



# Diabetes : Foot Education

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# OBJECTIVE

- Background
- Diabetes overview
- Diabetes complications
- Complete foot exam
- Patient education
- References

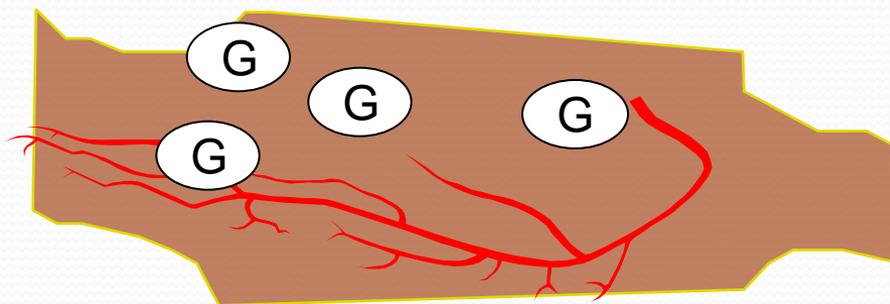
# Background

## U.S. residents-2010 (CDC,2010)

- 65 years and above -10.9 million/26.9 percent, had diabetes.
- 215,000 people <20 years had diabetes—type 1 or type 2.
- 1.9 million people ages 20 years or> were newly diagnosed with diabetes
- 15-25% will develop ulcers on their feet.
- 20% of diabetics admitted to hospitals because of foot problems
- Nearly \$174 billion spent annually for direct and indirect medical costs(CDC,2010).
- Average acute hospital cost in 1996 for a foot ulcer 9,910.
- 5 year survival rate ~50% for BKA(O'Brian, 1997)
- *DIAGNOSED*                      *UNDIAGNOSED*  
7.0 million people              18.8 million people

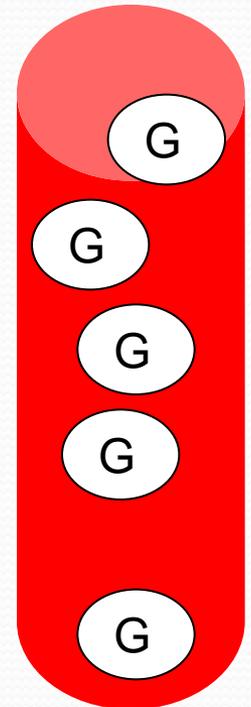
# Diabetes : Overview

- ▶ Diabetes means that blood glucose in the body (often called blood sugar) is too high.
- ▶ Glucose comes from the food we eat
- ▶ Glucose is transported by the blood stream to all the cells in the body.



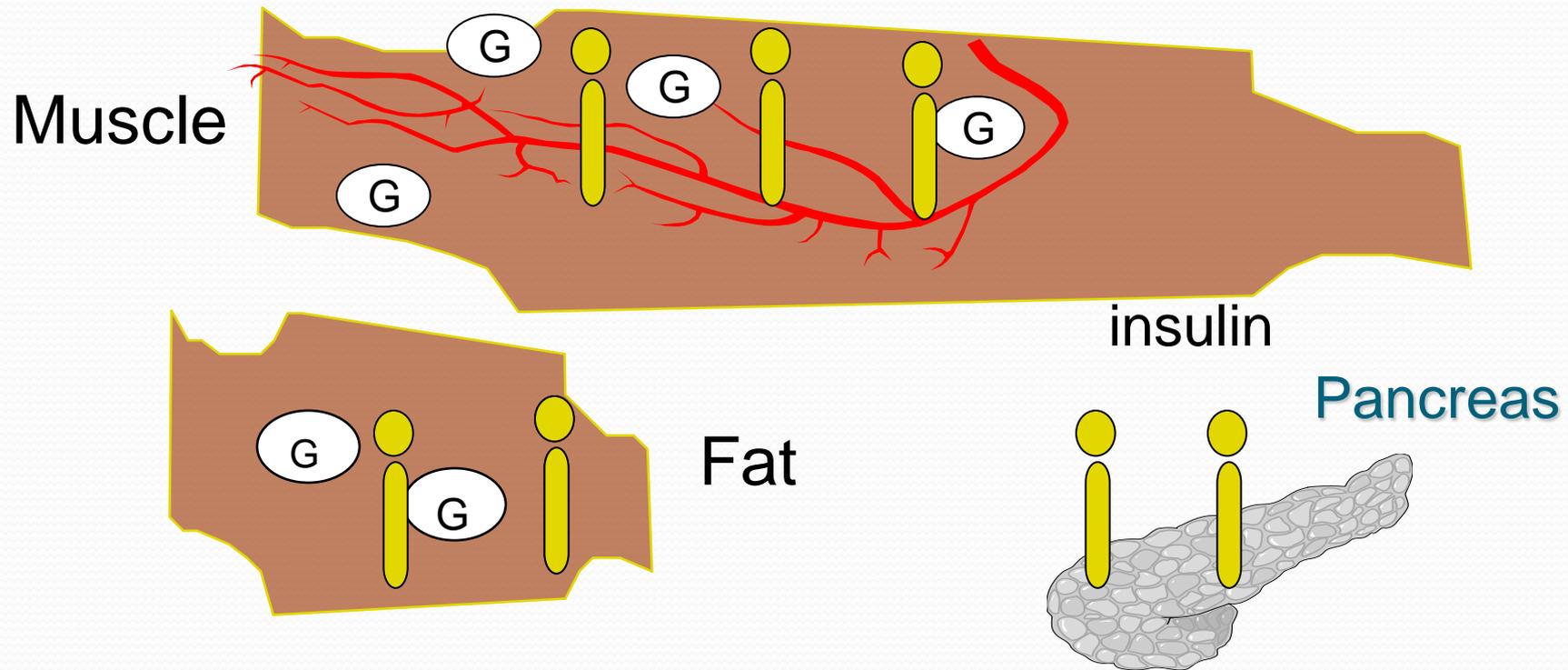
Muscle

Bloodstream



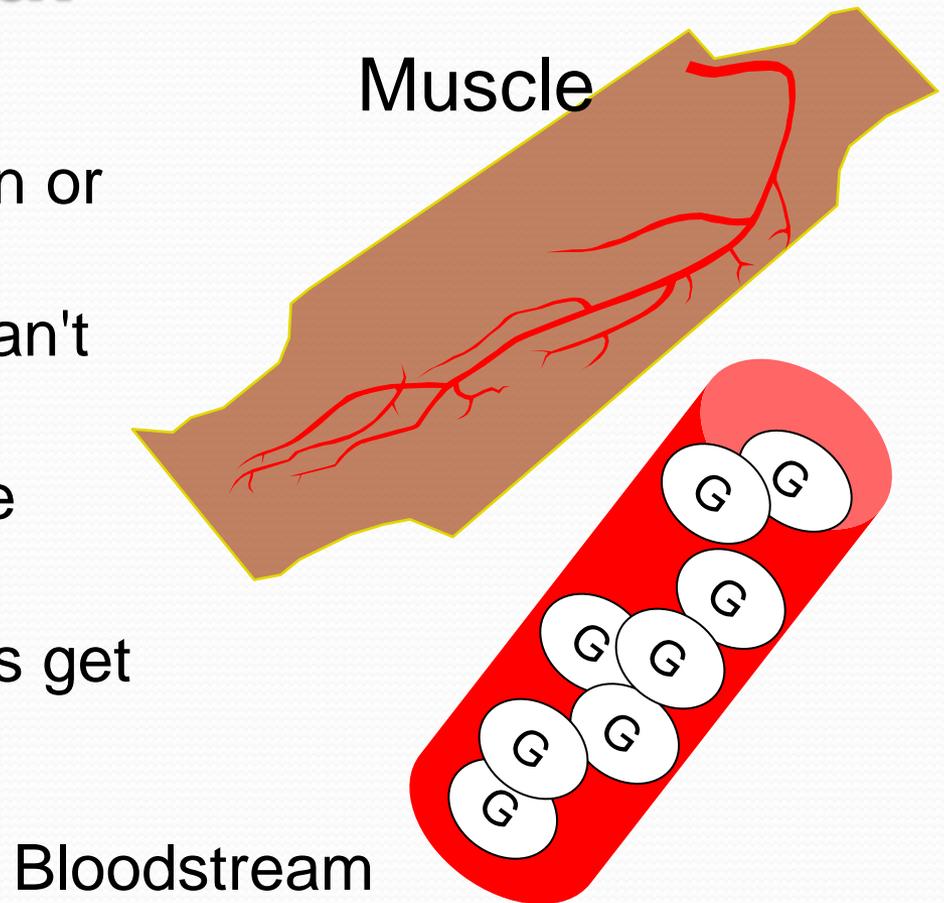
# Overview Contd.

- ▶ Insulin helps the glucose from food to get into muscle and fat



# Overview Contd.

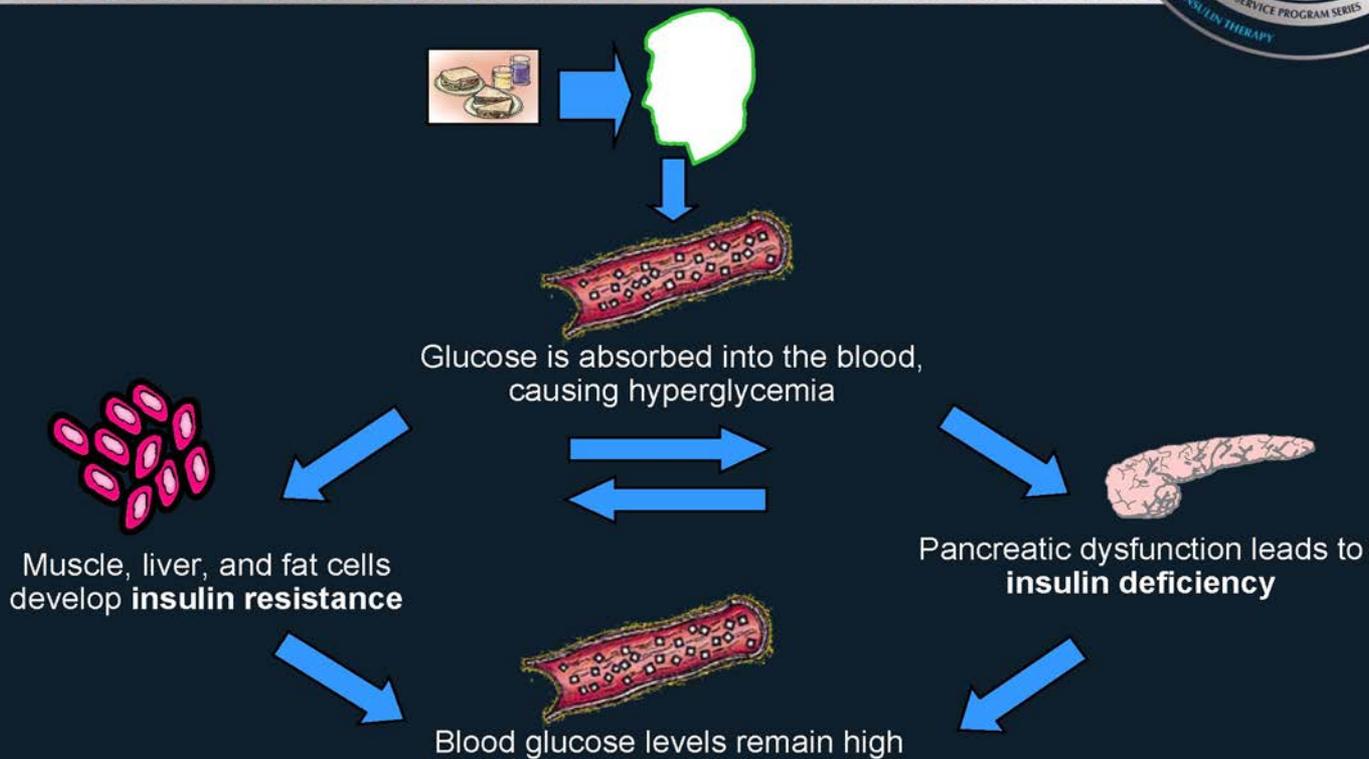
- ▶ If your body doesn't make enough insulin or your body is insulin resistant, glucose can't get into cells.
- ▶ Glucose stays in the blood.
- ▶ Blood glucose levels get too high, causing diabetes



# Common types of diabetes

	Type 1	Type 2
<b>Age of onset</b>	Usually <40	Usually >40
<b>Body weight</b>	Lean	Usually obese
<b>Prone to ketoacidosis</b>	Yes	No
<b>Medication</b>	Insulin essential	Tablets and /or insulin
<b>Onset of symptoms</b>	Acute	Gradual (may be asymptomatic)

# T2DM Evolves From 2 Primary Defects: Insulin Deficiency and Insulin Resistance



# Diabetes: symptoms

Frequent  
urination

Excessive  
thirst

Extreme  
hunger or  
constant  
eating

Unexplained  
weight loss

Presence of  
glucose in  
the urine

# Symptoms Contd.

- Tiredness or fatigue
- Changes in vision
- Numbness or tingling in the extremities
- Slow-healing wounds or sores
- Abnormally high frequency of infection



Always tired



Blurred vision



Numbness and tingling of feet



Wounds that won't heal



Infections

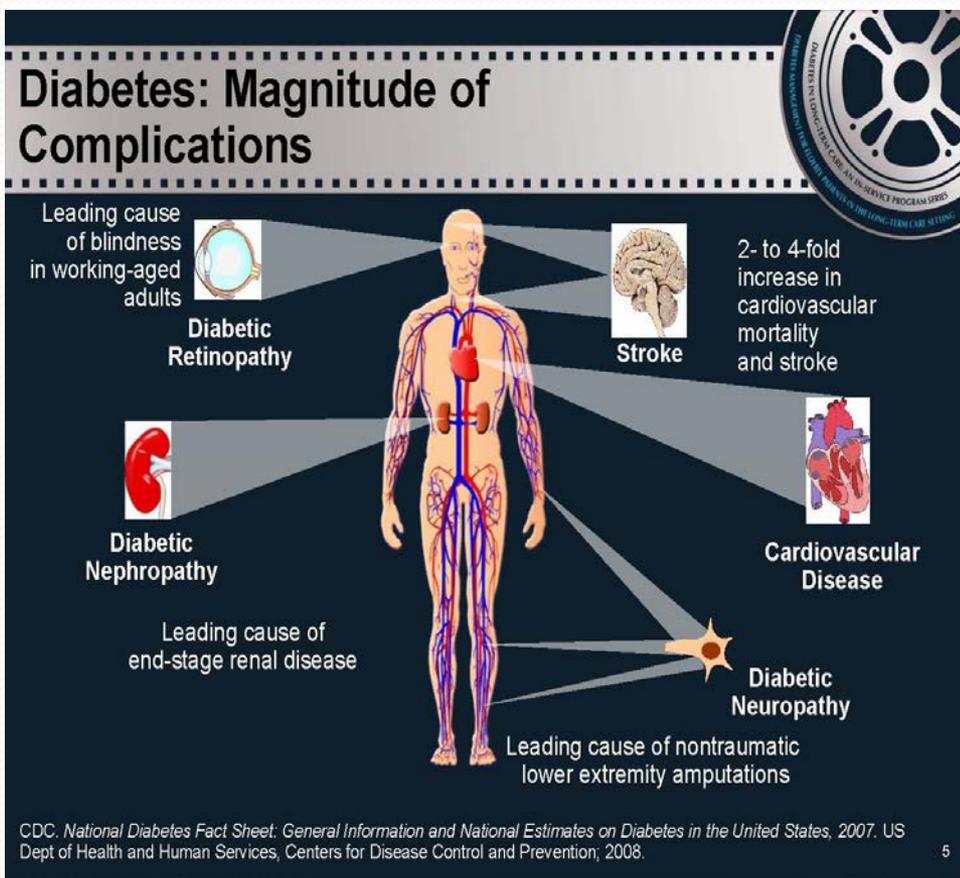
# Diabetes complications

Macrovascular

Microvascular

Neuropathy

Infections



# Macrovascular Complications

Metabolic injury to large vessels

**Heart**

**Brain**

**Extremities**

**Coronary artery disease**

- Coronary syndrome
- MI
- CHF

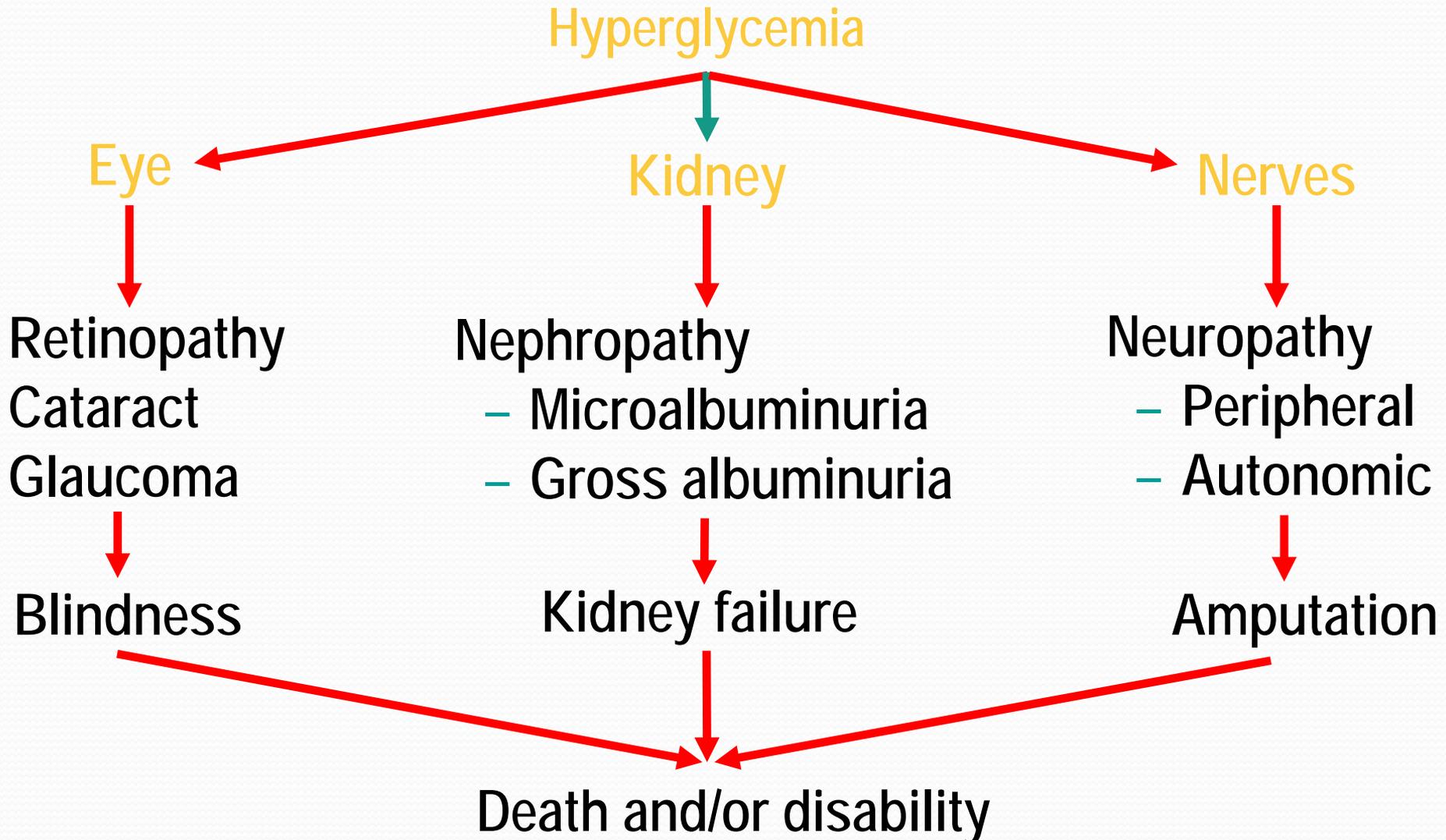
**Cerebrovascular disease**

- TIA
- CVA
- Cognitive impairment

**Peripheral vascular disease**

- Ulceration
- Gangrene
- Amputation

# Microvascular Complications



# Foot screening: Physical examination

**SHOES**  
*and*  
**SOCKS**

*take 'em off!*

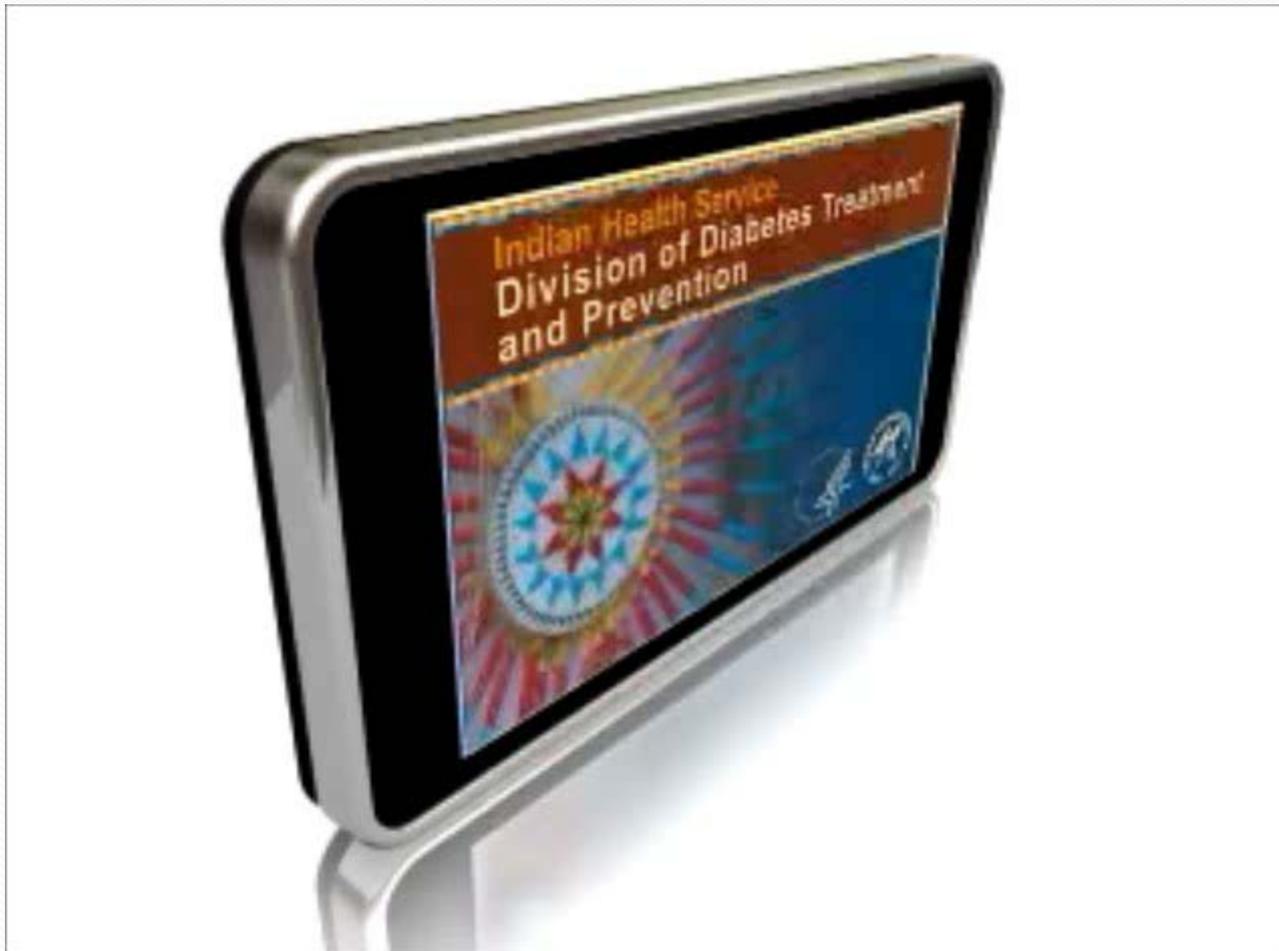


**IF YOU HAVE DIABETES**  
Have your doctor check your feet.

# Key components of foot exam

Musculoskeletal	Dermatological	Neurological assessment	Vascular assessment
<ul style="list-style-type: none"><li>• Deformity, e.g., claw toes, Charcot joint</li><li>• Muscle wasting</li></ul>	<ul style="list-style-type: none"><li>• Skin status, color, thickness, dryness, cracking</li><li>• Sweating</li><li>• Infection, check b/w toes for fungal infection</li></ul>	<ul style="list-style-type: none"><li>• 10 -g monofilament + 1 of the following</li><li>• Vibration using 128-Hz tuning fork</li><li>• Pinprick sensation</li><li>• Ankle reflexes</li><li>• VPT +</li></ul>	<ul style="list-style-type: none"><li>• Foot Pulses</li><li>• ABI if indicated</li></ul>

# Foot deformities and Foot Exam



# Foot Screening

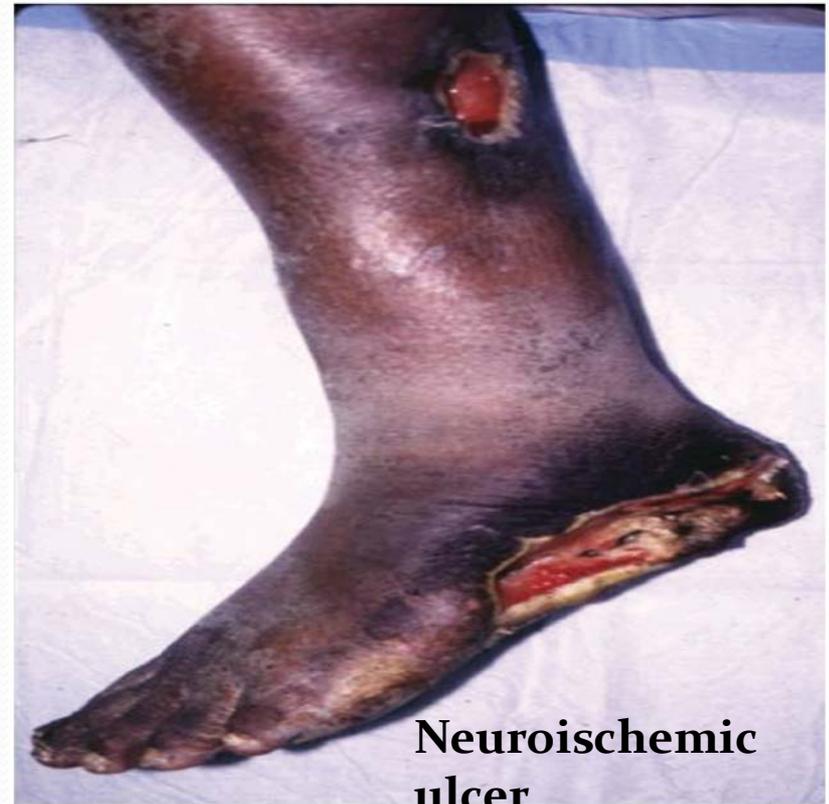
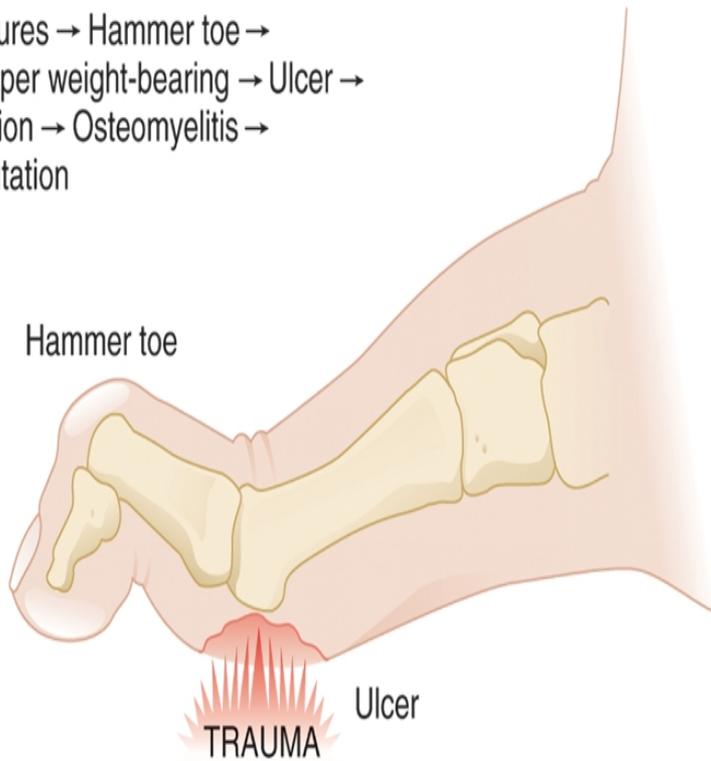
Essential Components	Optional Components
History-Ulcer, amputation	Sensory testing with a 10 gram monofilament
Foot inspection-Deformity, calluses, wounds, lesions	Confirmation testing with a 128Hz tuning fork if sensate to monofilament
Checking for pedal pulses or taking measurements for an ABI pressure	
Teaching patient to do foot exam	
Referral to specialist when appropriate	

# Foot risk assessment

- **No LOPS, No PAD, No deformity-Follow up annually( generalist/specialist)**
- **LOPS +- deformity- Follow up 3-6 months(generalist/specialist)**
- **PAD +- LOPS- Follow-up 2-3 months by specialist**
- **Ulcer/amputation- 1 month by specialist**

# Pathways leading to foot ulceration

Contractures → Hammer toe →  
Improper weight-bearing → Ulcer →  
Infection → Osteomyelitis →  
Amputation



(University of Texas category 2C).  
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**Neuroischemic  
ulcer**

(From Vinik AI: Diabetic neuropathies. In Kahn CR [ed]: Atlas of Endocrinology, vol 2. Philadelphia, Lippincott Williams & Wilkins, 2002, pp 169-184.)

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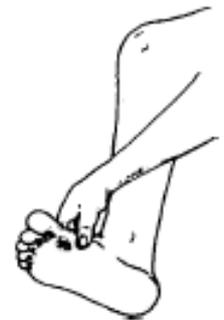
# Patient Education: Foot inspection

- ▶ Check feet for cuts, sores, red spots, swelling, and infected toenails every day.
- ▶ Individuals may have serious foot problems, but feel no pain.

**LOOK BETWEEN YOUR TOES**

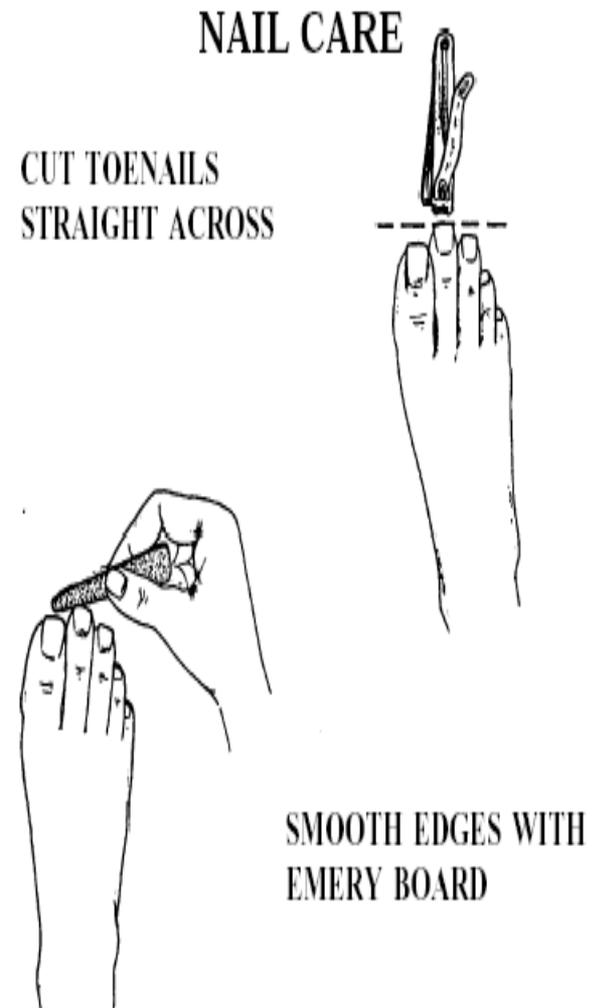


**CUTS  
BLISTERS  
SORES  
SWELLING  
DRY SKIN  
CRACKS**



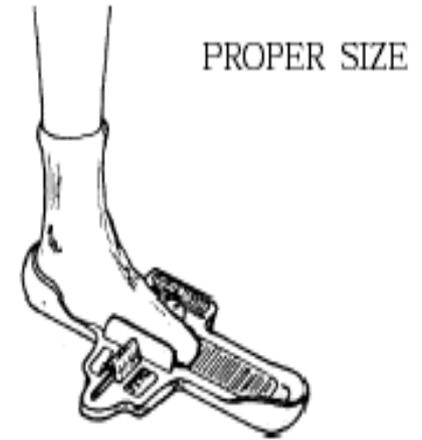
# Nail care

- ▶ Toenails should be trimmed regularly
  - With clippers after bath/shower.
  - Straight across and smooth with an emery board or nail file.
  - don't cut into the corners of the toenail.
  - If toenails are thick or yellowed, or nails curve and grow into the skin, have a podiatrist trim them.



# Footwear selection

- ▶ Protect the feet
  - Athletic or walking shoes are good for daily wear. They support the feet and allow them to "breathe."
  - Avoid vinyl or plastic shoes, because they don't stretch or "breathe."



# Diabetic Shoes



# Caring for the feet

- ▶ Smooth corns and calluses gently.
  - Check with the doctor/podiatrist before using a pumice stone.
  - Use pumice stone after bathing or showering
  - Don't cut corns and calluses.
  - Don't use razor blades, corn plasters, or liquid corn and callus removers - they can damage the skin.



# Caring for the feet

- ▶ Keep the skin soft and smooth
  - Rub a thin coat of skin lotion or cream.
  - Do not put lotion or cream between toes



## **Barriers to foot management**

- vision impairment
- mobility impairment
- cognitive impairment
- lack of caregiving assistance

## **Tips to help overcome barriers**

- Assess for the individual patient's barriers in each of the areas of self-care
- Mutually consider suggestions to help overcome barriers (Prioritize and set mutual Goals)

# Refer when appropriate

**Podiatrist**

**Endocrinologist**

**Neurologist**

**Vascular Surgeon**

**Orthopedist**

**Wound Care Specialist**

# Prevention is better than cure!

- ▶ *Feet can last a life time-  
.....Prevention and early identification of foot problems can prevent foot ulcers and amputation*



*Source: Footcare in Diabetes Workbook for Health Professionals. Australian Diabetes Educators Association*

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# Questions

An acceptable fasting blood sugar range for patient is

- 70-140
- 140-200
- 50-90
- 60-190