Vestibular Evaluation

1. History
   - Most important aspect of evaluation (see DHI)
2. Vital Signs
   - Check blood pressure in supine and sitting
3. Eye Exam
4. Positional Testing
5. Balance Testing
Eye Exam
Eye Exam

• Cranial Nerve testing

  • *Oh great, this again!*
  • Cranial nerves II, III, IV and VI all control eye movement and vision and have connections with the vestibular cortex (and, of course, CN VIII)
  • Simply have a patient track your pen, making sure to go horizontal, vertical, diagonal and convergence (eyes moving inward)
Eye Exam

- Smooth Pursuit
  - This is the eye tracking the pen
  - Look for jerky eye movements or inability to track
  - Look for induced nystagmus, reproduction of symptoms, and inaccuracy
Eye Exam

- **Saccades**
  - This tests the ability of the patient to change their focus on multiple targets
  - Have the patient look at your pen, then switch to your nose, moving back and forth
  - Change the location of the pen to assess their ability to perform saccadic movements in multiple planes
  - Look for induced nystagmus, reproduction of symptoms, and inaccuracy
Eye Exam

- VOR
  - Have the patient stare at your pen while moving their head left and right, and up and down
  - Again, look for induced nystagmus, reproduction of symptoms
Eye Exam

- Visual acuity
  - Have the patient stand the proper distance away from the eye chart and assess their ability to correctly read the line
  - Then ask the patient to move their head left and right and read the line correctly
  - A difference of more than 3 lines indicates a problem with gaze stabilization
Eye Exam

- Head Shaking Nystagmus
  - Grasp the patient’s head and tilt it down into flexion 20 degrees
  - Ask them to stare at your nose as you passively rotate their head left and right
  - Mix in a fast rotation to elicit nystagmus
Eye Exam

*any reproduction of symptoms with smooth pursuit, saccades, VOR, or dynamic visual acuity is indicative a central vestibular pathology*
Nystagmography

- Study of ocular movement
- Take note of speed and direction of eye movement
Nystagmography

- Upbeating torsional nystagmus
  - Typically indicative of posterior SCC pathology
  - Most common (α 60%)
- Downbeating Torsioal Nystagmus
  - Typically indicative of anterior SCC pathology
  - α 30%
- Lateral Nystagmus
  - Indicative of horizontal SCC pathology
  - <10%
Nystagmography

Upbeat nystagmus

edited by Mr. C.N. Chua
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Nystagmography

Downbeat Nystagmus

edited by Mr. C.N. Chua

@ April, 2001
Positional Testing
Hallpike-Dix Maneuver

*Assess for a vertebral artery test prior to testing if the patient is elderly and has not had an ultrasound performed*

- Have the patient wear the frenzel lenses during the testing (if available)
- Test the side opposite the potential pathology to give the patient a sense of comfort with the maneuver
Hallpike-Dix Maneuver

- Grasp the patient’s head, rotate it away from the side being tested approximately 45 degrees, and extend the cervical spine 30 degrees
- Have the patient hold your opposite forearm
- Explain that you are trying to provoke their symptoms and must change positions quickly in order to elicit them
Hallpike-Dix Maneuver

- Quickly place them in sidelying, with their head extended off the edge of the treatment table and hold the position for 45-60 seconds
Hallpike-Dix Maneuver

- Look for nystagmus, noting time of onset, duration and direction of eye movement
- Eyes moving upward (up beating) indicate posterior canal pathology, horizontal for horizontal canal, and downward (down beating) for anterior canal
- Up or down beating are also referred to as rotational or torsional nystagmus
Roll test

- This can elicit nystagmus for horizontal canal involvement
- It can also elicit torsional nystagmus, and is a proper substitute for the Hallpike maneuver if the patient is obese or unable to comply with the testing
Roll test

- Begin with the patient in supine and head flexed 20 degrees
- Quickly roll the head to one side, looking for downward (geotropic) or upward (ageotropic) nystagmus
- Take note of time of onset and duration of nystagmus
Positional Testing

*Immediate and prolonged nystagmus indicate cupulolithiasis, where later onset (10-40 seconds) and short duration of nystagmus indicate canalithiasis*
Neck Torsion Test

- Assesses for cervicogenic component of vertigo
- Stabilize client’s head
Neck Torsion Test

- Have client rotate torso left and right
- Note elicitation of nystagmus or reproduction of vertiginous symptoms
Motion Sensitivity Quotient (MSQ)

- This take the patient through a variety of positions that may or may not elicit their symptoms
- The score of the test is arbitrary and seldom used as an objective measure
- The test is used to determine which positions are creating symptoms, and can be used to assess for improvement during reassessment or discharge testing
- Refer to attached forms for the MSQ
Vestibular Treatments
Treatment

- Gaze Stabilization
  - X1 Viewing

- Fix your eyes on a target and move your head from side to side without removing your eyes from the target.
Treatment

- Gaze Stabilization
  - X2 Viewing
    - Strengthens saccade system
    - Have client staring at one object
    - Their eyes then shift toward the other object, while the head is still facing the 1\textsuperscript{st}
    - The head then follows toward the 2\textsuperscript{nd} object
    - Repeat 25x
Treatment

- **Gaze Stabilization**
  - **Visual Targets**
    - Have client stare at object, then close their eyes
    - Client then turns their head, but eyes are still in the direction of the object
    - Client opens their eyes and assesses accuracy
Treatment

- Progression
  - Begin with gaze exercises in sitting
Treatment

- Progression
  - Progress to viewing with loud background
  - For example: near wallpaper, blinds, on gift wrap etc.
Treatment

- Progression
  - Attempt in standing,
  - Standing on foam,
  - Standing in single limb stance
  - On a wobble board
  - On a trampoline
  - (be creative)
Treatment

- Habituation Exercise
  - Theory is to hyperstimulate a hypostimulated system
  - Each position is held for 10-15 seconds, or until symptoms resolve
  - Repeat 10 times
  - Performed 5 times/day
  - Use pillows to reduce excursion
  - Progress with gradual removal of pillows
Treatment

- Canalith Repositioning Techniques
  - To be used on patients with BPPV
  - Maintain each position for 30-120 seconds, or until symptoms subside
  - Repeat if symptoms do not subside or worsen
Treatment
Canalith Repositioning Techniques

- CRT for Posterior SCC
  - Begin with patient in long sitting
Canalith Repositioning Techniques

- Posterior SCC
  - Quickly move client to supine with head rotated toward involved side 45° and neck extended
Canalith Repositioning Techniques

- Posterior SCC
  
  - Slowly rotate head 45° toward uninvolved side, maintaining neck in extension
Canalith Repositioning Techniques

- **Posterior SCC**
  - Have client slowly roll to sidelying with uninvolved side down.
  - Maintain head in 45° rotation toward uninvolved side and neck in extension
Canalith Repositioning Techniques

- Posterior SCC
  
  - Gently have client return to a sitting position with head rotated toward uninvolved side
Canalith Repositioning Techniques

- Posterior SCC
  - Have client look forward
Canalith Repositioning Technique

- CRT for Horizontal SCC
  - Begin with client in supine
  - Rotate head 45° toward uninvolved side
Canalith Repositioning Technique

- Horizontal SCC
  - Slowly rotate head to neutral
Canalith Repositioning Technique

- Horizontal SCC
  - Gently rotate head toward involved side
Canalith Repositioning Technique

- **Horizontal SCC**
  - Continue until client is prone with head is face down
Canalith Repositioning Technique

- Horizontal SCC
  - Gently have client move self from prone to quadriped to sitting
Liberatory Maneuver

- Canalith Repositioning technique
- Utilized with cupulolithiasis
- Treats anterior and posterior SCC
- Similar to CRT, each position is held for 1+ minutes, or when vertiginous symptoms subside
Liberatory Maneuver

- Begin with client seated
- Head is rotated 45° toward uninvolved side
Liberatory Maneuver

- Client then quickly lies to involved side
- Head is maintained at 45° rotation toward uninvolved side
Liberatory Maneuver

- Client then quickly moves to opposite side
- Head remains 45° rotated toward uninvolved side
Liberatory Maneuver

- Client slowly returns to seated position
Brandt-Doroff Maneuver

- Similar to that of Liberatory Maneuver
- Utilized in treatment of horizontal cupulolithiasis
- Similar to habituation exercises
- Each position held until symptoms subside plus additional 30 seconds
- Often used as last resort
Brandt-Doroff Maneuver

- Begin with client in seated position
Brandt-Doroff Maneuver

- Client quickly lies to involved side
Brandt-Doroff Maneuver

- Client returns to seated position
Brandt-Doroff Maneuver

- Client then quickly moves to opposite side
Brandt-Doroff Maneuver

- Client, again, returns to seated position
Post Repositioning Instructions

- Patient should sleep upright (head over body) for 48 hours
- Avoid excessive head motion (bending, looking up)
- Avoid prolonged cervical flexion or extension
Let’s go try it