

MEDICAL ENCYCLOPEDIA: PERIPHERAL NEUROPATHY

Alternative names

Peripheral neuritis; Neuropathy - peripheral; Neuritis - peripheral

Definition

Peripheral neuropathy is a problem with the nerves that carry information to and from the brain and spinal cord. This produces pain, loss of sensation, and inability to control muscles.

"Peripheral" means nerves beyond the brain and spinal cord.

"Neuro" means nerves.

"Pathy" means abnormal.

Causes, incidence, and risk factors

The peripheral nerves relay information from your central nervous system (brain and spinal cord) to muscles and other organs and from your skin, joints, and other organs back to your brain.

Peripheral neuropathy occurs when these nerves fail to function properly, resulting in pain, loss of sensation, or inability to control muscles.

In some cases, the failure of nerves that control blood vessels, intestines, and other organs results in abnormal blood pressure, digestion problems, and loss of other basic body processes.

Peripheral neuropathy may involve damage to a single nerve or nerve group (mononeuropathy) or may affect multiple nerves (polyneuropathy).

There are numerous reasons for nerves to malfunction. In some cases, no cause can be identified.

Some people have a hereditary predisposition for neuropathy.

Prolonged pressure on a nerve is another risk for developing a nerve injury. Pressure injury may be caused by prolonged immobility (such as a long surgical procedure or lengthy illness) or compression of a nerve by casts, splints, braces, crutches, or other devices.

Symptoms

The symptoms depend on which type of nerve is affected. The three main types of nerves are sensory, motor, and autonomic. Neuropathy can affect any one or a combination of all three types of nerves. Symptoms also depend on whether the condition affects the whole body or just one nerve (as from an injury).

Sensation Changes

Damage to sensory fibers results in changes in sensation, burning sensations, nerve pain, tingling or numbness, or an inability to determine joint position, which causes in-coordination. For many neuropathies, sensation changes often begin in the feet and progress toward the center of the body with involvement of other areas as the condition worsens.

Movement Difficulties

Damage to the motor fibers interferes with muscle control and can cause weakness, loss of muscle bulk, and loss of dexterity. Sometimes, cramps are a sign of motor nerve involvement.

Other muscle-related symptoms include:

- Lack of muscle control
- Difficulty or inability to move a part of the body (paralysis)
- Muscle atrophy
- Muscle twitching (fasciculation) or cramping
- Difficulty breathing or swallowing
- Falling (from legs buckling or tripping over toes)
- Lack of dexterity (such as being unable to button a shirt)

Autonomic Symptoms

The autonomic nerves control involuntary or semi-voluntary functions, such as control of internal organs and blood pressure. Damage to autonomic nerves can cause:

- Blurred vision
- Decreased ability to sweat
- Dizziness that occurs when standing up or fainting associated with a fall in blood pressure
- Heat intolerance with exertion (decreased ability to regulate body temperature)
- Nausea or vomiting after meals
- Abdominal bloating (swelling)
- Feeling full after eating a small amount (early satiety)
- Diarrhea
- Constipation
- Unintentional weight loss (more than 5% of body weight)
- Urinary incontinence
- Feeling of incomplete bladder emptying
- Difficulty beginning to urinate (urinary hesitancy)
- Male impotence

Signs and tests

A detailed history will be needed to determine the cause of the neuropathy. Neurologic examination may reveal abnormalities of movement, sensation, or organ function. Changes in reflexes and muscle bulk may also be present.

Tests that reveal neuropathy may include:

- EMG (a recording of electrical activity in muscles)
- Nerve conduction tests
- Nerve biopsy
- Blood tests to screen for medical conditions, such as diabetes and vitamin deficiency, among others.

Tests for neuropathy are guided by the suspected cause of the disorder, as suggested by the history, symptoms, and pattern of symptom development. They may include various blood tests, x-rays, scans, or other tests and procedures.

Treatment

The first steps of treatment are to identify and treat the underlying medical problem (such as diabetes) or remove the cause (such as alcohol). Other goals include controlling symptoms, curing the disorder if possible, and helping the patient gain maximum independence and self-care ability.

Physical therapy, occupational therapy, and orthopedic interventions may be recommended. For example, exercises and retraining may be used to increase muscle strength and control.

Wheelchairs, braces, and splints may improve mobility or the ability to use an affected arm or leg. Safety is an important consideration for people with neuropathy. Lack of muscle control and reduced sensation increase the risk of falls and other injuries. The person may not notice a potential source of injury because he or she can't feel it. For this reason, people with decreased sensation should check their feet or other affected areas frequently for bruises, open skin areas, or other injuries, which may go unnoticed (because there is no pain) and become severely infected. Often, a podiatrist can determine if special orthotic devices are needed.

Safety measures for people experiencing difficulty with movement may include railings, various appliances, removing obstacles such as loose rugs, and other measures as appropriate. Safety measures for people having difficulty with sensation include adequate lighting (including lights left on at night), testing water temperature before bathing, use of protective shoes (no open toes, no high heels, and so on) and similar measures. Shoes should be checked often for grit or rough spots that may cause injury to the feet.

People with neuropathy (especially those with polyneuropathy or mononeuropathy multiplex) are prone to new nerve injury at pressure points (knees and elbows, for example). They should avoid prolonged pressure on these areas from leaning on the elbows, crossing the knees, or assuming similar positions.

Over-the-counter or prescription pain medications may be needed to control nerve pain. Anticonvulsants (phenytoin, carbamazepine, gabapentin, and pregabalin), tricyclic antidepressants (duloxetine), or other medications may be used to reduce the stabbing pains that some people experience. Use the lowest dose possible to avoid side effects.

Adjusting position, using frames to keep bedclothes off tender body parts, or other measures may also be helpful to reduce pain.

The symptoms of autonomic changes will be treated. However, they may be difficult to treat or respond poorly to treatment.

Postural hypotension (low blood pressure) -- use of elastic stockings and sleeping with the head elevated may help. Fludrocortisone or similar medications may be beneficial in reducing postural hypotension for some people.

Reduced gastric motility -- medications that increase gastric motility (such as metoclopramide), eating small frequent meals, sleeping with the head elevated, or other measures may help.

Bladder dysfunction -- manual expression of urine (pressing over the bladder with the hands), intermittent catheterization, or medications such as bethanechol may be necessary. Impotence, diarrhea, constipation or other symptoms are treated as appropriate.

Expectations (prognosis)

The outcome greatly depends on the cause of the neuropathy. In cases where a medical condition can be identified and treated, the outlook may be excellent. However, in severe neuropathy, nerve damage can be permanent, even if the cause is treated appropriately. For most hereditary neuropathies, there is no cure. Some of these conditions are harmless, while others progress more rapidly and may lead to permanent, severe complications.

Complications

The inability to feel or notice injuries can lead to infection or structural damage. Changes include poor healing, loss of tissue mass, tissue erosions, scarring, and deformity. Other complications include:

- Partial or complete loss of movement (or control of movement)
- Partial or complete loss of sensation
- Difficulty breathing
- Difficulty swallowing
- Cardiac arrhythmias (uncommon)
- Decreased self esteem
- Relationship problems related to impotence
- Recurrent or unnoticed injury to any part of the body

Calling your health care provider

Call your health care provider if symptoms of peripheral neuropathy are present. In all cases, early diagnosis and treatment increases the possibility that symptoms can be controlled. Nerve pain, such as that caused by peripheral neuropathy, can be difficult to control. If pain is severe, contact a pain specialist to make sure you get the best and most up-to-date pain treatment. Emergency symptoms include irregular or rapid heartbeats, difficulty breathing, difficulty swallowing, and fainting.

Prevention

If a prolonged procedure or immobility is expected, appropriate measures (such as padding vulnerable areas) can be taken beforehand to reduce the risk of nerve problems. Some people have a hereditary predisposition for neuropathy. Such people need to be especially careful to limit alcohol and manage other medical problems closely. All people can reduce the risk of neuropathy through a balanced diet, drinking alcohol in moderation, and maintaining good control of diabetes and other medical problems, if present.

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