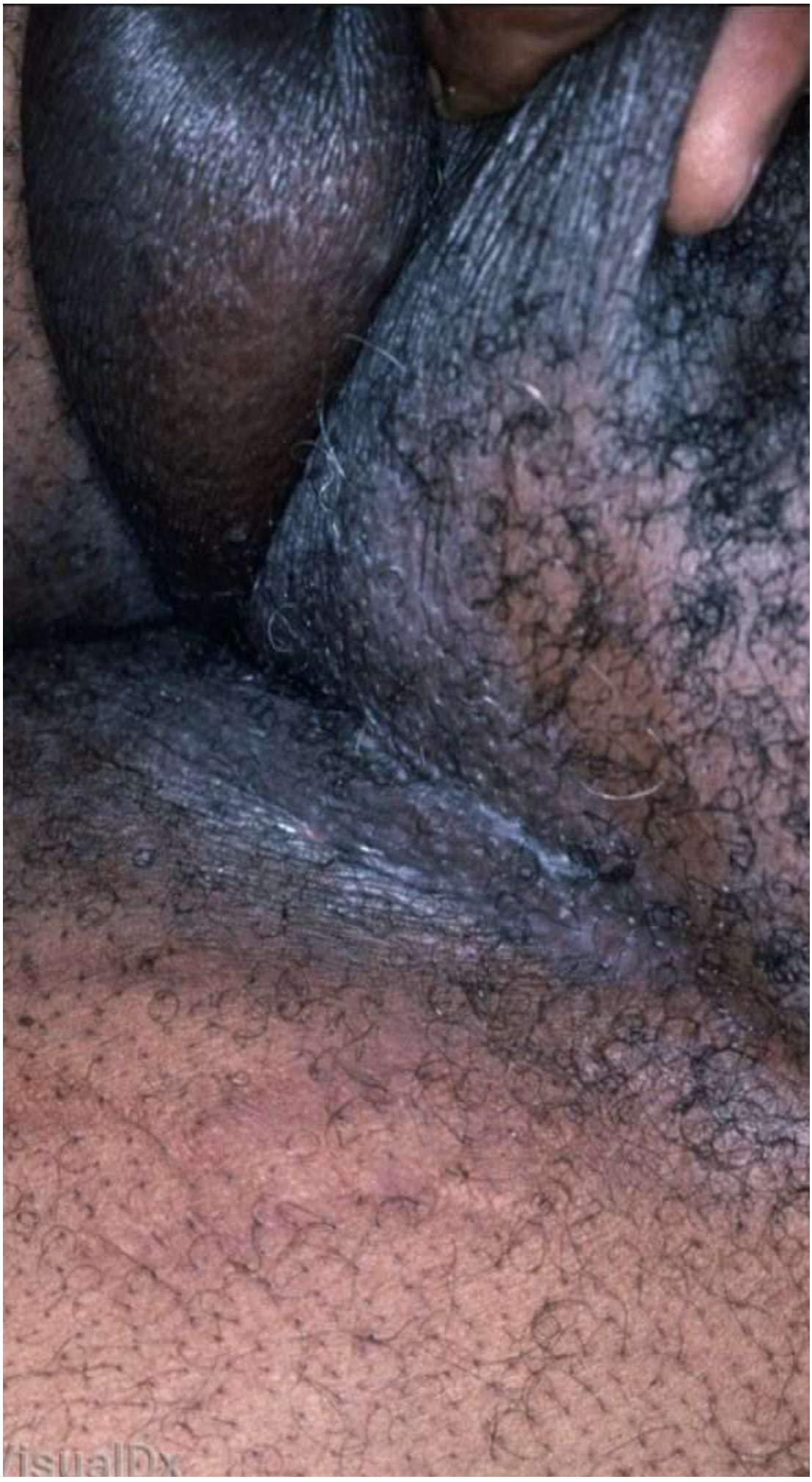
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Intertrigo Treatment

- Several combination barrier creams are often used in the treatment of intertrigo, including the following:
  - Desitin (zinc oxide, cod liver oil, talc)
  - Triple Paste (petrolatum, aluminum acetate, zinc oxide)
  - Vusion (miconazole, petrolatum, zinc oxide
- Dry out area
- Powder to prevent reoccurrence.

COMMON WOUNDS: INFESTATIONS

Scabies Features

- Burrows, can be seen with a marking pen
- Check interdigital webs, axillae, groin.
- Itching is hallmark, can take up to a week for itching to resolve even after treatment


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Scabies Treatment

- Permethrin cream (5%) applied to all areas of the body from the neck down and washed off after 8-14 hours, OR
- Ivermectin 200 µg/kg orally, repeated in 1 week.
- All clothes either Laundry or Airtight bags 3-7 days.

COMMON WOUNDS: INJECTION DRUG USE RELATED

Cellulitis and Abscess

- erythema (rubor), pain (dolor), warmth (calor), and swelling (tumor).
- Cellulitis requires antibiotics
- Abscess requires incision and drainage (not sterile procedure, can be performed in variety of settings)
- CLINICAL RED FLAGS: severe pain, dishwater discharge, gas, rapid progression.


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Cellulitis and Abscess:

Treatment:

Purulent Cellulitis: Treatment duration of 5-10 days. MSSA, MRSA

- Trimethoprim-sulfamethoxazole (TMP-SMX) 1-2 double-strength tabs orally 2 times daily, OR
- Doxycycline or minocycline 100 mg orally 2 times daily, OR
- Clindamycin 300-450 mg orally 4 times daily

Nonpurulent Cellulitis: Treatment duration of 5-10 days. MSSA, Strep

- Dicloxacillin 500 mg orally 4 times daily, OR
- Amoxicillin / clavulanate 875 / 125 mg orally 2 times daily, OR
- Cephalexin 500 mg orally 4 times daily, OR
- Penicillin VK 250-500 mg orally every 6 hours

Xylazine- associated Wounds Features

- From WW Drug Checking, Xylazine in 10-20% of fentanyl samples.
- Value to Xylazine test strips, but cross reactive with lidocaine (in 50% samples)
- nonopioid **alpha-2 adrenergic agonist** veterinary anesthetic agent
- vasoconstriction and decreased skin blood flow, tissue damage and impaired healing; pressure injury?
- When to refer: enlarging abscess, signs of sepsis, not responding to treatment


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Xylazine- associated Wounds Treatment

- Change Dressings Daily to every other day
- Necrotic Tissue: Debridement
- Healthy, Red, Beefy Tissue: Petroleum-impregnated gauze cut to shape
- Excess Drainage: Alginate absorbent dressing
- Protect viable skin from maceration: A&D ointment.
- Wrap it up: non adherent pads, Kerlix w/ tape, ACE Wrap

COMMON WOUNDS: CHRONIC ULCERS

Neurogenic Ulcer/Diabetic Foot Ulcer

Key Features

- Pathology = Neuropathy
- Meggit-Wagner Classification based on wound depth and presence of infection/necrosis. T
  - Grade 0, no ulcer high risk prevention
  - Grade 1: full thickness skin ulcer debridement, wound care, offloading
  - Grade 2: Deep ulcer, tendon, muscle debridement, wound care, offloading
  - Grade 3: Deep ulcer, cellulitis, ? Osteo need imaging + above
  - Grade 4: Localized gangrene hospital, surgical consult
  - Grade 5: extensive gangrene hospital, surgical consult

Regular Debridement

Offloading

Infection management

Neurogenic Ulcer/Diabetic Foot Ulcer Treatment

Venous Stasis Ulcer Features

- Venous insufficiency
- Associated with hemosiderin deposition, leg edema, varicose veins, stasis dermatitis.
- ASSESS BOTH ARTERIAL AND VENOUS FUNCTION: ABI/TBI, Venous Doppler
- Consult Vascular surgery is ABI < 0.8

Lim CS, Baruah M, Bahia SS. Diagnosis and management of venous leg ulcers. *BMJ*. 2018 Aug 14;362:k3115. **PubMed ID: 30108047**


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Venous Stasis Ulcer Treatment

- Leg elevation and compression stockings/Unna boots
- Recommended pressure gradients for compression stockings are:
  - 15-20 mm Hg – Indicated for mild varicose veins and minor leg swelling.
  - 20-30 mm Hg – Indicated for moderate edema and moderate to severe varicosities.
  - 30-40 mm Hg – Indicated for chronic venous insufficiency, severe edema, deep vein thrombosis and post-thrombotic syndrome, venous ulceration, lymphedema, and orthostatic hypotension.

Arterial Ulcer Features

- Well demarcated, punched out ulcers
- Associated with diminished pedal pulses, claudication
- More painful than other ulcers
- Pain releived with ulcer in gravity dependent position

Singer AJ, Tassiopoulos A, Kirsner RS. Evaluation and management of lower-extremity ulcers. N Engl J Med. 2017 10 19;377(16):1559-1567. PubMed ID: 29045216


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Arterial Ulcer Treatment

- Evaluation for Vascular Insufficiency ESSENTIAL: ABI/TBI
- Vascular Surgery Consult
- Dry, Exudative Wounds Keep Moist with hydrogel dressings, such as Nu-Gel, IntraSite, and Curasol, that rehydrate wound.

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EVIDENCE-BASED INFORMATION FOR WASHINGTON STATE HEALTHCARE PROVIDERS

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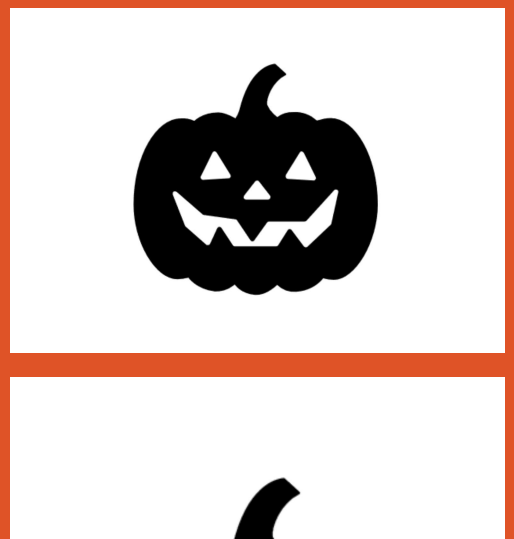

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a.bauer@bmh2h.org