

# Practical examination

Amal Abu Kteish

## Revision!!!

- <https://www.youtube.com/watch?v=oR4hAwL4iFw>
- Direction
  - Horizontal – right or left beating
  - Vertical – up or down beating
  - Oblique
  - Torsional
- Speed – slow phase velocity
- The effect of direction of gaze – Alexander's Law
- The effect of visual fixation
- Nature – pendular, linear slow component

## Peripheral vs central nystagmus

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>• Acute</li> <li>• <u>Direction fixed</u></li> <li>• <u>Follows Alexander's Law</u></li> <li>• Enhanced without visual fixation</li> <li>• Linear slow component</li> </ul> | <ul style="list-style-type: none"> <li>• Acute or chronic</li> <li>• <u>Direction fixed or changing</u></li> <li>• Enhanced with visual fixation</li> <li>• Decreasing speed of slow component</li> </ul> |
|--|---|



## Alexander's Law

- The intensity (slow phase velocity) of the nystagmus is greatest when gazing in the direction of the fast component
- First degree
  - Present only when gazing in the direction of the fast component
- Second degree
  - Present when gazing in direction of fast component and straight ahead
- Third degree
  - Present in all positions

## Vestibular Nystagmus following Alexander's law

- <https://www.youtube.com/watch?v=mghGeKkNBzQ>

## Direct Examination - tests requiring no additional equipment

- Eye movement exam
  - Ocular ROM
  - Spontaneous and gaze evoked nystagmus
  - Pursuit and saccades
  - Skew deviation
- VOR
  - Slow
  - Head thrust– horizontal, vertical, translational
  - VOR cancellation
- Balance function
  - Romberg/sharpened Romberg
  - Stepping test

## Eye movement exam

- Ocular ROM
  - Looking at function of cranial nerves III, IV and VI
  - Look for conjugate eye movement and restrictions in one or both eyes
- Spontaneous and gaze evoked nystagmus
  - Pause for 10-15 secs right left up and down
  - Note the presence, direction and nature of any nystagmus
- Pursuit
  - Is it smooth in all directions?
- Saccades
  - Is the eye movement conjugate?
  - Consider velocity and accuracy

## Ocular ROM

- Prior vestibular testing a quick ocular-motor assessment must be performed by the clinician.
- Using a finger or probe.
- Idea of patient`s control on voluntary eye movements .
- Central nervous system disorders or other ophthalmoparetic disorders will need a referral .

## Occular ROM

- <https://www.youtube.com/watch?v=tQTof1AVNmA>
- <https://www.youtube.com/watch?v=gxyZxASGxck>
- <https://www.youtube.com/watch?v=D-wP29938as>

## Pursuit

- Follow finger moving slowly from side to side and up and down
- 50-100cm
- Age dependent
- Abnormal = central

## Video 4

- <https://www.youtube.com/watch?v=gqCgzSSwPLk>

## Saccades

- 10-150cm
- Horizontal and vertical
- Velocity, accuracy
- Conjugate eye movement

## Video 5

- <https://www.youtube.com/watch?v=UEqraYeP7Qs>

## VOR - direct exam

- Slow – Move head slowly from side to side while pt fixates on a target
- 30 degrees below the horizontal

## VOR - direct exam

Headthrust – horizontal, vertical, translational

–Quick, small amplitude, unpredictable head movement

–Look for catch up saccade after the movement

- <https://www.youtube.com/watch?v=BmNCEhN61gM>
- [https://www.youtube.com/watch?v=KYI7eHhw\\_hwk](https://www.youtube.com/watch?v=KYI7eHhw_hwk)

## VOR - direct exam

- VOR cancellation
  - Head and target move together
  - Abnormal VOR cancellation is a central sign
  - Vor may be cancelled due to cerebellum inhibitory input ( so if the eyes are moving (slipping)  problem in the cerebellum.

## Video 8 & 9

- <https://www.youtube.com/watch?v=D5AVkyQzZ58>
- <https://www.youtube.com/watch?v=ExOs7HSHV-c>

## Balance function - direct exam

- Patients who are able to maintain a stable posture while eyes are open, may experience a fall or sway when eyes are closed.
- This is referred to as “Romberg sign”.

- It was suggested by Barany in 1910 that it can be used in the assessment of the dizzy patients of vestibular disorders.
- Suggesting that the patient would fall towards the side of the vestibular dysfunction.
- Romberg should be used to compare the postural stability with eyes open and closed only.

- Romberg is a test that assesses the function of lower spinal reflexes, by relying only on vestibular and proprioceptive inputs to maintain an upright posture.

- Normally a patient with a unilateral vestibular impairment may not exhibit a difference due to vestibular compensation .

## Balance function - direct exam

- **Romberg**

- Stand with feet together hands folded and crossed on the shoulders.
- Eye open then eyes closed (**support patient**).
- Note the direction of sway.
- <https://www.youtube.com/watch?v=YBQNwvWgREU>

## Normal

- Maintain in standing position with eyes closed for 30 secs (without falling or swaying).

## Abnormal (positive) results

- Fall or sway when eyes closed.
- If they move their legs from original position or hands from shoulders.

- Patient who sways when eyes are open and closed may have a vestibular or cerebellar dysfunction.
- Acute uncompensated vestibular lesion will result in a sway towards the side of lesion.
- Test is not sensitive to compensated vestibular lesions thus patients with compensated or chronic vestibular losses will often perform normally on the Romberg test.
- video

## Sharpened Romberg

- If normal results the test can be modified to a more difficult task to increase the difficulty by having the patient stand in the tandem position (toe to heel) or on a foam pad.
- It reduces the proprioceptive feedback so there is more reliance on the vestibular system.

## Stepping test - Fukuda/Unterberger

- More clinical value for assessing vestibular weakness.
- Asymmetry in the vestibulospinal reflex.
- <https://www.youtube.com/watch?v=XGUNTSZ2UM>

### •Stepping test – Fukuda/Unterberger

-arms extended 90 ° in front of body.

-eyes closed.

- March in place for 50 steps

Helpful to make a reference mark.

Only done with patients who can maintain balance on Romberg test when eyes closed.

## Normal results

- Normal patients can perform the 50 steps without a significant deviation (no more than 50 cm).
- Its also normal to rotate in the direction of the dominant hand and forward not backwards (non organic dysequilibrium).

## Abnormal results

- A rotation of more than 45 ° in either direction.
- Fall or sway.
- As it was originally described, patients with significant unilateral vestibular impairment would have a tendency to deviate (rotating greater than 45 degrees) in the direction of the affected labyrinth.
- However some suggest its pathology related.
- Do not use in isolation.