

NEUROPHYSIOLOGY

# HOW DOES THE NERVOUS SYSTEM WORK? NEUROPHYSIOLOGY HAS THE ANSWER

Neurophysiology is a medical specialty that uses sophisticated non-invasive techniques for studying the nervous system. For thousands of years human beings have been seeking to understand this complex system, but it was only with the advances in technology that we were able to gain some knowledge in this area and develop methods that help in the evaluation and treatment of neurological diseases.

Today we know that the nervous system consists of neurons, which are cells that transmit information by electrical and chemical impulses to the brain. These neurons form complex networks that in turn form the brain and spinal cord (central nervous system).

The nerves that connect the brain and spinal cord to the various organs and muscles (peripheral nervous system) are also made up of neurons. It is through the recorded data of the bioelectrical activity generated by the neurons and muscles that neurophysiology studies the central and peripheral nervous system.

The main tests in neurophysiology are:

**ELECTROENCEPHALOGRAPHY (EEG):** it is a non-invasive test that records the electrical activity of the brain. It is essential in the study of neurological diseases such as epilepsy and neurodegenerative disease, but can also be an asset in the study of psychiatric disorders such

as depression. The Hospital Particular do Algarve (HPA) has all the necessary medical and technical expertise for the diagnosis and treatment of both neurological and psychiatric diseases. Through Neurofeedback, the EEG also has a therapeutic component, which is used mainly in the treatment of attention deficit, hyperactivity and emotional trauma.

**ELECTROMYOGRAPHY AND NERVE CONDUCTION STUDIES (EMG and NCS):** these tests are essential in the study of diseases affecting the muscles, peripheral nerves and nerve roots (spinal cord). By recording the electrical activity of nerves and muscles, these tests permit the study of diseases that affect the nerves, such as Carpal Tunnel Syndrome and Multiple Sclerosis. This test is also



essential in the study of nerve compression in the spinal column which results in pain and lack of strength in the limbs as well as in the study of other neuromuscular disorders. At the HPA these tests are not limited to laboratory

tests, but are an extension of the neurological and neurophysiological consultation.

**SLEEP STUDIES:** These are tests for assessing sleep disturbances and are often used in the study of sleep

apnoea. The Neurophysiology Laboratory of the Alvor Hospital is the only one of its kind in the Algarve providing advanced diagnostic methods in this area (including Complete Polysomnography and Multiple Sleep

Latency) that, in addition to a further evaluation of sleep apnoea, also assists in the study of various disorders such as insomnia, periodic leg movements during sleep and restless leg syndrome, narcolepsy, among others.

**EVOKED POTENTIALS:** these studies consist of stimulating one of our senses (usually sight, sound or touch) and the registration of the reply of the brain and/or spinal cord to this stimulus. These results can be used to complement the study and monitoring of various neurological diseases.

The medical specialty of Neurophysiology is available at the Alvor and Gambelas hospitals of the HPA Health Group, comprising state of the art medical equipment and qualified professional staff, providing excellent results in an area with huge diagnostic and therapeutic potential in the study and treatment of various complex diseases.

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