



NERVOUS SYSTEM

**Check List for
History Taking
and
Physical Examination**

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History Taking: Nervous System

In the beginning please note the following:

1. **The informant:** May be the patient himself or a relative, a friend, an eyewitness or the person (for example, police) who brought the patient (in case the patient was found unconscious)
2. **Reliability of the information:** This means, the extent to which you can believe the information. This varies depending on the degree to which the informant is associated with the events in the history. Describe in terms of 'good', 'fair', 'poor'.
3. **Handedness of the patient:** right or left. The history taking and its interpretation is sometimes determined by the handedness. For example, in right-handed individual with left cerebral dysfunction, you have to ask about comprehension of verbal and written speech.

Common symptoms due to affections of the of nervous system

The symptoms may be either 'positive' (due to irritation) or 'negative' (loss of function).

Common positive symptoms are:

- Pain
- Seizures
- Paresthesiae

Common negative symptoms are:

- Weakness/paralysis
- Numbness/sensory loss
- Loss of balance/walking difficulty
- Loss of memory

The first symptom is often very important in localizing a lesion, and should always be sought carefully. Other symptoms should be listed in chronological order.

Analysis of history

From the details of symptoms or their combination pattern, attempt to determine the site and nature of lesion(s). Sometimes, the diagnosis may be clear from the history itself (e.g. migraine). More often, the following steps are necessary:

1. From symptoms, deduce the structures involved.
2. From the knowledge of your anatomy, determine the probable site where all the structures involved are closest together. This gives the site of lesion (The principle is: to attempt to explain with one lesion of the smallest size). Often, you may also have to determine whether the lesion is within or outside the brain or spinal cord (neuraxis).
3. Determine the probable nature of lesion (usually from the onset and course):

Some guidelines (mostly applicable in adults) are as follows:

- A. Onset sudden, peak within minutes
 1. Traumatic
 2. Vascular
- B. Onset acute, evolving over minutes to hours
 1. Vascular
 2. Traumatic
 3. Demyelinating
 4. Sometimes Infections/Inflammatory
 5. Metabolic
- C. Onset rapid, evolving to weeks
 1. Infections/Inflammatory
 2. Metabolic
 3. Vascular
 4. Sometimes Compressive (includes neoplastic)
 5. Demyelinating
- D. Onset gradual, evolving over weeks to months
 1. Infections/Inflammatory
 2. Neoplastic
 3. Degenerative (sometimes, may be in years)
 4. Congenital (may be in years)

Screening neurological examination

1. Higher mental functions: orientation, serial 100-7, Registration and recall.
2. Cranial nerves (voice and speech already noted during history)
 - visual acuity, visual fields, and ocular fundus
 - pupillary reactions
 - Extraocular movements
 - Corneal reflexes and jaw movements
 - Facial movements
 - Hearing
 - Palatal movement and swallowing
 - Tongue
3. Gait and legs
 - walk across the room
 - walk on the toes, then on the heels
 - walk heel-to-toe
 - hop in a place on each foot in turn
 - do a shallow knee bend
 - rising from sitting position
 - Romberg test and heel-shin test
4. Arms, shoulders and hands
 - check for a pronator drift (tap the arms briskly down)
 - raise both arms overhead
 - test grip strength
 - finger-nose test
5. Reflexes
 - Biceps, Triceps, Supinator, Knee, Ankle, Plantar
6. Sensory
 - Pain and vibration in the hands and feet
 - Light touch on both arms and on both legs
 - Assess stereognosis in the hands.

Test/Action	Normal	Abnormal
<p>with 100 and count backwards by 7.</p> <p>If he does not or cannot perform serial 7s, try serial 3s or ask him to spell a word (eg WORLD) backwards.</p>	<p>one and half minutes, with fewer than four errors.</p> <p>Can spell backwards in correct order.</p>	<p>or makes >4 errors.</p> <p>Cannot spell the word in correct order.</p>
<p>Recall: Ask the patient to recall the three words you previously asked him to remember.</p>	<p>Can recall all three</p>	<p>Cannot recall one or more words given earlier.</p>
<p>Speech:</p> <p>a) Spontaneous speech: Note the quantity and quality of speech throughout the interview.</p> <p>b) Comprehension: Give the patient a piece of blank plain paper, and ask to "Take the paper in your right hand, fold it in half, and put it on the floor" (Three-stage command)</p> <p>c) Naming: Show the patient a wristwatch and pencil one by one and ask him "What it is".</p> <p>d) Reading: Write clearly 'CLOSE YOUR EYES' on a Paper. Ask the patient to read it and do what it says.</p> <p>e) Writing: Ask the Patient to write a Sentence on a Paper.</p> <p>Constructional apraxia (copying):</p> <p>a) On a clean piece of paper, draw intersecting pentagons, each side about 2.5cm, and ask him to copy it.</p> <p>b) Make a clock face with time showing 9 am.</p>	<p>Effortless sound making.</p> <p>Speaks understandable words, clearly articulated.</p> <p>Word choice is correct, effortless, fluent, and appropriate to educational level.</p> <p>Executes the command correctly and completely.</p> <p>Both named correctly.</p> <p>The patient reads it and then closes his eyes.</p> <p>The sentence is sensible and has a subject and a verb.</p> <p>Patient's pentagon has 10 angles and two of them intersect.</p> <p>Makes correctly.</p>	<p>Dysphonia: Decreased volume (e.g. whispered) or abnormal pitch (e.g. hoarse)</p> <p>Dysarthria* (poor articulation of words)</p> <p>Non-fluent or inappropriate words. (Motor aphasia)</p> <p>The command is not or only partly executed correctly.</p> <p>None or only one named correctly.</p> <p>Does not read or close his eyes.</p> <p>Sentence not written or does not have a subject or verb.</p> <p>Cannot copy.</p> <p>Cannot make accurately.</p>

* Read types of dysarthria and dysphasias from a text.

CRANIAL NERVES*

Test/Action	Normal	Abnormal
<p>I. Olfactory Test smell using a familiar, and non-irritating odor, one nostril at a time.</p>	Recognizes the odors	Cannot recognize one or more odors.
<p>II. Optic a) Test visual acuity using Snellen chart (for distant vision and a Jaeger card (for near vision) b) Test visual field using confrontation test c) Ocular Fundi: See optic disc <ul style="list-style-type: none"> • Colour • Shape • Margins • Cup d) Color Vision</p> <p>III, IV, and VI: <u>Oculomotor, Trochlear and Abducens nerves.</u> a)Palpebral fissure b)Pupils: size, shape, equality and reaction to light and accommodation. c) Eyeball: Position, Alignment and movements of six extra ocular muscles. d) accommodation / Convergence</p>	<p>6/6 50° superiorly 60° Nasally 70° inferiorly 90° temporally Creamy yellow to pink Round or oval Distinct Brighter yellow-white and not >one-half the disc diameter Differentiate blue, red and green Symmetrical. 2-5mm, equal, round, both direct and consensual reaction brisk. Reaction to accommodation present. Eyeballs remain parallel while tracking the object Eyes moves medially and pupil become small.</p>	<p>6/9 or less. (The larger the denominator, poorer the vision) Pale, Hyperemic (sometimes, white) Irregular Blurred Larger than normal cup. Unable to differentiate colors. Ptosis Constricted, Dilated, Unequal, Impaired, Direct and/or Consensual reflex. Paresis of one or more muscles. Nystagmus. Failure to convergent and pupil change</p>

Test/Action	Normal	Abnormal
tongue movement, anterior and lateral	Mid line movement forward and laterally against resistance.	Deviation of tongue sideways and weak tongue deviation against cheek.

- Method of testing are beyond the scope of this checklist and is best understood with illustrations. Consult a textbook on physical examination. This is only a checklist.

Test/Action	Normal	Abnormal
	plantar flexion, eversion and inversion of the foot. Plantar flexion and dorsiflexion.	
<p>5. Coordination: <u>Finger-nose test:</u> Hold your finger out about an arm's length in front of the patient. Ask the patient to touch your finger with his index finger and then touch his nose. When he has done this correctly ask him to repeat this faster.</p> <p><u>Rapid alternating movements</u> Ask patient to pat his knees with both hands, lift up, turn hands over, and pat the knees with the backs of hands, repeat this faster.</p> <p><u>Heel-shin test:</u> Ask him to lift his leg, place the point of his heel on his knee, and then run it down the sharp part of his shin.</p>	<p>Smooth and accurate movement.</p> <p>Normally quick, rhythmic and symmetrical.</p> <p>The patient moves the heel in a straight line down the shin.</p>	<p>Misses the mark.</p> <p>Slow, clumsy, and sloppy movements.</p> <p>Lack of coordinations. Heel falls off shin.</p>

* When weakness is confined to specific parts of the body, a more detailed testing of individual muscles should be done (for methods, refer to a text book)

- Remember cerebellar signs

- ↳ Face: nystagmus, staccato speech
- ↳ Upper limb:
 - ↳ Hypotonia
 - ↳ Intention tremor (finger-nose test)
 - ↳ dysdiadochokinesia
 - ↳ Rebound phenomenon
- ↳ Lower limb:
 - ↳ Hypotonia
 - ↳ Impaired heel-shin test
 - ↳ Pendular knee jerk
 - ↳ Ataxic gait

SENSORY SYSTEM

Test/Action	Normal	Abnormal
A) Light touch	Felt at all points symmetrically	Hypoesthesia - decreased touch sensation.
B) Pain	Felt at all points symmetrically	Anaesthesia - absent touch sensation
C) Temperature	Felt at all points symmetrically	Hyperesthesia - increased touch sensation
D) Vibration (For D & E test over distal parts and only if you find abnormality, test over proximal points/trunk)	Felt at all the bony prominences symmetrically	Hypoalgesia - decreased pain sensation.
E) Sense of joint position passive movements (Test distal phalanx of middle finger and great toe)	Can detect fine movement of middle fingers or big toe by a few degrees = up to 3mm in finger and 5mm in big toe.	Analgesia - absent pain sensation.
		Hyperalgesia - increased pain sensation.
		Thermo - hypoesthesia or Thermo-anesthesia or Thermo-hyperesthesia.
		Unable to feel or felt for shorter duration (than of yours or the other side)
		Impairment of the sense (cannot detect few degrees of movements).

GAIT AND STANCE

Test/Action	Normal	Abnormal
<p>a) Romberg's test (Wait about 20 seconds)</p> <p>b) Gait: Ask the patient to walk across the room, then turn and come back. Observe posture, balance, swinging of arms, step length.</p> <p>b) Tandem walking (Test if Gait is normal) (Ask the patient to walk in a straight line in a heel-to-toe fashion)</p>	<p>Maintains posture and balance. Slight swaying may occur</p> <p>The person moves with ease, confidence, and balance. The gait is smooth, rhythmic, and effortless with arms swinging at sides. The turns are smooth. The step length is about 15 inches from heel to heel.</p> <p>The person can walk straight and stay balanced.</p>	<p>Sways, Falls or widens base of feet to avoid falling.</p> <p>For abnormal Gaits, see table -3</p> <p>Widens base to maintain balance, staggering, reeling, loss of balance.</p>

MENINGEAL SIGNS

Test/Action	Normal	Abnormal
Neck rigidity	Supple neck (chin can touch the chest)	Rigidity present.
Kernig's sign	Negative (Knee can be straightened, slight resistance to full extension, with discomfort behind the knee occurs in many normal people)	Positive (Pain and increased resistance to extension)
Brudzinski's leg sign	Negative (No flexion of hips and knees)	Positive.

- Also examine skull, spine, and peripheral nerves (for thickening) and auscultate for carotid bruit.
- Note: This is only a checklist. For methods of testing, you must read from a textbook on physical examination/clinical methods. Some test methods (where books differ in methods or are more elaborate than required) are given. For neurological examination, figures in the textbooks are very helpful in learning.

Table - 2: LEVELS OF CONSCIOUSNESS

These terms are commonly used in clinical practice. They spread over a continuum from full alertness to deep coma. The terms are qualitative and therefore are not always reliable. (A *quantitative* tool that serves the same purpose and eliminates ambiguity is the Glasgow Coma Scale) These terms are widely accepted, however, and are useful as long as all co-workers agree on definitions and are consistent in their application.

To increase clarity when using these terms, record also:

1. The level of stimulus used, ranging progressively from:
 - a. Name called in normal tone of voice
 - b. Name called in loud voice
 - c. Light touch on person's arm
 - d. Vigorous shake of shoulder
 - e. Pain applied
2. The person's response
 - a. Amount and quality of movement
 - b. Presence and coherence of speech
 - c. Opening of eyes and making of eye contact
3. What the person does on cessation of your stimulus

(1) Alert

Awake or readily aroused, oriented, fully aware of external and internal stimuli and responds appropriately, conducts meaningful interpersonal interactions.

(2) Drowsy (or Somnolent)

Not fully alert, drifts off to sleep when not stimulated, can be aroused to name called in normal voice but looks drowsy, responds appropriately to questions or commands but thinking seems slow and fuzzy, inattentive, loses train of thought, spontaneous movements are decreased.

Table -3: ABNORMAL GAITS

Type	Characteristic Appearance	Possible Cause
Spastic hemiparesis (Hemiplegic gait)	Arm is immobile against the body, with flexion of the shoulder, elbow, wrist, fingers, and adduction of shoulder. The leg is stiff and extended and circumducts with each step (drags toe in a semicircle)	Upper motor neuron lesion of the corticospinal tract, e.g., cerebrovascular accident, trauma.
Cerebellar ataxia (Ataxic gait)	Staggering, wide-based gait; difficulty with turns; Tendency to fall to side of lesion or either side (in midline lesion)	Cerebellar degeneration, infarction, tumor or multiple sclerosis.
Parkinsonian (Festinating gait)	Posture is stooped; elbows, hips and knees are flexed. Steps are short and shuffling. Hesitation to begin walking, and difficult to stop suddenly. The person holds the body rigid. Walks and turns body as one fixed unit. Difficulty with any change in direction. Lack of spontaneous movements of upper limbs.	Parkinsonism
Scissoring gait (Spastic)	Knees cross or are in contact, steps may criss-cross. The person uses short steps, and walking requires effort.	Spastic paraplegia or quadriplegia.
High Steppage gait	Slapping quality - looks as if walking up stairs and finds no stair there. Lifts knee and foot high and slaps it down hard and flat.	Lateral popliteal nerve palsy or weakness of peroneal and anterior tibial muscles due to lower motor neuron lesion.
Waddling gait	Walking like a duck. When the person takes a step, the opposite hip drops which, requires compensatory lateral movement of pelvis. Often, the person also has marked lumbar lordosis and a protruding abdomen.	Hip girdle muscle weakness due to muscular dystrophy, dislocation of hips.