

Diabetes is a disease in which the body doesn't produce or properly use insulin, a hormone that's needed to convert sugar, starches, and other foods into the nourishment and energy the body needs. This means the blood sugar (glucose) is too high (hyperglycemia). It affects about 16 million Americans, of all races and ethnic groups, and about half of these people are older than 60. Diabetes affects many body systems and, can lead to, or cause, other medical problems.

Those most at risk for diabetes:

- are overweight
- have a family history of diabetes
- are African American, Latino, Pacific Islander, Asian American, or Native American
- have a history of diabetes during pregnancy (gestational diabetes), or have had a baby weighing more than nine pounds at birth

People with diabetes have a greater risk of heart attack, blood vessel disease, nerve damage, kidney disease, blindness, and are more likely to have high cholesterol levels. However, one of the most common problems caused by diabetes is diabetic neuropathy.

What is Diabetic Neuropathy?

Diabetic neuropathy is a term that includes several nerve diseases. "Neuropathy" means "nerve disease."

Diabetic neuropathy affects peripheral nerves — those that are outside of the brain and spinal cord, such as nerves in the arms, legs,

hands, and feet. Some elderly diabetics with neuropathy also develop a condition called diabetic myopathy (muscle wasting), in which the small muscles of the foot, as well as some other muscles, become thinner and weaker.

What Causes Diabetic Neuropathy?

No one knows exactly what causes diabetic neuropathy, but studies have shown that people whose blood sugar levels are not well controlled are more likely to develop it.

Research also suggests that about half of persons who have had diabetes for a long time (more than 25 years) will develop some type of neuropathy. People with diabetes who smoke and drink alcohol are more likely to develop neuropathy.

Can Diabetic Neuropathy Be Prevented?

In some cases, diabetic neuropathy can be prevented. Patients who follow their recommended self-care program are less likely to develop diabetic neuropathy. Tight control and frequent checking of blood sugar (keeping as near to normal levels as possible), following your diet and exercise plan, not smoking, and maintaining normal weight, are all very important in preventing diabetic neuropathy. Regular, frequent visits to your health care provider are also important.

What Is Diabetic Neuropathy Like?

Diabetic neuropathy can cause pain that usually affects the arms, legs, hands, and feet. It can also affect other areas of the body, such

as the digestive system and urinary bladder. Neuropathy can also be caused by other conditions such as infectious diseases, blood diseases, and immune system disorders.

It is helpful to understand the different types of nerves that can be involved. The sensory nerves send messages back to the brain about various sensations, such as temperature, pain, and movement. Motor nerves send signals from the brain to the muscles to tell them to move. Autonomic nerves are involuntary, and control such things as heart rate, smooth muscles, and the function of glands.

Diabetic neuropathy can cause pain in the nerves of both legs or partial or complete loss of feeling, particularly in lower limbs. The pain is often worse in bed at night. A less common type involves weakness, severe pain, and muscle wasting.

Neuropathic pain can feel like burning, prickling, tingling, aching, stabbing, pins and needles, shooting, and even like an electrical current "buzz." The most common type of neuropathic pain occurs on both sides of the body, as in both legs and feet, or both hands. Neuropathic pain can come and go or it can continue for a long time.

Femoral neuropathy refers to pain in the thigh. This type of neuropathy can be accompanied by muscle wasting and weakness. In some cases, muscle wasting affects both thighs without any pain.

There may also be areas of decreased feeling (sensation) or numbness. Patients might not

be able to distinguish between sharp and dull sensations (a pinprick compared with a rubber pencil eraser, for example).

Loss of sensation in the lower limb and feet contributes to the risk of developing foot ulcers. This is one reason it is important that persons with diabetes wear properly fitting shoes and regularly examine their own feet for sores or other skin changes. Your health care provider can discuss appropriate foot care and monitoring with you.

Diabetic neuropathy can also lead to a condition called neuropathic arthropathy or Charcot joint. In this condition the joints are deprived of pain and position sense due to the neuropathy. This means they are more susceptible to injury. Also, since blood circulation in the diabetic foot is abnormal, joint nourishment is reduced. These factors combined result in severe damage, usually in the joints in the foot. Sometimes, surgery is necessary to repair the joint.

In autonomic neuropathy, functions and organs that are controlled by autonomic nerves are affected. If the autonomic nerves are involved, patients can experience low blood pressure when getting out of bed or rising from a chair (called orthostatic hypotension), diarrhea, urinary retention (difficulty emptying the bladder completely), impotence (erectile dysfunction), and the pupils of the eyes may become smaller and react slowly to light. Digestive problems can occur if the stomach is affected.

How Is Diabetic Neuropathy Diagnosed?

The first step in diagnosing neuropathy is to tell your health care provider what you are feeling or about problems that you are experiencing. It is important to tell your provider if you are having pain, incontinence (leaking of urine), difficulty with digestion, sexual problems, or a loss of feeling in your lower limbs. Treatments are available to help decrease your symptoms.

Your health care provider might perform some tests to evaluate how the nerves in your lower limbs are working. Simple tests include checking your muscle strength and checking if you can feel light pinpricks or vibrations from a tuning fork.

Your health care provider might also perform other tests, such as electromyography (EMG) which measures electrical impulses in muscles from a small electric shock stimulation. He or she might also do electromyographic studies or take an x-ray, if a joint is affected.

What Can Be Done About Neuropathic Pain?

So far, there is no "cure" for neuropathic pain. However, patients with neuropathic pain or autonomic problems can be treated.

Pain medications can help, especially if taken at regular times throughout the day. Waiting until the pain becomes severe before taking medication is not as effective as taking regularly scheduled doses.

Your health care provider will prescribe pain medication after reviewing your medical con-

dition. Depending on the type and level of pain, your health care provider might recommend an over-the-counter pain medication or a prescription drug. Research has shown that certain anticonvulsant drugs can help relieve persistent neuropathic pain. Other medicines known to help relieve some kinds of persistent pain include antidepressant medications and local anesthetics. Capsaicin creams that can be applied to the skin are also effective in treating some neuropathic pain.

Remember, neuropathic pain can be prevented in some cases and improved in most cases. The most important steps in avoiding neuropathic pain are to maintain your ideal weight, exercise, control your blood sugar levels, and not to smoke.

Additional Resources

American Diabetes Association
ATTN: National Call Center
1701 North Beauregard Street
Alexandria, VA 22311
1-800-DIABETES (1-800-342-2383).
www.diabetes.org

Source: California Healthcare Foundation/AGS Panel on Improving Care for Elders with Diabetes. Guideline for Improving the Care of the Older Person with Diabetes Mellitus. *J Am Geriatr Soc* 2003; 51: S265 – S280



The American Geriatrics Society

The American Geriatrics Society (AGS) is dedicated to improving the health and well-being of older adults. With a membership of over 6,000 health care professionals, the AGS has a long history of improving health care for older adults.



The AGS Foundation for Health in Aging

The Foundation for Health in Aging (FHA) builds a bridge between the research and practice of geriatrics health care professionals and the public. FHA advocates on behalf of older adults and their special needs through public education, clinical research, and public policy.

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