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ECHO: Antibiotic Stewardship Program
Management of Diabetic Foot Infections

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Diabetic Foot Infections (DFIs)

- Increasingly common problem: >100,000 diabetic foot amputations yearly
- Main reason for diabetes related hospitalizations
- Diabetics with amputations have poor quality of life and high 5 year mortality risk
- Almost all have peripheral neuropathy
- The presence of peripheral arterial disease (PAD) is significantly associated with poor outcome
Why do diabetics get foot infections?

- **Nerve and blood vessel impairment**: Diabetes impairs the function of the nerves and blood vessels supplying the feet making them prone to cuts and pressure ulcers.
- **Sensory neuropathy**: Decreases pain allowing ulceration to develop in response to minor trauma or rubbing.
- **Autonomic neuropathy**: Reduces sweating causing dry, cracked skin. This allows entry of bacteria causing localized infection.
The all too frequent cascade leading to the **Charcot Foot**
1. Repetitive fractures- foot swells, become red and warm
2. healing, but continued trauma from body weight and walking leads to deformed healing and more fractures
3. poorly fitted shoes lead to pressure sores over deformed sites, ulcers develop and then infection may occur
1. When should a clinician consider infection present?

Factors that increase the risk for DFI and if present should lead to evaluation for infection:

- Probe to Bone test is positive
- Ulcer present for over 30 days
- History of recurrent ulcers
- Previous lower extremity amputation
- Renal insufficiency
- Walking barefoot
How do you assess a patient with a possible DFI?

Clinical signs of infection

I. Primary signs:
   redness, warmth, swelling, pain
   Purulent drainage

II. Secondary signs:
   friable granulation tissue, undermining wound edges, foul odor

III. Any systemic findings
   fever, chills, etc.
Foot ulcers – infected?
Initial assessment, cont.

- Evaluate on exam for arterial ischemia and venous insufficiency—often with severe pain in severe PAD
Arterial insufficiency ulcers
A positive probe to bone test: means osteomyelitis present
When do you culture?

- **No infection** - ***Do not*** culture a wound that does not look infected - the results will be misleading - just skin contamination - stuff like coag neg staph, *enterococcus* - don’t cause skin infection

- **Mild infection** - not previously on antibiotics – may not need culture

- **Deep infection** - try to first clean and debride wound and then curettage to get more accurate results
Hospital evaluation - three critical interventions for the diabetic foot infection

• **Appropriate antibiotics**, narrowed down to culture results

• **Debridement and drainage** of infected tissue, resection of infected bone

• **Evaluate circulation** to the effected foot for any reversible ischemic complication
The 3 phase bone scan

- Phase 1 - Vascular Phase - first 60 seconds - Is there blood flow to the limb? If none - then test will be false negative

- Phase 2 - Blood Pool (tissue phase) - first few minutes - is there increased flow to the limb? - as is seen in cellulitis

- Phase 3 - Delayed Bone stage - 3 hours later - A radiolabeled marker is picked up by osteoblasts involved in active bone turnover - very non-specific - fracture, tumor, infection etc will light up
No role for a 3 phase bone scan in the evaluation of a diabetic foot
Charcot foot bone scan – Totally non-specific. In the long standing Charcot foot the positive bone scan is from *trauma, not infection.*

If you see an ulcer, bone is palpable and pus is draining- then the foot is infected. You don’t need a bone scan to tell you that. Look at the foot, not the Scan

• Charcot Bone Scan
Cases
diabetic patient with new onset of painless, warm, reddened and swollen feet. Has a “rocker bottom” where there is a bulge on the bottom of the foot from bone collapse. Diagnosis? Will bone scan help determine if osteomyelitis is present and need for antibiotics? What is a likely complication of this without intervention?
48 yo male diabetic presents with foot ulcer he noticed two days ago. Patient has no systemic signs of infection. How should he be treated?
Off-loading techniques

a) total contact cast
b) wedge type shoe to off load plantar forefoot
c, d) off-weighting boot with adjustable inserts
48 yo male comes to outpatient clinic. Pt is afebrile with no systemic signs of infection. Complains of painful toe.

How would you treat this patient?
56 yo male diabetic presents as below. Complains of some pain in the hallux. Afebrile, WBC normal. What would you do?
Diabetic patient with few week history of warm, swollen relatively painless foot. Diagnosis? Would you order a bone scan next? Initial treatment?
48 yo male is brought to the hospital by his family after being confused x 12 hours. Temp 102F, WBC 16,000 with 10 bands, HR 108bpm.

What next?
What is the cause of the problem here?
66 year old poorly controlled diabetic admitted with fever and smelly, swollen foot
What happened here? Is there osteomyelitis? How would you treat it?
What the...???