

08 - Neurological examination in psychiatry

Neurological examination in psychiatry

© SPMM Course Neurological examination in psychiatry Cranial nerves examination: No. Name
Main clinical examination technique I Olfactory Smell – each side separately II Optic Test visual acuity using Snellen's charts (near and distance), colour using Ishihara charts, field by confrontation/perimetry and pupillary reflexes. III Oculomotor Eyelid elevation, eye elevation, adduction, depression in abduction, pupillary reflex for efferent fibres IV Trochlear Eye intorsion, depression in adduction V Trigeminal Facial and corneal sensation, muscles of mastication VI Abducens Eye abduction VII Facial Facial movement, taste fibres VIII Vestibular Balance – Romberg / Caloric test Minor Physical Anomalies in putative developmental disorders □ Preauricular tag □ Preauricular pits □ Lip pit □ Bifid uvula □ Supernumerary nipples: □ Partial syndactyly (generally involving toes 2–3) □ Pigmented naevi □ Cafe-au-lait spots □ Sacral haemangioma □ Prominent or flat occiput □ Prominent or flat forehead □ Primitive shape of ears □ Earlobe crease □ Fine electric hair □ Tongue with smooth and rough spots □ Double antihelix □ Simian crease [Instead of the two usual creases only a single uninterrupted palmar crease traverses the palm from the radial to the ulnar border. To be considered as an anomaly, the line should be uninterrupted]. □ Single flexion crease on 5th finger □ Sole crease □ Prominent heel □ Double posterior hair whorl □ Multiple buccal frenula □ Furrowed tongue □ Brushfield spots

© SPMM Course Cochlear Hearing – Rinne, Weber tests. IX Glossopharyngeal Sensation - soft palate, taste fibres X Vagus Cough, palatal and vocal cord movements XI Accessory Head turning, shoulder shrugging XII Hypoglossal Tongue movement Adapted from Kumar & Clark Textbook of clinical medicine 6th edition Pg 1179 □ The auditory function is tested using 512 Hz – Weber's test and Rinne's test; vibration sense is tested for peripheral neuropathy using a 128Hz fork. □ The Weber test involves holding a vibrating tuning fork against the forehead in the midline. The vibrations are normally perceived equally in both ears because bone conduction is equal. In conductive hearing loss, the sound is louder in the abnormal ear than in the normal ear. In sensorineural hearing loss, lateralization occurs to the normal ear. □ In the Rinne test, the vibrating tuning fork is placed over the mastoid region until the sound is no longer heard. It is then held at the opening of the ear canal on the same side. A patient with normal hearing should

continue to hear the sound. In conductive hearing loss, the patient does not continue to hear the sound since bone conduction, in that case, is better than air conduction. In sensorineural hearing loss, both air conduction and bone conduction are decreased to a similar extent. □ The vestibular portion transmits information about linear and angular accelerations of the head from the utricle, saccule, and semicircular canals of the membranous labyrinth to the vestibular nucleus. □ The Romberg test is performed to evaluate vestibular control of balance and movement. When standing with feet placed together, and eyes closed, the patient tends to fall toward the side of vestibular hypofunction. Results of the Romberg test may also be positive in patients with polyneuropathies, and diseases of the dorsal columns, but these individuals do not fall consistently to one side as do patients with vestibular dysfunction. □ Provocative tests include caloric testing. Normally on cold water testing, nystagmus is noted to the opposite side; warm water elicits nystagmus towards the same side. (COWS – Cold Opposite, Warm Same, can be used as a mnemonic) Neurological soft signs: Neurological signs are often referred to as either “hard” or “soft” signs. The ‘hard signs’ refer to impairments of the basic motor and sensory functions that are localisable to the pyramidal, extrapyramidal or cranial nerve systems.

© SPMM Course The soft signs are non-localisable neurological findings thought to reflect neurodevelopmental aberrations when seen in psychiatric disorders. These are seen in many psychiatric disorders including schizophrenia, autism, OCD and ADHD. However, this distinction between hard and soft signs is artificial, merely reflecting our inability to define the brain-behaviour relationship that underlies certain neurological abnormalities. There are three groups of symptoms collectively known as soft signs - abnormalities of motor coordination, sensory integration and signs of cortical disinhibition. In recent times, neuroimaging studies that parse finer details of the cortex have implicated several parts of the brain in ‘soft’ signs, further blurring their distinction from hard signs.

Cerebellar signs The cerebellum provides an important feedback loop for coordination of muscle activity. Midline cerebellar dysfunction results in ataxia of gait, difficulty in maintenance of upright posture, and truncal ataxia. The following cerebellar signs are noted in various degrees in psychiatric disorders. The lateral cerebellar hemispheres (the neocerebellum) controls the movement of the ipsilateral limbs. The midline vermis is involved in the control of truncal tone, speech and eye movements. The flocculonodular lobe (also called archicerebellum) is involved in vestibular functions. Cerebellar signs Ataxia Difficulties in coordinating truncal and limb movements, often seen in midline damage. Tested using tandem walking (heel-to-toe walk) test. Hypotonia Reduced muscle tone resulting in loss of ‘checking’ effect when passively manipulated (leg swinging test results in pendular swinging of legs until passive inertia sets in) Intention tremor An oscillating tremor that accelerates in pace on approaching the target Dyssynergia (incoordination) Results in loss of smoothness of execution of a motor activity. Dysmetria (past pointing) Overshooting or undershooting of a target while attempting to reach an object Common soft neurological signs in psychosis Choreoathetosis (predating psychosis esp. in children) Abnormal gait Grimacing Abnormal reflexes Changes in muscle tone Abnormal saccades Frequent blinking Dysdiadochokinesia Astereognosis Poor left-right discrimination Anosognosia Apraxia Gaze impersistence Frontal release

© SPMM Course Dysdiadochokinesis Inability to perform rapid alternating movements. Tested by asking the patient to tap 1 hand on the other repeatedly while simultaneously pronating and

supinating the hand Dysrhythmia Inability to tap and keep a rhythm Dysarthria Staccato or scanning speech with poor modulation of the volume and pitch of the speech. Dyssynergia, dysmetria and tremor can be elicited by finger nose or heel shin test. Dysarthria is usually a sign of diffuse involvement of the cerebellum. Meningeal signs: These signs can be elicited in the presence of meningeal inflammation or irritation due to haemorrhage/trauma. Nuchal rigidity or neck stiffness: □ The Brudzinski sign (Flexion of his knees and hips when you try to flex one's neck constitutes a positive Brudzinski's sign.) □ The Kernig sign (this is elicited by flexing one hip and knee and then extending the knee with the hip still flexed). Hamstring spasm may occur; if severe, opposite knee may flex during the test – positive Kernig's) The Lasègue or straight-leg raising (SLR) sign is elicited by passively flexing the hip with the knee straight while the patient is in the supine position. Limitation of flexion due to hamstring spasm and/or pain indicates local irritation of the lower lumbar nerve roots. Reverse SLR sign is elicited by passively hyperextending the hip with the knee straight while the patient is in the prone position. Limitation of extension due to spasm and/or pain in the anterior thigh muscles indicates local irritation of the upper lumbar-nerve roots. Cortical sensory signs: The cortical sensory system includes the somatosensory cortex and its central connections. Functions include kinaesthetic sensation, stereognosis, graphesthesia and tactile localization and tactile 2-point discrimination on both sides of the body. Position sensation is tested with the subject's eyes closed. The subject is then tested in the various directions of passively elicited distal joint movements. Movement abnormalities: □ Fibrillations are not visible to the naked eye except when the tongue is affected.

© SPM Course □ Fasciculations may be seen under the skin as quivering of the muscle. Although fasciculation is usually benign (e.g. can occur with fatigue); if widespread it can be associated with neuromuscular disease, including amyotrophic lateral sclerosis (ALS). □ Asterixis can be elicited by having the patient extend both arms with the wrists dorsiflexed and palms facing forward, and eyes closed. Brief jerky downward movements of the wrist are considered a positive sign. Asterixis is commonly seen in metabolic encephalopathies. (Note pronator drift is elicited by having the patient extend both arms with the wrists supinated and palms facing upwards and eyes closed – slow unequal drift towards pronation indicates hemiparetic weakness) □ Myoclonus is a brief <0.25 seconds muscle jerk; generalized and sometimes asymmetric. These occur alone or in association with various primarily generalized epilepsies; associated with CJD and also with severe Alzheimer's. □ In athetosis, the spasms have a slow writhing character and occur along the long axis of the limbs or the body itself; the patient may assume different and often peculiar postures. □ The term chorea means dance. Quasi-purposeful (patient turn it to appear as if they are purposive) movements affect multiple joints with a distal preponderance. It is associated with caudate lesions. □ Hemiballismus is a violent flinging movement of half of the body. It is associated with lesions of the subthalamic nucleus. Reflexes Primitive reflexes: These include the glabellar tap, rooting, snout, sucking, and palmomental reflexes. These are generally absent in adults. When present in the adult, these signs signify diffuse cerebral damage, particularly of the frontal lobes (hence the name frontal-release signs). Superficial reflexes: These are segmental reflex responses that indicate the integrity of cutaneous innervation and the corresponding motor outflow. These include corneal, conjunctival, abdominal, cremasteric and plantar (Babinski) reflexes. □ Corneal and conjunctival reflexes – afferent is via 5th nerve while efferent is via 7th nerve. □ Abdominal reflex can be elicited by drawing a line away from the umbilicus along the diagonals of the 4 abdominal quadrants. A normal reflex draws the umbilicus toward the direction of the line that is drawn. □ The cremasteric reflex is elicited by scratching on the medial surface of the thigh to elicit scrotal

contraction or lift in male subjects. A normal reflex results in elevation of the ipsilateral testis.

© SPMM Course □ The best known of this group of reflexes is the plantar reflex or Babinski reflex. The normal response is plantar flexion of the great toe. This normal response is considered an absent (negative) Babinski sign. Dorsiflexion of the great toe (Babinski sign present) suggests an upper motor neuron lesion and is referred to as a positive Babinski sign. Lack of either response may indicate the absence of cutaneous innervation in the S1 segment or loss of motor innervation in the L5 segment ipsilaterally. Deep tendon reflexes: Intact cutaneous innervation, motor supply, and cortical input to the corresponding spinal segment are required for normal deep tendon reflexes. Deep tendon reflexes include biceps, brachioradialis, triceps, patellar, and ankle jerks. These get exaggerated in UMN lesions and are absent in respective LMN lesions. Pseudobulbar palsy is a UMN lesion; exaggerated jaw jerk is noted in patients with this condition. Bulbar palsy is a result of LMN lesion and jaw jerk is absent in this case. Neurocutaneous system □ Frontal baldness: Myotonic dystrophy □ Dermatomal eruptions: Herpes Zoster □ Ash leaf macules: Tuberous sclerosis □ Ungual fibromas: Tuberous sclerosis □ Dimples and large moles along the spine: spina bifida occulta □ Cafe au lait spots: Neurofibromatosis, Tuberous sclerosis. □ Axillary freckling: Neurofibromatosis Speech abnormalities Dysarthria Types Description Spastic dysarthria Strained and hoarse voice, hypernasality and slow, imprecise articulation related to bilateral UMN lesions. Often accompanied by swallowing and drooling difficulties (Palmer 2005). Flaccid dysarthria Isolated areas of involvement are depending on which motor neurone is affected. LMN type lesion. The tongue is usually small due to loss of tone if XII nerve is involved and lies flaccidly on the floor of the mouth. Could be of nasal quality if IX and X nerves are involved. Ataxic dysarthria Excess loudness, tremor and irregular articulatory breakdowns (scanning speech). Intonation, pitch and volume and also be affected, as well as difficulty with alternate tongue movements. The cerebellum is often involved. Hypokinetic dysarthria A breathy monotone voice with reduced loudness and articulation tends to be accelerated and imprecise. Associated with motor control circuit Muscle Spinal Roots Biceps C5, 6 Brachioradialis C6 Triceps C7 Patellar L2-4 Achilles S4

© SPMM Course damage. Hyperkinetic dysarthria Features strained hoarseness and voice arrests. Associated with basal ganglia damage. Mixed dysarthria Similar symptoms to spastic dysarthria, and tends to be accompanied by a wet sounding voice with rapid tremor, poor laryngeal and tongue movements and poor control of lips (Damage to more than one motor system). Hysterical aphonia The examination is usually normal. Sudden loss of voice, but preserved vocal cord activity is notable.

Gait Gait is the motor attitude of a person in the upright position. □ Hemiparetic gait: Seen in patients with stroke affecting the pyramidal system. Typically, clenched hand with extended knee and plantarflexed ankle. This makes the paralyzed leg appear longer (pole-like) than the other. The patient resorts to circling it around resulting in repeated circumduction of the affected leg while walking. □ Ataxic gait: In mild cases this can only be elicited by or tandem walking tests. In severe cases, a staggering wide-based gait is seen. Unilateral (rather than midline) cerebellar lesions may result in the patient veering to the side of the lesion (resulting in sailor's gait). □ Shuffling gait: This is often seen in Parkinsonian patients. The patient takes very short steps and appears to shuffle legs away or apart rather than propelling them forward. Progressively short steps result from a tendency of the patient to accelerate (festinating gait). □ Steppage gait: Here the patient takes high steps as if climbing a flight of stairs while walking on a level surface. Steppage gait is

seen in chronic peripheral neuropathies e.g. drop foot and dorsal column disorders. □ Waddling gait: It is seen in patients with proximal myopathy. Patients have a broad-based gait with a duck-like waddle resulting from the dropping of the pelvis to the side of the leg being raised. A compensatory forward curvature of the lumbar spine adds to the body swing. This is also seen in patients with congenital hip dislocation and near term in pregnant women. □ Scissoring gait: This is seen in patients with spastic paraplegia. Marked rigidity and excessive adduction of the swinging leg together with plantar flexion of the ankle and flexion at the knee due to contractures of all spastic muscles leads to forced tip-toe walking with knees rubbing together and crossing like scissors.

Revision #1

Created 2026-01-04 20:05:08 UTC by Omar Ayman

Updated 2026-01-04 20:05:08 UTC by Omar Ayman