

Basics of neuro-exam

Neurology is:

- Stroke
- Vertebrogenic disorders
- Craniocerebral and spinal traumas
- Polyneuropathies, mononeuropathies
- Epilepsy
- Multiple sclerosis
- Alzheimer's disease and other dementias
- Parkinson's disease and other neurodegenerative disorders
- Metabolic disorders
- Neuroinfections
- Toxic disorders of the brain
- Nutritious deficiencies
- Tumors
- Migraine and other headaches
- Myasthenia gravis
- Neurologic complications of systemic diseases
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Principles of neuro-exam

- To enable the student to detect and record the physical signs of common and important disorders of the nervous system
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- The student should understand the principle behind each test and what it is designed to detect.

Neurologic exam

- Anamnesis- history
- Clinical exam
- Other examinations (radiological, biochemical, haematological, laboratory, neurophysiological, etc.)
- **Diagnosis:**
 - Syndromological
 - Topical
 - Etiopathogenetical

Neurological history

- Current history (anamnesis)
- Family history
- Personal history
- Past medical history
- Pharmacological history
- Physiological functions
- Abusus
- Occupational
- Social
- Alergies
- Driving license
- Gynecological and obstetrics history

The Neuro Exam: History

- History often provides the key since the neuro exam may be normal
 - Subarachnoid Hemorrhage
 - Carbon Monoxide Poisoning
 - Subdural Hematoma
 - Nonconvulsive Seizures
- Neuro complaints may be primary or secondary to other system disease
 - Infection
 - Overdose (elicit drugs, alcohol, etc.)
 - Metabolic Disorders

Neurologic history

- Time of Onset
- Type of Onset
- Progression
- Trauma
- Associated Symptoms
- Factors that make it better/worse
- Past Symptoms / Events
- Past Medical History
- Occupational / Environ Exposures

The order of neuro-exam

- General appearance
- Higher functions
- Cranial nerves
- Motor system
- Reflexes (deep tendon reflexes, superficial reflexes)
- Sensory system
- Stance and gait

Physical exam

- Vital Signs
- Head: Evidence of Trauma
- Neck: Bruits, Rigidity
- Heart: Murmurs
- Lungs: Crepitation, Breathing frequency
- Abdomen: Masses / Distention
- Skin / Scalp: Lesions / Tenderness

Motor Exam

- Strength
- Tone
 - Hypertonia (upper motor neuron lesion)
 - Hypotonia (lower motor neuron lesion)
 - Rigidity (basal ganglia lesion)
 - Fasciculation (anterior horn cell lesion)
- Tenderness
 - metabolic / inflammatory muscle disease

Motor Exam (strength)

- 0 = no movement
- 1 = flicker but no movement
- 2 = movement but can not resist gravity
- 3 = movement against gravity but can not resist examiner
- 4 = resists examiner but weak
- 5 = normal

Deep tendon reflexes

- Eliciting a deep tendon reflex (DTR):
- patient be relaxed with his/her limb in an appropriate position
- to compare one side to the other— asymmetry

- When DTR's are difficult to elicit:
- testing after reinforcement (“Lock your fingers together and pull when I tell you to”; “Clench your teeth”)

Reflexes

- Symmetry / upper vs lower
 - 0 = absent
 - 1 = hyporeflexia
 - 2 = normal
 - 3 = hyperreflexia
 - 4 = clonus (usually indicates organic disease)
- Superficial reflexes (corneal, pharyngeal, pharyngeal, abdominal, anal, cremasteric, bulbocavernosus)

Deep Tendon Reflexes

- Biceps (C5-C6)
- Brachioradialis (C5-C6)
- Triceps (C6-C8)
- Flexor of hands and fingers (C7-C8)
- Adductor (L2-4)
- Patellar (L2-L4)
- Mediolplantar (L5-S2)
- Plantar (L5-S2)
- Achilles (L5, S1-S2)

Superficial Reflexes

- Elicited by cutaneous stimuli
- Abdominal
 - Upper abdomen (T8-T10)
 - Lower abdomen (T10-T12)
- Other
 - Corneal (trigeminus-facialis)
 - Gag (Glossopharyngeus, vagus- vagus)
 - Cremasteric (L1-L2)

Pathologic Reflexes

- Plantar reflex
- the Babinski response (abnormal dorsiflexion of the great toe with fanning of the other toes) is a pathologic reflex indicative of UMN disease.
- Frontal release signs
- Blink reflex/Glabellar tap
- Grasp reflex
- Snout/sucking reflex

Neuronatomy

- Central versus peripheral
 - symmetrical vs asymmetrical
- If central, what is the level:
 - Cerebrum („big brain“)
 - BrainStem
 - Spinal cord
- If peripheral, is it
 - Nerve (nerve roots)
 - Neuromuscular junction
 - Muscle

Impairment of the central versus peripheral motoneuron

- **Upper motor neuron lesion:**
- increased DTR
- muscle tone increased
- no fasciculations
- Paresis (decreased strength)
- Pathological reflexes (Babinski, etc.)
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- **Lower motor neuron lesion:**
- decreased DTR
- tone decreased, atrophy
- Fasciculations
- Paresis (decreased strength)

Pitfalls in neuroexam leading to misdiagnosis

- Insufficient history, including history taking from the family members, other close relatives, co-workers etc.
- Insufficient performance of the systematical exam (I'm just performing the exam where the problem is seen by the patient)
- Very preliminary diagnosis before the acquisition of all acquired data
- Misinterpretation of the „older“ lesions and current lesions
- Misinterpretation of the limiting factors- f.i. pain- misdiagnosed as the neurological deficit (like paresis, etc.)