NEUROLOGICAL EXAMINATION

OBSERVE:

CONSCIOUS?

ENVIRONMENT:
- Bed against the wall = maybe stroke hemiparesis
- Sheep skin on bed
- All meds within the reach of one arm
- Wheelchair
- Walker
- Nasogastric tube
- Life support machinery

GENERAL APPEARANCE
- Age
- Ethnicity
- Stooped forward?

WEIRD BEHAVIOUR
- Chorea
- Ballismus
- Dystonia
- Obvious Tremor

HANDEDNESS:
- Shake their hand, or simply ask
  (Lt hemisphere = dominant)

MINI MENTAL STATE EXAM

ORIENTATION
- WHAT DATE, DAY, SEASON, MONTH, YEAR
- WHERE – WARD, SUBURB, CITY, STATE, COUNTRY

REGISTRATION
- REPEAT 3 OBJECTS, REMEMBER THEM

ATTENTION + CALCULATION
- COUNT BACK FROM 100 IN 7's
- SPELL "WORLD" BACKWARDS

RECALL
- WHAT WERE THOSE 3 OBJECTS I POINTED TO?

LANGUAGE
- REPEAT "NO ANDS, IFS OR BUTS"
- FOLLOW A 3-STAGE COMMAND
- WRITE A SENTENCE
- COPY AN INTERLOCKING PENTAGON DESIGN

SPECIAL TESTS OF STIFF-NECKEDNESS

Rotate passively:
- pain + spasm = increased ICP, Spondylosis, Parkinsons, or cervical spine fusion

Flex passively towards the chest:
- pain + spasm = meningitis

KERNIG’S SIGN:
- extend knee while hip is flexed
- Hamstring spasm = meningitis
HIGHER ORDER FUNCTION

HANDEDNESS FIRST!!

ORIENTATION in person, place, time

SPEECH

**PROPOSITIONAL**
- describe room, clothes
- expressive aphasia = non-fluent, aware of deficit

**COMPREHENSION**
- touch chin, nose, ear
- Y/N questions: socks on before shoes?
- receptive aphasia = fluent but gibbering

**REPETITION**
- no Ifs, Ands or Buts
- conductive aphasia
- follows command but cannot repeat words

**OBJECT IDENTIFICATION**
- what is this thing I am holding?
- nominal aphasia = cant name selective objects
  not localising (dominant temporo-parietal region)

**ARTICULATION**
- “British constitution”
- dysarthria:
  - pseudobulbar = tight squeezing out of lips
  - bulbar = nasal speech
  - CN 7 = slurred drunken speech
  - Extrapyramidal = monotonous bradykinetic
  - Cerebellar = explosive

**VOICE QUALITY**
- dysphonia? Not a higher order problem

PARIETAL LOBE

DOMINANT:
- Arithmetic = acalculia

Gerstmann’s Syndrome: AALF
Writing skill = agraphia  
Lt-Rt disorientation  
Finger agnosia (cannot name them)

NON-DOMINANT  
Sensory and visual INATTENTION  
ASTEREOGNOSIS = unable to recognise by touch  
DRESSING APRAXIA = is it inside-out?…  
CONSTRUCTIONAL APRAXIA: cant copy pictures  
SPATIAL NEGLECT: draws clockface with all numbers on one side

TEMPORAL LOBE  
SHORT TERM MEMORY: 3 objects after 5 minutes  
LONG TERM: where do you live? When did WW2 end?  
May start to see Korsakoff’s confabulation psychosis here

FRONTAL LOBE  
Emotion, memory, judgement, inhibition- the seat of the soul  
= ALTERNATING IRRITABILITY AND EUPHORIA

PRIMITIVE REFLEXES  
- Grasp (contra to lesion)  
- Palmomental (ipsi)  
= contraction of orbicularis oris when thenar eminence is stroked  
- Pout and Snout = tap along upper lip to produce pouting

ASK THE PATIENT TO…  
interpret a proverb  
test their smell for ANOSMIA  
look for GAIT APRAXIA  
fundoscope for PAPILLOEDEMA
CRANIAL NERVES
OLFATORY

Block one nostril, use good coffee
Unilateral loss = meningioma or increased ICP
Bilateral loss = trauma

OPTIC

Look at the pupils. Different sizes? = ANISOCORNEA

SCOPE THE FUNDUS: weirdness? Pale disk, hemorrhages etc?...

TEST ACUITY: get their glasses off, use Snellen chart
Normal = able to read line 6 at 6 metres
(1st number = seen by pt)
(2nd number = seen by normal person)

VISUAL FIELDS:
Look into my eyes; see wiggling finger?
(comes INTO field, not out of it)

BLIND SPOT:
come from the lateral, its normally @ temporal visual field
Scotoma?

PUPILLARY REFLEX:
shine light into pupil:
watch: what is the OTHER pupil doing?
Should also constrict

SWINGING LAMP SIGN:
Move light to contra pupil:
The ipsi pupil will then DILATE after the light has moved away from it.
This is an AFFERENT PUPILLARY DEFECT
(eye with reduced acuity will dilate abnormally)

ACCOMODATION:
Near and far focussing

NORMAL ACCOMODATION BUT NO LIGHT REFLEX? = Syphilis pupil
OCULOMOTOR, TROCHLEAR, ABDUCENT

**PTOSIS?** Oculomotor = opens eyelid;
**CONSTRICTED PUPIL?** Sympathetic (Horners) dysfunction
**DILATED PUPIL?** Oculomotor dysfunction

**TEST CARDINAL DIRECTIONS (LR 6 SO 4)**

**DIPLOPIA?** = weakness of a muscle;
**OUTERMOST IMAGE IS FALSE**

**NYSTAGMUS?** = jerky or pendular
  **PENDULAR** = retinopathy or congenital
  **Jerky:**
  \[ \rightarrow \leftarrow \] = vestibular, cerebellar, toxic (INO@MLF)

  **Upbeat** = midbrain or floor of 4rth
  **Downbeat** = foramen magnum

**CONVERGENCE**
Move finger → patients nose

**Supranuclear palsy:**
loss of vertical, horisontal or both
Both eyes, fixed unequal pupils, no diplopia!

**Progressive Supranuclear palsy:**
loss of first vertical, then horisontal gaze
+ monotonous speech
+ dementia

**Parinaud’s syndrome:**
Loss of vertical gaze
Nystagmus on convergeance
Pseudosyphilis pupil: no light response but accommodating fine
**TRIGEMINAL**

**CORNEAL REFLEX:** expect both eyes to blink
- If only contra eye blinks = ipsi 7th palsy
- If touch is still felt, trigeminal nerve is intact

**FACIAL SENSATION:** forehead, cheek, chin
- Total loss = preganglionic, eg. acoustic neuroma
- Dissociated = brainstem issue

**MASSETERS:** clench teeth

**ABNORMAL MOVEMENTS**
- Jaw tremor? = Parkinsons
- Repetitive chewing? = Tardive Dyskinesia
- Tetanus clench

**JAW JERK REFLEX**
- Open mouth
- Strike lower chin
- Normally: NO REFLEX
- EXAGGERATED = UMNL or pseudobulbar palsy

**FACIAL**

**LOOK:** Facial asymmetry?
- Unilateral droop?
- Wrinkle smoothing?
- Loss of NASOLABIAL FOLD?

**MUSCLE POWER:**
- Wrinkle forehead; try to smooth out
- Test facial expressions:
  - SURPRISE
  - GRIN
  - SNARL
  - POUT
  - PUFF
  - SQUINT

**TASTE @ Ant 2/3rds**

**ACOUSTIC**

**LOOK @ EAR**
- Pull pinna
- Pain = Otitis externa or TMJ disease

**FEEL FOR NODES**

**OTOSCOPE THE DRUMS**

**TEST HEARING: 256 Hz fork:**

**Rinne’s Test:**
- Put struck fork @ mastoid:
- When you can’t hear anymore:
- Put fork in front of ear.
- **SHOULD BE ABLE TO HEAR IT AGAIN**
- If not = conductive loss

**Weber’s Test:**
- Put struck fork on centre of glabella
- Should hear it all @ centre of head
- NERVE-DEAF = better @ Normal ear
- CONDUCTION-DEAF = better @ Clogged ear
VESTIBULAR

HALLPIKE’S TEST FOR VERTIGO:
Asit patient up in bed
Grab patients head and smoosh it into the
bed to ~ 30 degrees below horizontal
At the same time turn patients head towards
yours with eyes open.
+ve test: LOOK FOR
NYSTAGMUS
VERTIGO
For 15 sec, then- not
reproducible
= benign positional vertigo
IF REPRODUCABLE = cerebellar or brainstem problem

GLOSSOPHARYNGEAL and VAGUS

OPEN MOUTH AND SAY “AAAH”
Uvula gets pulled to NORMAL side
GAG REFLEX (9th sensory, 10th motor)
Ask if they can feel it;
Feel it but don’t gag = vagus issue
No sensation or gag = glossopharyngeal
problem

SPEECH: Hoarse?
= unilateral recurrent laryngeal palsy

COUGH: bovine?
= Bilateral recurrent laryngeal lesion

TASTE @ posterior 1/3rd

ACCESSORY

SHRUG versus resistance
TURN HEAD versus resistance
Unilateral = something wrong @ jugular foramen
Bilateral = motor neurone disease

HYPOGLOSSAL

POKE OUT YER TONGUE
Wasting? Fasciculations?
TONGUE WILL DEVIAE TOWARDS LESION

Unilateral UMNL = no deviation
Bilateral UMNL = small immobile tongue
Bilateral LMNL = dysarthria

BULBAR PALSY: LMNL of 9th, 10th, 12th
wasted tongue,
no gag reflex,
nasal speech,
limb fasciculations

PSEUDOBULBAR PALSY: UMNL of 9th, 10th, 12th
=spastic tongue, exaggerated jaw jerk reflex,
dysarthria, upper limb UMNL
SENSORY AND MOTOR SYSTEMS

General template:

LOOK:
- scars
- wasting
- fasciculations
- tremor
- symmetry
- abnormal movements

FEEL MUSCLE BULK
TONE
POWER
REFLEXES
COORDINATION
Lower = GAIT
Upper = Fine Functions

PAIN with needle
Temperature with ice cube

Vibration with tuning fork @ bony prominences

Proprioception with eyes closed
Light Touch with cotton bud

UPPER LIMB MOTOR
Shake hands;
Cant relax grip = myoclonus
Fasciculations? Wasting?

CLOSE EYES, HOLD OUT BOTH HANDS WITH PALMS UP:
Drift UP = cerebellum
Drift DOWN = UMNL
Searching drift = pseudoathetosis, = proprioception loss

TONE
POWER
REFLEXES:
Biceps, Triceps, brachioradialis

COORDINATION
Close eyes, touch own nose
Open eyes, touch my finger
DYSDIADOCHOKINESIS

LOWER LIMB MOTOR
GAIT:
1. Walk normally
2. Walk heel-to-toe = cerebellum
3. Walk on toes = S1-S2
4. Walk on heels = L4, L5
5. Romberg’s test

Fasciculations?
Wasting? LOOK AT THE QUADS
TONE
POWER
REFLEXES:
Knee jerk, Achilles tendon,
Babinsky (Normal = scrunch)

COORDINATION
touch my finger with your toe
t foot tapping
Heel along shin
CEREBELLUM
INTRODUCE SELF, ASK PATIENT HOW THEY FEEL:
Mr. Cerebello will reply EXPLOSIVELY + MONOSYLLABICALLY
Stand the patient up.

GAIT:
walk back and forth,
walk heel-to-toe
Cerebello will stagger → affected side

CLOSE EYES + STAND WITH FEET TOGETHER
(Romberg’s test)
Cerebello will sway + collapse

OPEN EYES, FOLD ARMS
Swaying = trunkal ataxia

SIT DOWN, PUT ARMS OUT + HOLD
Cerebello will OSCILLATE

CLOSE EYES, PUT ARMS OUT
Cerebello will OVERSHOOT (rebound)

CLOSE EYES, TOUCH NOSE
Cerebello will MISS HIS NOSE

OPEN EYES, TOUCH MY FINGER
Cerebello will have an INTENTION TREMOR

PRONATE + SUPINATE HAND, QUICKLY
Cerebello will have DYSIDIADOCHOKINESIS

NYSTAGMUS
Cerebello will have
JERKY HORIZONTAL NYSTAGMUS

SIT ON EDGE OF BED, SWING LEG LIKE PENDULUM
Cerebello’s leg WILL NOT STOP SWINGING

LIE DOWN, RUN HEEL ALONG ANT. TIBIA
Cerebello WILL NOT BE ABLE TO DO THIS PROPERLY

TOUCH MY FINGER WITH YOUR BIG TOE
Cerebello will have an INTENTION TREMOR