

# Nerves move to avoid damage

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New research from the University of Eastern Finland and Kuopio University Hospital can help explain the prevalence of widespread syndromes such as carpal tunnel syndrome and sciatica. According to the results, neural movements can be measured by using non-invasive techniques, which are also applicable in diagnostics and rehabilitation planning.

Marinko Rade, MSc (Orthopaedic Medicine), presented the results in his doctoral thesis.

## Work or hobbies can put a strain on nerves

Daily motion can be extremely varied in terms of the movements of [peripheral nerves](#). Office workers can spend hours on a computer, repeatedly compressing the median nerve in its pathway into the carpal tunnel, but not all of them will develop [carpal tunnel syndrome](#). The same applies to auto mechanics who are prone to compression of the median nerve in the carpal tunnel in a similar way as [office workers](#), but not all of them will eventually need medical help. Water polo and handball players, on the other hand, are vulnerable to stretching of the median nerve around the glenohumeral joint and in front of the elbow when preparing for a shoot, but not all of them will become symptomatic and develop peripheral neuritis, either. The innovative research sheds light on the underlying reasons.

## Neural movements can be measured - and supported

It is believed that nerves move within the body in order to avoid potentially harmful mechanical forces such as tension and compression. They slide longitudinally to avoid tensile forces and transversally to avoid compression..

However, until now, it has not been known whether the direction and magnitude of such movements can be measured and predicted in patients. The studies showed that neural movements can indeed be quantified and also predicted with non-invasive techniques, and this information can be used to the advantage of the patients. The studies explored the use of [magnetic resonance imaging](#) to investigate the neural movements into the thoraco-lumbar vertebral canal of asymptomatic persons. Furthermore, the studies used electrophysiological methods to quantify the muscular reactions in response to neural stress, showing that muscles can be reflexively activated in order to protect the peripheral nerves in the most logical way: by shortening their pathway and opposing harmful body movements.

"In order to explore the normal neural adaptation mechanisms, the principle of no harm has to be respected, that is, the investigation methodologies have to be non-invasive," Rade says.

"Our results indicate that preserving the free movement of neural structures in the anatomical tunnels might be absolutely essential for maintaining an asymptomatic situation. This line of reasoning will be extensively used in clinical practice."

Provided by University of Eastern Finland

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