

NEUROLOGICAL EXAMINATION OF THE LEGS AND ARMS

These notes are mainly for guidance, they are not meant to be prescriptive.

Aims of this session:

- 1 Show students a **basic** standard approach to neurological examination of the legs. Time is desperately short for the NS demonstrations so just do the basics.
- 2 Demonstrate generic components of examination:
 - deciding what signs you need to look for (hypotheses from history)
 - explaining what you are going to do
 - avoiding pain
 - interpreting findings as you go along
 - ensuring adequate patient exposure
 - maintaining patient comfort and coverage
 - adequate lighting
- 3 Illustrate reasons why signs are sought. What, for example, does an extensor plantar response tell you?
- 4 Model professional attitude to patients in approach to student volunteer.
- 5 Allow students to 'have a go' under supervision. Remind them that this is only a taster and that they will go over everything again in detail in their skills firms. For this session the technique is the important thing, not the findings.

Please **do not** use this session to discuss all the abnormalities you might find. Those mentioned below are for the purposes of illustration only, they do not all have to be mentioned to the students.

PROCEDURE

Introduce yourself and explain the procedure. Ensure the patient is comfortable and maintain the patient's dignity.

EXAMINATION OF THE LEGS

INSPECTION

Look at (*for example*)

- patient's gait and stance, if possible
- abnormal movements
- muscle wasting – symmetrical, asymmetrical, proximal, distal
- generalised or localised fasciculation (*motor neurone disease*)

MOTOR

1 CO-ORDINATION

Ask the patient to run one heel up and down the other shin – lack of co-ordination should be obvious.

2 TONE

Ask the patient to relax and then lift each leg in turn. Lift the leg and move it at the knee and hip joint. 'Roll' the fully extended leg on the couch. Can also assess for ankle clonus.

3 POWER

There are two basic methods:

- i Ask the patient to push against resistance in a specified way.
 - ii Ask the patient to maintain a set posture while you attempt to move the joint and test the relevant muscle power. This is often slightly easier for the patient because all they have to do is remain still.
- Hip flexion L1, 2, 3 – ask the patient to lift each leg in turn off the bed while you press down just above the knee
 - Hip extension L5 – ask the patient to keep the leg straight on the bed and you try to lift the leg up at the ankle or knee
 - Knee flexion L5, S1 – ask the patient to bend his knee and then pull his foot into his bottom while you pull against him
 - Knee extension L3, L4 – ask the patient to bend his knee and then kick outwards while you resist
 - Ankle (plantar) flexion S1, S2 – ask the patient to straighten his leg and then push his foot down against your hand
 - Ankle extension (dorsiflexion) L5 – ask the patient to straighten his leg and pull his foot upward against your hand
 - Toe extension S1 – ask patient to push up the great toe against resistance

REFLEXES

The student website guide is on:

<http://www.mds.qmw.ac.uk/biomed/kb/stage1bdocs/brainandbehaviour/clinskillsreflexes.htm>

- Knee L3, 4 - show how to hold up both knees together
- Ankle S1, 2 - show 'classical' method, with hip flexed, knee bent and leg everted, also 'straight leg' method, dorsiflexing foot by pressing up on metatarsal heads and percussing your hand

Reflexes can be normal, brisk in an upper motor neurone lesion (UMN), decreased or absent. If reflex is absent by reinforcement, either get the patient to grit his teeth or to pull one hand against the other as you perform the reflex.

Plantar reflex – scratch the lateral side of the sole of the foot firmly, normal is plantar flexion. Extension (first movement of the great toe) occurs in UMN lesion.

SENSORY

The student website guide is on:

<http://www.mds.qmw.ac.uk/biomed/kb/stage1bdocs/brainandbehaviour/clinskillssensory.htm>

This supplies the full details of local methods.

1 VIBRATION

Using 128/cps tuning fork, first place the fork on the sternum so the patient appreciates what vibration feels like. Then place the tuning fork on the lateral malleoli. If the patient cannot feel vibration, test more proximally. The patient's eyes should be shut.

2 PROPRIOCEPTION

Holding onto the side of the great toe, show the patient what you are going to do and then assess whether they can differentiate between up and down.

3 PAIN

Using a pin or 'neurotips' to test for sensation according to dermatomes:

- L1 – inguinal area
- L2 – anterior thigh
- L3 - knee
- L4, 5 – shin
- S1 – lateral border of foot, sole, back of calf
- S2 - back of thigh
- S3 - buttock

4 LIGHT TOUCH

Show patient what sensation feels like on part of the body believed to be normal. Then move to area to be tested. Say to the patient "say yes when you feel me touch you" and ask whether the sensation is different to normal. Use cotton wool tip. Dab, don't stroke if you wish to test posterior column sense.

EXAMINATION OF THE ARMS

The general approach is the same as with the legs.

MOTOR

1 CO-ORDINATION

Ask the patient to touch his nose with his index finger and then to touch your index finger. Keep your finger still unless you want to make the task difficult. Make sure the patient can see your finger. Test for dysdiadochokinesia (cerebellar lesions) by asking the patient to tap rapidly on any surface.

2 TONE

Ask the patient to relax and then hold the patient's arm by the hand and elbow. Move the wrist, elbow and shoulder joints simultaneously. Abnormalities of tone should be checked by testing at the elbow alone. They will broadly be shown as:

- rigidity - tone is increased throughout the range of movement (*basal ganglia lesions*)
- spasticity - tone is increased though only the initial part of the movement ('clasp-knife') occurs in pyramidal tract lesions

3 POWER

The following constitute a basic examination:

- Shoulder abduction C5 - ask the patient to lift his elbows out from his sides against resistance
- Elbow extension C7, 8 - hold the arm at the wrist, bend it to 45° at the elbow, support the arm at the elbow and ask the patient to push to his arm straight
- Elbow flexion C5 - as above and ask the patient to push to bend his arm up
- Wrist extension C6 - hold the arm at the wrist, get the patient to clench his fist and push up against resistance applied to the back of his hand
- Wrist flexion C7 - hold the arm at the wrist, get the patient to clench his fist and push against resistance applied to palm of his hand

- Finger flexion C8 - ask patient to hold out hand with palm up; ask him to push up the ends of his fingers against resistance
- Finger adduction T1 - ask patient to grip a piece of paper held between their fully outstretched fingers

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Students often have difficulty with the mechanics of these. These arise partly because of problems finding the tendon and partly because of incorrect use of the hammer.

- Biceps C5, 6 - interpose forefinger between the tendon and the hammer
- Triceps C7, 8 - strike the tendon directly
- Supinator C6 (brachio-radialis) - strike the tendon directly

SENSORY

The principles of testing are the same as for the legs. The sensory root distribution is:

- C2 - under chin
- C3 - lower part of neck
- C4 - lateral part of shoulder
- C5 - lateral art of upper arm
- C6 - lateral part of forearm
- C7 - middle finger
- C8 - little finger
- T1 - medial part of forearm
- T2 - medial art of upper arm