

DIABETES FOOT CARE

Make your feet last a lifetime

Judy Heubel RN, BSN – CDE, CFCN
Ho-Chunk Nation Community Health Nurse

*When we are in love we may be
"swept off our feet."*

*When we don't want to do something,
we are said to have "cold feet."*

*A sensible person "has both feet on the
ground."*

Sometimes we even "vote with our feet."

Diabetes facts

- Diabetes has increased to epidemic proportions –
1958 1.5 million people
2010 18.8 million people
- Today 25.8 million Americans have diabetes —
8.3 % of the total US population
7 million do not know they have the disease
- An estimated that 79 million adults aged 20 and older have pre-diabetes.
- Native Americans / Alaska Natives are over 2x as likely as Non Hispanic Whites to have diabetes

Interesting facts about diabetes

For the year 2000

- ▣ About 1/3 of the individuals born will develop diabetes
- ▣ About 1/2 of the individuals born in that same year will develop pre-diabetes

- ▣ In the United States, among those diagnosed with diabetes:
 - Every hour
 - 2 individuals will go blind
 - Another 5 will start dialysis
 - 6 will suffer stroke
 - 9 will undergo amputation
 - 10 will have a heart attack
 - Another 26 will die
 - 15 million dollars is spent on diabetic health care in the U. S.

Diabetic Foot Care in Indian Country

- ▣ More than 50% of all lower extremity amputations in the U. S. occur in people with diabetes
- ▣ 1 in 4 adult patients seen in IHS are likely to have diabetes
- ▣ Of the diabetes patients seen, 20% will present with an acute foot problem.
- ▣ Over the course of their care, 15% will experience a foot ulcer
- ▣ 5 – 10% will need lower limb amputation
- ▣ 50% of those who get an amputation die within 5 years
- ▣ Approximately 75% of lower extremity amputations due to diabetes can be prevented

Diabetic Foot Care in Indian Country

A clinical study from Indian Health Service in the Bemidji Area showed that the use of foot care guidelines decreased amputation rates by 50%.

The same study showed that additional vascular surgery outreach services and the use of specialty shoes further reduced the amputation rate by half, resulting in an overall reduction in amputations of 75%.

**** Treatment is not going to fix this problem –
Prevention and Education are the key****

OVERVIEW

- ▣ Common foot problems

- ▣ Diabetic foot problems
 - Wounds
 - What is neuropathy?
 - Prevention strategies

- ▣ Foot care / protection
 - Annual foot exam
 - Daily foot care
 - ▣ Foot Hygiene
 - ▣ Foot Protection

**Keep your feet healthy by
learning to recognize and treat
common foot problems**



Understanding the problem

Only a small percentage of the population is born with foot problems. It is neglect, and a lack of awareness of proper care -- including ill-fitting shoes -- that bring on the problems.

75-80%

Of all individuals will have some type foot problem in their lifetimes

Knowledge is power



Foot Pain is not “normal” and needs investigation!

In the workplace

Understand the "big three" federal safety regulations for foot protection:

1. OSHA 1910.132 (d) - hazard assessment within your plant environment;
2. OSHA 1910.136 - occupational foot protection, general requirements; and
3. OSHA 1910.132 (f) a, iv, v - employee training and fitting for protective footwear compliance.

In the workplace

- ▣ According to the Bureau of Labor Statistics, more than 60,000 foot injuries per year result in lost work days.
- ▣ According to the National Council on Compensation Insurance, the average cost of a lost work day foot injury is \$9,600.
- ▣ Eighty percent of all footwear injuries are caused by an object weighing no more than 30 pounds impacting the foot.

In the workplace

The HSE estimates that almost 200,000 people are suffering occupational lower limb disorders caused or made worse by their work.

One of the causes is prolonged standing which can cause:

- ❑ Damage joints
- ❑ cause swelling of the legs
- ❑ Varicose veins are also associated with prolonged standing.
- ❑ Foot problems: bunions and corns, steel spurs and even flat feet.

Workers who are required to spend too much time on their feet are at greatly increased risk of pain and discomfort around their feet, legs, hips and lower back.

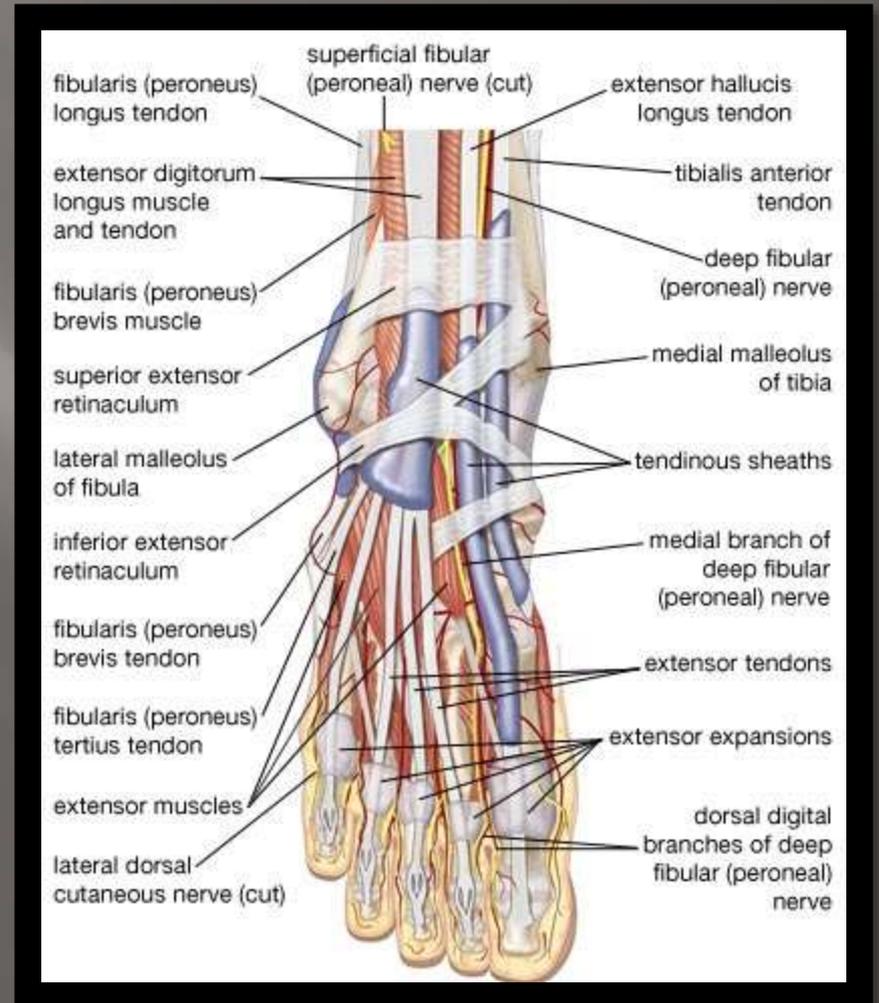
Workplace designers can help employees who stand for a long time by using flooring material that has some give, such as wood, cork, or rubber, rather than hard, unyielding concrete. This isn't possible for every job, but it should be considered when it is an option.

In the workplace

- ❑ Don't think that foot injuries only happen in factories or construction sites either.
- ❑ Slippery floors can cause a fall.
- ❑ Long periods of standing or “pounding the pavement” can cause everything from bunions to fallen arches.
- ❑ Heavy boxes can fall off a store shelf.
- ❑ There are a whole range of foot problems associated with workplace conditions, including calluses, ingrown toenails and tired feet. (Not occupational injuries in the strictest sense) but associated discomfort, pain and fatigue have a direct impact on productivity and can lead to further injuries.

Foot & Ankle

- ▣ **26 bones**
- ▣ **33 joints**
- ▣ **Over 100 ligaments, tendons, muscles**
- ▣ **250,000 sweat glands producing 1/2 pint moisture**
- ▣ **3-4 miles/day | 15,000 miles/lifetime**



Bunion treatments



Correction of the bunion with minimally invasive surgery



Pre-operative bunion



Post-operative bunion

Hammertoe

When toe muscles get out of balance, they can cause painful toe problems



Flatfoot (pes planus)

Flatfoot is characterized by the sole of the foot coming into complete or near-complete contact with the ground.



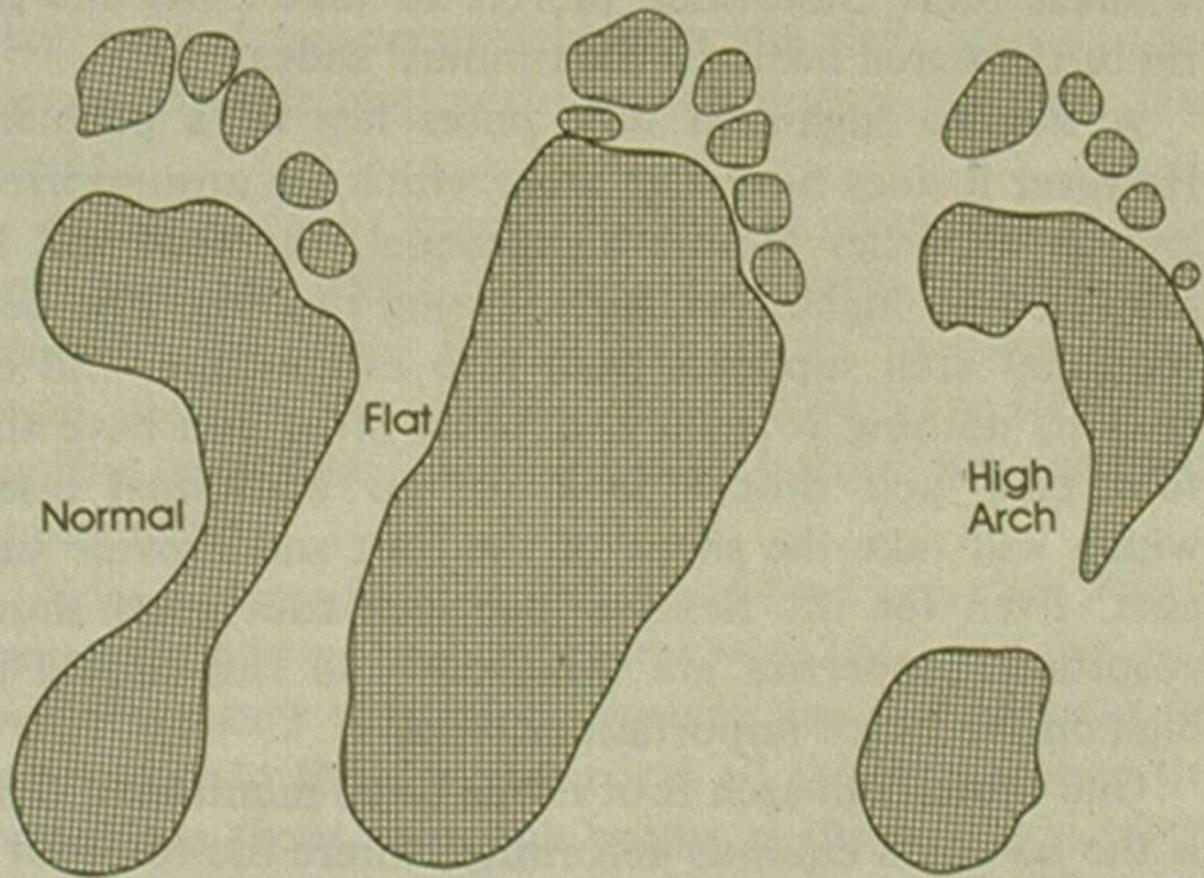


Fig. 14.1 Footprints from normal, flat, and high arched feet.

Corns and calluses

Friction causes the thick, hardened, dead skin of corns and calluses, which form to protect sensitive skin



Warts

Plantar warts are tough, horny growths that develop on the soles of the feet, warts can develop on other areas of the feet also. Contagious, they're caused by a virus entering through broken skin.



Athlete's foot

A fungal infection that can cause peeling, redness, itching, burning, and sometimes blisters and sores, athlete's foot is mildly contagious.



Fungal nail infection

Occuring when microscopic fungi enter through a break in the nail, a fungal infection can make your nails thick, discolored and brittle



Onychomycosis



Fungal infections of the nail, the fungi that cause them thrive in warm, moist areas and high levels of glucose fuel fungal growth.

Ingrown toenail

A toenail that has grown into the skin, an ingrown toenail can result in pain, redness, swelling, even infection



Paronychia



Paronychia is a skin infection that occurs around the nails.

Gout



Acute gout attacks are characterized by a rapid onset of pain in the affected joint followed by warmth, swelling, reddish discoloration, and marked tenderness. The small joint at the base of the big toe is the most common site for an attack.

Diabetic Skin

- If you have diabetes and your blood sugar is high, the body loses fluid through excess urination and this can cause your skin to become dehydrated and dry.
- Your skin can also get dry if the nerves, especially those in your legs and feet, do not get the message to keep your skin soft and moist (because of diabetic neuropathy). Dry skin can become cracked and allow germs to enter and cause infection.
- In addition, dry skin can become red and sore, and can crack and peel. Germs can enter through the cracks in your skin and cause an infection. Dry skin usually is itchy, and scratching can lead to breaks in the skin and infection.
- Skin problems are common in people with diabetes. High levels of sugar in the blood provide an excellent breeding ground for bacteria and fungi, and can reduce the body's ability to heal itself. These factors put people with diabetes at greater risk for skin problems.
- Fortunately, most skin conditions can be prevented and successfully treated if caught early. But if not cared for properly, a minor skin condition can turn into a serious problem with potentially severe consequences.



Cellulitis Foot



Diabetic Dermopathy

Also known as shin spots, usually found on the lower legs of people with diabetes. The result of changes in the small blood vessels that supply the skin and leak from these vessels into the skin.



The Diabetic Foot

- ▣ The feet can be affected by:
- ▣ Decreased blood supply → poor healing
- ▣ Nerve damage → loss of feeling
- ▣ High Blood Sugar levels → slow healing

Foot Complications

- ▣ **Infection**
 - **Skin and bone**
- ▣ **Foot ulcers**
- ▣ **Gangrene**
- ▣ **Neuropathy**
- ▣ **Peripheral vascular disease**
- ▣ **Trauma / Charcot**

Diabetic Foot Infection



Diabetic Foot Infection: Acute cellulitis and osteomyelitis causing death of the middle toe (appears bluish/black), ulceration, and systemic illness in patient with poorly controlled diabetes.

Diabetic Foot Infection



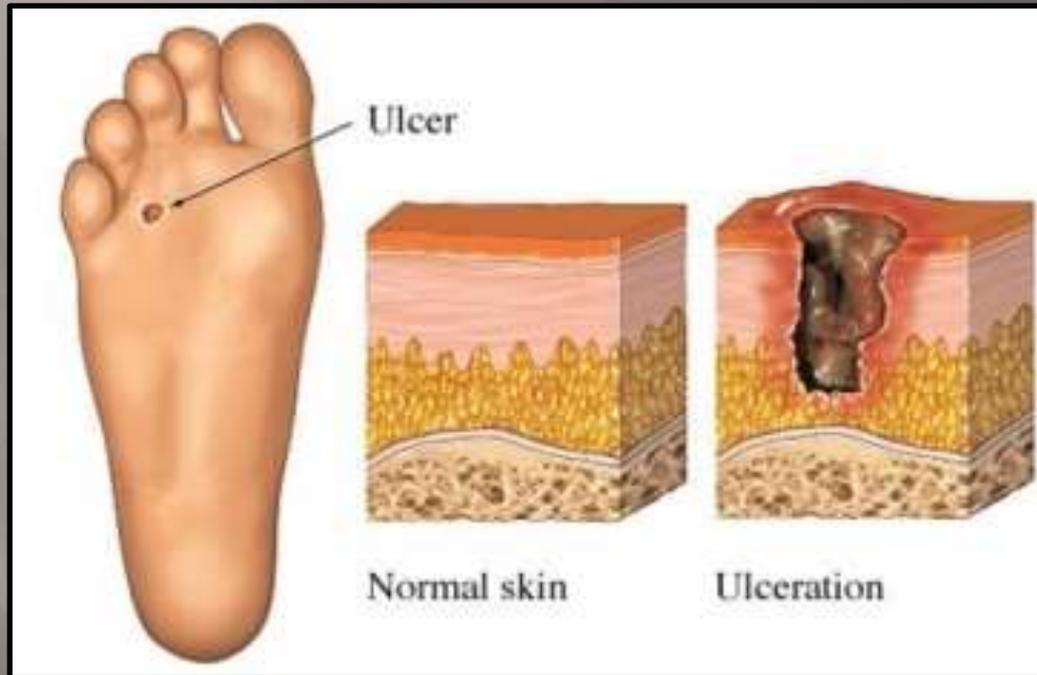
Long standing, poorly controlled diabetes has led to peripheral arterial disease and neuropathy. These disorders put patient at risk for the severe infection seen in the right foot.

Foot ulcers



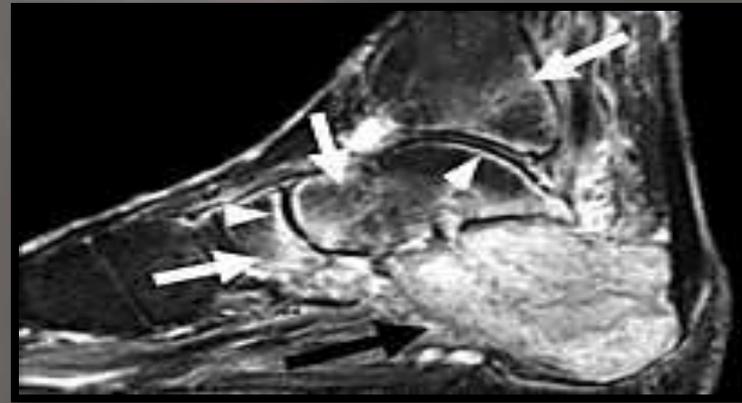
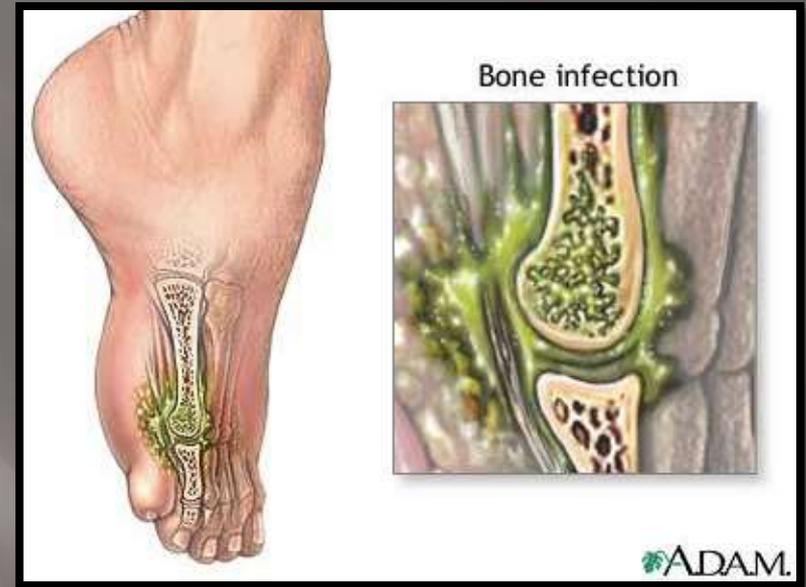
Ulcer formation begins with loss of protective sensation, repeated stress (pressure) leading to tissue damage and tissue death, inflammation, infection which continues to break down and increase in size.

Foot ulcers



Ulcers may look small on the surface but can be very deep and extensive under the surface.

Osteomyelitis

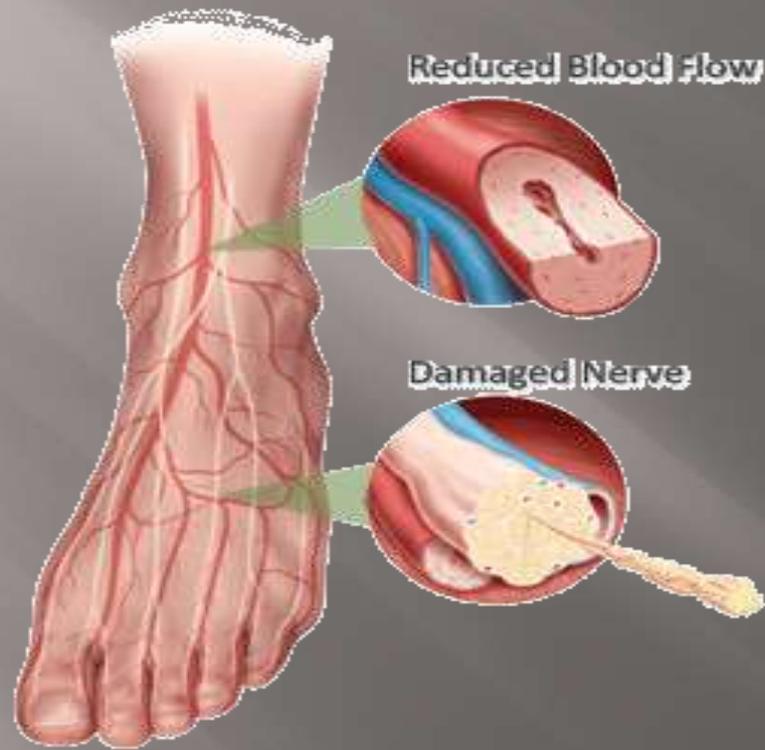


Bone infection can be caused by bacteria, infection may spread to a bone from under a chronic skin ulcer

Gangrene of the Toes

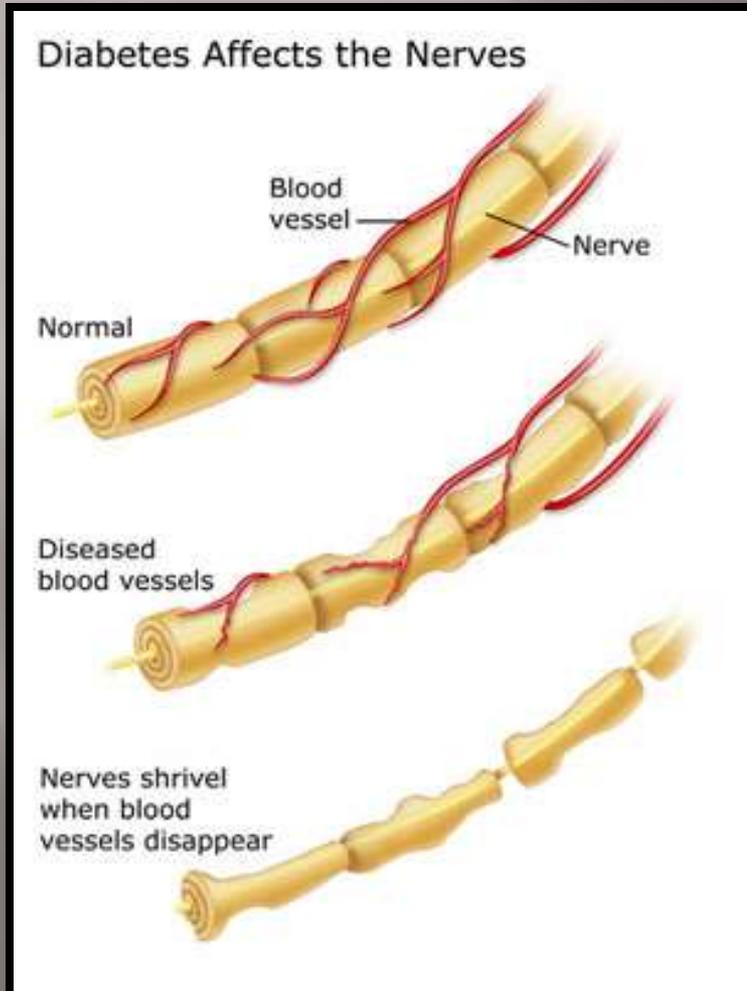


What is Diabetic Neuropathy?



A neuropathy is a disorder that affects the nervous system. A diabetic neuropathy can affect nearly any part of the body, but the feet are typically affected first.

What Causes Diabetic Neuropathy?



High glucose or blood sugar levels over a long period of time cause damage to the blood vessels that supply the nerve endings, throughout the body. Since, the blood vessels and the nerves in the hands and feet are some of the smallest; those are the areas of the body that are affected first.

To function properly, the nerves need adequate blood flow. If blood flow is reduced, the nerves may cause constriction of the blood vessels, which further reduces the blood flow. Eventually, the nerves can simply die, due to lack of oxygen and nourishment from the blood. When the nerves die, the blood supply to the toes and other extremities is reduced even further.

What are the Symptoms of Diabetic Neuropathy?

The symptoms of diabetic neuropathy vary, depending on which nerves or which area of the body are affected. Since we are focusing here on diabetic foot care, the symptoms may include:

- ▣ Decreased sensitivity to pain
- ▣ Hypersensitivity to pain
- ▣ Numbness
- ▣ Tingling
- ▣ Shooting, burning or electric pains
- ▣ Cold feet/inability to judge temperatures
- ▣ Foot ulcers
- ▣ Infections
- ▣ Muscle and bone deformities (Hammertoes or Charcot foot)



How Is Diabetic Neuropathy Treated?

- ▣ Prescription drugs, such as anti-depressants or anticonvulsants may be prescribed, but there are **no treatments that reverse neuropathies.**
- ▣ Tight blood glucose control is essential to help prevent the conditioning from progressing rapidly.
- ▣ Effective diabetic foot care helps to relieve the pain and prevent the most serious complications.

PREVENTIVE FOOT CARE IS THE KEY!

Neuropathy consequences

- Peripheral neuropathy

most common type of diabetic neuropathy

causes pain or loss of feeling in the toes, feet, legs, hands, and arms

leads to weakness / falls / injury/ ulcers

- Autonomic neuropathy

causes changes in digestion, bowel and bladder function, sexual response, and perspiration

can affect the nerves that serve the heart and control blood pressure, as well as nerves in the lungs and eyes

can cause hypoglycemia unawareness a condition in which people no longer experience the warning symptoms of low blood glucose levels

Charcot Foot

- ▣ **Charcot foot** is a medical condition in patients having significant **nerve damage (neuropathy)**. This nerve damage limits the ability of the patient to feel pain when foot is injured due to trauma or overdoing an exercise program.

As a result of inability to feel the pain, the patient continues to use the injured foot, not giving it the time to heal. This results in weakening and eventual fracture of bones in the foot, leading to joint collapse and deformity.

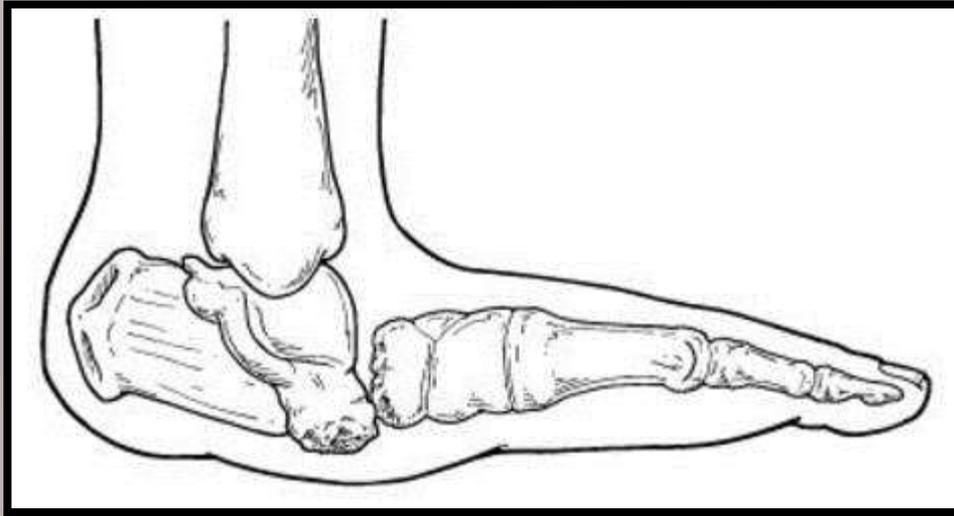
Charcot Foot x-ray



Normal right foot x-ray

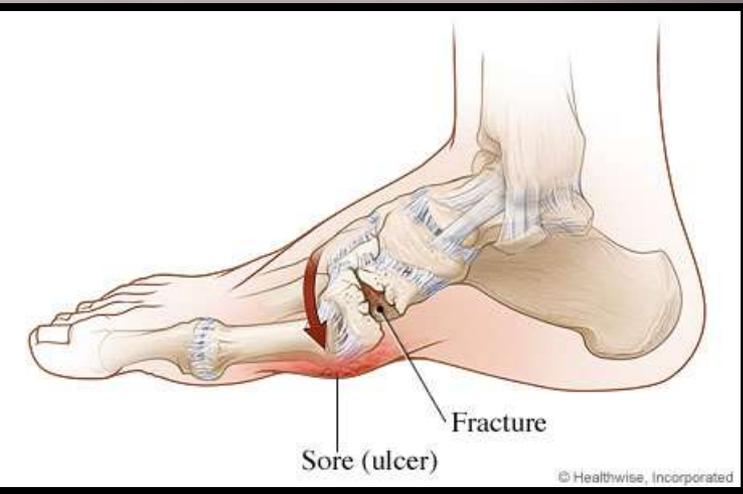


Charcot right foot x-ray



The charcot foot assumes a rocker-bottom appearance making it very difficult for patient to walk.

Ulcers caused by Charcot foot



As the disease progresses, it can result in developing pressure sores, infection of bone and eventual amputation

Pressure Unloading



Felt insoles
Protective foot wear
Crutches/walkers

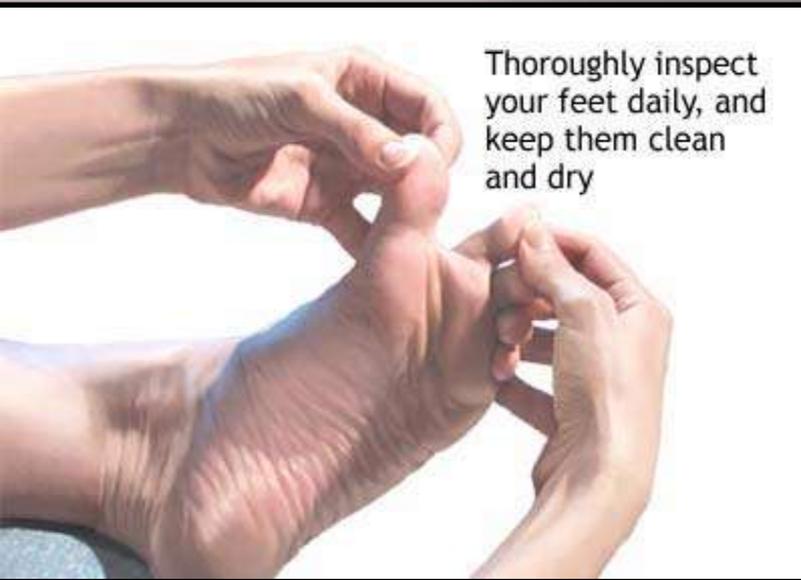




Foot Care / Prevention

- ▣ **Check both feet daily**
- ▣ **Wash with warm - not hot - water**
- ▣ **Trim Your Toenails Carefully**
- ▣ **Toe nails should be cut straight across and filed smooth**
- ▣ **Stay soft (lotion)- but dry**
- ▣ **Skip the barefoot look**
- ▣ **Treat Corns and Calluses Gently**
- ▣ **Protect Your Feet from Heat and Cold**
- ▣ **Get Your Health Care Provider to Check Your Feet at Least 4 Times a Year**

Inspect and Wash Daily



Wash your feet every day in warm but not hot water and dry carefully between the toes. Many problems can be prevented by good hygiene. Tinea Pedis can cause splits in the skin between the toes as you can see in the picture

Check your feet

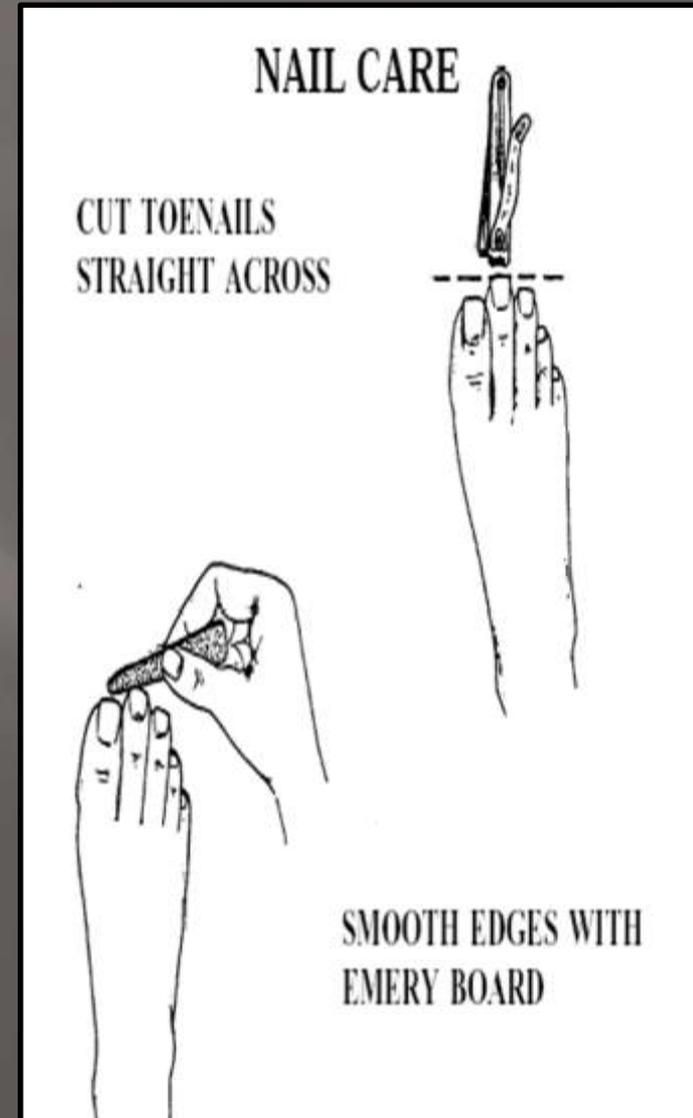
Keep them soft



Use of an emollient cream daily will help prevent cracks, especially around the heels. Emollient should not be used between the toes as this area is often too moist in the first place

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 or nurse trim them

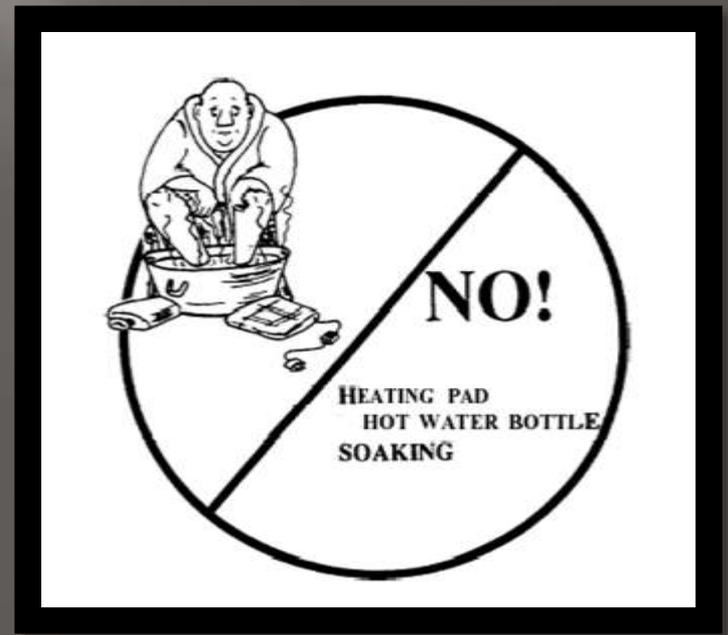
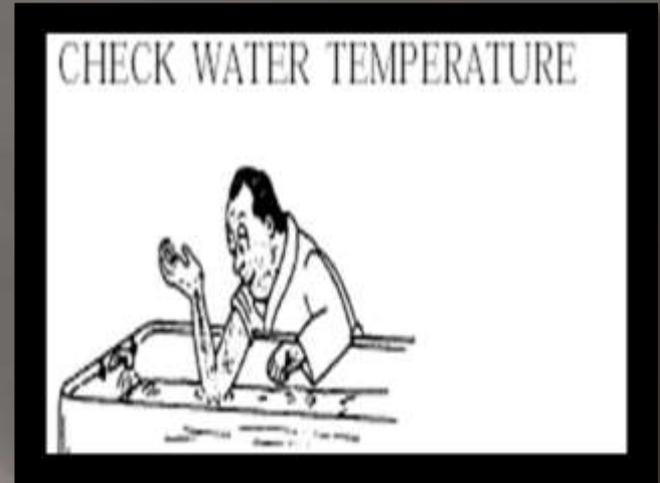


Keep the blood flowing to the feet

- Keep feet up when sitting
- Exercises for the feet
 - Wiggle toes for 5 minutes, 2 or 3 times a day
 - Move ankles up and down and in and out
- Circulation
 - Avoid crossing legs
 - Avoid constriction of tight socks, elastic or rubber bands, or garters around your legs
- Don't smoke
 - Smoking reduces blood flow to feet
- Control
 - Blood glucose, blood pressure and cholesterol

Protect your feet from hot and cold

- Keep your feet away from radiators and open fires
- Do not use hot water bottles on feet
- Lined boots are good in winter to keep your feet warm and socks at night



Get Your Health Care Provider to Check Your Feet



SHOES *and* SOCKS

take 'em off!



IF YOU HAVE DIABETES

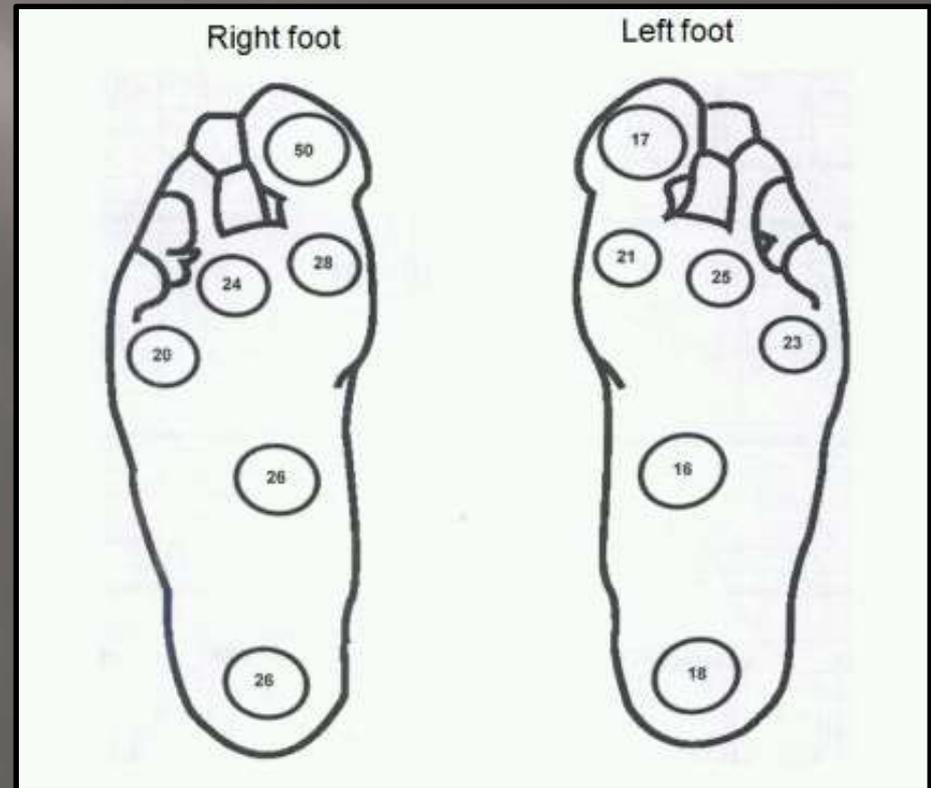
Have your doctor check your feet.

FOOT EXAM

- ✓ Skin & Integument
- ✓ Vascular
- ✓ Neurological
- ✓ Musculoskeletal
- ✓ Shoe gear

Monofilament Testing

Patients with diabetes who have lost protective sensation as measured by monofilament testing are at significantly increased risk to develop a foot ulcer that can lead to subsequent lower extremity amputation.



FOOT PROTECTION

**It stands
to reason!**



Foot Protection



Wear shoes and socks at all times

Shoes should fit well and protect your feet. Don't wear shoes that have plastic uppers, and don't wear sandals with thongs between the toes. New shoes should be comfortable at the time you buy them—don't expect them to stretch out.

Slowly break in new shoes by wearing them only 1 or 2 hours a day.

Appropriate shoes



Shoe shape must match foot shape.

Pointed toes or high heels put too much pressure on the toes

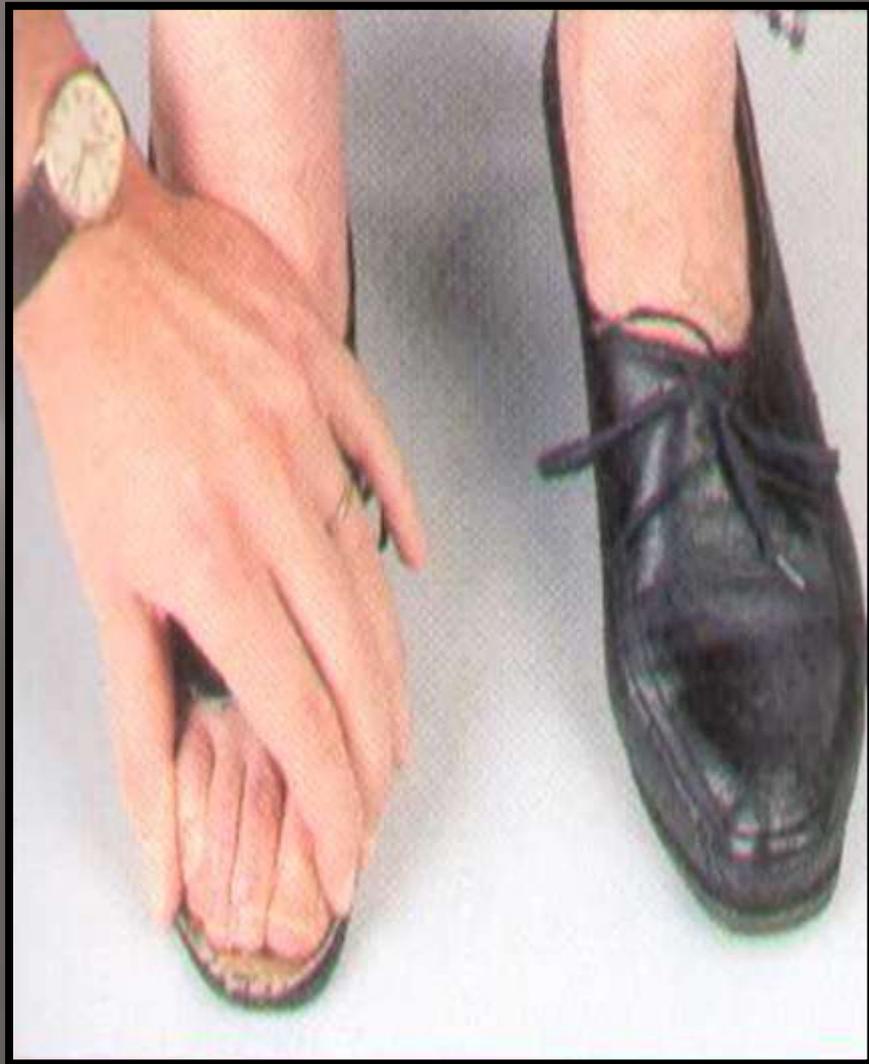
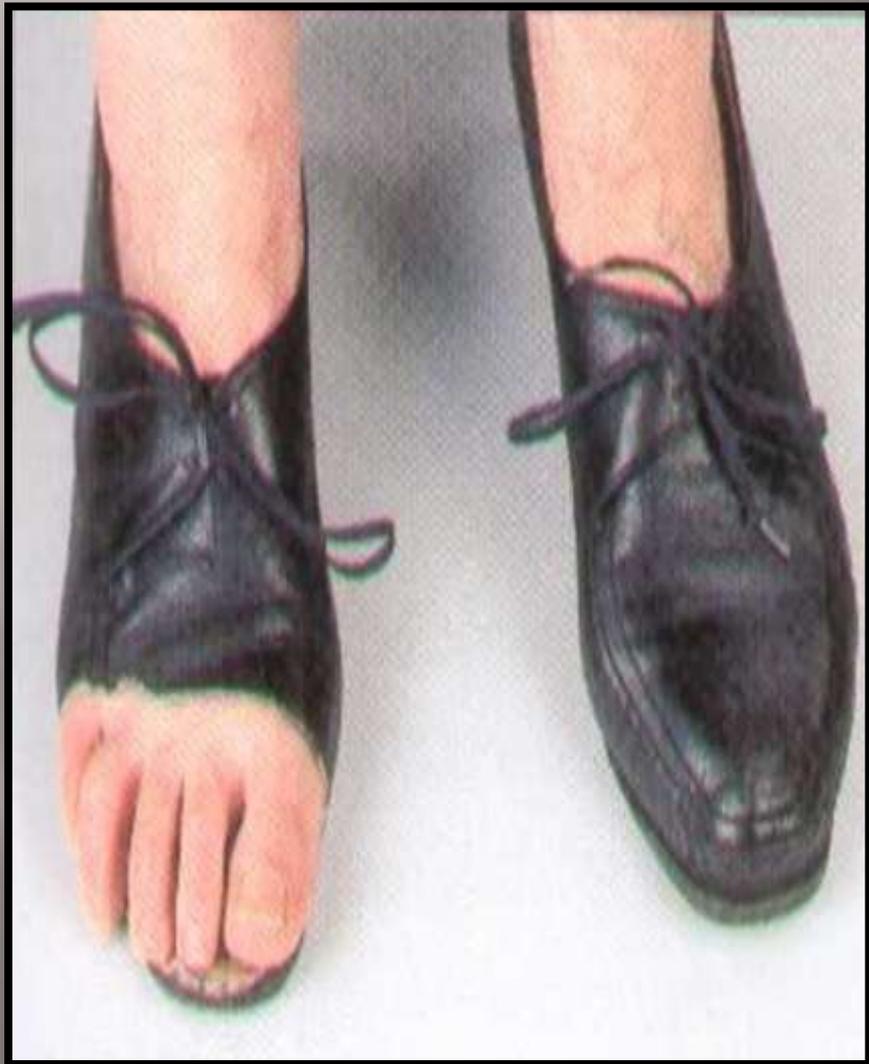
A better shoe is the soft-topped lace up shoe with plenty of room in the toe-box

Lace up shoes hold the foot more firmly into the heel of the shoe and do not allow the foot to slide about in the shoe the way slip-ons do

less likelihood of getting callous and in-growing toenails with lace up shoes



Shoes must accommodate foot deformities.



Diabetic shoes



ADDED DEPTH IN TOE BOX AND FOREFOOT allows extra toe room and provides adequate space for use of orthotics.

PADDED TONGUE minimizes lacing pressure over the instep.

FOAM CUSHIONED COLLAR prevents heel slippage for a snug and friction-free fit.

EXTENDED MEDIAL HEEL STABILIZER provides rear foot walking stability and minimizes slippage.

REMOVABLE, DUAL-DENSITY INSOLE with Drilllex cover wicks moisture away from the foot to keep it healthy and dry. The insole permanently forms to the foot, where the molded bottom provides additional cushioning.

STEEL SHANK adds support and stability with excellent arch support.

WIDE SHANK, LIGHTWEIGHT OUTSOLE provides a ball-of-foot base for stability and great fit, and a mild Rocker Bottom to move the foot forward during walking.

Diabetic shoes, sometimes referred to as extra depth or therapeutic shoes, are specially designed shoes or inserts intended to reduce the risk of skin breakdown in diabetics with co-existing foot disease.

Orthotics



Custom orthotics are specially made devices designed to support, provide pressure relief and comfort for your feet

Diabetic socks



- Choose socks made of cotton or wool—they help keep your feet dry.
- Made without seams or wrinkle-prone material to reduce pressure and blistering
- Non-binding top, loose tops constrict less and improve blood flow



Seams in socks cause increased pressure (10x) on the toes that can lead to the development of blisters or abrasions.

If blisters or abrasions become infected, they could lead to something much worse – ulcers and amputation.

Check your shoes!



It is always a good idea to check the inside your shoes every day to see that there are no stones or other sharp objects inside which could injure the foot. Watch out for torn linings in shoes - they can so easily cause blisters to form.

Fortunately, a little TLC goes a long way in preventing foot problems from diabetes

