

Peripheral neuropathy is a common condition which involves damage to the peripheral nerves, i.e. nerves once they have left the spinal cord.

It is often called the 'Silent Disease' because many people are unaware of its existence.

A recent book suggests that around 25 million Americans may have this condition!

The term encompasses quite a wide variety of different problems, so it is helpful to subdivide peripheral neuropathy into:

1. Polyneuropathy : several nerves affected, often bilateral symptoms (e.g. both legs); usually affects extremities first, in what is known as a 'glove and stocking' pattern.
2. Mononeuropathy: one nerve affected.
3. Mononeuropathy multiplex: random involvement of several nerves.
4. Radiculopathy: involvement of nerve roots.
5. Demyelination: e.g. Guillain-Barre Syndrome; affects both proximal (near the trunk) and distal (extremities) segments of the nerve.
6. Axonal degeneration: a 'dying back' neuropathy which starts in the extremities and works back towards the spine.

Peripheral neuropathy (PN) can also be subdivided into the type of nerve function which is affected:

1. Sensory (sensation loss)
2. Motor (weakness)
3. Sensorimotor (combined)
4. Autonomic: (involuntary nervous system which regulates body functions such as blood pressure, sweating etc.)

Often, PN will affect more than one type of nerve.

Another way to look at the various types is by causative factor:

1. Toxic: e.g. alcohol; arsenic; thalidomide; heavy metals; carbon monoxide; phenytoin; botulism; organophosphates; vincristine; colchicine; solvent abuse
2. Immune: Guillain-Barre Syndrome; CIDP#; Vasculitis; Sjogren's
3. Hereditary: amyloidosis; porphyria.
4. Metabolic: Diabetes\*; alcohol (acute); pellagra (deficiency of niacin, a B vitamin); beri-beri (thiamine deficiency) hypothyroidism.
5. Mononeuritis multiplex
6. Motor disorders with pain: polio
7. Localised disorders: Compression syndromes (e.g. Carpal Tunnel; see below); Radiculopathies; Reflex Sympathetic Dystrophy (CRPS Type I); herpes zoster infection(shingles);
8. Infective: TB, leprosy
9. Collagen vascular disorders: Systemic lupus, scleroderma, sarcoidosis; rheumatoid arthritis
10. Gluten sensitivity: coeliac disease; neuropathy may present in absence of other symptoms of gluten sensitivity.

Sometimes no causative factor is found: the condition is then termed 'idiopathic neuropathy'.

Note that mononeuropathy can be caused by direct pressure in activities such as gardening, stooping, jobs with repetitive mechanical duties (especially if using power tools such as routers, jack hammers etc.) A rather amusing one is 'back pocket sciatica' which arises from sitting on a wallet!

\*Diabetes is probably the commonest cause of peripheral neuropathy; the majority of patients with insulin dependent Diabetes will develop a degree of the condition, although it may remain subclinical (no symptoms). See below for further details.

# CIDP= Chronic Inflammatory Demyelinating Polyneuropathy : a sporadic inflammatory disorder, which is like a chronic Guillain-Barre Syndrome. Some authors suggest that CIDP is

the peripheral nerve equivalent of MS (which affects the central nervous system).

Arachnoiditis typically causes a radiculopathy, although in some patients, there seems to be an association with autoimmune conditions such as lupus, so that there might be a secondary cause of that type.

Note: some neuropathies (depending on the cause) may be improved considerably after treatment. It is therefore important not to assume that new symptoms are necessarily related to arachnoiditis

Symptoms and Signs:

- Pain: neuropathic type
- Pins and needles
- Loss of sensation
- Weakness
- Muscle wasting
- Reflex loss
- Loss of sweating
- Postural blood pressure drop

Effectively, there are 3 stages:

1. Slight loss of vibration sensation, light touch and ability to differentiate between sharp and dull; Some loss of proprioception (ability to tell position); this sensory loss may be imperceptible; EMG is normal at this stage.
2. Apparent sensory loss of vibration, light touch, sharp/dull distinction, proprioception; No severe pain as yet. EMG shows positive.
3. Advanced loss of sensation as well as sharp, shooting or dull, aching severe pain. EMG shows marked change.

The onset and duration of each of these stages varies considerably between

patients, regardless of the cause.

The experience of peripheral neuropathy:

- Inability to bear weight on legs
- Inability to sense temperatures>> accidents with burns and scalds
- Severe burning pain in numb areas: worse at night
- Feeling as if walking on broken glass
- Feeling as if hands/feet are thawing out after being frozen
- Inability to tolerate bed sheets, contact with partner's body in bed
- Loss of balance and co-ordination
- Disrupted sleep pattern
- Depression

Treatment

There is no 'cure' as such, so that treatment will largely depend initially upon treating the underlying cause:

- Diabetic neuropathy: stabilise blood sugar levels
- Remove any toxic agent
- Supplement any deficiency
- Correct any metabolic/endocrine abnormality
- Autoimmune/ inflammatory neuropathy can be treated by plasmapheresis, IVIg or immunosuppressive medication\*
- Paraneoplastic (tumour-related) neuropathy can be treated by eliminating the tumour.

Immunosuppressive medication includes: prednisolone (steroid) given orally; azathioprine; cyclophosphamide; cyclosporin.

Symptomatic treatment: the mainstay of PN therapy:

- For burning pains: antidepressants such as amitriptyline; anticonvulsants such as gabapentin; mexiletine; Ultram (tramadol)
- For shooting/stabbing pains: anticonvulsants: Phenytoin/tegretol/gabapentin/clonazepam
- For persistent aching pain: clonidine; gabapentin (baclofen is associated with muscle spasm/cramps)

You will no doubt note that we have met most of these medications elsewhere in this article!

Pyridoxine (Vitamin B6) has been found to be a useful measure of nutritional support following peripheral nerve damage; doses of up to 250mg/day have been used.

Alternatively a good vitamin B complex preparation might be helpful.

Anti-oxidants such as gamma-linoleic acid (GLA) found in Evening Primrose Oil, and alpha-lipoic acid have recently been found to be of some help in reducing the symptoms of PN.

General measures:

Use of hot/cold:

Heat tends to relieve sore muscles whereas cold alleviates pain by numbing the area.

However, arachniacs vary as to whether they can tolerate heat or cold; extremes of either can potentially be damaging if you have decreased temperature sensation, so don't use either heat/cold for more than 20 minutes maximum.

Foot care:

If you have numbness, you are less likely to notice injuries or sores, which could become infected or ulcerated if left untended.

The following are useful tips:

1. Check your feet every day, using a mirror if you can't bend to look closely, or ask someone else to do it.
2. Wash your feet every day in warm water, checking the temperature first using an elbow (just as they suggest for a baby bath!)
3. Always dry your feet thoroughly, especially between the toes
4. Your feet may have become wider and flatter as a result of small muscles becoming weaker. It is vital to wear comfortable shoes; cool ones for warm weather and good warm socks in colder weather (circulation may be poor: reduce the risk of chilblains or the impact of Raynaud's\*)
5. Use shoe inserts or buy shoes with air soles: they may cost more but it is well worth it.
6. Visit a chiropodist for treatment of corns/calluses and also for advice on shoes: he/she may take a plaster cast of your foot and make special shoes inserts for your individual needs.
7. Avoid walking round barefoot
8. When cutting toenails, cut straight across to avoid leaving sharp edges
9. Avoid sitting with your legs/ankles crossed: it cuts down your blood supply and can even cause further nerve damage such as pressure palsies
10. If you get a sore, seek medical attention to ensure necessary treatment is implemented.

Further reading: "Numb Toes and Aching Soles: Coping with Peripheral Neuropathy" Sennef, John A Trade paperback, 336 pages, MedPress July 1999

UK based organisation: The Neuropathy Trust, PO Box 26, Nantwich, Cheshire CW5 5FP; Tel: 01270 611 828

See below for more information about painful feet.

Diabetic neuropathy

It is impossible to cover this in depth but here are some brief points:

Most symptoms are mild and are confined to the extremities.

Autonomic nervous system involvement (autonomic neuropathy) is common and tends to cause the following problems:

- Sexual dysfunction
- Gastroparesis (slowed emptying of the stomach)
- Diabetic diarrhoea
- Bladder atony
- Loss of sweating in the feet
- Postural hypotension (dizziness/fainting on standing up)
- Abnormal heart rate/rhythm

A period of unstable blood sugar control may trigger an episode of acute painful neuropathy; this may resolve to some extent if control is re-established.

Proximal motor neuropathy (diabetic amyotrophy), femoral neuropathy or sacral plexopathy may occur; typically this causes deep, sharp pain in the thigh region, either in one or both legs, followed by muscle wasting and weakness. This tends to improve if blood sugar control is re-established.

Mononeuropathies: diabetic patients can develop a variety of isolate nerve problems.

These may include the third cranial nerve, which can cause acute pain around the eyes and in the forehead and double vision; the 6<sup>th</sup>. cranial nerve, (which innervates the muscle which moves the eye to the side) can also be affected.

Older patients may suffer from thoracoabdominal neuropathy, which is uncommon.

This presents as acute chest or abdominal pain, which may be mistaken for cardiac or gut disease.

Nerve entrapment (carpal tunnel syndrome etc.: see below) occurs more commonly in diabetic patients than in the general population.

A study has shown that PENS, which had already been demonstrated as effective in low back pain, may be helpful in treating painful diabetic neuropathy.