

A **nerve conduction study** (NCS) is an ideal neurophysiological examination that assesses the function of peripheral nerves by measuring the speed of the electrical activity along the course of a nerve.

The motor conduction study examines purely motor nerves that carry information with regards to movement from the brain or spinal cord to the muscles, whereas the sensory conduction study examines purely sensory nerves that carry information with regards to sensation (eg, pain, temperature) from skin receptors, to the brain and spinal cord and nerves that have both motor and sensory properties.

The Nerve Conduction Studies (NCS) held at the Neuroscience unit of the Dikteon Medical Centre are used to investigate the causes of:

- paralysis in a muscle or group of muscles
- the numbness in the hands or feet
- compressions of a nerve e.g. as a consequence of cervical/lumbar herniation
- entrapment neuropathies such as carpal tunnel syndrome, ulnar neuropathy, Saturday night palsy, peroneal neuropathy etc.
- compressions of the spinal cord e.g. in cervical myelopathy
- branchial/lumbar plexopathies
- radiculopathies
- rarer conditions such as polyneuropathies (with diabetes being the most common cause), myopathies, motor neuron disease and multiple sclerosis.

Every effort is made to create a comfortable and safe environment offering routine, out-patients Nerve Conduction Studies that meets the gold-standard set by the American Clinical Neurophysiology Society.

PROCEDURE

- Two small, round electrode discs are attached to the skin – a **recording electrode** is placed on the belly of a muscle innervated by the nerve to be tested, and a **reference electrode** is placed usually 3-4cm distal to the recording electrode (away from the muscle).
- A **ground electrode** is also attached to the skin, usually over the dorsal hand between the electrodes and the point of stimulation.
- An electrical depolarization (shock) building up to supramaximal level is given to the nerve using a stimulator, producing a Compound Muscle Action Potential (CMAP).
- Second or more points along the course of the nerve are stimulated.
- Action Potentials are recorded on the EMG device and these are used to measure the speed (myelination) and amplitude (axonal response) of the nerves tested.
- By stimulating different points along the course of the nerve and by precisely measuring the distance of the segments (millimetres) and dividing this by the difference in time (milliseconds), the conduction velocity or speed (metres per second) of the nerve can be calculated.
- The results are analysed by the Neurophysiologist and sent to the referring Neurologist or Neurosurgeon/Orthopedic Surgeon for clinical interpretation, further evaluation and management.