



Neuropathy

Indications

Neuropathy is a term for a group of conditions where nerves are damaged. The main symptoms include numbness, tingling, burning or stabbing pains, muscle weakness, and loss of balance or co-ordination. ⁽¹⁾ Types of neuropathy include peripheral, cranial, autonomic and focal.

There can be many causes. The most common cause of peripheral neuropathy is diabetes, ⁽¹⁾ affecting between 30-90% of diabetic patients around the world. ⁽²⁾⁽³⁾ It can also be caused by other health conditions such as excessive alcohol drinking, ⁽⁴⁾ nutritional issues, physical injury to the nerves, hypothyroidism, vasculitis, chronic kidney or liver disease, high level of metal toxins, Lyme disease, and other diseases such as rheumatoid arthritis, lupus, Sjogren's syndrome or Guillain-Barre syndrome. ⁽¹⁾

The susceptibility of damage to the nerves can also be a result of toxins, medications and vitamin deficiencies. ⁽⁵⁾ Additionally, increased free-radical production and oxidative stress have been linked to neuropathy. ⁽³⁾

Side effects of some medications can also cause neuropathy especially if taken for long periods, such as metronidazole, nitrofurantoin, phenytoin, amiodarone, thalidomide and chemotherapy. ⁽¹⁾ However, in some cases there is no cause identified. ⁽¹⁾

Diagnosis involves testing sensation, strength and reflexes, or a more specialised test such as a nerve conduction test or electromyography. ⁽⁶⁾

Treatment depends on the underlying cause of the neuropathy, and controlling the symptoms of that cause. ⁽⁷⁾ However, many types cannot be cured. ⁽⁷⁾ Peripheral neuropathies are often treated with pain relievers, lidocaine patches, anti-seizure drugs, anti-depressants and capsaicin.

Recommended Tests

Blood Glucose HbA1c

It is being increasingly recognised that many individuals have neuropathy at the time of diagnosis, suggesting it may be a marker for pre-diabetes and may precede, rather than follow, type 2 diabetes. ⁽⁸⁾ A glucose test is recommended where undiagnosed diabetes is indicated.

[Sample requirement: EDTA blood lavender top tube]

Vitamin Profiles, Tests for B1, B6, B12, D and E

Vitamin B1 deficiency can affect neuropathy, ⁽⁷⁾ and a deficiency due to malnutrition may affect the cranial nerves. Neuropathy in alcoholism can present similar to beriberi symptoms. ⁽⁵⁾

Vitamin B6 can be problematic when there is a deficiency⁽⁷⁾ or excess. Since many patients with neuropathy often take vitamin B supplements, an excess of B6 is possible.⁽⁵⁾

Vitamin B12 deficiency is associated with neuropathy.⁽⁵⁾⁽⁷⁾⁽⁹⁾ Symptoms in both hands and feet may point to a vitamin B12 deficiency due to the involvement of the cervical spinal cord.⁽⁵⁾

Vitamin D insufficiency has been associated with symptoms⁽¹⁰⁾ and risk factors for peripheral neuropathy.⁽¹¹⁾

Vitamin E deficiency is linked to peripheral neuropathy⁽⁷⁾ and can be a result of fat malabsorption.⁽⁵⁾

[Sample requirements: clotted blood tube (gold top) for fat soluble vitamins & B12, heparin (green top) for vitamins B1 & B6]

Mineral Profile (without RBC Mg)

Copper deficiency may present similarly to vitamin B12 deficiency, and should be investigated in parallel with patients presenting with myeloneuropathy.⁽⁵⁾ Copper absorption competes with zinc absorption and there is an association with copper deficiency and zinc supplementation.⁽⁵⁾ Imbalanced copper and zinc levels have an impact on diabetic complications such as neuropathy.⁽¹²⁾

[Sample requirement: Trace element free plasma (navy blue top tube), heparin [green top] and clotted blood tube (gold top) - Copper and Zinc also available individually]

Toxic Metals Screen

Lead, Arsenic, Thallium and Mercury are all thought to be possible factors in neuropathy.^{(5) (7)} In addition, chronic arsenic poisoning will show on urine tests, they may not show late effects of single or repeated exposures, in which case a hair mineral test (Hair Element Analysis) is valuable if poisoning is suspected.⁽⁵⁾

[Sample requirement: Trace element free plasma (navy blue top tube)/6 hour urine specimen]

Fatty Acids Profile

Side effects from chemotherapy drugs (Paclitaxel) can cause numbness and tingling.⁽¹³⁾ Omega-3 fatty acids may be an efficient neuroprotective agent.⁽¹⁴⁾

[Sample requirement: EDTA (lavender top)]

HDL/Triglycerides

Dyslipidemia has been shown to affect peripheral nerve function.⁽²⁾ Low HDL cholesterol and high triglycerides are strongly correlated with the development of diabetic neuropathy.⁽¹⁵⁾

[Sample requirement for lipid profile: clotted blood tube (gold top)]

Gliadin Antibodies

Gluten sensitivity may be linked to a number of idiopathic neuropathies.⁽¹⁶⁾⁽¹⁷⁾ A Coeliac/gluten sensitivity profile is recommended covering all antibodies required to confirm/exclude gluten sensitivity (gliadin, tissue transglutaminase and Endomyseal antibodies)

[Sample requirement: clotted blood tube (gold top)]

Patient preparation

Patients should avoid mineral and vitamin supplements for 24-48 hours prior to having samples collected for above tests that cover these micronutrients. An overnight fast is required before the HDL/triglycerides test (minimum of 14 hours with no food or drink except water) and gluten should be consumed in the days before gliadin and related antibodies are measured.

Turn around time

Typically 5-7 working days for all of the above tests.

Advisory note:

This guide to a disease specific recommended panel of tests, lists those nutritional & biochemical pathology investigations that are justified in current medical literature and which may be appropriate for some individuals. These are guidelines only and individual requirements will vary depending on multiple factors (diet, use of nutritional supplements, food exclusions etc).

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