Ulcers and Foot Care

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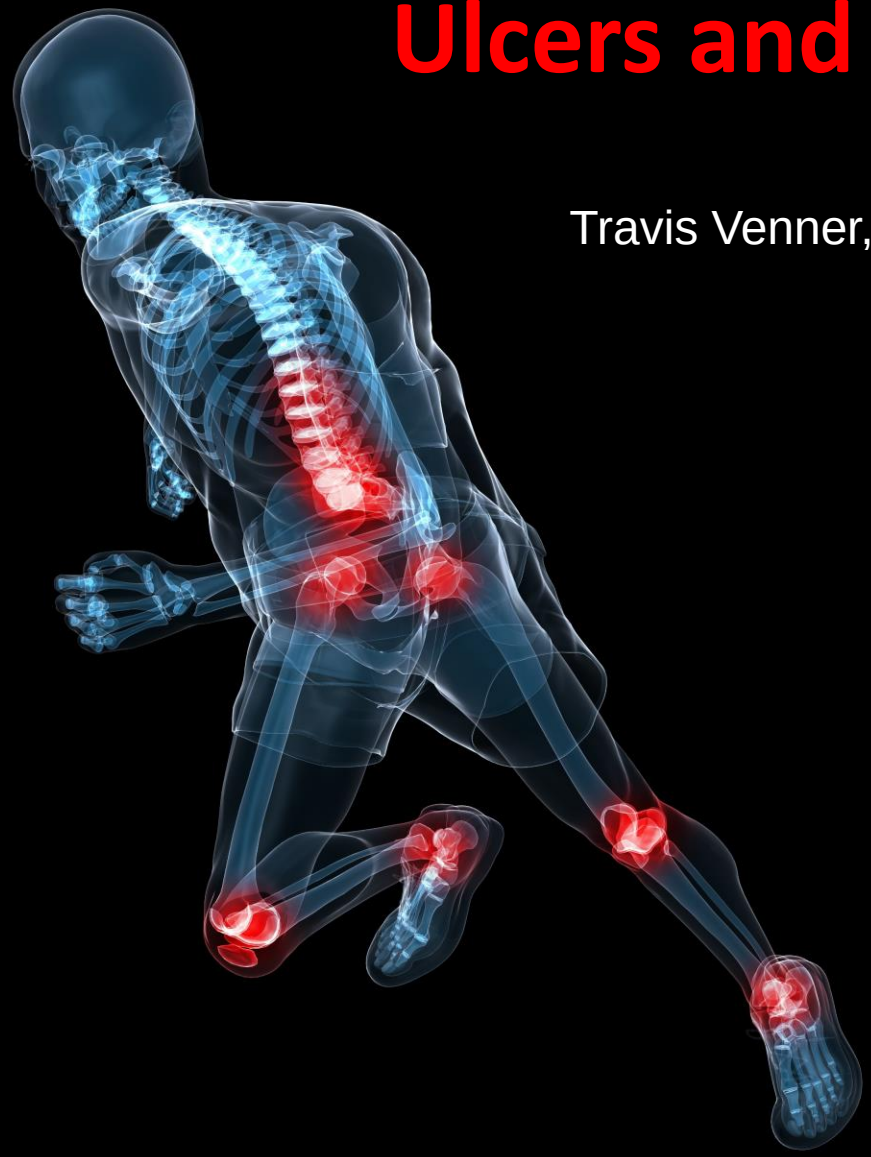


CORE Orthopedics

October 10, 2018

Overview

- Diabetic Facts
- Diabetic Foot Evaluation
- Conservative Treatments
- Surgical Treatments

Diabetic Facts

- The CDC estimates 23.6 million Americans with Diabetes. 7.8% of the population.
- Death rates from heart disease and stroke are 2-4 times greater with diagnosis of diabetes.
- Diabetic retinopathy causes 12,000-24,000 new cases of blindness per year.

Diabetic Facts

- Hypertension: 75% of adults with self reported diabetes had blood pressure greater then 130/80 or used medication for hypertension.

Diabetic Facts

- Diabetes accounts for 44% of new cases of renal failure per year.
- In 2005, 178,689 people with end-stage renal disease were living on chronic dialysis or living with a kidney transplant.

HOWEVER

The most common reason for hospitalization of the diabetic patient is a diabetic foot ulcer or foot infection.

Diabetic Foot Facts

- At any time, 3-4% of all patients with diabetes will have a foot ulcer.
- 15% of all diabetics will develop an ulcer.
- Once a patient develops a foot ulcer, their risk of undergoing a LEA increases by a factor of 8.
- 85% of nontraumatic LEA are preceded by a foot ulceration.
- In 2004, approximately 71,000 LEA were performed in diabetic patients.

Estimated Cost of Diabetes to the US in 2007

- Total cost Direct and Indirect: $174 billion
- Direct medical cost: $116 billion
  - After adjusting for population age and sex differences, average medical expenditures amoung people with diagnosed diabetes were 2.3 times higher than a non-diabetic person.
- Indirect Costs: $58 billion
  - Disability, work loss, premature mortality.

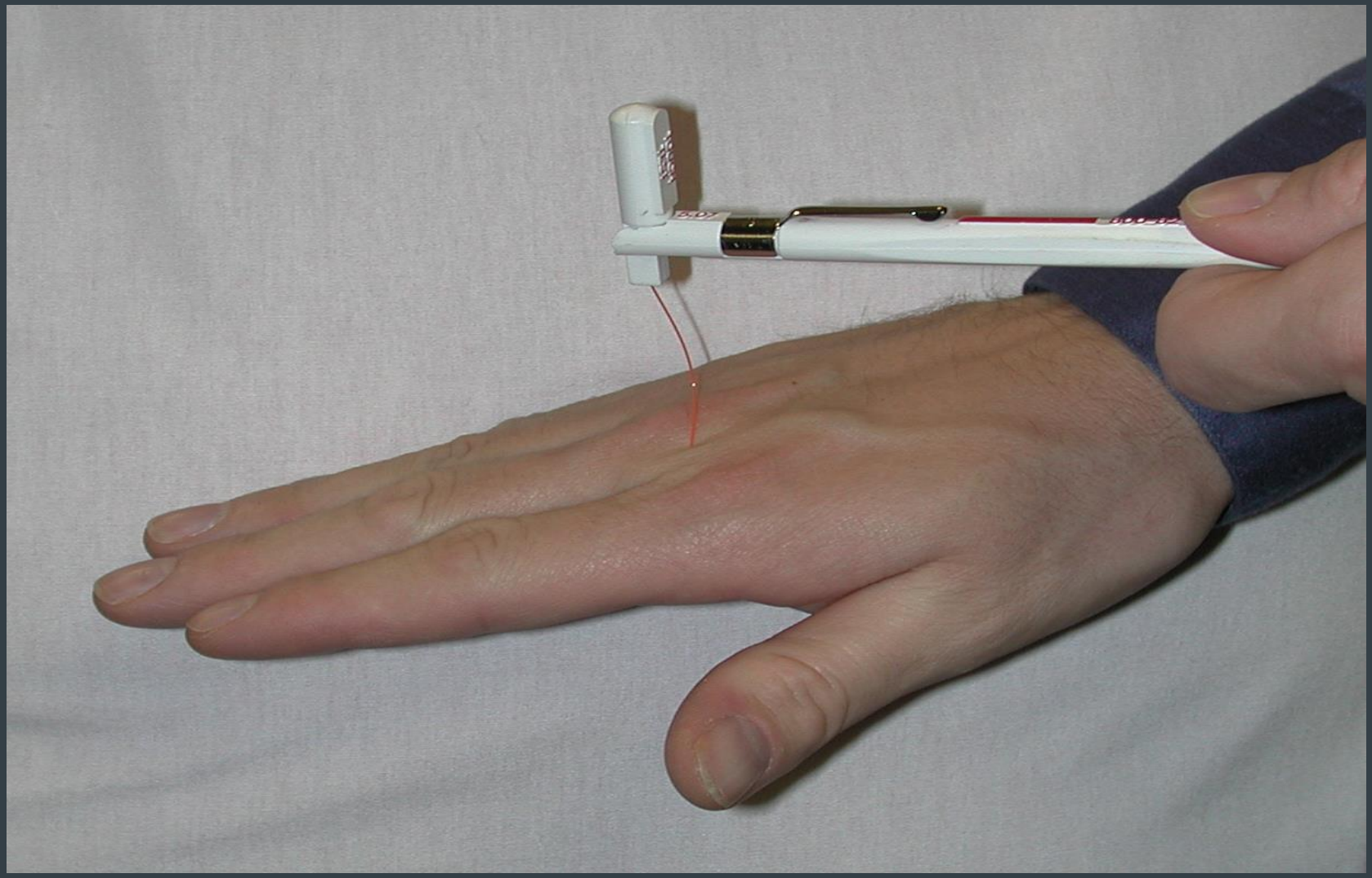
Evaluating a Diabetic Foot

- Neurology
- Musculoskeletal
- Vascular
- Dermatology

Neurologic Exam

Neurologic Exam

- Peripheral Neuropathy
  - Gradual loss of nerve function.
  - Pain and burning of feet more at bedtime.
- Bedside test
  - 5.07 SWF (10 g pressure)
  - Two-point discrimination
  - Vibration (tuning fork)



Semmes-Weinstein monofilament wire

- Easy bedside test to evaluate if protective threshhold is intact.
- 5.07 SWF bends at 10g of force.
- Test at 10 different sites.

SWF 5.07 Site Location

- Plantar aspect of the hallux, 3rd and 5th digits.
- Plantar aspect 1st, 3rd and 5th MTPJ.
- Plantar medial arch (navicular area).
- Plantar lateral midfoot (cuboid area).
- Plantar central heel.
- Dorsal 1st web space.

Treatment of Painful Neuropathy

- Topical Medication
  - Capsaicin
- Oral Medication
  - Amitriptyline
  - Neurontin
  - Cymbalta
  - Lyrica
  - Narcotics

Musculoskeletal Exam

Musculoskeletal Exam

- Evaluate for any bony prominences – very common in Charcot foot.
- Evaluate for bunions, hammertoes, tailors bunions, and exostosis.
- Evaluate if foot is compatible with shoes. Most ulcers are caused by poor shoe gear.


SW
L

Hammertoes

Bunions

Do the shoes fit?

Vascular Exam

Vascular Exam

- Palpate pulses
  - Dorsalis pedis
  - Posterior tibial
  - Popliteal
  - Femoral

Non-Invasive Vascular Exam

- Doppler
- Ankle-brachial Index test
- Transcutaneous oxygen

Doppler Exam

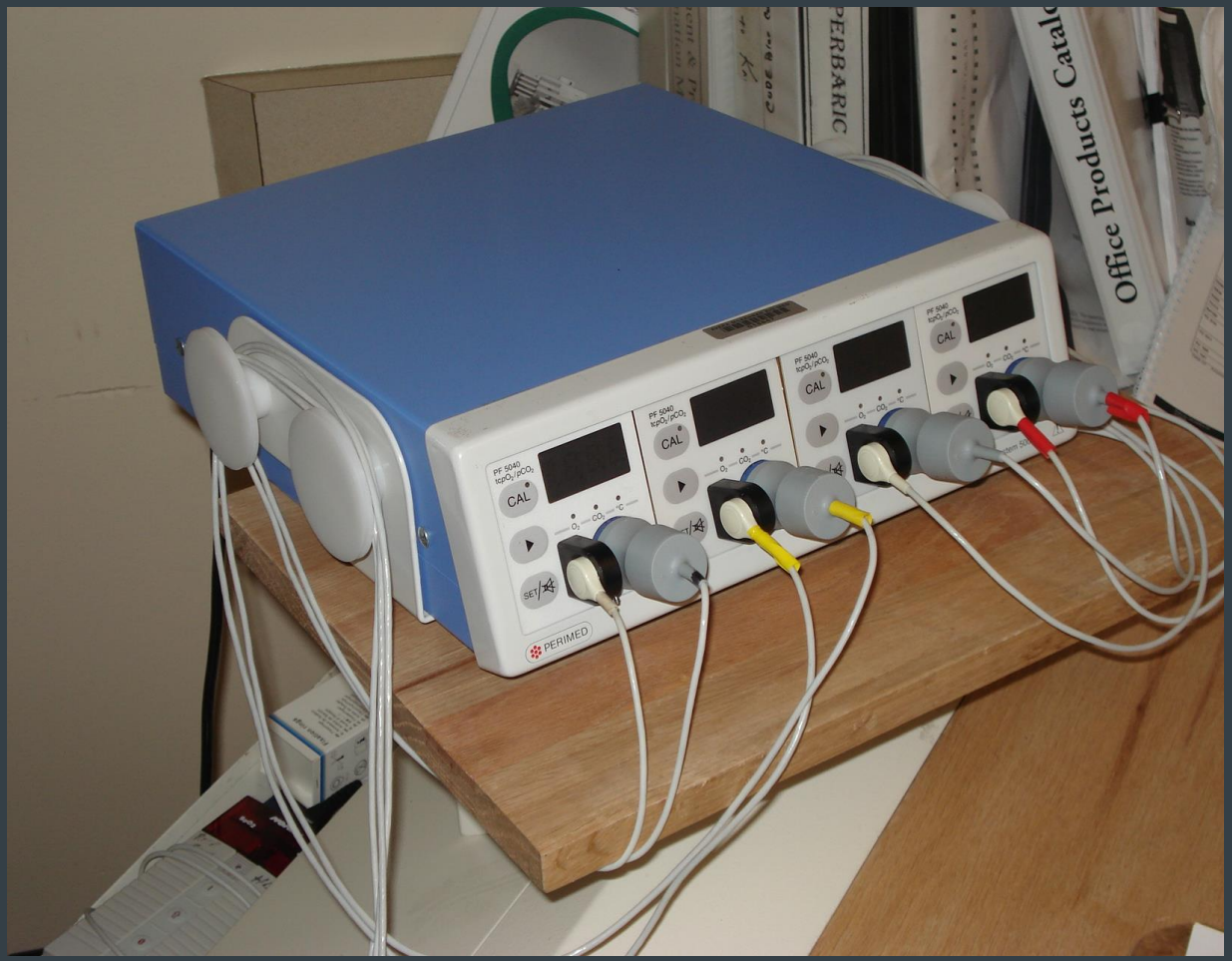
Ankle-brachial Index (ABI)

- Obtain systolic pressure in the ankle and the arm. Ratio of ankle to arm pressures.
- Normal value is 1.0.
- Test can be skewed in patients with calcific vessels.

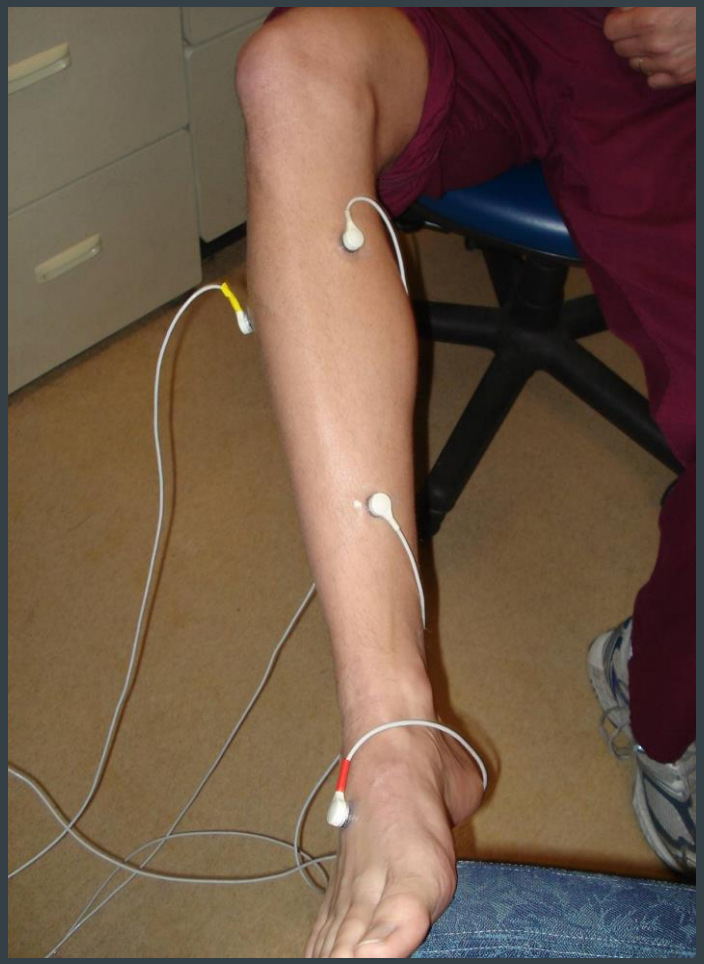
Ankle-brachial Index

- Normal is 1.0.
- < 0.95 signals narrowing of one or more blood vessels.
- < 0.8 indicates pain may occur during exercise.
- <0.4 and patient can have pain at rest.
- 0.25 or less is limb threatening.

Transcutaneous Oxygen (TCPO2)



Transcutaneous Oxygen (TCPO2)



Transcutaneous Oxygen (TCPO2)

- < 5 mm Hg – 0% chance of healing
- > 20 mm Hg but < 35 mm Hg – 20% to 50% chance of healing.
- > 35 mm Hg – 80% chance of healing.
- > 100 mm Hg – greater than 95% chance of healing.

Dermatological Exam

Dermatology

- Toe nails
  - Loose, Ingrown/infected, or onychomycosis.
- Calluses
  - Should be debrided – may have ulcer.
- Dry skin
  - Skin may crack – bacterial infection
- Ulcers

Onychomycosis

Ulcerations

Wagner Classification of Ulcers

- Grade 0: The skin is intact, but there may be some osseous deformity placing the foot at risk.
- Grade 1: Localized superficial ulcer.
- Grade 2: Deep ulcer with extension to tendon, bone, ligament or joint.
- Grade 3: Deep abscess with osteomylitis.
- Grade 4: Gangrene to the toes or forefoot.
- Grade 5: Gangrene to the whole foot.

Evaluating Diabetic Ulcers

- Vascular
- Why does the ulcer/wound exist?
- Does the wound probe?
- Debride the wound.
  - Dressings
    - Saline, betadine or wound products.
- X-rays
  - MRI
  - Bone scan
    - 3-phase,
    - Indium or HMPAO

Conservative Treatment of the Diabetic Foot

Conservative Treatment

- EDUCATE, EDUCATE, EDUCATE.
- Routine foot care.
  - Medicare allows nail/callus debridement every 63 days.
- All cotton white socks.
- Wear different pair of shoes every other day.
- Lotion feet daily. Tops and bottoms only.
- Diabetic shoes and inserts.
- Have patients look at feet daily.

EDUCATION

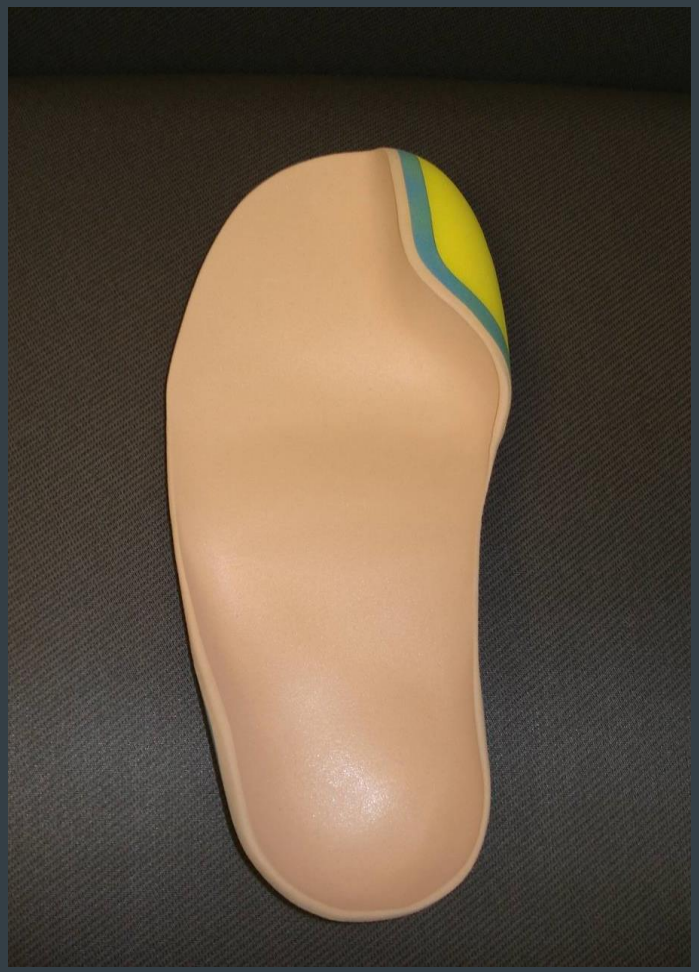
- Education programs have shown to be effective in reducing amputation rates and hospitalizations.
- Frequency of hospitalization has been reduced 23% in patients with educational programs.
- Length of stay was reduced from 9.7 days to 3.5 days.
- More distal amputations could be completed instead of LEA due to patient awareness.

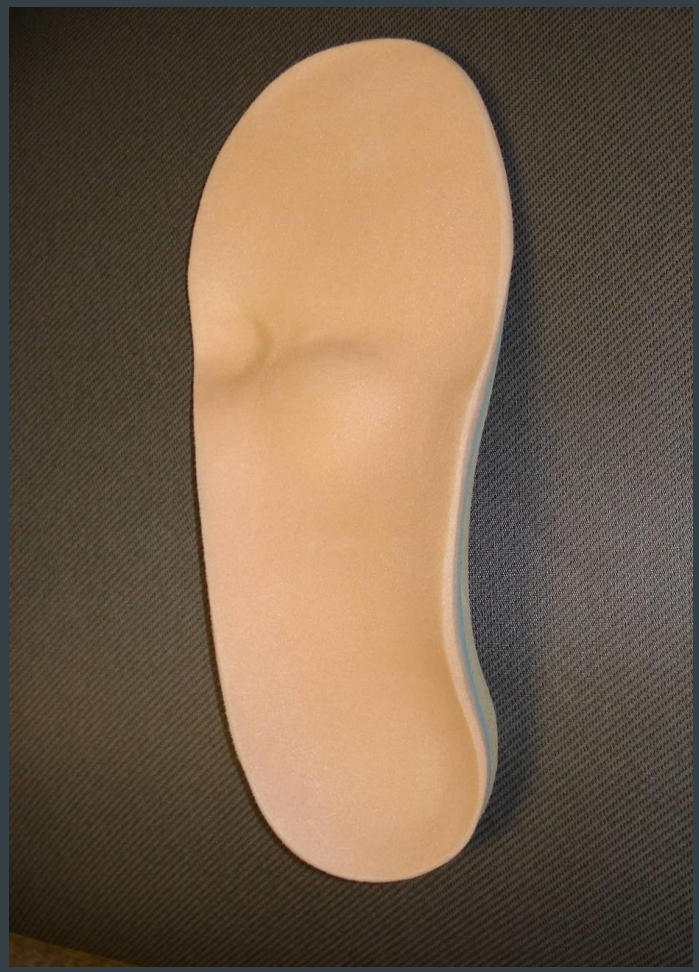
Shoes/Inserts

- Medicare will cover a pair of diabetic shoes once a year.
- Medicare will cover diabetic inserts every 4 months.
- Medicare will cover any other device to off-load ulceration/bony prominence.

Diabetic Shoes

Diabetic Inserts



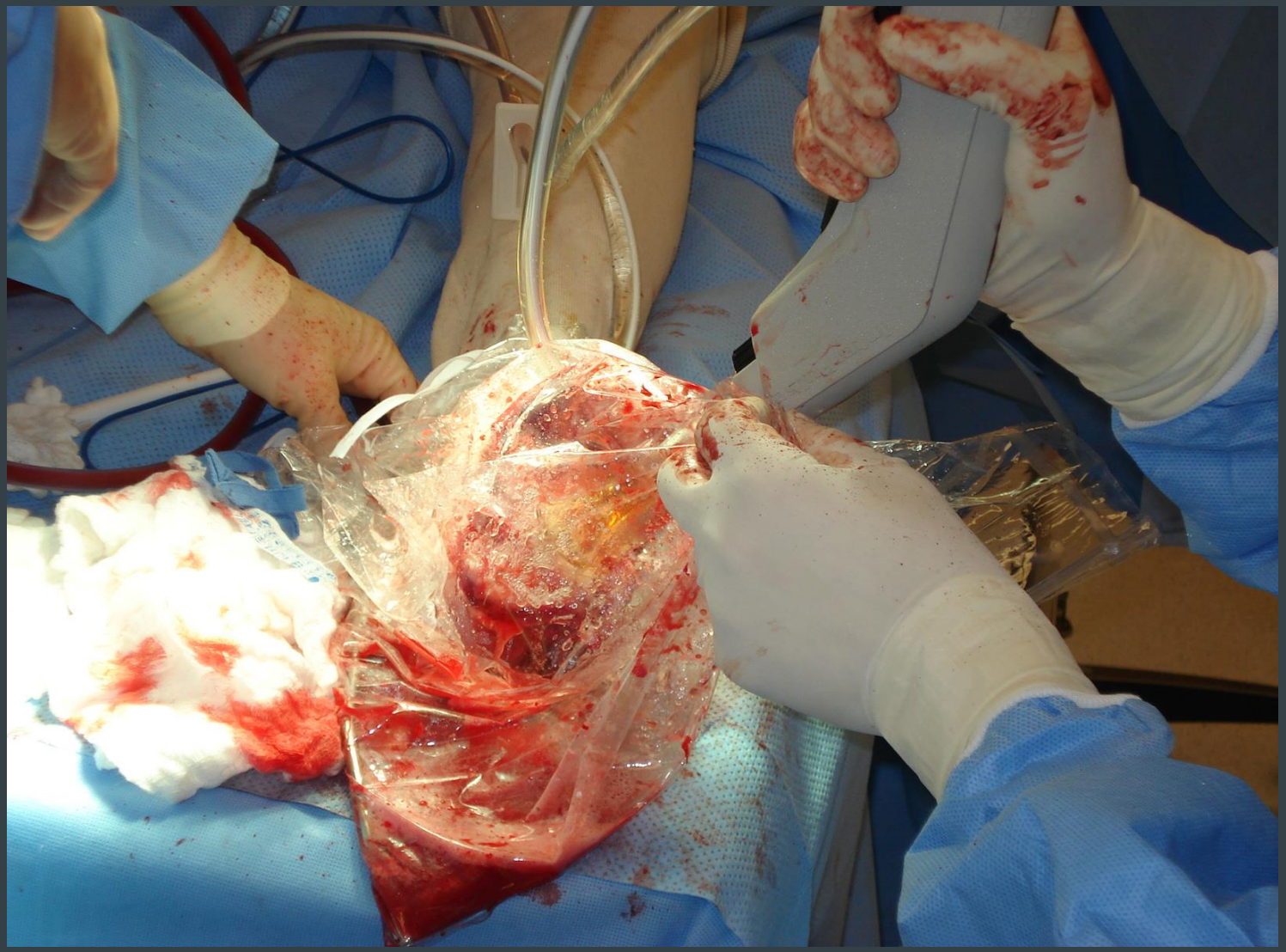


Off-loading Device
PTB brace

Surgical Treatment

Surgical Case 1

- 60 y/o w/m with 25 year history of diabetes.
- S/P right BKA
- S/P Fem-Pop bypass on the left with hallux and 4^{th} toe amputation X 2 weeks. Smokes 1 pack/day X 40 years.
- Heavy ETOH user.



Surgical Case 2

- 49 y/o male farmer with a 10 year history of diabetes.
- Developed an ulceration under the 1st metatarsal head with an abscess coming out the medial aspect of the foot.
- Completely neuropathic from the ankle joint distal.
- No osteomylitis, circulation intact.

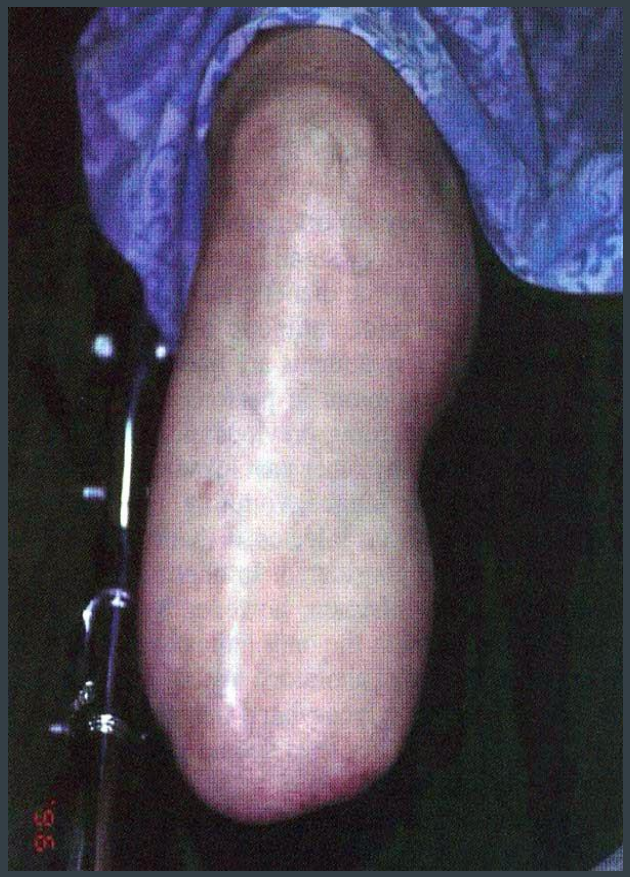
Surgical Case 3

- 55 y/o morbidly obese w/f with 8 year history of diabetes.
- Chronic charcot foot with plantar ulceration.
- No osteomylitis, circulation intact.
- Neuropathic from mid-leg distal.


L
CM


L
CM

CDC study shows 5-year survival rate for a diabetic amputee is less then 40%.



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