



## *Diabetic Nephropathy (Kidney Disease)*

What is diabetic nephropathy?

Nephropathy is the deterioration of the kidneys. The final stage of nephropathy is called end-stage renal disease, or ESRD.

Diabetes is the most common cause of ESRD, accounting for more than 43 percent of cases. About 17 million people in the US have diabetes, and more than 100,000 people have ESRD as a result of diabetes. Both type 1 and type 2 diabetes can lead to diabetic nephropathy, although type 1 is more likely to lead to ESRD.

There are five stages of diabetic nephropathy, or deterioration of the kidneys. The fifth stage is ESRD. Progress from one stage to the next can take many years, with 23 years being the average length of time to reach stage five.

What causes diabetic nephropathy?

Hypertension, or high blood pressure, is a complication of diabetes that is believed to contribute most directly to diabetic nephropathy. Hypertension is believed to be both the cause of diabetic nephropathy, as well as the result of damage that is created by the disease. As kidney disease progresses, physical changes in the kidneys often lead to increased blood pressure.

Uncontrolled hypertension can make the progress toward stage five diabetic nephropathy occur more rapidly.

Can diabetic nephropathy be prevented?

The onset and progression of diabetic nephropathy can be slowed by intensive management of diabetes and its symptoms, including taking medications to lower blood pressure.

Treatment for diabetic nephropathy:

Specific treatment for diabetic nephropathy will be determined by your physician based on:

- your age, overall health, and medical history
- extent of the disease
- your tolerance for specific medications, procedures, or therapies
- expectations for the course of the disease
- your opinion or preference

Treatment may include any, or a combination of, the following:

proper diet

exercise

strict monitoring and controlling of blood glucose levels, often with medication and insulin injections

medication (to lower blood pressure)

Treatment for ESRD often initially includes dialysis to cleanse the blood, and, eventually, kidney transplantation.

### The Importance of Foot Care

Taking care of your feet is especially important if you are experiencing neuropathy. The nerves of the feet are the longest in the body and often are affected by neuropathy. When a diabetes patient loses sensation in the feet, sores or injuries may go unnoticed until ulcers develop.

According to the National Institute of Diabetes and Digestive and Kidney Diseases, proper foot care in diabetes includes checking the feet daily; washing the feet daily; covering the feet with petroleum jelly before putting on socks and shoes; wearing thick, soft socks; wearing shoes that fit properly; checking the shoes for sharp edges or object before putting them on; never walking barefoot; cutting nails short and straight across; filing away dead skin, but not calluses; testing bath water temperature before getting in; wearing socks at night if the feet have a tendency to get cold; not sitting cross-legged; and having your physician check the feet regularly at visits.

### Diabetic Neuropathy (Nerve Problems)

What is diabetic neuropathy?

Diabetic neuropathy, a nerve disorder, is a complication of diabetes that can lead to problems throughout the body.

Persons with diabetes can develop nerve problems at any time, but significant clinical neuropathy can develop within the first 10 years after receiving a diabetes diagnosis. The risk of developing neuropathy increases the longer a person has diabetes. About 50 percent of people with diabetes have some form of neuropathy.

What causes diabetic neuropathy?

Although the exact causes of diabetic neuropathy are unknown, several factors may contribute to the disorder, including the following:

high blood glucose

High blood glucose causes chemical changes in nerves and impairs the nerves' ability to transmit signals. It also has the potential to damage blood vessels that carry oxygen and nutrients to the nerves.

inherited factors

There are some genetic traits that may make some people more susceptible to nerve disease than others.

What are the symptoms of diabetic neuropathy?

The following are the most common symptoms of diabetic neuropathy. However, each individual may experience symptoms differently. Symptoms include:

numbness in the hands or feet

pain in the hands, feet, or legs

problems with internal organs such as the digestive tract, heart, or sexual organs causing the following:

indigestion

diarrhea or constipation

dizziness

bladder infections

impotence

weakness

weight loss

depression

The symptoms of diabetic neuropathy may resemble other conditions or medical problems. Always consult your physician for a diagnosis.

What are the different types of diabetic neuropathy?

Diffuse neuropathy is neuropathy that affects many parts of the body, and includes the following:

diffuse peripheral neuropathy - neuropathy that affects nerves in the extremities (legs, feet, arms, and hands).

Symptoms include:

numbness

tingling, burning, or prickling

sharp pains or cramps

extreme sensitivity to touch

loss of balance or coordination

insensitivity to pain or temperature changes

diffuse autonomic neuropathy - neuropathy that affects nerves that serve internal organs, processes, and systems of the heart, digestive system, sexual organs, urinary tract, and sweat glands.

Symptoms include:

incontinence

digestive problems

low blood pressure

dizziness

fainting

impaired perception of pain

hypoglycemia

profuse sweating

focal neuropathy - neuropathy that affects a single, specific nerve and part of the body, such as the eyes, facial muscles, hearing, pelvis and lower back, thighs, and abdomen.

Symptoms include:

pain in the thighs

severe pain in lower back or pelvis

pain in the chest, stomach, or flank

chest or abdominal pain that mimics angina, heart attack, or appendicitis

aching behind the eyes

inability to focus the eyes

double vision

paralysis on one side of face

hearing problems

How is neuropathy diagnosed?

In addition to a complete medical history and physical examination, the physician may:

check muscle strength.

check muscle reflexes.

check muscle sensitivity to the following:

position

vibration

temperature

light touch

request additional tests, such as:

nerve conduction studies (to check flow of electrical current through a nerve)

electromyography (to determine how muscles respond to electrical impulses)

ultrasound (to determine how parts of the urinary tract are functioning)

nerve biopsy (to remove a sample of nerve for examination)

Treatment for neuropathy:

Specific treatment for neuropathy will be determined by your physician based on:

your age, overall health, and medical history

extent of the disease

your tolerance for specific medications, procedures, or therapies

expectations for the course of the disease

your opinion or preference

The goal of treatment is to relieve pain and discomfort, as well as to prevent additional tissue damage. Treatment may include:

pain medications

antidepressant medications

topical creams

transcutaneous electronic nerve stimulation (TENS) therapy

hypnosis

relaxation training

biofeedback training

acupuncture

Treatment may also be prescribed for complications of neuropathy, such as gastrointestinal problems, dizziness and weakness, and urinary or sexual problems.