

## Peripheral Nervous System Examination

- NB - ask if the patient has any pain/sore joints before beginning the examination
- Sit patient on side of bed. Do cranial nerve exam first.
- **Upper limb motor exam**
- Observe
  - Wasting (1<sup>st</sup> dorsal interosseus and abductor pollicis), fasciculations, abnormal movements.
  - Hands outstretched with eyes closed and palms up (check for drift – non-specific test).
- Tone: wrist, supination, elbow - slow (rigidity) and rapid (spasticity) full range movements
- Power
  - Shoulder abduction and flexion (deltoid, C5-6 axillary nerve).
  - Shoulder adduction and extension (C6, 7, 8)
  - Elbow flexion (biceps, brachialis, C5-6, musculocutaneous nerve)
  - Elbow extension (triceps, C7-8, radial)
  - Wrist extension (extensor carpi ulnaris and radialis, C6-7, radial nerve)
  - Wrist flexion (flexor carpi ulnaris and radialis, C6-7, ulnar and median nerves)
  - Finger extension (extensor digitorum, C7-8).
  - Finger flexion (flexor digitorum, C7-8).
  - Finger abduction (ulnar nerve, T1, dorsal interosseus). Look for thenar wasting
  - Thumb abduction (median nerve, T1, abductor pollicis).
  - Thumb adduction (ulnar nerve, T1 adductor pollicis) test with Froman's paper grip test.
- Reflexes - SJ, BJ, TJ
  - Supinator (C5/C6), biceps (C5/C6), triceps (C7)
  - Finger reflex if suspect C8 lesion: tap your fingers while placed over outstretched fingers of pronated hand. Often normally absent
- Coordination: rapid alternating movements, finger-nose test.
- Gait
  - ALWAYS observe posture and gait: movement of arms, stride length, broadness, smoothness.
  - Heel-toe walking: tests midline cerebellar vermis
  - Romberg: tests dorsal column sensory loss (proprioception- rare in clinical practice) and vestibular function. Also test one leg standing for balance (with eyes closed if necessary)
  - Rapid leg tests:
    - If they can walk on their heels, then no foot drop (L5 or common peroneal)
    - If they can walk on their tiptoes, then no S1 lesion (plantar-flexion)
    - To test proximal leg function, crouch and stand up or rising from a seat without using hands (up and go test) and
- **Lower limb motor exam**
- Observe: Look for wasting (esp tibialis anterior and small muscles of feet) and fasciculations
- Tone: knees, ankle clonus (2-3 beats may be normal if symmetrical)
- Power
  - Hip flexion and adduction (ilio-psoas, L2-3, lumbar plexus).
  - Hip extension and abduction (gluteus maximus, sciatic nerve, L5-S1).

- Knee Extension (quadriceps, femoral n, L3-4).
- Knee Flexion (hamstrings, sciatic nerve, L5 – S1)
- Ankle dorsiflexion (tibialis ant peroneal n, L4 – 5)
- Ankle plantarflexion (gastrocnemius, sciatic nerve, S1 – 2)
- Ankle inversion (tibialis ant & Post, peroneal and tibial n, L4 – 5)
- Ankle eversion (peronei, peroneal nerve, L5 – S1)
- Leg (if no response, interlock fingers of both hands and pull just before tap)
  - Patella (hold knees up) (L3/L4), ankle (passively dorsiflex ankle) (S1).
  - Plantar responses (Not positive if withdrawal response (hip and knee flexion))
- Superficial Abdominal reflexes: Not tested routinely. Stroke lightly with sharp object in each quadrant towards midline. Normal reflex is contraction. Tires quickly (T7-T11)
- Coordination: heel-shin test, tapping foot rapidly with heel on the ground

### **Cerebellum (lesion on ipsilateral side to symptoms)**

- Flocculonodular (vestibulo-) cerebellum - truncal ataxia, vertigo, nystagmus
- Lateral (cerebro-) cerebellum - distal limb ataxia, intention tremor, heel-shin, rapid movements
- Midline (spino-) cerebellum - truncal ataxia (broad based drunk gait), broad-based gait, dysarthria, heel-toe problems

### **Sensory test**

- Avoid suggestion. Test from area of least sensation outwards (better discrimination this way)
- Get patient to close eyes. Stimulate at irregular intervals so patient can't anticipate them. Test from abnormal to normal. Don't try to completely map – just test key boundaries
- Guide extent and focus of testing according to history and earlier examination findings.
- Common scenarios: Hemisensory (stroke, nerve root or peripheral nerve). Glove and/or stocking (spinal chord or peripheral neuropathy)
- Dermatomes:
  - Stand on S1,
  - Sit on S3,
  - Groin: L1,
  - Umbilicus T10,
  - Nipple T4,
  - T2 meets C4 on line connecting axillae,
  - Middle finger C7.
- Light touch (cotton wool)
- Pinprick: Use large safety pin and discard after use. Toes, fingers, face (no more unless suspicious, eg ↓ reflexes). Is it sharp or blunt? Can alternate sharp and blunt end to see if they can tell the difference. More reliable than light touch if both damaged
- Position: Big toe and thumb. Hold digit by the sides, explain which way is up and down, then test. Has low yield in practice. If absent test next joint proximally.
- Vibration: 128 Hz fork. First sensation to go in progressive deterioration. On bony prominences (what do you feel?). Move up until positive. Bunion → medial malleolus → tibial tuberosity → anterior iliac spine. Test fingers for completeness.
- Temperature (Rarely done. Same pathways as pinprick)
- Others:

- Two point discrimination
- Stereognosis: recognising objects by their feel (coin, key, etc). Normal hand first
- Graphaesthesia: write numbers on the hand
- Sensory inattention: touch sides separately and together – which is being touched?