



## Diabetic Neuropathy

Diabetic neuropathy is nerve damage caused by diabetes. When it affects the arms, hands, legs and feet, it is known as diabetic peripheral neuropathy. Diabetic peripheral neuropathy is different from peripheral arterial disease (poor circulation) which affects the blood vessels rather than the nerves.

Three different groups of nerves can be affected by diabetic neuropathy:

- *Sensory nerves*, which enable people to feel pain, temperature and other sensations
- *Motor nerves*, which control the muscles and give them their strength and tone
- *Autonomic nerves*, which allow the body to perform certain involuntary functions such as sweating

Diabetic peripheral neuropathy does not emerge overnight. Instead it usually develops slowly and worsens over time. Some patients have this condition long before they are diagnosed with diabetes. Having diabetes for several years may increase the likelihood of having diabetic neuropathy.

The loss of sensation and other problems associated with nerve damage make a patient prone to developing skin ulcers (open sores) that can become infected and may not heal. This serious complication of diabetes can lead to loss of a foot, a leg or even a life.

### Causes

The nerve damage that characterizes diabetic peripheral neuropathy is more common in patients with poorly managed diabetes. However, even diabetic patients who have excellent blood sugar (glucose) control can develop diabetic neuropathy. There are several theories as to why this occurs, including the possibilities that high blood glucose or constricted blood vessels produce damage to the nerves.

As diabetic peripheral neuropathy progresses, various nerves are affected. These damaged nerves can cause problems that encourage development of ulcers.

Deformities such as bunions or hammertoes resulting from motor neuropathy may cause shoes to rub against toes and create a sore. The numbness caused by sensory neuropathy can make the patient unaware that this is happening. Because of numbness, a patient may not realize that he or she has stepped on a small object and cut the skin. Cracked skin caused by autonomic neuropathy combined with sensory neuropathy's numbness and problems associated with motor neuropathy can lead to developing a sore.

### Symptoms

Depending on the type(s) of nerves involved, one or more symptoms may be present in diabetic peripheral neuropathy.

#### **For sensory neuropathy:**

- Numbness or tingling in the feet
- Pain or discomfort in the feet or legs, including prickly, sharp pain or burning feet

#### **For motor neuropathy:**

- Muscle weakness and loss of muscle tone in the feet and lower legs
- Loss of balance
- Changes in foot shape that can lead to areas of increased pressure

#### **For autonomic neuropathy:**

- Dry feet

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- Cracked skin

## **Diagnosis**

To diagnose diabetic peripheral neuropathy, your podiatrist will obtain the patient's history of symptoms and will perform simple in-office tests on the feet and legs. This evaluation may include assessment of the patient's reflexes, ability to feel light touch and ability to feel vibration. In some cases, additional neurologic tests may be ordered.

## **Treatment**

First and foremost, treatment of diabetic peripheral neuropathy centers on control of the patient's blood sugar level. In addition, various options are used to treat the painful symptoms. Medications are available to help relieve specific symptoms such as tingling or burning. Sometimes a combination of different medications is used. In some cases, the patient may also undergo physical therapy to help reduce balance problems or other symptoms.

## **Prevention**

The patient plays a vital role in minimizing the risk of developing diabetic peripheral neuropathy and in preventing its possible consequences. Some important preventive measures include:

- Keeping your blood sugar levels under control.
- Wearing well-fitted shoes to avoid getting sores.
- Inspecting your feet every day. If you notice any cuts, redness, blisters or swelling, see your foot and ankle surgeon right away. This can prevent problems from becoming worse.
- Visiting your podiatrist on a regular basis for an examination to help prevent the foot complications of diabetes.

***Have periodic visits with your primary care physician or endocrinologist. Your podiatrist works together with these and other providers to prevent and treat complications from diabetes.***

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