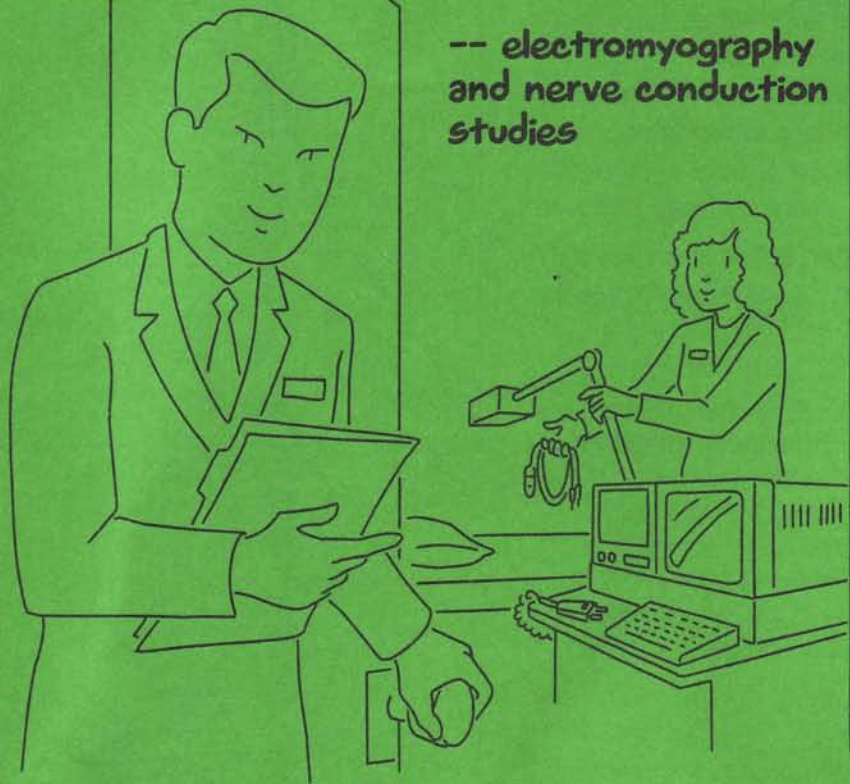


# ABOUT EMG AND NCS

-- electromyography  
and nerve conduction  
studies



## WHAT ARE EMG AND NCS?

They're special tests used to detect neuromuscular disorders (nerve and muscle problems).

### EMG (ELECTROMYOGRAPHY)

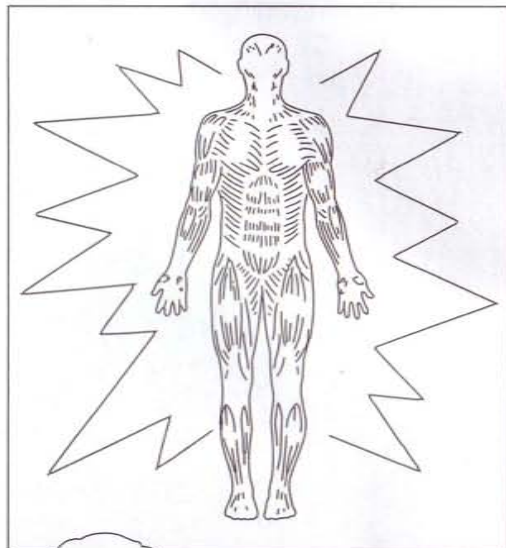
can measure the electrical activity of muscles.

### NCS (NERVE CONDUCTION STUDIES)\*

can measure the:

- speed and intensity of electrical signals that travel along nerves
- time it takes muscles to respond to these signals.

\*Nerve conduction studies are also called NCV tests (nerve conduction velocity tests).



This booklet is not a substitute for an informed discussion between a patient and his or her health-care provider of the procedures or medications described in this booklet.

## WHY SHOULD I LEARN ABOUT EMG AND NCS?

Because these tests can provide vital information about the health of your muscles and nerves.

### EMG AND NCS ARE IMPORTANT DIAGNOSTIC TOOLS

They can help:

- detect the cause of problems, such as muscle weakness, numbness, spasms, paralysis or pain
- determine if the problem involves the nerves, muscles, spinal cord or brain.



An accurate diagnosis is the  
first step to effective treatment.  
Learn more...

## HOW DO EMG AND NCS WORK?

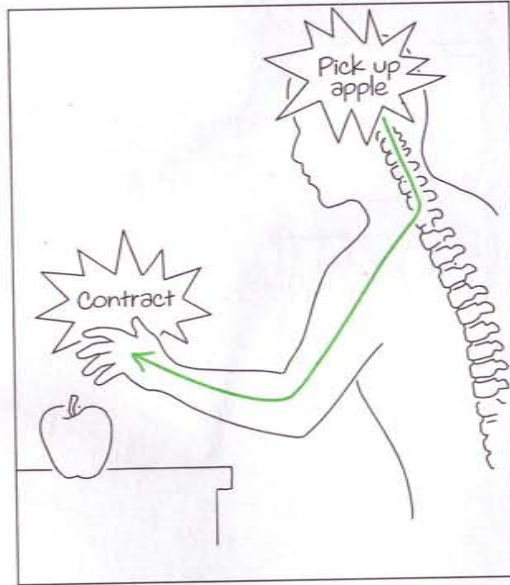
In brief:

### NERVE AND MUSCLE CELLS

produce tiny amounts  
of electricity.

- Nerves send electrical signals to muscles, telling them to contract or relax.
- Muscles produce electrical activity when they move.

If nerves or muscles are affected by injury, disease or another condition, their electrical activity changes.



### HOW EMG AND NCS EQUIPMENT DETECTS CHANGES

in electrical activity:

- Electrodes record the electrical activity of muscles or nerves.
- A computer displays, analyzes, stores and prints the data.
- A monitor displays the electrical activity in wave patterns.
- Speakers allow the electrical activity to be heard.



## WHAT ARE THE MAJOR USES OF EMG AND NCS?

They can help diagnose:

**PINCHED NERVES AND  
INFLAMED MUSCLES,**  
due to injury, a ruptured disk,  
disease or other conditions

### CARPAL TUNNEL SYNDROME

-- pressure on a major nerve,  
causing pain in the wrist  
or hand

### PRIMARY MUSCLE DISORDERS,

such as muscular dystrophy  
(a disease that causes certain  
muscles to waste away)

### NEUROMUSCULAR DISORDERS,

such as myasthenia gravis  
(a defect in nerve impulses  
that causes chronic  
muscle weakness)

### NERVE DISORDERS,

such as amyotrophic lateral  
sclerosis (Lou Gehrig's disease).

## HOW DO I PREPARE FOR THESE TESTS?

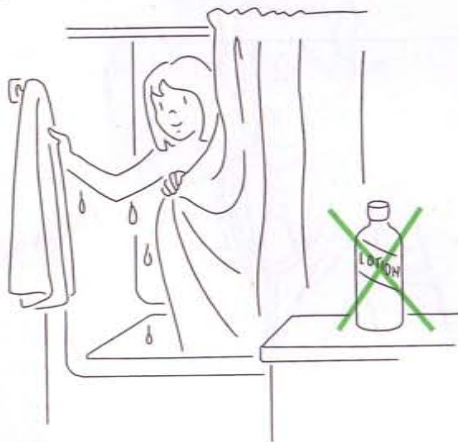
It's simple! In general:

### BATHE OR SHOWER

on the day of your test.

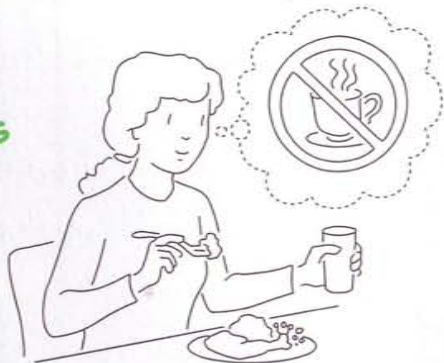
- Wash your arms and legs well to remove body oils.
- Do not use any bath oils, lotions or creams.

Oils can interfere with your test.



### EAT YOUR NORMAL MEALS

at your usual times. You may be asked to avoid tobacco and caffeine for a few hours before your test.



### TELL YOUR HEALTH-CARE PROVIDER

about all the medications you're taking, especially any blood thinners.

Also, be sure to tell him or her if you:

- bruise easily
- have hemophilia or diabetes
- have a pacemaker
- have a skin infection.



### BE PREPARED

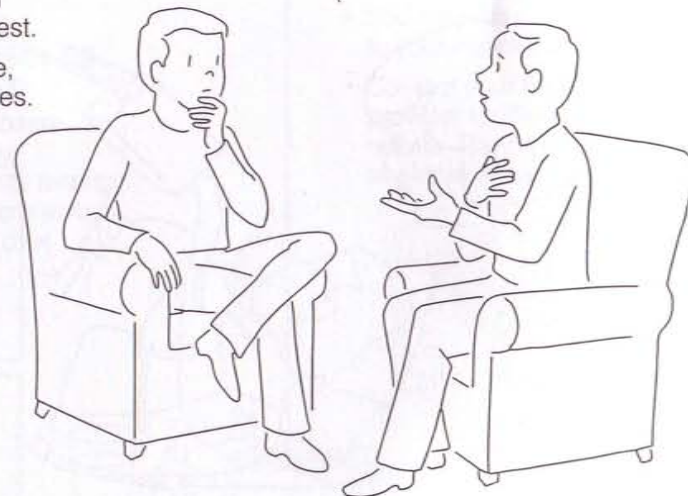
to fill out forms, answer questions, etc. Allow plenty of time to avoid feeling rushed. Be sure to ask any questions you may have.



### RELAX

to ensure accurate results. Tense muscles can interfere with your test.

- Wear comfortable, loose-fitting clothes.
- Keep your arms and legs warm and relaxed.
- Talk about your feelings, to help relieve any anxiety or fear you may have.



### AT THE HEALTH-CARE FACILITY:

- Your medical history will be taken. Describe any symptoms and past illnesses.
- You may have a brief physical examination. This exam will test your nervous system, muscles and reflexes.

# THE EMG PROCEDURE

Procedures may vary. In general, here's what happens:

## 1 YOU LIE DOWN OR SIT

in a comfortable and relaxed position. Certain areas of your skin may be cleaned.

## 2 ONE OR MORE NEEDLE ELECTRODES ARE GENTLY INSERTED

into the muscle. You may feel some pain, a dull ache or pressure as the electrode is inserted. Other electrodes are attached to your skin.

## 3 THE MUSCLE IS TESTED AT REST

-- normally there is no electrical activity in a resting muscle. The electrodes may be moved to get readings from different sections of the muscle.

## 4 THE MUSCLE IS TESTED AS IT CONTRACTS

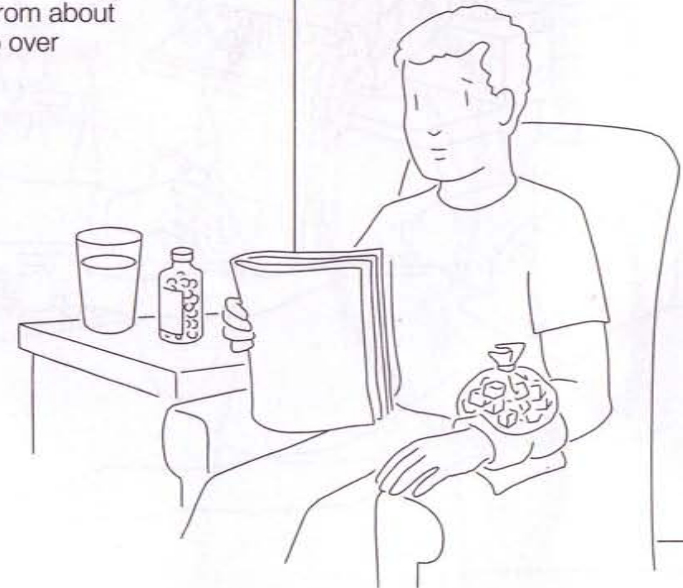
-- you'll be asked to slowly flex the muscle. Normally there is electrical activity as a muscle contracts. The electrodes may also be moved.

## 5 OTHER MUSCLES ARE TESTED

-- the ones chosen depend on your symptoms. Total testing time ranges from about 30 minutes to over an hour.

## AFTER YOUR EMG

- You may feel tenderness or soreness in the tested muscles for a few hours.
- To relieve discomfort, apply ice or a cold pack. (Do not apply ice directly to skin -- wrap in a cloth.) Check with your health-care provider about taking a pain reliever.
- You may return home or to your hospital room.
- Contact your health-care provider for the test results. They're usually available within 24 hours.



# THE NCS PROCEDURE

Again, procedures may vary. In general, here's what happens:

## 1 YOU LIE DOWN

or sit (less common), depending on what area of your body is being tested. Certain areas of your skin may be cleaned.

## 2 RECORDING ELECTRODES ARE ATTACHED

to your skin. (A gel may be applied first.) Other electrodes are also attached for electrical grounding and to serve as reference points.

## 3 STIMULATING ELECTRODES ARE HELD

against your skin. These electrodes may also be called the "stimulator."

## 4 A TINY ELECTRICAL IMPULSE IS SENT

through your nerves and the responses are recorded. You may feel:

- tingling, like when you hit your "funny bone"
- your muscles, fingers or toes twitch.

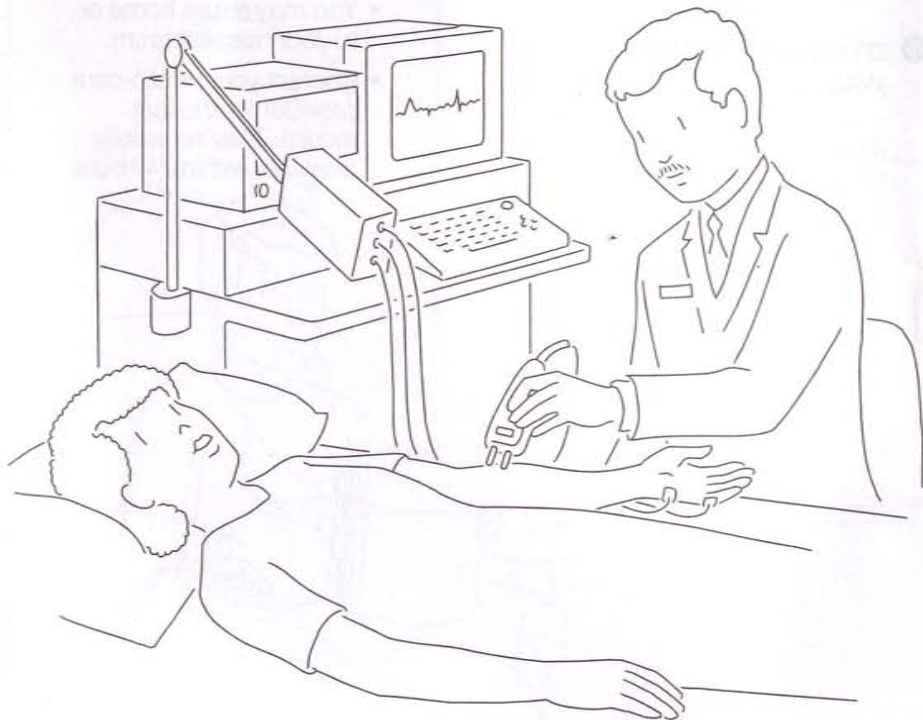
This tiny "shock" is unusual, but harmless.

## 5 THE STIMULATING ELECTRODES ARE REPOSITIONED

and step 4 is repeated. Total testing time is about 15-30 minutes.

## AFTER YOUR NCS

- Your skin may be cleaned. You may return home or to your hospital room.
- Contact your health-care provider for the test results. They're usually available within 24 hours.



# QUESTIONS AND ANSWERS

**Does EMG hurt?**



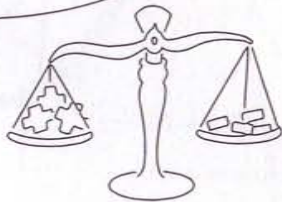
Most people do feel some temporary pain or discomfort. However, most people tolerate this minor level of pain quite well. Anesthesia or sedatives are not usually needed.

**Is the stimulus given during NCS painful?**



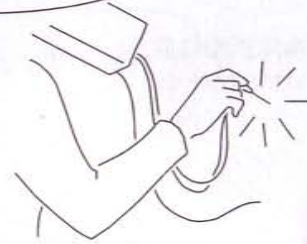
Most people feel an unusual tingling sensation. Some may also experience slight, temporary pain or discomfort.

**Are there any risks involved with these tests?**



Risks are usually very minor. However, people with certain medical conditions may face increased risks. As with any procedure, be sure to talk to your health-care provider about all risks and benefits.

**Are sterile needle electrodes used for EMG?**



Yes! To prevent infection, electrodes inserted into skin are:

- disposable (used once, then discarded)
- sterilized if reusable, following proper procedures.

**How effective are these tests?**



Very. These tests help your health-care provider make an accurate diagnosis and develop an effective care plan for you.

**How do I pay for these tests?**



Most health insurance plans help cover the costs of these tests. However, to be sure, ask your health-care provider or contact your insurance carrier directly.

## WHO PERFORMS EMG AND NCS?

Meet the team  
of professionals:

### A SPECIALIST

performs or supervises the testing and interprets the results. He or she is a physician, usually a neurologist or physiatrist, who has expert training in nerve and muscle disorders.

Physical therapists with special training may also perform these tests.

### A TECHNOLOGIST

may assist the specialist and/or perform the NCS.

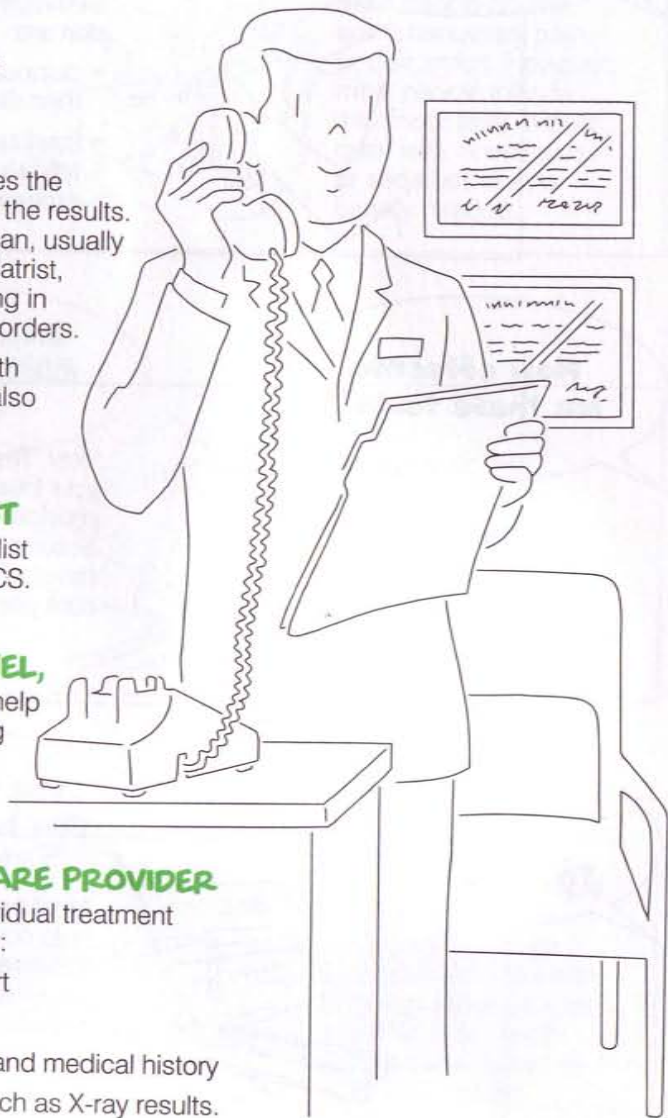
### OTHER PERSONNEL,

such as nurses, may help prepare you for testing and/or assist with the procedure.

### YOUR HEALTH-CARE PROVIDER

then develops an individual treatment plan for you, based on:

- the specialist's report
- your symptoms
- your physical exam and medical history
- other information, such as X-ray results.



So --

## EMG AND NCS ARE VALUABLE DIAGNOSTIC TOOLS!

✓ **COOPERATE FULLY**  
to help ensure the best results.

✓ **ASK QUESTIONS**  
if you have any.



**And relax**  
-- you're in  
caring hands!

Your test(s) are scheduled  
on \_\_\_\_\_ at \_\_\_\_\_ am/pm.

Please arrive at \_\_\_\_\_.

Special instructions:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_