

DIABETIC FOOT ULCERS & COMPLICATIONS:

- Diabetes can lead to many different types of foot complications, including athlete's foot (a fungal infection), calluses, bunions and other foot deformities, or wounds and ulcers that can range from a surface wound to a deep infection.
- Longstanding high blood sugar can damage blood vessels, decreasing blood flow to the foot. This poor circulation can weaken the skin, contribute to the formation of ulcers, and impair wound healing. Some bacteria and fungi thrive on high levels of sugar in the bloodstream, and bacterial and fungal infections can break down the skin and complicate ulcers.
- More serious complications include deep skin and bone infections.
- Gangrene (death and decay of tissue) is a very serious complication that may include infection; widespread gangrene may require foot amputation.
- Approximately 5 percent of men and women with diabetes eventually require amputation of a toe or foot. This tragic consequence can be prevented in most patients by managing blood sugar levels and daily foot care.
- Elevated blood glucose levels over time can damage the nerves of the foot, leading to

neuropathy decreasing a person's ability to notice pain and pressure. Without these sensations, it is easy to develop callused pressure spots and accidentally injure the skin, soft tissue, bones, and joints.

- Over time, bone and joint damage can dramatically alter the shape of the foot. Nerve damage, also called neuropathy, can also weaken certain foot muscles, further contributing to foot deformities.
- Patients who have had a previous foot ulcer are more likely to have future foot complications.
- Nerve damage, poor circulation, and chronically high blood sugar levels also increase the likelihood of foot complications.
- It is important to wear shoes that fit well. Shoes that are too tight can cause pressure ulcers. Going barefoot, even in the home, should be avoided as this increases the risk of injury to the foot.
- People with type 1 diabetes for at least five years should have their feet examined at least once a year. People with type 2 diabetes should have their feet examined once per year.
- During a foot exam, a healthcare provider checks for poor circulation, nerve damage, skin changes, and deformities. An exam may reveal

decreased or absent reflexes or decreased ability to sense pressure, vibration, pin pricks, and changes in temperature.

- Special devices, including a monofilament or tuning fork, can help determine the extent of nerve damage. A monofilament is a very thin, flexible thread that is used to determine if a patient can sense pressure in various areas of the foot. A tuning fork is used to determine if a patient can sense vibration in various areas, especially the foot and toe joints.
- Some simple clues can point to circulatory problems. Poor pulses, cold feet, thin or blue skin, and lack of hair signal that the feet are not getting enough blood.
- Nerve damage may lead to unusual sensations in the feet and legs, including pain, burning, numbness, tingling, and fatigue.
- Nerve damage may cause no symptoms as the foot and leg slowly lose sensation and become numb. This can be very dangerous because the person may be unaware that they have improperly fit shoes, a rock or other irritant in a shoe, or other problems that could cause damage.
- Excessive skin dryness, scaling, and cracking may indicate that circulation to the skin is

compromised. Other skin changes may include healed or new ulcers, calluses, and broken skin between the toes

- The structure and appearance of the feet and foot joints can indicate diabetic complications. Nerve damage can lead to joint and other foot deformities. The toes may have a peculiar "claw toe" appearance, and the foot arch and other bones may appear collapsed. This destruction of the bones and joints is called Charcot arthropathy
- Controlling blood sugar levels can reduce the blood vessel and nerve damage that often lead to diabetic foot complications.
- If a foot wound or ulcer does occur, blood sugar control reduces the risk of requiring amputation.
- Avoid smoking as it can worsen heart and vascular problems and reduce circulation to the feet
- Avoid activities that can injure the feet, including walking barefoot, using a heating pad or hot water bottle on the feet, and stepping into the bathtub before testing the temperature.
- Use care when trimming the nails and trim the toe nails along the shape of the toe and file the nails to remove any sharp edges. Never cut (or allow a manicurist to cut) the cuticles. Do not

open blisters, try to free ingrown toenails, or otherwise break the skin on the feet.

- Wash and check the feet daily — Use lukewarm water and mild soap to clean the feet. Gently pat your feet dry and apply a moisturizing cream or lotion.
- Check the entire surface of both feet for skin breaks, blisters, swelling, or redness, including between and underneath the toes where damage may be hidden. Use a mirror if it is difficult to see all parts of the feet or ask a family member to help.
- Choose socks and shoes carefully and select cotton socks that fit loosely, and change the socks every day. Select shoes that are snug but not tight, and break new shoes in slowly to prevent any blisters. Ask about customized shoes if the feet are misshapen or have ulcers; specialized shoes can reduce the chances of developing foot ulcers in the future. Shoe inserts may also help cushion the step and decrease pressure on the soles of the feet.
- See a healthcare provider for a foot check at least once a year, and more frequently if there are foot changes.
- Treatment of superficial ulcers (involving only the top layers of skin) usually includes cleaning

the ulcer and removing dead skin and tissue (debridement) by your healthcare provider or Wound Specialist.

- If the foot is infected, antibiotics are generally prescribed. The patient should keep weight off the foot ulcer as much as possible, meaning that they should not walk with the affected foot. The foot should be elevated when sitting or lying down. The ulcer should be checked by healthcare provider or Wound Specialist at least once per week to make sure that the ulcer is improving.
- Ulcers that extend into the deeper layers of the foot, involving muscle and bone, usually require hospitalization. More extensive laboratory testing x-rays and MRI may be done, and intravenous antibiotics are often necessary. Surgery may be necessary to remove infected bone.
- If part of the toes or foot become severely damaged, causing areas of dead tissue (gangrene), partial or complete amputation may be required. Amputation is reserved for patients who do not heal despite aggressive treatment, or whose health is threatened by the gangrene. Untreated gangrene can be life-threatening.

- Some patients with severe foot ulcers and peripheral vascular disease (poor circulation) may require a procedure to restore blood flow to the foot
- New options include synthetic wound dressings, substances that stimulate healing and support the growth of infection-fighting cells, skin substitutes, and exposure to elevated oxygen levels including hyperbaric Oxygen Therapy.

National Library of Medicine

(www.nlm.nih.gov/medlineplus/healthtopics.html)

•National Institute of Diabetes and Digestive and Kidney Diseases

(www.niddk.nih.gov)

•American Diabetes Association (ADA)

(800)-DIABETES ([800-342-2383](tel:800-342-2383))
(www.diabetes.org)

•The Endocrine Society

(www.endo-society.org)