

Diabetes Mellitus

Understanding Diabetes Mellitus and the complications relating to the disease can assist the fitter to better serve patients.

What is Diabetes Mellitus?

- A metabolic disease in which the body's inability to produce any or enough insulin causes elevated levels of glucose in the blood.
- Without diabetes, your body converts the carbohydrates that you eat in to glucose.
- The pancreas then releases insulin that allows the cells in your body to use that glucose for energy.
- But with diabetes, this system does not work as it should.
- Without insulin the glucose remains in the blood causing microvascular inflammation as it circulates throughout the body.

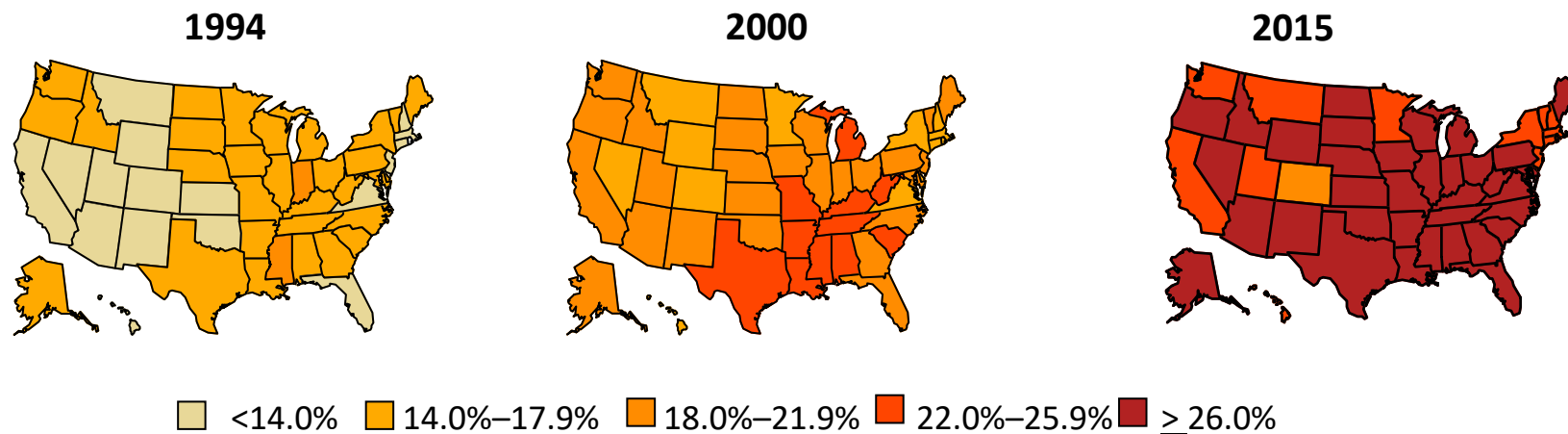


Diabetes and Its Cost in the U.S.

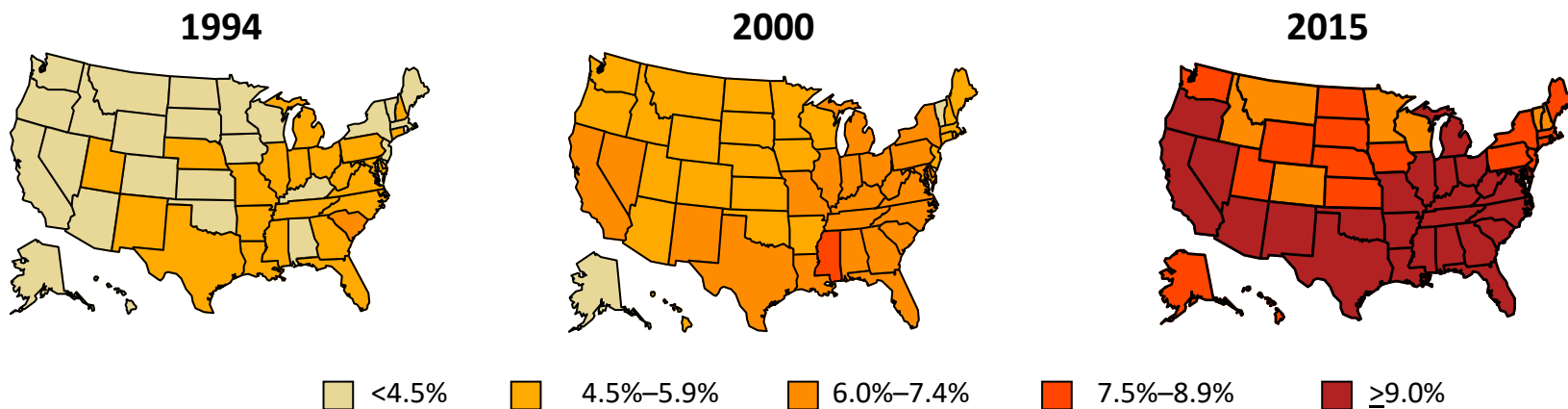
- Current estimates show that 1 in 3 Americans will develop diabetes sometime in their lifetime.
- More than 1 in 3 Americans currently has pre-diabetes
- Nearly 1 in 5 adolescents aged 12 to 18 have prediabetes.
- Diabetes is more common among American Indian or Alaska Native, non-Hispanic Black, Hispanic, and Asian people than non-Hispanic White people
- \$327 billion – annual cost of diabetes in the US
- \$1 out of every \$4 in US health care costs is spent on caring for people with diabetes.
- 61% of diabetes costs are for adults aged 65 or older, which is mainly paid by Medicare.
- 48% to 64% of lifetime medical costs for a person with diabetes are for complications related to diabetes.

Age-Adjusted Prevalence of Obesity and Diagnosed Diabetes Among US Adults

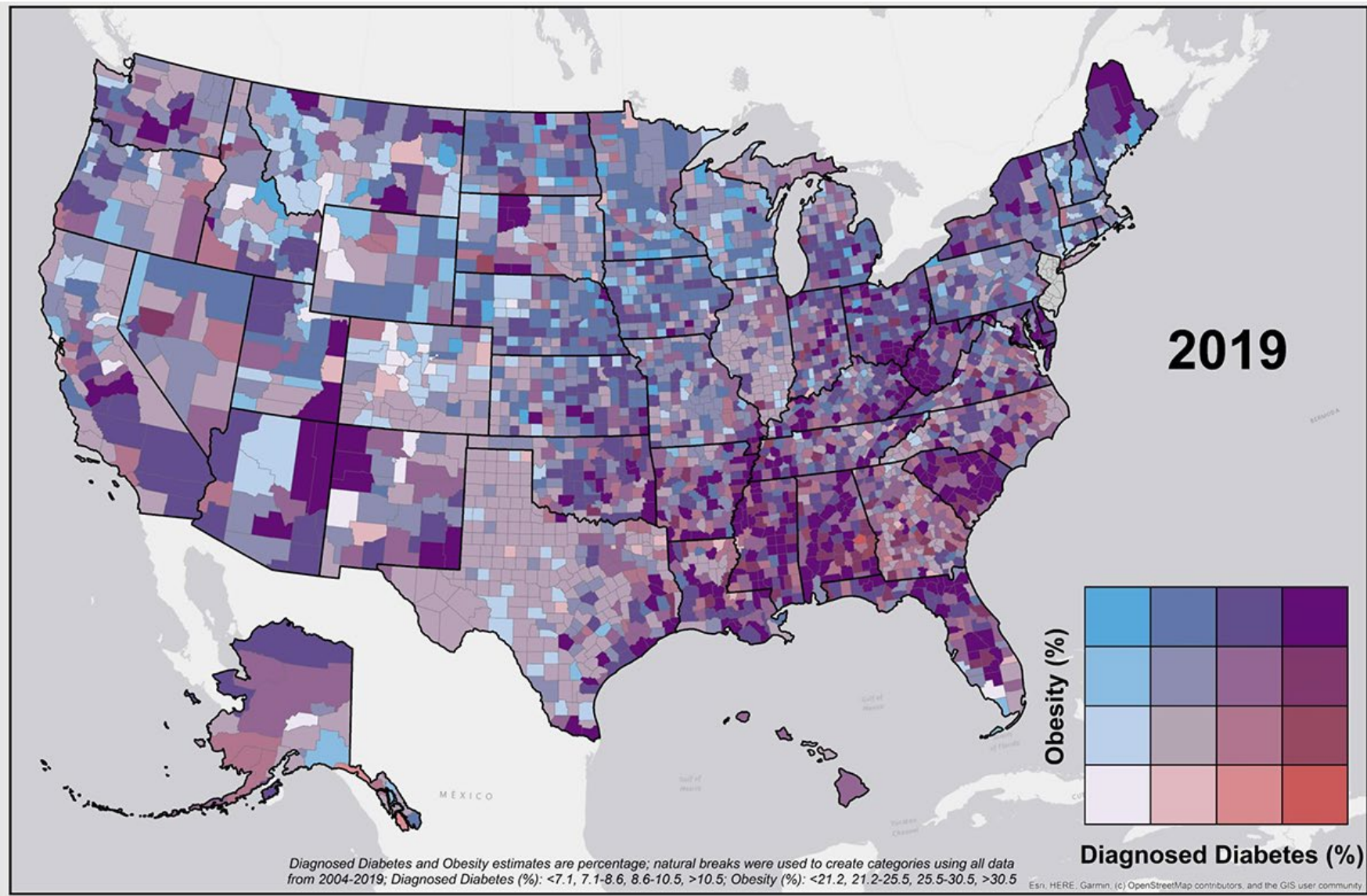
Obesity (BMI ≥ 30 kg/m²)



Diabetes

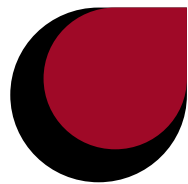
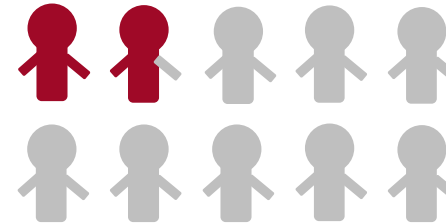


Age-Adjusted Prevalence of Diagnosed Diabetes and Obesity Among Adults



Diabetes & Your Feet

**LESS THAN 20%
WHO QUALIFY FOR SHOES
ARE ACTUALLY RECEIVING THEM**



**THE LEADING CAUSE OF
NON-TRAUMATIC LOWER LIMB
AMPUTATIONS
IN THE UNITED STATES IS
DIABETES**

Comprehensive Foot Care

PROGRAMS

CAN REDUCE DIABETIC FOOT

AMPUTATIONS

45-85%

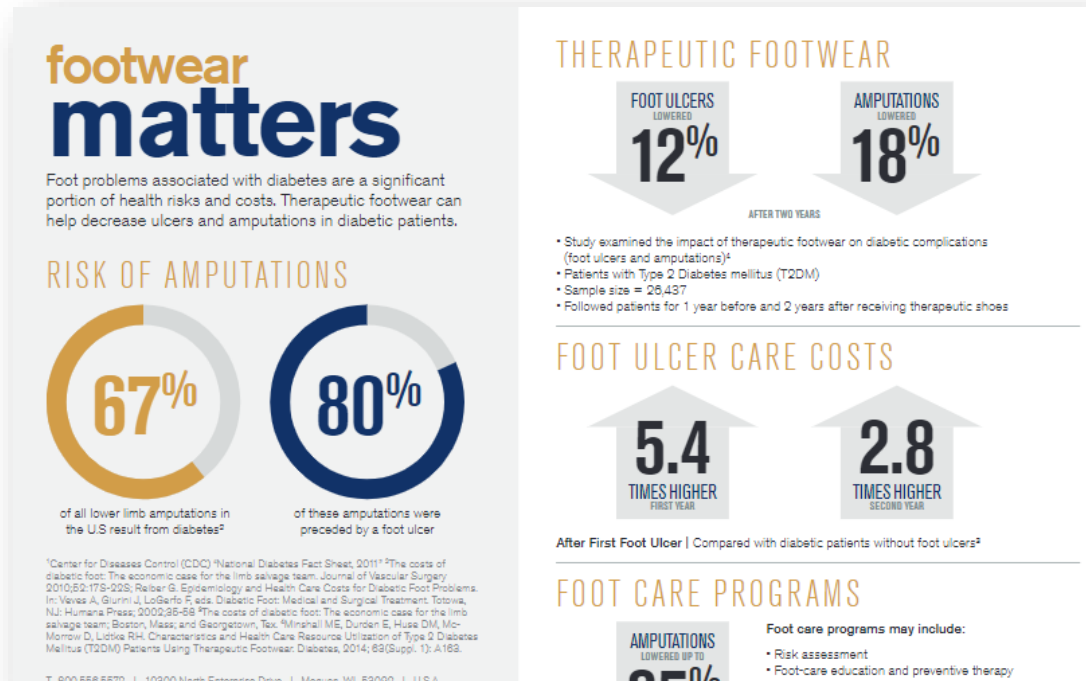
Footwear Matters

A 2014 retrospective study compared over 26,000 patients who received diabetic shoes and inserts

Results:

12% reduction in ulcers

18% reduction in amputations



Type 1

The body does not produce insulin. Some people may refer to this type as **insulin-dependent diabetes**, **juvenile diabetes**, or **early-onset diabetes**. People usually develop type 1 diabetes before their 40th year, often in early adulthood or teenage years

Approximately 10% of all diabetes cases are type 1

Patients with type 1 diabetes will need to take insulin injections for the rest of their life. They must also ensure proper blood-glucose levels by carrying out regular blood tests and following a special diet

Type 2

The body does not produce enough insulin for proper function, or the cells in the body do not react to insulin (insulin resistance)

Approximately 90% of all cases of diabetes worldwide are type 2

Some people may be able to control their type 2 diabetes symptoms by losing weight, following a healthy diet, exercise, and monitoring their blood glucose levels.

Overweight and obese people have a much higher risk of developing type 2 diabetes compared to those with a healthy body weight. Being overweight/obese causes the body to release chemicals that can destabilize the body's cardiovascular and metabolic systems.

Type 2

Being overweight, physically inactive and eating the wrong foods all contribute to our risk of developing type 2 diabetes.

Drinking just one can of (non-diet) soda per day can raise our risk of developing type 2 diabetes by 22%, researchers from Imperial College London reported in the journal *Diabetologia*. The scientists believe that the impact of sugary soft drinks on diabetes risk may be a direct one, rather than simply an influence on body weight.

The risk of developing type 2 diabetes is also greater as we get older.

A family history of diabetes is a risk factor.

People of Middle Eastern, African, or South Asian descent also have a higher risk of developing the disease.

Gestational

Diagnosis of gestational diabetes is made during pregnancy.

This type affects females during pregnancy. Some women have very high levels of glucose in their blood, and their bodies are unable to produce enough insulin to transport all the glucose into their cells, resulting in progressively rising levels of glucose.

Most gestational diabetes patients can control their diabetes with exercise and diet. Between 10% to 20% of them will need to take blood-glucose-controlling medications. Undiagnosed or uncontrolled gestational diabetes can raise the risk of complications during childbirth. The baby may be bigger than they should be.

Complications Linked to Poorly Controlled Diabetes

Eye complications - glaucoma, cataracts, diabetic retinopathy

Foot complications - neuropathy, ulcers, and amputations

Skin complications - skin infections and skin disorders

Heart problems - heart disease and cardiac arrest

Hypertension - kidney disease and stroke

Mental health - depression, anxiety and other mental disorders

Hearing loss - hearing problems

Complications Linked to Poorly Controlled Diabetes

Gum disease - gingivitis

Gastroparesis - muscles of the stomach stop working properly

Neuropathy - diabetic neuropathy

Nephropathy - uncontrolled blood pressure can lead to kidney disease

PAD (peripheral arterial disease) - pain in the leg, tingling and sometimes problems walking properly

Stroke - if blood pressure, cholesterol levels, and blood glucose levels are not controlled, the risk of stroke increases significantly

Erectile dysfunction - male impotence

Infections - susceptible to infections

Healing of wounds - cuts and lesions take much longer to heal



Myth
Diabetes is caused by eating too much sugar.

Fact
Type 1 diabetes is caused by **genetics** and **unknown factors** that trigger its onset.
Type 2 diabetes is caused by **genetics** and **lifestyle factors**.

STOP DIABETES
American Diabetes Association

MYTH
You have to lose a lot of weight for your diabetes to improve.

FACT
Losing just 7% of your body weight can offer significant health benefits - about 15 pounds if you weigh 200.



STOP DIABETES
American Diabetes Association

MYTH Healthy foods won't raise
your blood glucose.



FACT Eating too much of even healthful foods, such as fruit
and whole grains, can lead to high blood glucose.



MYTH People who follow their
treatment plan never have
high blood glucose readings.



FACT A person with diabetes may
experience highs even when
diligently following their
treatment plan.

Strict Medicare Guidelines

Under Medicare Guidelines, having Diabetes alone does not qualify a beneficiary to receive footwear.

Proper documentation for one of 6 existing or past conditions determines eligibility for footwear to be covered under Medicare (See Statement of Certifying Physician)

Diabetic Neuropathy

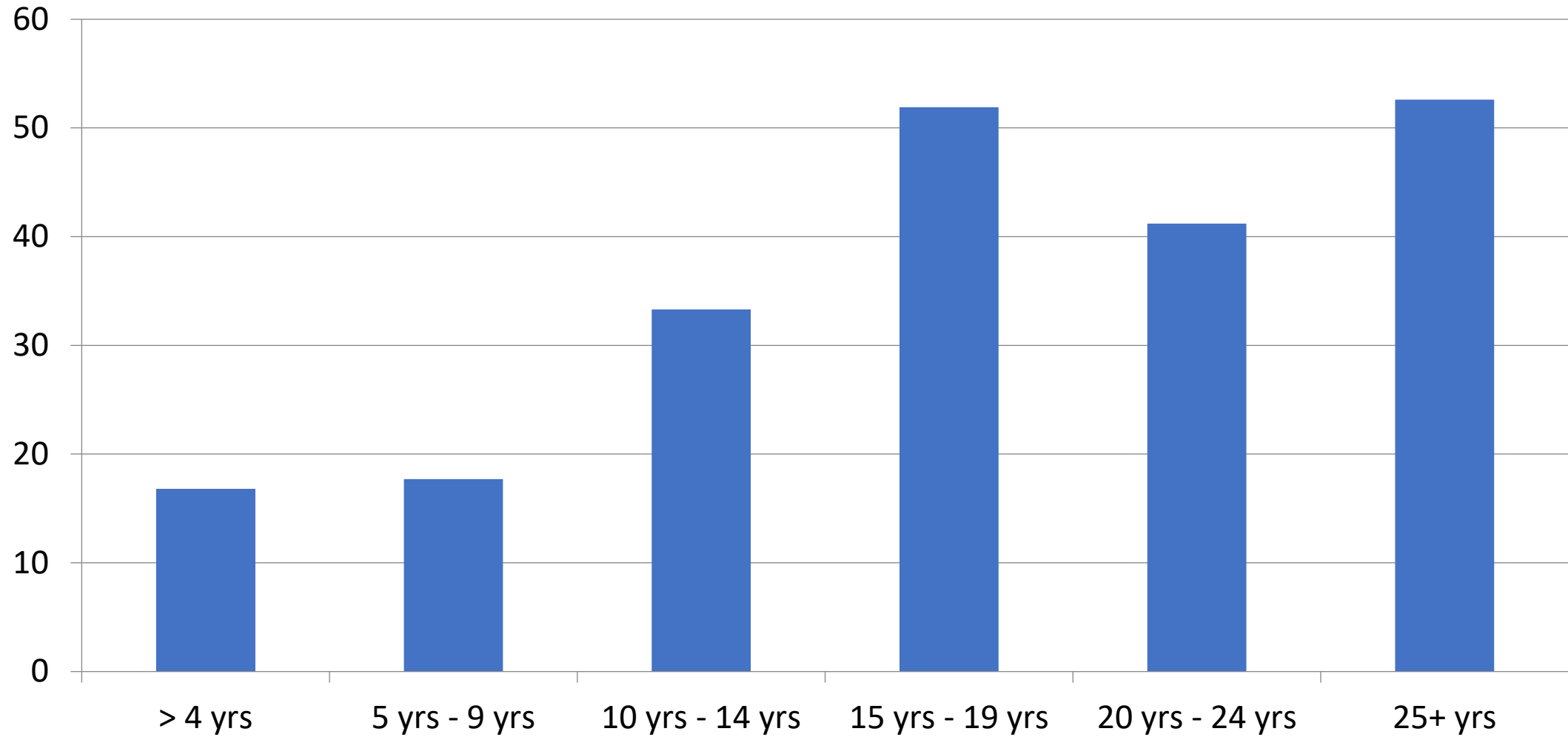
- A family of nerve disorders caused by diabetes.
- Nerves not sending the proper messages to the brain.
- Symptoms include numbness or insensitivity to pain or temperature, tingling or burning, sharp pains or cramps, extreme sensitivity to touch, loss of balance.
- How does diabetes cause neuropathy?
 - Microvascular inflammation
 - Toxic levels of blood glucose
- Keeping blood sugars in check is ONLY way to prevent neuropathy.
- Note – diabetes is NOT the only cause of neuropathy!

Peripheral Neuropathy

- Sensory neuropathy
 - Abnormal sensation
 - Glove and stocking distribution
 - Paresthesia
 - Dysesthesia
 - Hypesthesia
 - Anesthesia
 - Allodynia
 - Proprioception
- Motor Neuropathy
- Autonomic Neuropathy



Percentage of Patients with Polyneuropathy by Duration of NIDDM



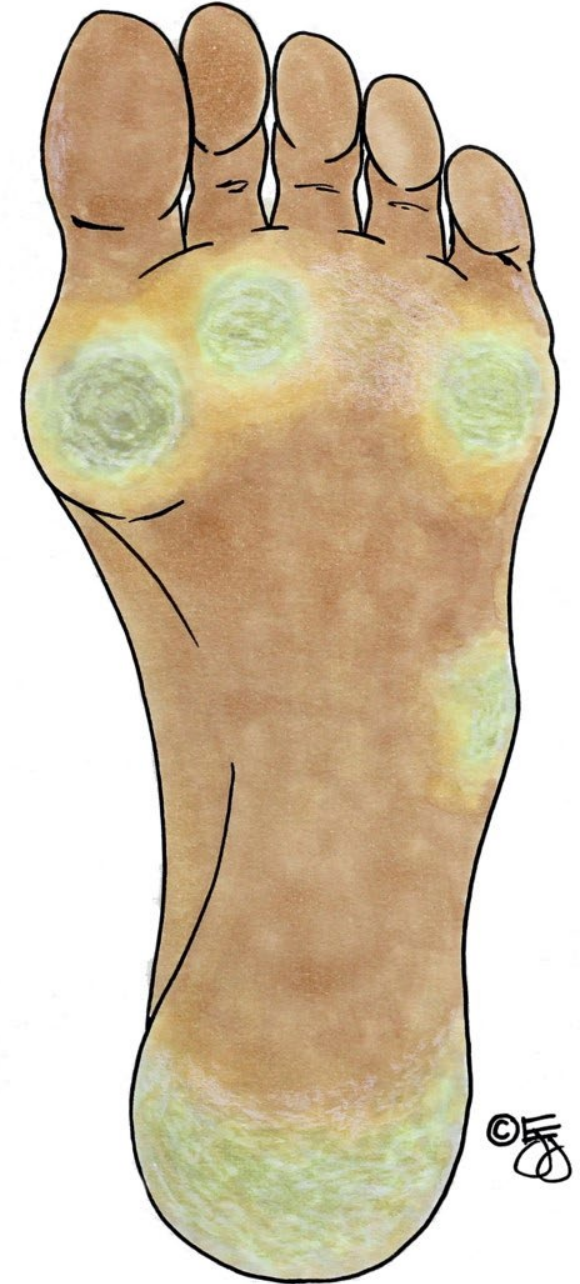
Franklin, GM, et al: Sensory Neuropathy in Non-Insulin-Dependent Diabetes Mellitus: The San Luis Valley Diabetes Study. *Am J Epidemiol* 131:633-43, 1990.

Callus Formation (plantar keratoma)

Hard areas of skin form under areas of high pressure on the plantar surface of the foot

Very common occurrence even in non-diabetics

Usually painful with direct pressure



Ulcerations (malum perforans)

Open sores or wounds that most often occur on the bottom of the foot.

Untreated ulcers can become infected and may eventually lead to amputation.

More than 800,000
diabetic patients
experience foot ulcers
each year.



Ulcers

Diabetic foot ulcers require regular visits with a physician for debridement and monitoring. Treatment may include total contact casting, walker boots and/or foot orthoses.

Most common sites are plantar to the met heads and hallux.



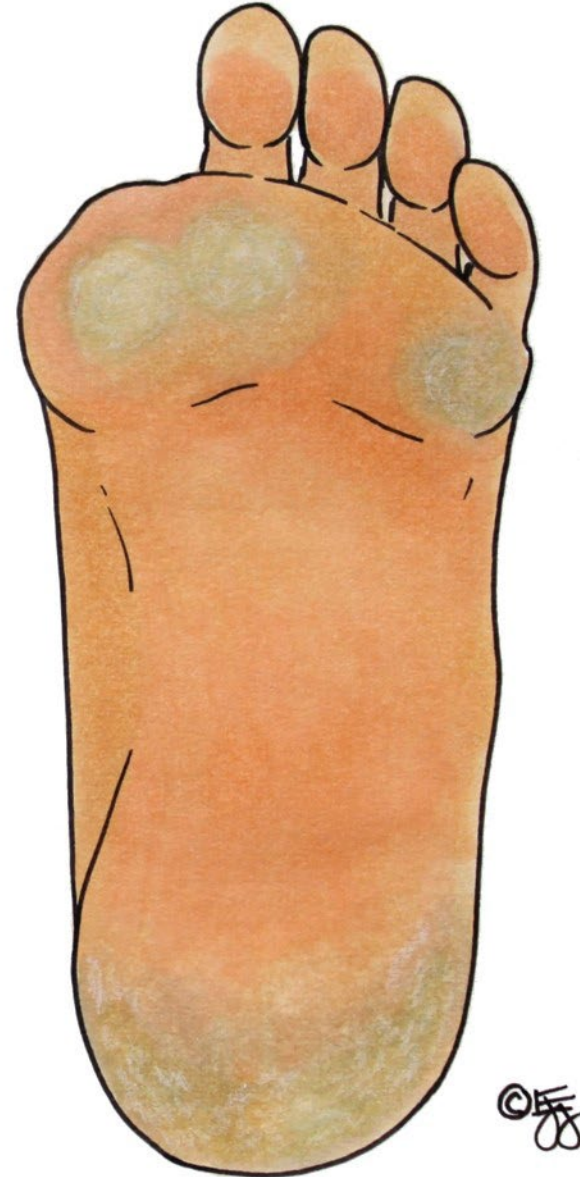
Risk Factors

- Previous amputation
- History of foot ulcer
- Peripheral neuropathy
- Foot deformity
- Peripheral vascular disease
- Poor glycemic control
- Cigarette smoking

Amputation

The removal of a limb, or part of a limb, by way of trauma, medical illness, or surgery.

As a surgical measure, it is used to control pain or arrest a disease process in the affected limb.



Foot Deformity

A **hammertoe** is contracted at the proximal interphalangeal (PIP) joint.

A **mallet toe** is contracted at the distal interphalangeal (DIP) joint.

A **claw toe** is or contracted at both the proximal (PIP) and distal interphalangeal (DIP) joints.

Very common, especially in diabetics due to weakened muscles and tendons in the forefoot.



Normal toe



Hammertoe



Mallet toe



Claw toe

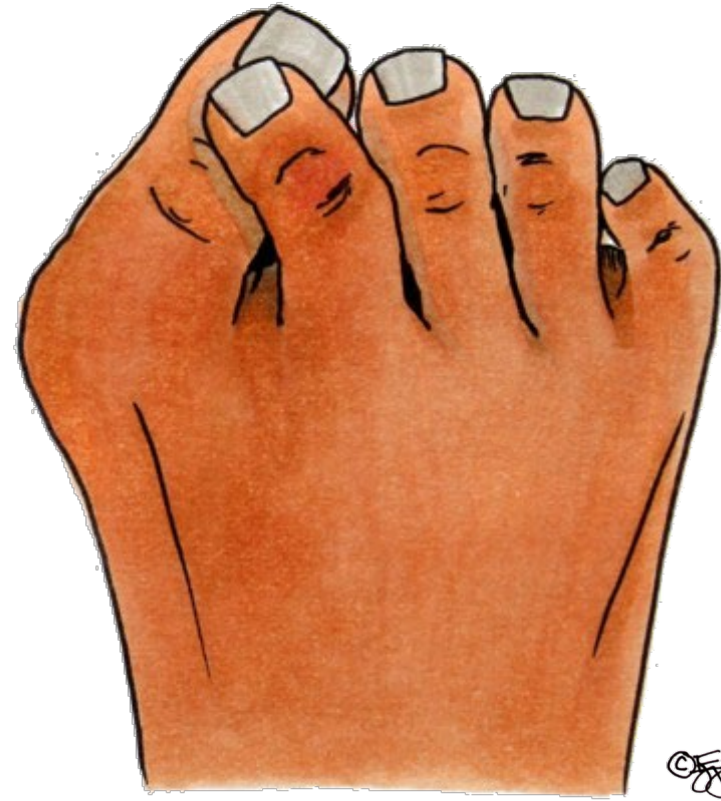
Foot Deformity

A **hallux valgus** or **bunion** is an enlargement of bone or tissue around the joint at the base of the big toe (MTPJ). The great toe may drift laterally, and the tissues surrounding the joint may be swollen and tender.



Foot Deformity

A **cross over toe** is a condition in which one toe drifts toward another to the point that they overlap. One or both toes may be dislocated, as well.



Foot Deformity

A **corn (heloma)** is a hard area of skin usually caused by ill-fitting shoes, bony prominence or position of a joint within the toes.

A **hard corn** is called a *heloma durum*, while a soft corn is called a *heloma molle*. Hard corns occur on dry, flat surfaces of skin.

A **soft corn**, sometimes referred to as a “kissing corn,” is frequently found between adjacent toes, stay moist and keep the surrounding skin soft.



Poor Circulation

Peripheral Arterial Disease is the build up of plaque on the artery walls of the legs and can cause pain and numbness.

A person's chance of getting an infection is greatly increased and it difficult for the body to fight the infection.

PAD and diabetes are the leading cause of non-traumatic, lower limb amputations.

