# NEUROLOGICAL EXAMINATION



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# **NEUROLOGICAL EXAMINATION**

# INTRODUCTION





#### Hand washing

- Essential to prevent cross infection
- Clean stethoscope

# Don appropriate PPE

#### Introduce yourself

- Use your full name and explain who you are

- Confirm you have the correct patient - Their name and date of birth
- Also how do they like to be addressed

#### Explain

- Explain that because of their condition that you would like to examine their eyes, face and mouth along with their arms & legs.
- Explain in plain English what that will involve
- Consent
  - Gain their consent to do this

# - Consid

Consider whether you need a chaperone for this examination

# MODIFIED CRANIAL NERVES EXAMINATION

# **GENERAL INSPECTION**



#### Position

- Sat face to face - knees almost touching

#### Exposure

- dressed for cranial nerves
- Surrounding area

# - walking aids **Patient**

- Patient
  - body habitus well/unwell
- weakness
- obvious tremor
- involuntary movement
- posturing

# **VISUAL FIELDS (CN II)**





#### VISUAL FIELDS (CN II)

- Ask the patient to cover their right eye with their right hand
- Close or cover your LEFT eye
- "Keep looking at my eye but tell me when you notice my fingers come in to view"
- Move fingers SLOWLY in from all four corners of the visual field towards the centre of vision
- Ensure your fingers remain equidistant between you and the patient throughout
- Compare your (hopefully normal) VF with theirs
- Repeat for the opposite eye



#### PUPIL REACTION

- Inspect both pupils closely for discrepancy in size or shape first
- Ask the patient to look at a spot on the wall
- Warn them that you are going to shine a light in their eye
- Check both pupils for direct and consensual reflexes

# **EYE MOVEMENTS (CN III, IV & VI)**



#### FUNDOSCOPY

Ideally in a darkened room

- pupil not normally dilated for CN exam
- Use your right eye to examine their right eye and left eye to left eye to avoid ending up nose to nose with your patient.
- Check for red-reflex
- Move in close, looking through the ophthalmoscope
- Adjusting the focus as needed to find a vessel
- Follow the vessel nasally to the optic disc
- Examine the optic disc for cup, colour and contour looking for evidence of papilloedema



- "Please follow my finger with your eyes but keep your head still"
- Hold your finger halfway between you and the patient (at least 50cm away)
- "Let me know if you get any double vision"
- Move your finger slowly in an H or cross pattern observing for <u>nystagmus</u> or <u>ophthalmoplegia</u>
  - slight nystagmus at the limits of lateral gaze is normal
- If double vision noted at what direction of gaze is it maximum and is it vertical, horizontal or tilted, does closing one eye make it better?

# **FACIAL NERVE (CN VII)**

Inspect for signs of any facial weakness if not already done
Demonstrating what to do as you explain may help here



"Raise your eye brows?" Does the forehead wrinkle both sides?



"Close your eyes really tight?" Look for asymmetry

"Don't let me open them" Any weakness?



"Show me your teeth" Look for asymmetry



"Keep your lips tightly shut Look for asymmetry

"Don't let me open them" Any weakness?

# PHARYNX (CN XI) & TONGUE (CN XII)



# PHARYNX (CN XI)

- Using a tongue depressor and, if necessary, a pen torch to inspect the palate and uvula
- Does the uvula deviate to one side
- AWAY from the side of a lesion
- Ask the patient to say "Aagh"
  - palate and uvula should move upwards



## TONGUE (CN XII)

- Look for fasciculation and wasting
- Ask patient to stick out their tongue and look for deviation
  - TOWARDS side of a lesion
  - "Wiggle your tongue side to side"
  - Check for speed of tongue movements

# **NEUROLOGICAL EXAMINATION OF THE LIMBS**

# **INSPECTION**



#### Positioned 45 degrees on couch Limbs uncovered

# Look for: Muscle wasting

# **Fasciculation**

- Associated with muscle wasting
- Irregular ripples or twitches
- Tapping over wasted muscle may illicit them

#### Tremor

- Describe as fast or slow, fine or coarse
- Examine limbs at rest, on posture and during coordination testing

#### Myoclonic jerks

- Sudden shock like contractions
- Focal, diffuse, singularly, repetitively

### **Deformity & Posture**

- Typical UMN problems cause adduction of shoulder, flexed elbow, flexed wrist



#### Pronator drift

- Arms straight out with palms up
- Eyes closed
  - Arm drifts down and pronates

# **TONE (upper limbs)**





- Hold patients hand as if shaking it and support elbow with your other hand
  - "Relax your arm completely"
  - Keeping talking to the patient will help keep their arm relaxed
- Rotate forearm
- Flex and extend wrist and elbow
  - Rotate wrist
    - Vary speed and direction of movements

# **POWER (upper limbs)**

Give clear instructions \_

\_

- Always get the patient to activate the muscle group first before applying resistance - "Push me away..." rather than "Don't let me pull you..."
- Compare sides and grade power



Shoulder Resisted abduction/adduction C5



Resisted flexion C5/6 Resisted extension C7





Resisted extension C7 Resisted flexion C8



Resisted abduction **T1** 



# **REFLEXES (upper limbs)**

- Get patient to relax
- Hammer should be held loosely and use its weight
- Strike the tendon rather than the muscle
- Look for the muscle contraction rather than the limb movement
- Have 2 attempts at each reflex then try reinforcement (ask the patient to grit their teeth just before you strike the tendon)
- Grade the reflex
  - Reduced or absent LMN lesion
  - Normal
  - Increased or brisk UMN lesion





# **SENSATION (upper limbs)**

#### Superficial pain

- Using a Neurotip® pressed firmly enough to distort the skin
- Demonstrate the sensation on the sternum and verify they can feel the sharp point
- Test in dematomal pattern, comparing one arm with the other then one leg with the other
- If deficit detected then can try to map out

# C4 C5 T1 C6 C7

#### Vibration

- Using a 128Hz tuning fork
- Demonstrate the buzzing tuning fork on the sternum and verify they can feel the buzz rather than the cold metal
- Place vibrating fork on tip of finger and ask if they can feel it
  - If yes then ask them to close their eyes and tell you when it stops confirm accuracy by pinching the prongs to stop vibration and see if they say it stopped
- If deficit detected then try more proximal bony prominences



# **TONE (lower limbs)**

# 

#### TONE

- "Relax your legs completely"
- Keeping talking to the patient will help keep their legs relaxed
- Roll leg from side to side look for normal movement of the foot as you do so
- Lift knee first slowly and then quickly from the bed
- The heel should stay on the bed if the foot lifts off and 'catches' tone is increased and if this occurs more with rapid movements then it is spasticity (velocity dependent increase in tone)
- Rigidity is increased tone that feels equal through all speeds of passive movement



#### CLONUS

- Rapidly dorsiflex the foot and hold to look for clonus (spasticity)
   More than 4-5 beats is pathological and suggests LIMN
- pathological and suggests UMN pathology

# **POWER (lower limbs)**

- Give clear instructions
  - Always get the patient to activate the muscle group first before applying resistance - "Push me away..." rather than "Don't let me pull you..."
- Compare sides and grade power







# **REFLEXES (lower limbs)**

- Get patient to relax
- Hammer should be held loosely and use its weight
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Ankle **S1/S2** 

#### Plantar

- In a fluid movement run a blunt object (blunt end of Neurotip?) up the lateral border of the foot from the heel to little toe then medially towards big toe
- Look for the INITIAL reaction of the big toe.
- Up is abnormal (Babinski response) UMN lesion

# **SENSATION (upper limbs)**

#### Superficial pain

- Using a Neurotip® pressed firmly enough to distort the skin
- Demonstrate the sensation on the sternum and verify they can feel the sharp point
- Test in dematomal pattern, comparing one leg with the other
- If deficit detected then can try to map out

# Vibration

- Using a 128Hz tuning fork
- Demonstrate the buzzing tuning fork on the sternum and verify they can feel the buzz rather than the cold metal
- Place vibrating fork on tip of big toe and ask if they can feel it
  - If yes then ask them to close their eyes and tell you when it stops - confirm accuracy by pinching the prongs to stop vibration and see if they say it stopped
- If deficit detected then try more proximal bony prominences





# **COORDINATION**



#### FINGER-NOSE

- Hold your finger at arms length in front of patients nose
- Ask patient to repeatedly touch between their nose and the tip of your finger
- Cerebellar lesions may cause their finger to under or overshoot



- placing it back on the knee again Get them to repeatedly perform this maneovre
- Cerebellar lesions may cause the heel to wobble off the line of the shin

# **GAIT & ROMBERGS**

#### GAIT

- Tandem gait walking
  - Heel-toe walking

#### **ROMBERG'S TEST**

- Ask patient to stand still and close their eye
- Be prepared to catch them



OR



# **FINISH**



-What else should you examine?

- What are your differentials?
- What investigations should you order?
- What medications should you start (or stop/adjust)?
- Who should you call?

#### ...AND WHY?



- Thank the patient
- Tell them you have finished
- Invite the patient to dress (do they need help?)
- Do they have any questions?
- Doff PPE in the appropriate area
- Wash your hands



#### Spotted an error? email me: nickharveysmith@gmail.com