Lower Extremity Ulcers and Amputation as Complications of Diabetes:

Role of the interdisciplinary wound team and wound centers:

HYPERBARIC WOUND AND EDEMA CENTER
FORT HEALTHCARE

LE ulcers and amputation as complication of diabetes: Medical aspects:

ROBERT GOLDMAN, MD, CWS-P; MEDICAL DIRECTOR
Epidemiology

- Amputation rate over past two decades.
- Obesity rate over past two decades.
- Net change in amputation
  - Wound centers have grown over the past 3 decades and now number in the thousands.

Progressive sensory, motor and autonomic loss.

- Dying back neuropathy.
- Foot deformities.
- Pressure areas
- Foot ulcers. Disease process: Neuropathy.
Peripheral arterial disease

- Distal more than proximal.
- Small vessel disease.
- NO mediated.

Immune problems

- WBC decreased phagocytosis.
- Decreased ability to fight infection.
Other problems; opportunity for early intervention, primary care

- Higher A1c associated with more severe complications, more quickly.
- Often associated with smoking.
- Adherence

Wagner Scale for Diabetic Foot Ulcers

- Wagner 1: Surface ulcer
- Wagner 2: Break fascial plane, no infection.
- Wagner 3: Break fascial plane, infection (cellulitis and/or osteomyelitis).
- Wagner 4: Gangrene
Treatment paradigms.

- Neuropathic disease—off loading
- PAD – revascularization.
- Mixed disease: both off loading and revascularization

Wagner I and II: Interdisciplinary care best practiced in comprehensive wound centers.

- Focus on local wound care
- Skin substitutes
- Treatment of infection.
- Off loading.
  - DH Walker
  - TCC
Wagner III and IV: Limb preservation: heal or turn major amputation into minor one.

- Plan: wound care, rehab, surgical, infectious disease, vascular, hyperbaric
- Revascularization has become commonplace.
- Treatment of osteomyelitis.
- Podiatric or Orthopedic surgery at the foot level.

Hyperbaric oxygen and limb preservation.

- Treatment of Wagner III and IV: This is a CMS approved indication:
- HBOT center for Diabetic foot ulcers: Closest is Fort Healthcare.
- Dane County: There is HBOT, but is not for CMS approved applications
Benefit is Limb preservation,
Risks include:

- Pressure (Barotrauma)
  - Ear
  - Eye
  - Lung
- Oxygen toxicity
  - Heart
  - CNS

Education For The Neuropathic Patient
Identify People At Risk

- Loss of protective sensation.
- Lower extremity arterial disease.
- History of previous ulcers or amputation.
- Elevated planter pressure, abnormal gait.
- Rigid foot deformity.
- Poor diabetes control, HgbA1c>9.
- Greater than 10 yrs with diabetes.
- Diabetic neuropathy.
- Smoking.
- Visual abnormalities.

Lower Extremity Amputation Prevention Program (LEAP model)

1. Annual foot screening.
   Monofilament 5.07 screen annually
2. Patient education.
4. Footwear.
5. Management of simple foot problems.
Education for the Neuropathic Patient

- Wash feet daily with lukewarm water (<110°).
- Dry feet well especially between toes.
- Moisturize feet daily with fragrance and alcohol free lotion, do not apply between toes.
- Change socks daily.
- Always wear shoes, even in the house.
- Do not use heating pads, water bottles, or electric blankets.

Education for the Neuropathic Patient

- Shoes with large toe box and adequate cushioning.
- Check feet daily for blisters, callus, wounds, cracks.
- Examine shoes before donning.
- **REPORT ANY FOOT ABNORMALITIES**
Education for the Neuropathic Patient
Multidisciplinary Approach

- Glycemic control, Diabetic educator
- Smoking cessation, PCP
- Foot care specialist.
- Vascular disease control.

Education for Neuropathic Wound

- Alleviate fears
  - Explain to patient & family interventions the MD may perform.
    - Debridement
      - Topical lidocaine
      - Pain medication 45-60 minutes before appointment
      - Insensate
Education for Neuropathic Wound Patient

- Dressing the wound
  - Where to get dressings
    - Insurance Finances
  - Can the patient dress the wound
    - Dexterity  Support system  Mental ability

Education for Neuropathic Wound

- Off loading of the wound
  - TCC
  - Creative dressing
  - Off loading boots
  - DH walker
A Day in The Life of an HBO Patient

TRICIA ABENDROTH, CHT

Initial encounter

- Overview on approved and Unapproved materials in the chamber
- Address Patient concerns
Treatment Day

- What to expect
- Barotrauma prevention
- Blood sugars & insulin dependent patients

Treatment specifications

- Depth & number of treatments
- Air breaks and Oxygen Toxicity
- In Chamber TCOM
The personal touch

- Warm and inviting environment
- Getting to know the patients
- Working as a family in wound care