

Autonomic neuropathy

Introduction

Neuropathy is the term for damage to your nerves. Autonomic neuropathy is damage to the nerves that regulate the body functions that you can't control, including the nerves that regulate your heart rate, blood pressure, perspiration and digestion, among other functions. Neuropathies are often due to diabetes, although they also have other causes.

Your nerves transmit messages between your brain and your muscles, blood vessels, skin and internal organs. Autonomic neuropathy results in faulty communication between your brain and the parts of your body that your autonomic nervous system serves.

Signs and symptoms of autonomic neuropathy vary depending on which nerves are affected but can range from dizziness to trouble with digestion and urination to sexual difficulties. Treatment of autonomic neuropathy involves addressing the underlying cause, if possible, and managing the signs and symptoms.

Signs and symptoms

Signs and symptoms of autonomic neuropathy depend on which parts of your autonomic nervous system are most affected. They may include:

- **A drop in blood pressure** on standing (orthostatic hypotension), which can cause dizziness and fainting
- **Trouble with urination**, including diminished sensation, overflow incontinence and inability to empty your bladder completely, which can lead to urinary tract infections
- **Sexual difficulties**, including impotence in men, and vaginal dryness and difficulties with arousal and orgasm in women
- **Difficulty digesting food** (gastroparesis), which can cause a feeling of fullness after eating little, loss of appetite, diarrhea, constipation, abdominal bloating, nausea, vomiting and heartburn
- **Cardiovascular problems**, such as heart rate abnormalities that may include a lack of normal heart rate changes when you exert yourself
- **Heat intolerance**, especially during exercise, and abnormal — usually decreased — sweating
- **Sluggish pupil reaction** to light and dark
- **Exercise intolerance**, which causes your heart rate to remain unchanged instead of increasing and decreasing in response to your activity level

- **Lack of usual warning signs of low blood sugar** (hypoglycemia), which include shakiness, sweating and palpitations

Causes

Your nervous system is made up of two parts. The core is your **central nervous system** — your brain and spinal cord. The rest of your nervous system, branching off from your spinal cord to the rest of your body, is your **peripheral nervous system**.

Part of the peripheral nervous system involves nerves that you consciously control — such as nerves you use to move your voluntary muscles. Part is your autonomic nervous system — the nerves that regulate the part of your nervous system that you can't control, such as your heart rate, blood pressure and intestinal function.

Damage to your peripheral nerves is called peripheral neuropathy. Autonomic neuropathy is a type of peripheral neuropathy.

A number of conditions can lead to damage of the autonomic nerves. The most common cause is diabetes. About half the people who have diabetes eventually develop some type of neuropathy.

Other causes may include:

- **Alcoholism**, a chronic, progressive disease that can lead to nerve damage
- **Abnormal protein buildup** in organs (amyloidosis), which affects the organs and the nervous system
- **Autoimmune diseases**, in which your immune system attacks and damages parts of your body, including your nerves
- **Some tumors**, which can press on nerves and cause direct or remote damage (paraneoplastic syndrome)
- **Multiple system atrophy**, a degenerative disorder that destroys the nervous system
- **Surgical or traumatic injury** to nerves
- **Treatment with certain medications**, including some chemotherapy drugs and anticholinergics
- **Other chronic illnesses**, such as Parkinson's disease and HIV/AIDS

Risk factors

Having diabetes puts you at high risk of developing nerve damage, including autonomic neuropathy. The longer you have diabetes, the higher your risk. Risk is greatest for people who've had the disease for more than 25 years, who are older than 40 and who have difficulty controlling their blood sugar. Smoking, being overweight and having high levels of blood fat and high blood pressure also increase your risk of nerve damage.

Researchers don't yet completely understand how having diabetes can cause nerve damage, but they suspect that high blood sugar plays a role. In fact, the higher the blood sugar, the greater chance

you have of nerve damage. Controlling blood sugar — keeping it as close to the normal range as possible — decreases the risk of developing nerve damage or helps keep it from progressing.

When to seek medical advice

If you have diabetes, a compromised immune system or other chronic medical condition, see your doctor regularly. Seek medical care promptly if you begin experiencing any of the signs and symptoms of autonomic neuropathy.

Screening and diagnosis

Because autonomic neuropathy isn't a single disease, it can be difficult to diagnose. Often, determining the diagnosis is a matter of ruling out other causes of the signs and symptoms. Your doctor is likely to take a medical history, ask for a thorough description of your symptoms and do a physical exam.

Your doctor also may use a number of tests to aid in diagnosis. These may include:

- **Breathing tests.** These tests measure what happens to your heart rate and blood pressure in response to breathing exercises such as the Valsalva maneuver, in which you exhale forcibly.
- **Tilt-table test.** This test monitors your blood pressure and heart rate as you lie flat on a table that is tilted to raise the upper part of your body. The tilting places stress on your autonomic nervous system, which regulates your blood pressure and heart rate. Your doctor can see how you respond to a situation that's similar to what occurs when you stand up from lying down. Normally, your body compensates for the drop in blood pressure that occurs when you stand up by narrowing your blood vessels and increasing your heart rate. However, this process may not occur properly in autonomic neuropathy.
- **Quantitative sudomotor axon reflex test (QSART).** A small electrical current passes through four capsules placed on your forearm, foot and leg to activate the nerves that supply your sweat glands. You'll feel a slight burning sensation during this test.
- **Thermoregulatory sweat test.** During this test, you're coated with a powder that changes color when you sweat. You then enter a chamber with slowly increasing temperature. It causes your body temperature to increase 1 to 1.5 degrees Celsius, which makes most people sweat. Digital photos document the results. Your sweat pattern may help confirm a diagnosis of autonomic neuropathy or other causes for decreased sweating.
- **Ultrasound.** For people with bladder symptoms, high-frequency sound waves create an image of the bladder and other parts of the urinary tract, which your doctor can check for abnormalities.

Complications

The possible complications of autonomic neuropathy are many. They may include:

- **Injuries from falls** caused by lowered blood pressure when you stand
- **Mental and physical fatigue** due to low blood pressure
- **Malnutrition and weight loss** from digestive system difficulties

- **Fluid or electrolyte imbalance** from excessive vomiting or diarrhea, a condition in which your body loses minerals you need
- **Relationship problems** due to sexual dysfunction
- **Urinary problems**, including urinary tract infections
- **Cardiovascular complications**, such as irregular heartbeat (arrhythmia)
- **Kidney failure** from bladder problems that aren't treated properly

Treatment

Treatment for autonomic neuropathy depends on the underlying cause and the particular signs and symptoms you're experiencing. For example, if the underlying cause is diabetes, you'll need to control your blood sugar to keep it as close to normal as possible. If the underlying cause is an autoimmune disease, treatment will focus on modulating your immune system and decreasing inflammation.

The goal of treatment is to manage the underlying condition, repair nerve damage, if possible, and provide symptom relief.

Medications

The type of medication your doctor may prescribe depends on your symptoms.

- **Gastrointestinal symptoms.** Your doctor may prescribe metoclopramide (Reglan, Metoclopramide HCL), which helps your stomach empty more rapidly by increasing the contractions of the stomach and intestines. Possible side effects include diarrhea when taken in high doses, drowsiness and restlessness. Other medications include fiber supplements to relieve constipation and tricyclic antidepressants for diarrhea and abdominal pain. Possible side effects of tricyclic antidepressants include orthostatic hypotension, drowsiness, urinary retention, constipation and dry mouth.
- **Sexual dysfunction.** Your doctor may prescribe sildenafil (Viagra), vardenafil (Levitra) or tadalafil (Cialis) for erectile dysfunction. Possible side effects include flushing, indigestion and headache. Don't take these medications if you've had a heart attack, stroke or life-threatening heart rhythm in the previous six months. Treatments for vaginal dryness include vaginal estrogen cream (Premarin, Estrace), which you insert into your vagina with an applicator two or three times a week, and vaginal estrogen rings (Estring), which release estrogen for 90 days.
- **Bladder problems.** Bethanechol (Urecholine) helps improve urination and emptying of the bladder. Possible side effects include dizziness, lightheadedness or fainting. The anticholinergic medications tolterodine (Detrol) and oxybutynin (Ditropan) calm an overactive bladder. You may experience dry mouth when taking anticholinergics. Your doctor also may prescribe an antibiotic to clear up a urinary tract infection.
- **Postural hypotension.** If you get dizzy or feel faint from a drop in blood pressure when you get up, your doctor may prescribe medication, a high-salt diet or support stockings. He or she may prescribe fludrocortisone acetate (Florinef) to help your body retain salt or recommend a blood pressure regulator such as midodrine (ProAmatine). Possible side effects of midodrine include blurred vision, headache and pounding in the ears. Recently, pyridostigmine (Mestinon) has shown promising results for treating postural hypotension without causing high blood pressure when lying down (supine hypertension), a common problem with midodrine.

- **Sweating.** If autonomic neuropathy affects sweating, it usually causes a decrease. But if you experience excessive sweating, your doctor may prescribe a drug that inhibits sweating, such as glycopyrrolate (Robinul, Robinul-Forte) or clonidine (Catapres).

Therapies and procedures

If you have trouble emptying your bladder fully, your doctor may recommend intermittent urinary catheterization, a procedure in which a tube is threaded through your urethra to empty your bladder. Psychotherapy or counseling may be appropriate if you're depressed. Sex therapy or couples counseling might be helpful if you're experiencing relationship problems as a result of sexual dysfunction.

Prevention

Taking good care of your health in general and managing any medical condition that puts you at risk of autonomic neuropathy is the best prevention. Unfortunately, however, there's no way to prevent degenerative diseases, such as multiple system atrophy, that increase the risk of developing autonomic neuropathy. Ways to help prevent autonomic neuropathy may include:

- Control your blood sugar if you have diabetes.
- Get help if you have a problem with alcohol.
- Get appropriate treatment if you have an autoimmune disease.
- Take steps to prevent or control high blood pressure.
- Achieve and maintain a healthy weight.
- Stop smoking.
- Exercise regularly.

Self-care

If you have trouble digesting food and your symptoms are mild, your doctor might recommend eating small, frequent meals, avoiding fats and reducing intake of dietary fiber. For a drop in blood pressure when you stand up, wearing elastic stockings and sleeping with your head elevated may help.

Coping skills

Living with a chronic illness or disability presents daily challenges. Some of these suggestions may make it easier for you to cope:

- **Set priorities.** Decide which tasks you need to do on a given day, such as paying bills or shopping for groceries, and which can wait until another time. Stay active, but don't overdo.
- **Seek and accept support.** Having a support system and a positive attitude can help you cope with the challenges you face. Ask for or accept help when you need it. Don't shut yourself off from family and friends.
- **Prepare for challenging situations.** If something especially stressful is coming up in your life, such as a move or a new job, knowing what you have to do ahead of time can help you cope.
- **Talk to a counselor or therapist.** Depression and impotence are possible complications of autonomic neuropathy. If you experience either, you may find it helpful to talk to a counselor or therapist in addition to your primary care doctor. There are treatments that can help.

[By Mayo Clinic Staff](#)

Apr 13, 2006

© 1998-2007 Mayo Foundation for Medical Education and Research (MFMER). All rights reserved. A single copy of these materials may be reprinted for noncommercial personal use only. "Mayo," "Mayo Clinic," "MayoClinic.com," "EmbodyHealth," "Reliable tools for healthier lives," "Enhance your life," and the triple-shield Mayo Clinic logo are trademarks of Mayo Foundation for Medical Education and Research.

DS00544

