

## Diabetic Foot Evaluation and Management



With nearly 246 million people across the globe battling diabetes and its complications, staying one step ahead of the disease has never been more important. More than 60 percent of non-traumatic, lower-limb amputations in the United States occur among people with diabetes. Because of this, the American Podiatric Medical Association (APMA) continues its national campaign that aims to educate the public about the importance of seeing a podiatrist regularly to prevent diabetic, lower limb amputations.

The APMA continue to emphasize that the rate of amputation for those with diabetes is 10 times higher than those without the disease. Being vigilant in your personal foot care and including your podiatrist in your diabetes management team, can save both your limbs and your life. A quarter of people with diabetes will develop a diabetic foot ulcer (DFU). Despite the prevalence and disabling consequences of a DFU, many people lack awareness of this serious diabetic complication.

The longer a DFU remains untreated, the greater risk of hospitalization and increased health care costs. Diabetic patients with a DFU are at a significant risk for infections like MRSA and increased risk for amputation. They are more prone to develop foot infections, and foot ulcers, which can quickly result in amputation. Preventing amputation means knowing all of the main warning signs. Every 30 seconds, a lower limb is lost to diabetes somewhere in the world. Preventing amputation means knowing all of the main warning signs.

In 2002 there were 82,000 lower extremity amputations in diabetics and this number continues to rise. A slow healing or non-healing open sore (ulceration) on the foot is the most common reason diabetics will end up with a foot or leg amputation. Over 2 million diabetics have ulcerations and one in four diabetics with an ulcer will have an amputation. Unfortunately, over 25% of diabetics have not heard of an ulcer. There are many factors which contribute to the development of ulcerations.

### Peripheral Angiopathy and Neuropathy

When we talk about circulation we are referring to the blood circulating in the body through the blood vessels. The arteries carry blood with oxygen and nutrients from the heart to the tissues. The veins carry blood with CO<sub>2</sub> and other waste products back to the heart and lungs to be excreted. Circulation problems are caused when the blood, oxygen and nutrients can't get to the lower extremities. High blood sugar can contribute to hardening of the arteries, making blood flow and nutrient transfer to tissues difficult. Without vital nutrients and oxygen, the feet and toes can become cold and painful, the skin changes color and even the smallest cut or scrape or infection will be difficult to heal. Smoking also causes problems with circulation to the feet and in combination with diabetes, usually results in disaster.

Diabetes increases the chance of developing foot problems because of poor circulation and decreased sensation in the lower extremities. Damaged nerves may make it difficult to feel irritations, pain, pressure, heat and cold. Decreased feelings may allow injuries to go unnoticed.

Poor circulation may lead to blocked blood vessels with reduced blood flow, oxygen and nutrients. Infection fighting white blood cells and healing red blood cells may be insufficient to fight an infection and heal wounds. Weakened bones and joints may cause your foot to collapse and provide less stability.

Your nerves tell you what types of sensations you are feeling, whether you are feeling something that is hot, cold or painful. We typically don't think of pain as a good thing, but pain tells your body something is wrong. For example, if you were to step on a sharp object, the pain signal would be sent to the brain and in response to this pain, you would pick up your foot up, off the sharp object.

In diabetics, the nerves can lose their ability to sense pain. There are many theories for why this happens:

- The blood supply is decreased to the nerves, causing dysfunction.
- The increase in blood sugar causes malfunction.
- The sugar metabolism within the nerve causes swelling and results in compression of the nerves.
- There are losses of specific enzymes that are needed to enable nerve function.
- There are more free radicals causing oxidative damage within the nerve as a result of the increased sugar.

Regardless, the result is the same. There is a loss of sensation in the feet and sometimes in the hands. This is called diabetic peripheral neuropathy. Diabetics develop ulcerations because of the lack of feeling in their feet due to diabetic peripheral neuropathy. The ulcerations don't heal because of the constant pressure and rubbing on the ulcer or because of poor circulation. For this reason, treating diabetic ulcers is difficult. Preventing diabetic ulcers is not.

Take these steps to help prevent diabetic foot complications:

1. **Check your feet everyday!** This is an absolute necessity. If you can't reach your feet, have a friend or family member check your feet. If needed, put a mirror on the floor and put your foot over it to look for cuts, scraps, bruises, openings or areas of irritation. Make sure you check between your toes. Look for moist areas, white areas or red areas. Look for anything unusual. If you see something unusual, make an appointment with your podiatric physician.
2. **Don't walk around barefoot.** Needles, tacks, broken glass, splinters of wood can be hidden in the carpet, even if you vacuum regularly. You can puncture a foot without sensation. Punctures can go unnoticed and develop into ulceration or infections.

### 3. Diabetic red flags include

- *A tingling or loss of feeling in the feet*
- *Redness*
- *A change in the shape of the feet*
- *Loss of hair*
- *Cuts and scrapes that are slow to heal*

If you discover any of these symptoms, visit your podiatric physician immediately. A comprehensive foot care treatment plan can reduce amputation rates by 45 percent to 85 percent. Including a podiatrist in your diabetes management team, as well as having a proactive attitude about your foot care can drastically improve your chances of managing diabetes successfully.

Because diabetes is a condition that affects many different parts of the body (systemic disease), the ideal case management involves a team approach. The podiatric medical physician is an integral part of the team, providing early recognition and treatment of foot pathology associated with diabetes. Early intervention can prevent amputations and complications.