

Nerve Conduction Studies (NCS) and Electromyogram (EMG)



Neurophysiology Department

This leaflet aims to provide information for patients attending the Royal Surrey County Hospital for NCS and/or EMG testing. It describes what happens before, during and after the test, together with an explanation of any risks.

What are Nerve Conduction Studies?

NCS are used to test the functioning of the nerves in your hands, arms and/or legs. These are known as the peripheral nerves.

What is an EMG?

EMG testing is used to test the electrical activity within the muscles to help determine if weakness is caused by nerve damage or muscle disease.

Why am I having this/these tests?

You have been referred for NCS/EMG to assist your doctor in reaching a diagnosis.

Which test will I need?

You may need one or both tests depending on the reason for your referral and the findings during the test. NCS are commonly referred to as EMG – you may have been told you are to have an EMG, but often people will only need NCS.

What should I do before the test?

It would be helpful if you could keep the area to be investigated warm and remove any jewellery beforehand if possible.

The consultant or physiologist may need to examine your arms and legs. Please wear loose short sleeved tops and loose fitting trousers or a skirt, or layers that are easy to remove. Avoid the use of skin moisturisers as they can interfere with getting a good recording.

You can eat and drink as normal before the test. Please also continue to take any medication as normal. It would also be helpful if you could bring a list of your current medication with you.

If you have an implanted cardiac defibrillator (ICD) please ring us in advance. We may need advice from our Cardiology colleagues before we can carry out the test.

What does the test involve?

A Consultant Neurophysiologist or Clinical Physiologist will perform the test. He/she will explain the procedure to you and take any relevant medical history. Please feel free to ask any questions you have about the test to be performed.

There are two parts to the test. You may not need both.

During **NCS** recording pads are applied to the skin. Mild electrical pulses are used to stimulate different nerves and recordings are made of the responses.

During **EMG** testing a very fine needle is inserted into selected muscles and this is connected to the EMG machine. The muscle's electrical activity is played through a speaker and displayed on a screen. The very small size of the needle means it should cause only minimal discomfort.

Does it hurt?

Many people find the tapping and tingling sensation of **NCS** peculiar and sometimes uncomfortable but rarely consider it painful.

For **EMG** testing, the needles are very thin, similar to acupuncture needles. Some people barely feel these while others have more difficulty tolerating them. If you find it too uncomfortable let the doctor know and he/she will stop the testing.

The person carrying out these tests will always try to make it as comfortable as possible and will only do as much as is necessary to aid diagnosis.

How long will it last?

Test length varies depending on individual complexity, but generally lasts 20-45 minutes. Occasionally testing is more prolonged taking up to 75 minutes.

What else may be involved?

Occasionally it may be necessary for the test to be repeated. You will be sent a further appointment should this be required.

Are there any risks or side effects?

Some precautions need to be taken with patients who are on blood thinning drugs. Please tell the person doing the test anything you think is relevant.

There are no significant side effects with **NCS**. After NCS you may feel some tingling for a few minutes, but this soon passes.

If you have **EMG** needle testing your muscles may ache for a few hours afterwards, but this is usually very minor. Sometimes there will be bruising on the skin. Occasionally when we are asked to examine muscles which are difficult to access there can be specific side effects related to this and this will be discussed with you before proceeding. Your ability to drive after the test is not affected.

Are there any alternatives?

Both NCS and EMG are diagnostic tests and there is no alternative. If you would prefer not to have the test(s) done you would need to discuss your options with your referring doctor.

What happens next and how do I get my results?

You will not get the results of the test on the same day. A report will be written by the Consultant Neurophysiologist and sent to the doctor who referred you for the test. They should receive this within 2 weeks.

Reference sources

1. Nerve Conduction Studies: essentials and pitfalls in practice.
A Mallick & A I Weir
J Neurol. Neurosurg Psychiatry 2005;76
(ii23-ii31 doi:10.1136/jnnp.2005.069138)
2. Cooper R, Binnie C, Billing R (2005)
Techniques in Clinical Neurophysiology. A Practical Manual. Ch4
Measurement of Nerve Conduction P61-73. Elsevier
3. Potential risks of iatrogenic complications of nerve conduction studies (NCS) and electromyography (EMG)
A Gechev et al.
Clinical Neurophysiology Journal (2016) P62-66

Contact details

If you have any further questions, please contact the Neurophysiology Department on

Telephone: 01483 464128

PALS and Advocacy contact details

Contact details of independent advocacy services can be provided by our Patient Advice and Liaison Service (PALS) who are located on the right hand side as you enter the main reception area. PALS are also your first point of contact for health related issues, questions or concerns surrounding RSCH patient services.

Telephone: 01483 402757

Email: rsc-tr.pals@nhs.net

Opening hours: 9.00am–3.00pm, Monday to Friday

If you would like information documents in large print, on tape or in another language or form please contact PALS.

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