

Ocular motor and vestibular bedside testing

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Stare Splay, 12 May 2018

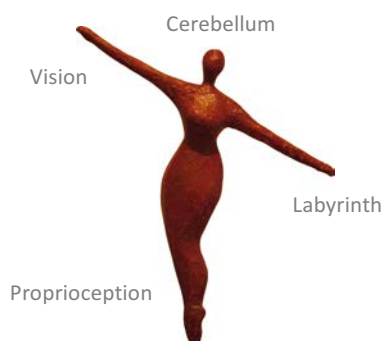


A. Brandner

Vestibular Bedside Testing

1. Spontaneous Nystagmus
2. Head Impulse Test
3. Skew Deviation
4. Romberg Test on Foam
5. Dynamic Visual Acuity
6. Polyneuropathy
7. Reposition, Reposition, Reposition!

HINTS



Help, my vision is jiggling!

Oszillopsia

At rest

With head movement



Downbeat Nystagmus

Bilateral vestibular loss



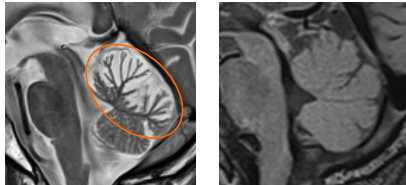
Courtesy M. Strupp

1. Spontaneous Nystagmus



Chronic Downbeat Nystagmus

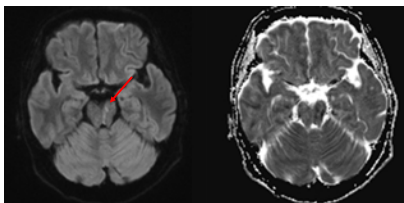
Cerebellar Atrophy



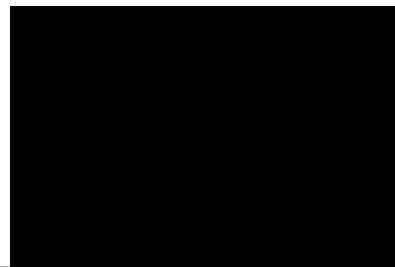
Acute Upbeat Nystagmus



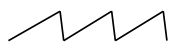
Pontomesencephalic stroke



Head Shaking Nystagmus



Nystagmus Waveforms



Constant velocity slow phase
(e.g. vestibular nystagmus)



Decreasing velocity slow phase
(e.g. gaze-evoked nystagmus)



Increasing velocity slow phase
(e.g. congenital nystagmus)



Pendular Nystagmus
(e.g. congenital/ acquired)



Video Oculography

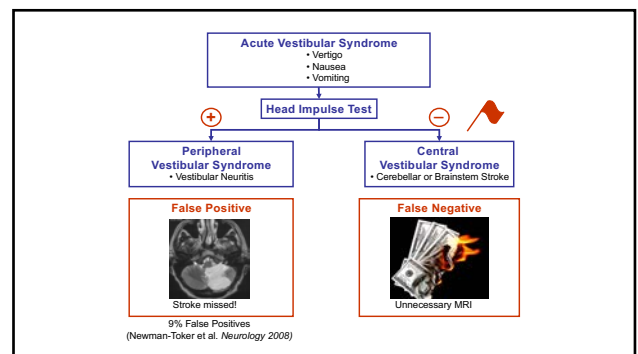
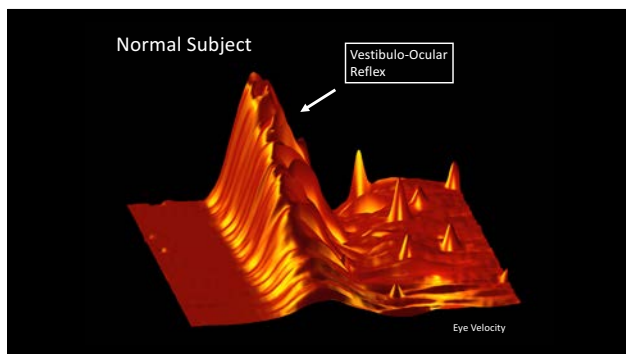
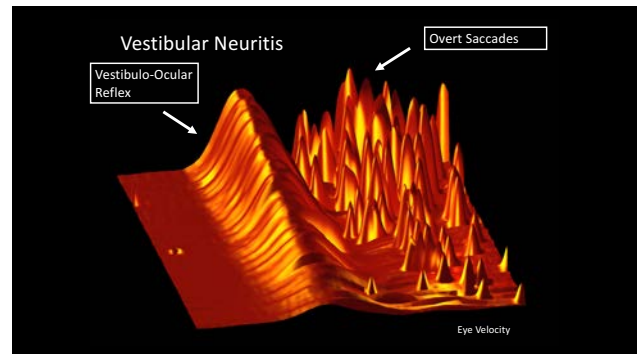
Investigation is Key



2. Head Impulse Test



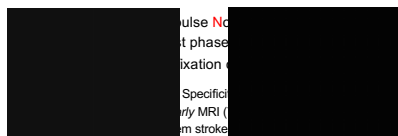
Weber et al. Neurology 2008



HINTS?

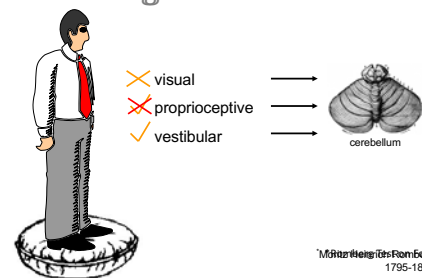
HI Head Impulse test
N Nystagmus
TS Test of Skew

Nystagmus **INFARCT!** Test of Skew

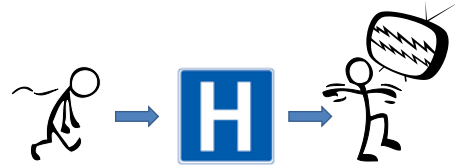


Neurology 2009

Romberg* Test



Fromberg Test



Gentamicin Vestibulotoxicity!

Polyneuropathy



Hepatitis C-associated Polyneuropathy

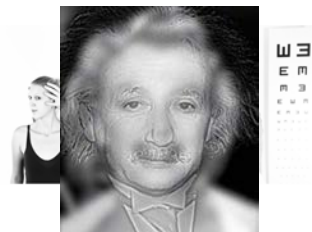


Encourage walking sticks & good footwear

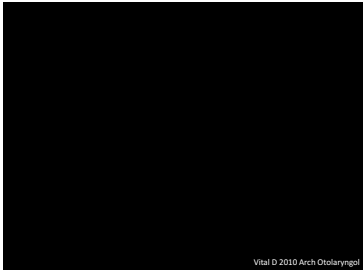


Dynamic visual acuity DVA

- Head shaking at least 2 Hertz
- Loss of 3 or more lines is indicative of bilateral vestibular loss



Dynamic Visual Acuity Test



Vital D 2010 Arch Otolaryngol

96-year old lady

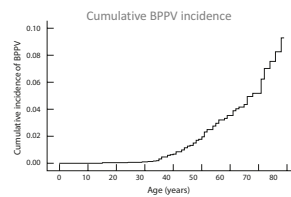
- Short-lasting vertigo when stooping
- Hospitalized after a fall
- Fracture of her pubic bone
- Right posterior BPPV
- Referral for repositioning on our motorized turntable

Epley liberation maneuver performed on a 96 year old women with right posterior canal benign paroxysmal positional vertigo (BPPV) in a motorized chair.

Bockisch et al. 2014 Curing a 96-year-old patient afflicted with benign paroxysmal positional vertigo on a motorized turntable.

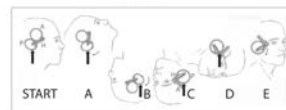
BPPV Epidemiology in the Elderly

- 10% cumulative incidence at 80y
- Up to 9% unrecognized BPPV in geriatric outpatient clinics
- Falls lead, directly or indirectly, to 12% of all deaths in elderly

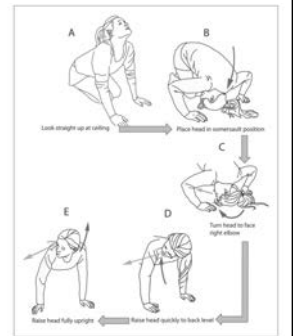


Baraff LJ Ann Emerg Med 1997.
Von Boven M et al. J Neurol Neurosurg Psychiatry 2007.
Oghalai JS et al. Otolaryngol Head Neck Surg 2000.

The Foster Maneuver



www.halfsomersaultmaneuver.com



Summary

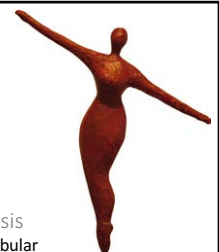
Examination Steps

1. Spontaneous Nystagmus
2. Head Impulse Test
3. Skew Deviation
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HINTS

Diagnosis

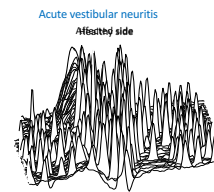
- Vestibular
- Visual input
- Proprioception
- Cerebellum



Video Head Impulse Test



Video Head-Impulse-Test



Ocular Motor Bedside Testing



Here's looking at you, kid!

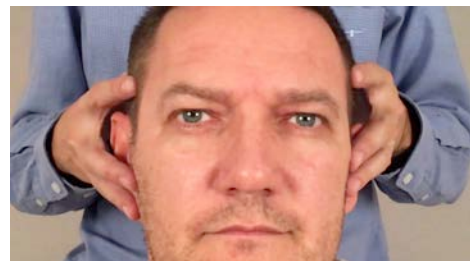
6 Classes of Eye Movements

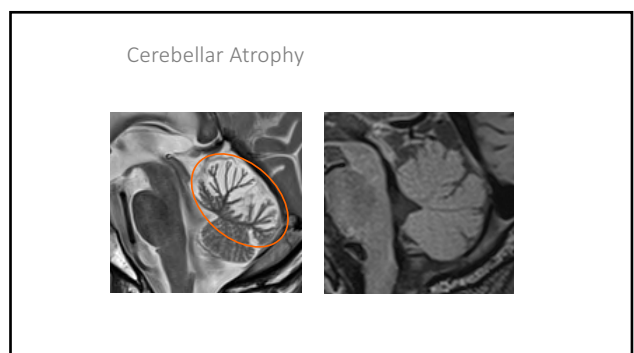
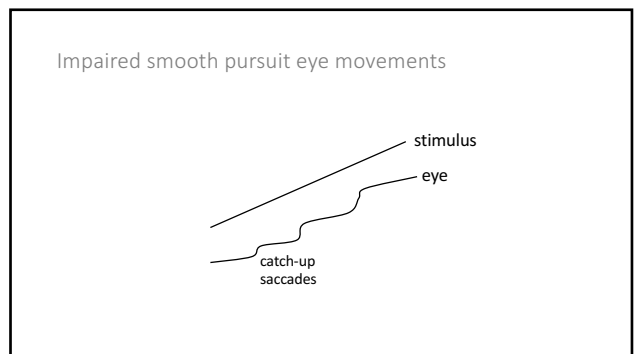
- **Stabilizing gaze on the retina (non-volitional)**
 - Fixation -> while stationary
 - Vestibulo-ocular reflex -> during self-motion
 - Optokinetic nystagmus -> moving environment
- **Directing gaze to a target (volitional)**
 - Smooth pursuit -> following a moving target
 - Saccades -> fast gaze shift
 - Vergence -> binocular control

Alternate Cover Test



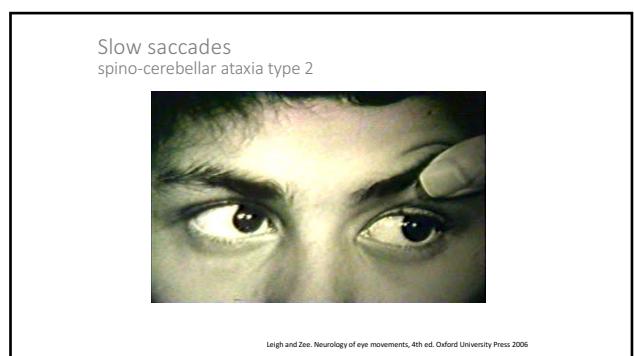
Head Impulse Test





Saccadic eye movements

- Fast eye movements for shifting gaze
- Triggered by brainstem nuclei and under cerebellar control
- Disorders of
 - Velocity (slow)
 - Metrics (hypo/hypermeteric)
 - Latency (increased)



Convergence spasm



Discourage progressive lenses



6 Classes of Eye Movements

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Questions?

