

7 Steps to Neuro Exam:

"Speak the Language"

- Mental Status - MS A_cO_{x4}, language fluent and appropriate, cognition nml
- Cranial Nerves - Visual Acuity OU, Visual field full, Discs sharp w/o papilledema PERRL 3mm OU EOMI's Nystagmus, Face & nml sensation & strength Hearing intact bilaterally, Palate and Tongue midline
- Motor Exam - nml Bulk and tone 5/5 throughout, no involuntary movement
- Sensory Exam - nml Pinprick, Vibration, Proprioception
- Coordination - Finger to nose, heel to shin, Rapidly alternating movements nml
- Reflexes - Symmetric throughout, Plantar response flexor (nml)
- Gait & Station - nml good tandem, negative Romberg's sign.

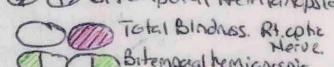
Neurologic EXAM

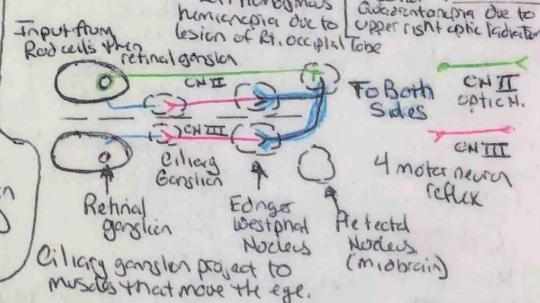
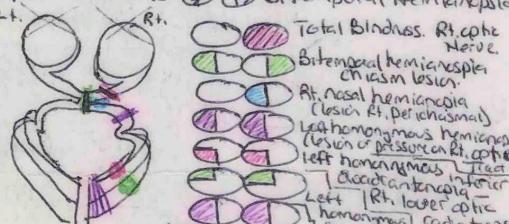
① Cranial Nerves

- CN II Visual Acuity OU (Optic nerve)
 CN III Visual Fields full
 CN IV Discs sharp w/o papilledema
 II, III PERRL 3mm OU = reactive
 III, IV, VI EOMI's Nystagmus
 IV Face & nml sensation & strength
 VIII Hearing intact bilaterally
 V Palate & Tongue midline
 optional CN I - smell (occluded)
 (impractical b/c Nasal
 in people with cold)
 CN II - shug shoulders
 CN II Do you wear glasses or contacts "bottomin"
 Read line w/ one eye covered, then other eye read backwards
 Allowed one error per line (1/2, etc.)
 20/150 a normal person sees at soft you see at soft.
 OU - Both eyes
 OS - Left eye
 OD - Right eye

CN II

- Pupil if we are most concerned w/ Asymmetry (anisocoria) → implies pathology
 Drugs small pupils (stimulate Parasympathetic) → Heroin, Fentanyl, Codeine, Methadone.
 Large Pupils → Cocaine, crack, Meth, Stimulants.
 Test Visual Acuity - "Point to the Hand where the fingers are wiggling"
 If questionable check Quadrants (use paper, cover one eye)
 "Look straight into person" so you also see thumb.

Homonymous Hemianopsia - you could take a field cut and superimpose it onto other eye
 exception to rule is  bitemporal hemianopsia



You can have anisotropia w/ CN III lesion = Tumor
 You can have CN III motor lesion Binasal strabismus = Diabetes.

Note! If we stress the system by flashing light back and forth quickly "Marcus Gunn Pupil" = the weak eye looks like it will get bigger (not smaller). This is an Afferent pupillary defect, the bad eye has bad sensory to光感 illusion of dilation b/c the eyes just constricted from light being shown in good eye.

Fundoscopy

Focusing on far away object will open up the eye.

Our goal is to find Papilledema (pressure behind eye) vs. Glaucoma

A Mound (3-D)

retinal emboli from plaque in the Internal Carotid Artery.

Bad Boys on Top - Determining which side CN II injury is on.

If vision corrects b/c tilting head to left the Lt. colliculus is on top.

Bad Girls on Top - Determining which side CN II injury is on.

If vision corrects b/c tilting head to right the Lt. colliculus is on top.

Bad Boys on Top - Determining which side CN II injury is on.

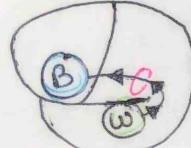
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Must Itaves		relevance to hemisphere dominance	
• Age, Sex, Race, "Handedness"			
• Temporal Profile (Sudden or gradual)			
• Change over time (Static, improved, worse)			
• Anatomic Distribution (focal, multi-focal, diffuse)			
• Identify "Triggers" or "Relievers" of symptoms			
• Gauge severity of symptoms (from 1 to 10)			

1 MS A_cO_{x4} person (cortical abilities) place (cognitive ability) time, language fluent and, cognition/mnse (20/20)
 mental status (level of consciousness)
 Speech 99.9% Rt. handed people (Left hemisphere dominant)
 80.0% Lt. handed people (also left hemisphere dominant)
 (rest have language area on Rt. side or both sides)



- (B) - Broca's Area (Temporal)
 (W) - Wernicke's Area (Parietal)
 connected by Arcuate Fasciculus (white matter bundle)
 conductive aphasia ("can't repeat")

Site of Lesion (injury)	Fluency (speak)	Understand, appropriateness of speech	Ability to repeat
Wernicke's Area	+ (intact)	-	-
Brocas	-	+	-
Arcuate Fasciculus (Conduction Aphasia)	+	+	-
Trans Cortical Sensory Aphasia (TCSA) (+ like Wernicke but can't repeat)	-	+	+
(Clips Wernicke but not beginning of Arcuate)			
Trans Cortical Motor Aphasia -	+	+	+
(Clips Brocas but doesn't get the arcuate)			
Global	-	-	-

Speech (Dominant Hemisphere)

Speech = Aphasia
 Reading = Alexia
 Writing = Agraphia
 Planning action = Agnosia

Agraphia, Rt. / Left confusion
 Acalculia, finger agnosia (trouble w/ math) (can't distinguish fingers, thumbs, pinky)

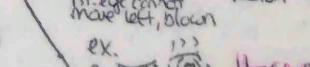
Dominant Hemisphere \rightarrow BERNSTAMM'S Syndrome

(Non-Dominant Hemisphere)

Visual-spatial Problems

- Prosopagnosia (forget faces - face on dollar bill)
- Constructional Apraxia (forget how to put things together)
- Dressing Apraxia (Dressing in AM)
- Neglect - show them their paralyzed arm and they don't think it exists.
- Anosognosia - Don't recognize their disease.
- Flatness of Emotion - (Non-emot. like also emotion)
- Dysprosody - can't understand emotion tied to a phrase said louder.
- Motor Impersistence - Person gets stuck in one action. Same speech over and over.

IX. Full CN III lesion

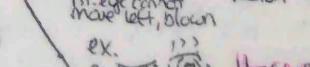
Ex. RI. 

Anisocoria (usually seen in Wallenberg's syndrome)

Paresis Lt. eye

Can happen from Cervical ganglion lesion

X. Horner's Syndrome

Ex. RI. 

Inability to sweat on Lt. side of face

X-X (CN III or CN VII)

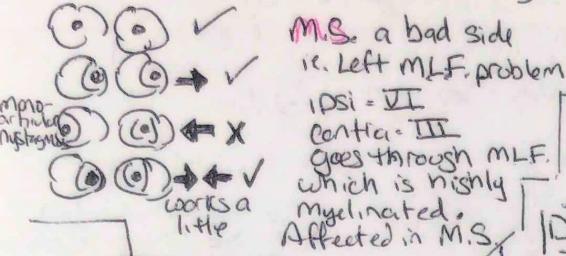
To position to correct vision.

XI. CN IV is smallest CN and most susceptible to trauma (AVPU)

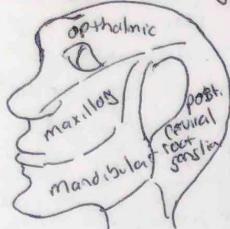
CN IV rotates eyes

XII. CN V rotates eyes

Interruption of oculomotor nerve (M.S.)



CN **IV**

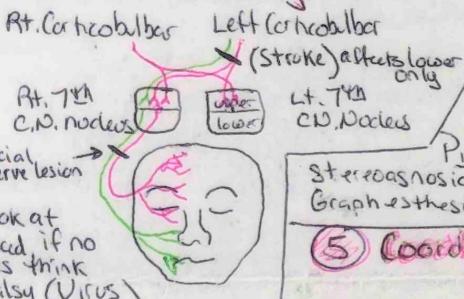


Jaw jerk - optional

Trigeminal ganglion (Sensory)
Corneal (**II**) + (**VII**)
Wrinkles of mouth have worn contacts and are desensitized.

CN **VII** Muscles of facial expression (look for asymmetry)
- Nasolabial fold
"Have them do something to assess symmetry"
Always inquire about old injury

Stroke vs. Bell's Palsy.



You look at forehead, if no wrinkles think Bell's Palsy (Virus) or windows down)

Note: Difficulty holding air in cheeks also Myasthenia Gravis
Note! Ask pt. to squint hard and forcibly close eyelids. If the examiner opens eye and can still see pupil then pt. is possibly malingering. "Bell's Phenomenon" is a reflex that rolls the eye backwards (you should see sclera, not cornea)

CN **VIII**

Hearing, hands, watch Weber Rhinines - Tuning Fork (If equal = Done)

If lateralizes means:
Rt. conductive on Rt.
Lt. conductive on Lt.

If Bone > Air then lateralized side then conductive (wax)

If Air > Bone, the possible sensorineural on Left.

CN **IX, X** → pharynx Larynx

+ goes also to Stylopharyngeus, Palate

- also, Taste

- Tongue will be pushed toward paralyzed side

- Tongue furrows (atrophy) → Means LMNL

If Groups:

CN I - ant. cranial fossa (Ventral frontal lobe tumor)

CN II, III, IV, VI - orbit

CN III, IV, V, VI, VII - cavernous sinus

CN III, IV, V, VI, VII - middle cranial fossa

CN III - ventral midbrain

CN II - mid lateral pons

③ Motor Exam "NML Bulk and tone 5/5 throughout"

"no involuntary movement"

Spastic or Rigid (moving limb either slow or fast)

Dependent (from old stroke) moving limb - NML slow then increasing velocity I would get resistance then breakthrough → called Clasp-Knife reflex

Paroxysm = Not sure of pt. tone ("gegenhalten")
- Normal
- Decreased (flaccid)
- Increased
- Velocity independent ("rigid tone")
- Velocity dependent ("Spastic tone")

Drift Test

"Asymmetry implies pathology but doesn't guarantee it!"

(hands out Palm up)

motor exam, involuntary movements

- Tremor - rhythmic, oscillating (Parkinsons)
- Chorea - Flit-like or dancing movement (Huntington's)
- Athetosis - writhing movements (tends)
- Tics - twitching or jumping movements
- Myoclonus - large muscle jerks (subthalamic)
- Ballism - Flinging of entire limbs (Dowd)
- Fasciculations - small twitches underneath skin (lower motor neuron lesion)

Muscle Grading

- 0 = no movement
1 = flicker movement
2 = movement but not against gravity
3 = movement against gravity but not full ROM.
4 = "breakable" weakness
5 = normal strength.

Proximal weakness?

Could be NMJ

If Distal could be Neuropathic Pattern.

To Test Proprioception: "must grab digits from sides" wobble it. This is up, this is down. Step, then ask if finger is left up or down. (Start distally fingers, wrist, arms)

④ Sensory "Normal Pinprick, Vibration, Proprioception"

Tuning Fork - Put on fingers and toes "Ask if vibrating or not"
Go distally to proximal and across hand, side to side (dermatome)

Pin Prick - (now doing CN II - done now for convenience) must point w/ sharp side, don't count, look for dermatomal patterns.

Stereognosia = put coin in hand. Can't recognize? Problem in Parietal lobe

⑤ Coordination & Gait "Finger to nose, heel to shin NML movements NML"

Upper Extremity

- Finger-to-Nose pt. - move to target.
- Rapid Movements
- Rebound

Lower Extremity

- Heel-to-Shin
- Foot Drifting
- Rebound

make sure to stress If Dystonia, he may miss target

If Spastic legs > spinal cord lesion.

when laying supine lift at knee (the foot should drag on the table)

Touch heel to Shin - if cerebellar lesion - he would be all over place.

⑥ Deep Tendon Reflex (DTRs)

Achilles - S1

Patellar - L4

Biceps - C5

Biceps - C6

Triceps - C7

0 = no reflex (Guillain-Barre)

1 = Decrease

2 = Normal

3 = Increased

4 = Increased w/ Clonus

Symmetric throughout, Plantar response Flexor

Note: 2 instances that are always pathological

* 4 → Clonus

* Asymmetry

Hoffmann: The "Babinski" of the hand. Flick the middle finger

→ pinching motion of finger/Index/thumb

⑦ Gait: "normal good Tandem, negative Romberg Sign"

Station: Base of stance

Stability of stance

Influence of vision (Romberg sign)

Gait: normal, Toe Heel, Tandem.

Feet, arm swing, stance

wide base - more stability

Not swinging arms: Parkinsons

Heel to Toe walk: Tandem

Gait Descriptions:

instead of wide base

Ataxic / Drunken Gait

Apraxic Gait → stuck w/ feet on floor. Also

Parkinsons and Normal Pressure Hydrocephalus

Scissors gait = be specific in both legs

Spastic gait = one leg spastic

Steppage Gait: Foot Drop

Parkinsonism Gait

Limp, cane etc...

* Note: Some people have their vocal cord act but other pharynx, palate still work. B/C

the nerve for vocal cord, recurrent laryngeal goes down into the chest, then back.

or lesion in lung can knock out vocal cord.

Nystagmus - many causes, not feed

- except Vertical Nystagmus

(extra-cervicomedullary junction)

CN VII, VIII - lateral ponto-medullary Juxta

CN IX, X, XI, XII - ventral medullary surface (post cranial fossa)