Diabetes and the Foot
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Numbers from around the world

- **371 million** people living with diabetes
- **50%** undiagnosed
- **4.8 million** deaths in 2012
- In 2012, more than **471 billion** USD spent on diabetes-related healthcare
Numbers in the United States

- **25.8 million** people
- **8.3%** of the population
- **1.9 million** new cases in 2010 (age > 20 years)
- By 2050, **one in three** adults will have diabetes
Numbers in the United States

• In 2006, **65,700** non-traumatic lower-limb amputations performed in people with diabetes

• More than **80%** of non-traumatic lower-limb amputations occur in people with diabetes
More numbers

• Every 7 seconds someone dies from diabetes

• Every 20 seconds someone is amputated.
Diabetic foot ulcer

• Up to 25% of people with diabetes will develop a foot ulcer at some point during their lifetime

• Half will become infected and require hospitalization

• One in five will go on to amputation

• People with a history of a diabetic foot ulcer have a 40% greater ten-year mortality rate than diabetic patients without a foot ulcer
Diabetic foot ulcer

• Of the people who undergo a major amputation, **20-50%** will have the contralateral (opposite) limb amputated in one to three years

• Greater than **50%** will require an amputation in five years
Diabetic Foot = Cancer?
Diabetes and the Foot

![Cost of Diabetic Foot Compared with 5 Most Costly Cancers](image)

Diabetes and the Foot

Relative 5 Year Mortality

Prostate CA 8
Breast CA 18
Hodgkin’s Lymphoma 18
Neuropathic Ulcer 46
Colon Cancer Amputation 46
PAD 63
Lung CA 64
Pancreatic CA 86

Aulivola, et al, Arch Surg, 2004
American Cancer Society, 2000
Moulak, et al, Diabetes Care, 2003
Office Natl. Statistics, UK, 2006
Singh, Armstrong, Lipsky, JAMA, 2006
Diabetes and the Foot

• Mortality rates following an amputation:
  – 13% to 40% at 1 year
  – 35% to 65% at 3 years
  – 39% to 80% at 5 years

• This is worse than for most malignancies
Wound Healing = Remission

Armstrong & Mills, JAPMA 2013
Diabetic neuropathy

- Sensory
- Autonomic
- Motor
Sensory neuropathy

- Burning, numbness, tingling
- Electrical or stabbing sensation
- Deep aching pain
“The gift of pain”
Diabetic neuropathy

- Sensory
- Motor
- Autonomic
Diabetic neuropathy

- Sensory
- Motor
- Autonomic
Autonomic (sympathetic) neuropathy

- Changes in foot temperature
- Dry skin
- Formation of callus
The 3-minute diabetic foot exam

- History
- Physical exam
- Education
DIABETIC FOOT

1. Wash your feet daily with water and soap
2. Dry your feet well, especially between the toes.
3. Use a file to shape your toenails regularly.
4. Keep the skin moisturized.
5. Don’t walk barefoot.
6. Change daily into clean soft socks.
7. Inspect your foot for injuries.
8. Seek help if they don’t heal quickly.

NEUROLOGICAL
- Lack of sensation at one or more sites with monofilament test
- Abnormal perception of vibration
- Abnormal cold/heat perception test

DERMATOLOGICAL / MECHANICAL
- Any broken skin
- Ingrown nail edges, long or sharp nails
- Interspace maceration
- Erythema, cellulitis, hot swollen foot
- Deformity
- Pulse, cold, foot

VASCULAR
- Absent/weak dorsalis pedis and posterior tibial pulses.
- Ankle-brachial index (ABI) < 1.0: peripheral arterial disease.
Complex Foot Wound Clinic (CFWC)

- Dedicated to the proactive treatment and prevention of lower extremity complications of diabetes

- Intended to provide focused care to patients at the highest risk for foot ulceration, infection, hospitalization, and amputation

- Advanced wound care modalities such as negative pressure wound therapy (NPWT), bioengineered alternative tissues and complex dressing changes

- Comprehensive strategies for offloading, including total contact casting (TCC) and surgical reconstruction
Podimetrics Remote Temperature Monitoring System™
Podimetrics Asymmetry Detection System™
Active ulcer

Remission

Courtesy of Podimetrics
Evaluation of a Remote Temperature Monitoring System for the Prevention of Diabetic Foot Ulcers

• Inclusion criteria
  
  – Male or female ≥ 18 years of age with a diagnosis of diabetes (Type I or II)
  
  – History of healed plantar Diabetic Foot Ulcer(s) or healed amputation(s) within the last 24 months
  
  – Ability to provide informed consent
  
  – Adequate lower extremity blood supply
Evaluation of a Remote Temperature Monitoring System for the Prevention of Diabetic Foot Ulcers

- Exclusion criteria
  - Patients with ulcers or open lesions
  - Active Charcot
  - Active foot infection or gangrene
  - Any mental health disorder, psychiatric disorder, or alcohol or drug abuse history such that, in the opinion of the investigator, the patient is unreliable as a study participant
  - History of amputation more proximal than a transmetatarsal amputation in either foot.
  - Inability to ambulate without the assistance of a wheelchair, walker, or crutches
  - Any travel plans expected to result in an interruption of Podimetrics Mat™ use for greater than two consecutive weeks [Note: OK for participant to take device with them and use during travel]
  - Unable to return to Physician Investigator for study visits and study related foot care for the duration of the study
References


Special thanks to David G. Armstrong, DPM, MD, PhD

For more information please visit his website at:

https://diabeticfootonline.com/
Thank you for your attention!

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