

PERIPHERAL NEUROPATHY

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The Neuropathy Trust states that: *'Peripheral neuropathy is not a complete diagnosis, but simply a statement that the peripheral nerves are not working properly.'*

The afferent peripheral nerves conduct sensory information from receptors on the surface and organs to the central nervous system (CNS) and carry efferent motor responses from the CNS to the effector muscles. Many nerves are mixed nerves carrying sensorimotor impulses. Peripheral neuropathy may be experienced as numbness, tingling or burning sensations, pain which may be intense but will eventually reduce to numbness, or muscular weakness.

To understand peripheral neuropathy it helps to understand the structure of a peripheral nerve. Neurons are the nerve cells that conduct nerve impulses via their axons to and from the CNS. A nerve consists of bundles of neuronal axons bound into a 'cable' complete with its own internal blood vessels. Sensory (afferent) and motor (efferent) neurons look different but have three essential things in common....

1. a cell body that regulates the growth and life processes of the neuron
2. dendrites that feed nerve impulses towards the cell body
3. an axon (myelinated in the fast A and B nerves) that conducts impulses away from the cell body and towards the synaptic junction with the dendrons of the next neuron.

Damage can occur to each of the parts of the neuron. Guillain-Barré syndrome attacks the myelin of the axon sheath and, by disruption of electrical impulse conduction, causes muscle weakness. A sudden drop-foot may arise from arteritis, damage to the axonal blood supply which occurs in systemic rheumatoid arthritis or systemic peripheral vascular disease, and the cell body may be damaged by toxins such as industrial chemicals or the excess sugar of systemic diabetes mellitus.

Damage may be of congenital, traumatic or systemic origin. Of the peripheral neuropathies of congenital origin (passed from parent to child), that of Charcot-Marie-Tooth Disease is the most common, causing weakness of limbs and appearing usually between childhood and the age of 30 years. Acquired damage may be the result of toxins, trauma, illness and infection (diabetes, alcoholism, certain medications, infections including Lyme disease, shingles, AIDS, kidney or thyroid disease, vitamin B1 or B12 deficiency, herniated vertebral discs). Neuropathies often arise from an unknown cause and are then labelled 'idiopathic' - one third of neuropathies remain unidentified and are classified under this heading. Fifty per cent of peripheral neuropathies are attributed to diabetes mellitus.

The nerves of the autonomic nervous system may also be affected by peripheral neuropathy leading to a host of diverse effects including loss of control of the sweating mechanism, cardio-vascular effects, inability to empty the stomach at the right time, loss of bladder control and erectile dysfunction.

The effect upon the sufferer is to reduce the quality of life, sometimes even to the point of losing the will to live. Those afflicted with peripheral neuropathy need mental support in addition to regular monitoring of the progress of the neuropathy. Regular neurological monitoring (standard fibre, 128 Hz tuning fork) aims at early recognition of any further loss causing treatment to be administered in time to minimise any advancement of the condition.

Defence of the foot by health advice, regular inspection and monitoring, padding, cushioning, footwear modification and orthotic provision if needed is of vital importance. The aim must be to prevent trauma to the foot that could lead to neuropathic ulceration which may prove recalcitrant and difficult to heal.

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The questions on this sheet are based upon the above-named paper. Answers should be submitted on A4 paper and should be of sufficient length to demonstrate full understanding of the topic. Single word answers are not permissible. Try to answer in one or two short paragraphs, not more than ¼ page per answer.

Q1. What is peripheral neuropathy?

Q2. What do sufferers of peripheral neuropathy complain of?

Q3. Damage to the axon sheath has the effect of?

Q4. Which part of the neurone is responsible for the neurone's life-processes?

Q5. What might be the effect of arteritis of a neurone?

Q6. Discuss the possible origins of nerve damage.

Q7. Toxins may cause damage to

Q8. What are 'idiopathic' neuropathies?

Q9. How is neuropathy monitored?

Q10. Why is important to recognise peripheral neuropathy?

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