

Acute Dizziness: Is It a Stroke?

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- No Disclosures

Dizziness

- Occurs in nearly $\frac{3}{4}$ of cerebellar strokes
- 4 categories in classic teaching*:
 - Vertigo
 - Presyncope
 - Imbalance
 - Non-specific dizziness
- Patients can't tell the difference! Timing and triggers may be more useful
 - Abrupt onset more typical of stroke
 - Acute vestibular syndrome intolerant of head movement

Acute Vestibular Syndrome

- Acute dizziness
- Nausea & vomiting
- Unsteady gait
- Nystagmus
- Intolerance to head motion

Labyrinthitis

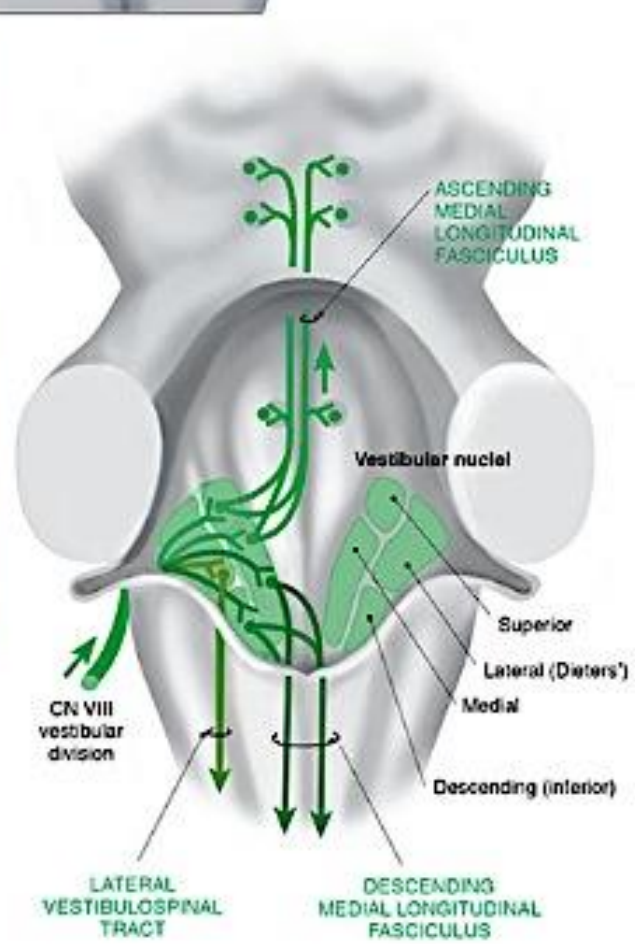
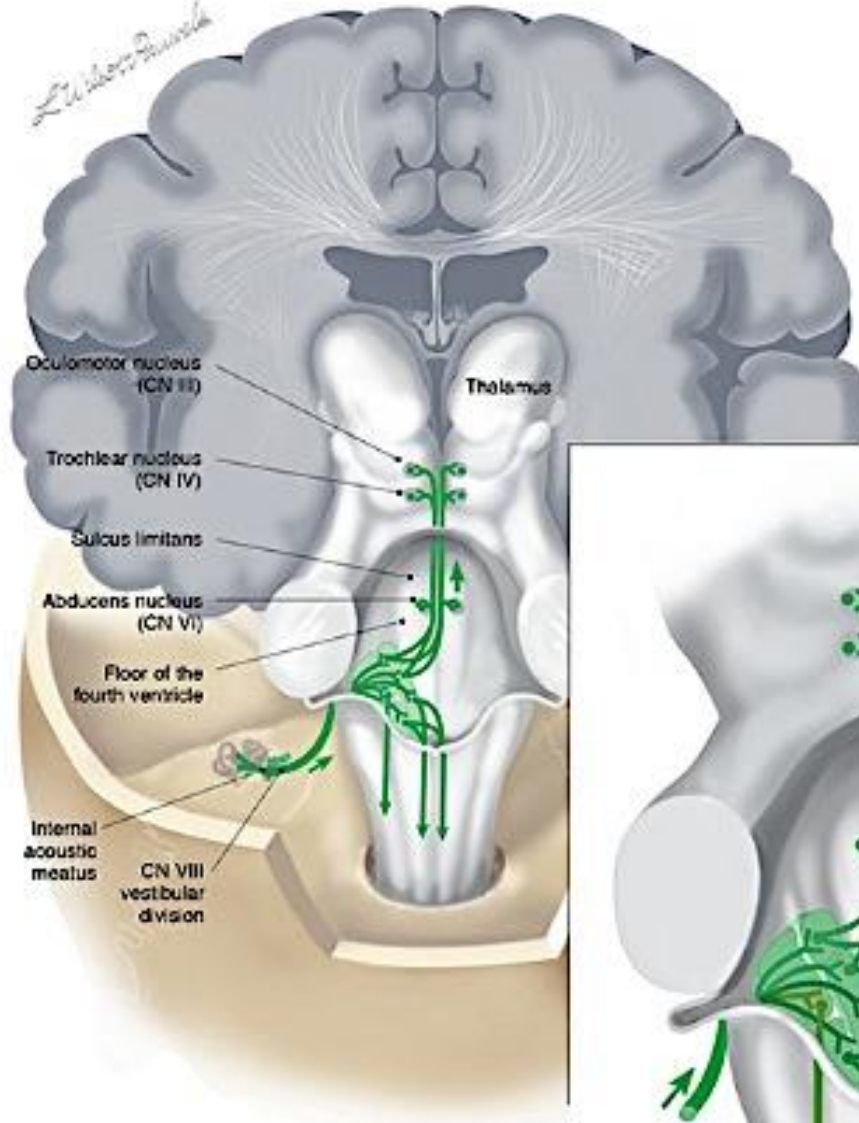
- aka **vestibular neuronitis**
- Pathology localizes to the inner ear or 8th cranial nerve
- True cause usually unknown; presumed viral similar to Bell's palsy
- Outcome usually good (better with course of steroids)

Vertebrobasilar Strokes

- Symptoms and signs are undervalued in NIHSS and F/A/S
- Clinical trials of thrombolytics have underrepresented or excluded these patients

Acute Vestibular Syndrome

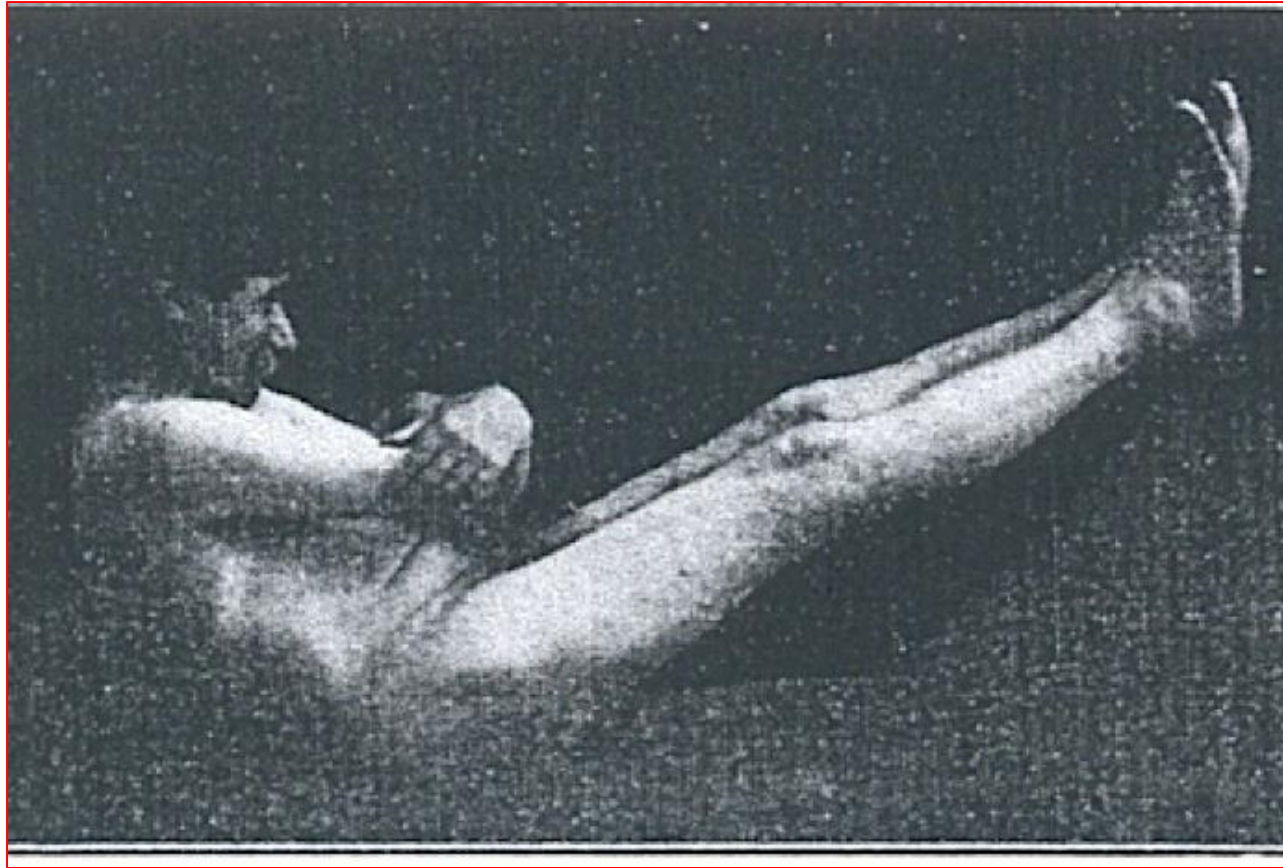
- In ER, cause is about
- 75% Labyrinthitis
- 25% Stroke



Ataxia

	Central PICA	Central AICA	Peripheral (vestibular neuritis)
No ataxia	0/32	0/10	5/72
Grade 1	3/32	0/10	39/72
Grade 2 (can't walk unassisted)	9/32	2/10	28/72
Grade 3 (can't sit up)	20/32	8/10	0/72

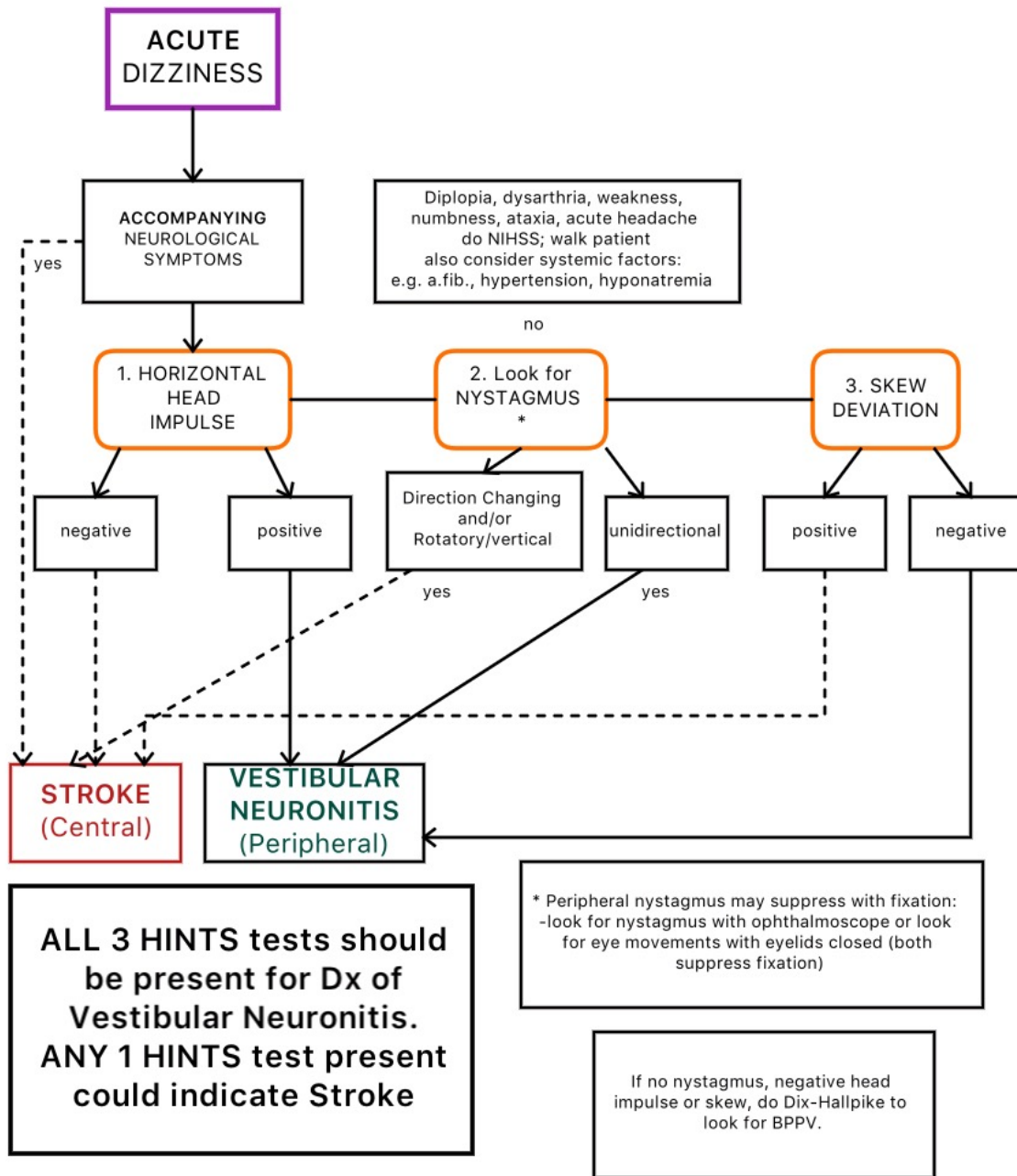
- Central lesions without ataxia are rare: AVS without ataxia is usually peripheral
- Grade 3 ataxia has 66.7% sensitivity and 100% specificity



- All patients with Grade 3 ataxia had Babinski's asynergia sign first described in 2013
- Allows evaluation in bed w/o testing gait

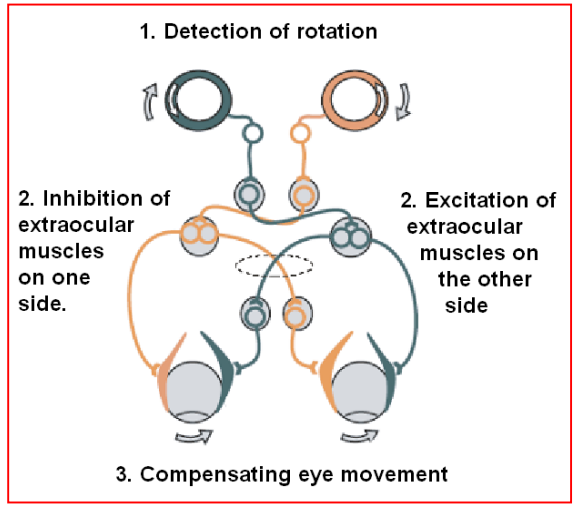
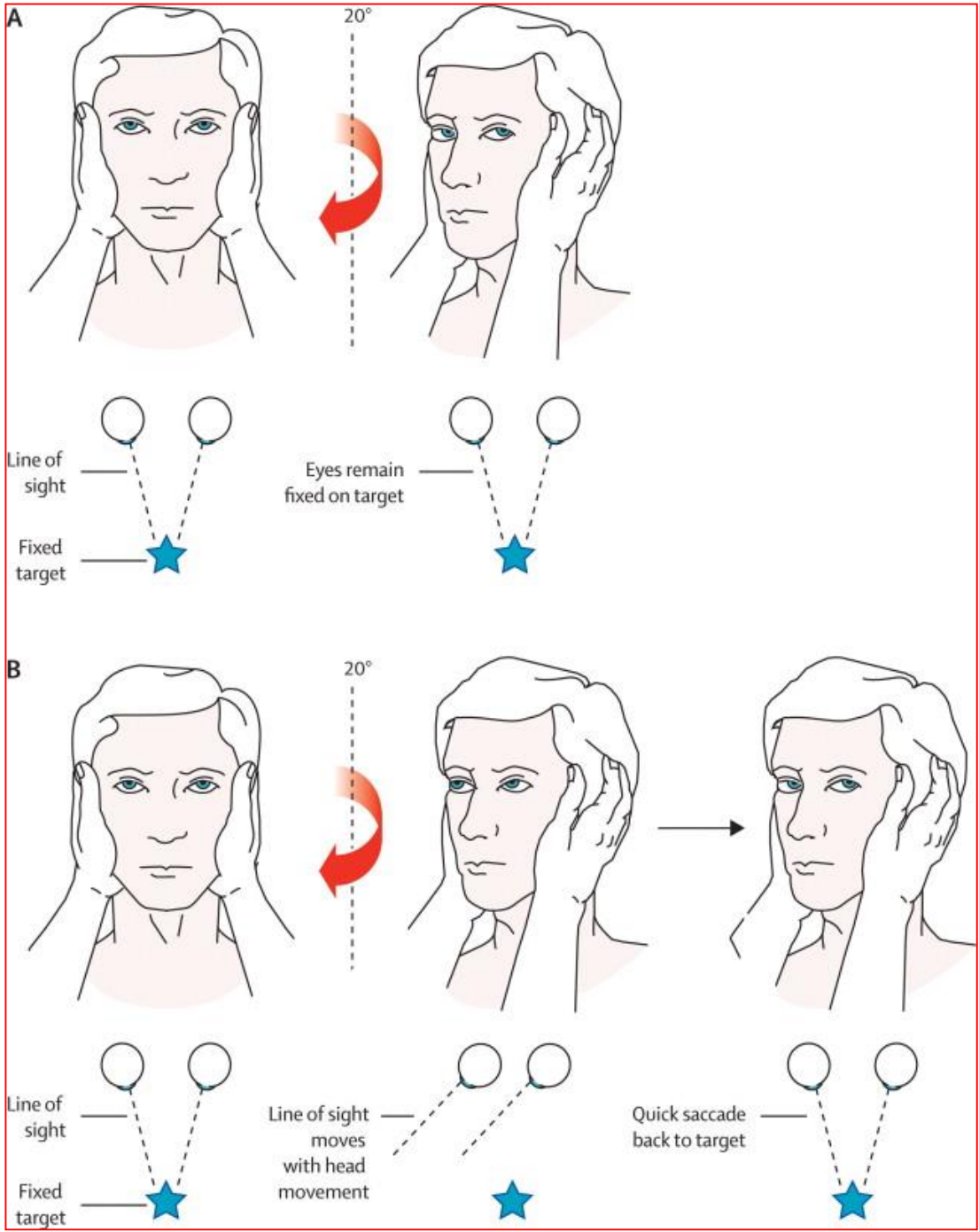
HINTS Exam

- A 3 part bedside exam taking less than 5 minutes is more sensitive than MRI in identifying acute stroke (sensitivity 98%, specificity 95% for HINTS vs 80% & 97% for MRI DWI)
- After a directed history and exam including NIHSS and observing gait, the HINTS exam involves
 - the head impulse test
 - observation of nystagmus
 - Looking for skew deviation of the eyes



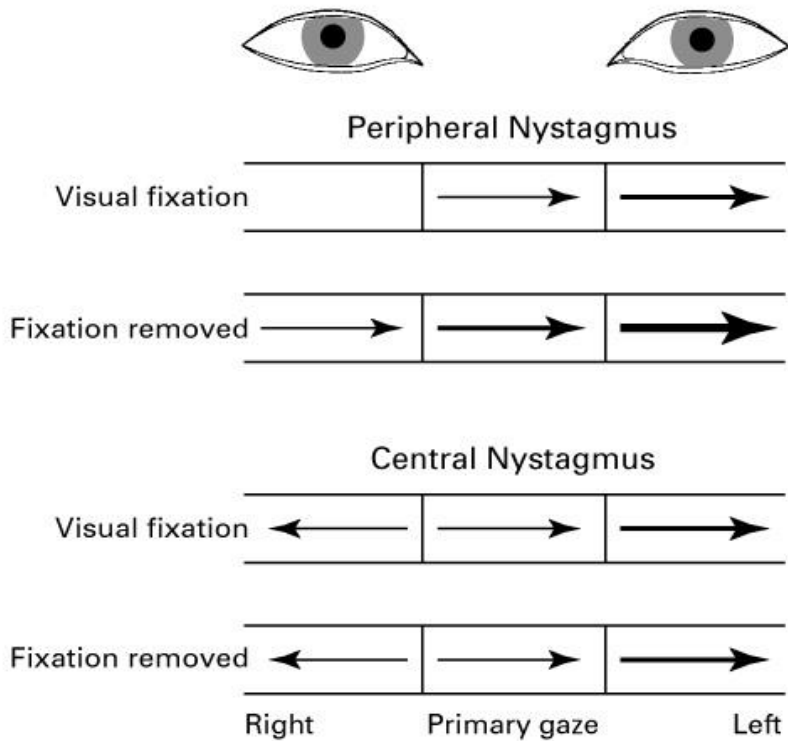
Reference: Kattah et al. Stroke; 2009; 40: 3504-3510.

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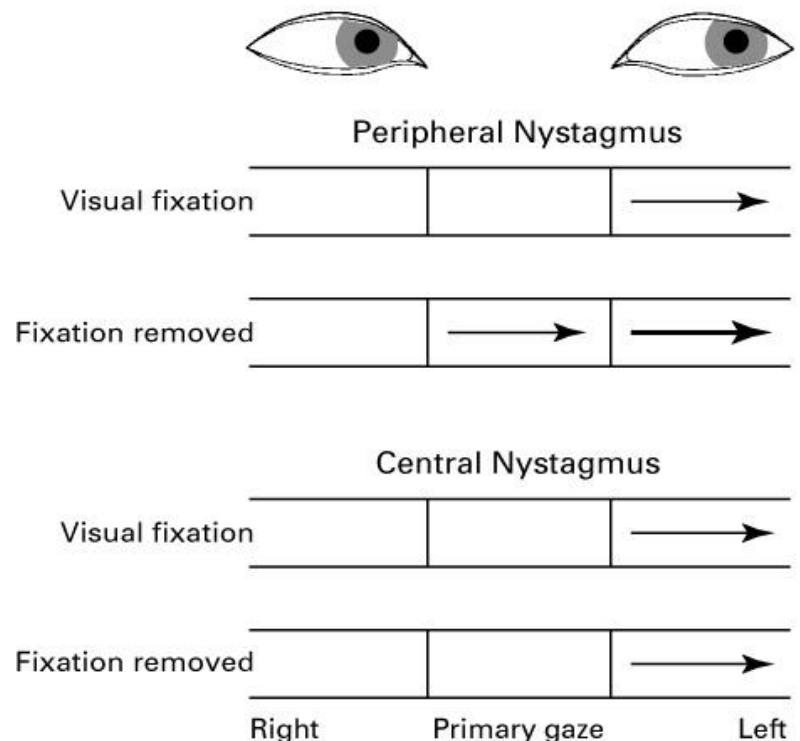


Horizontal Head Impulse Test

- Have the patient fixate on your nose
- Passively turn their head 15 degrees to either side
- The eyes should remain fixated on your nose
- In a positive test, the eyes turn with the head, then refixate back to your nose
- You may have to make a number of smaller head movements first to get the patient to relax before doing a more rapid movement



A



B

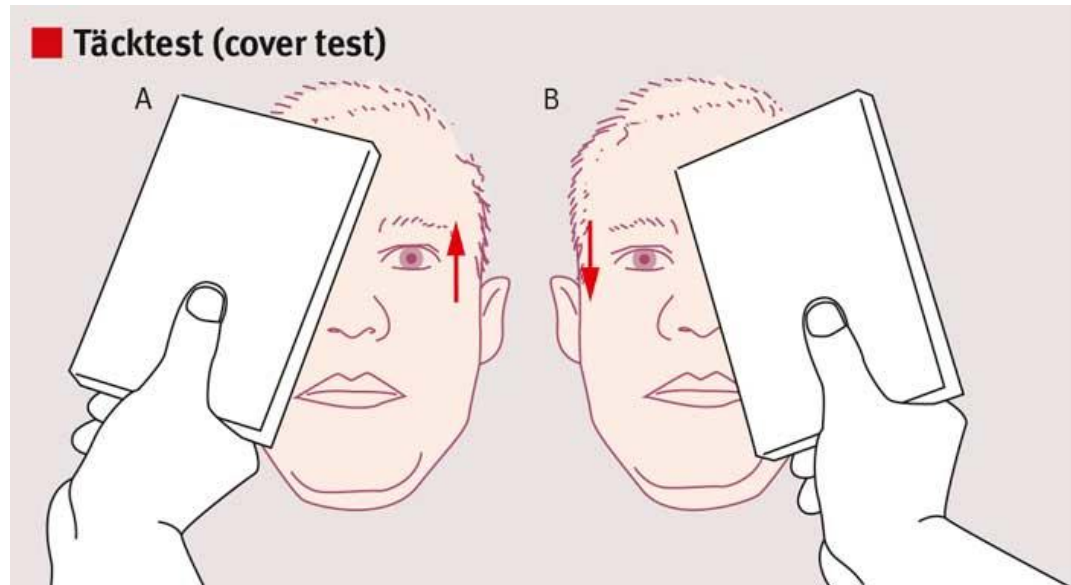
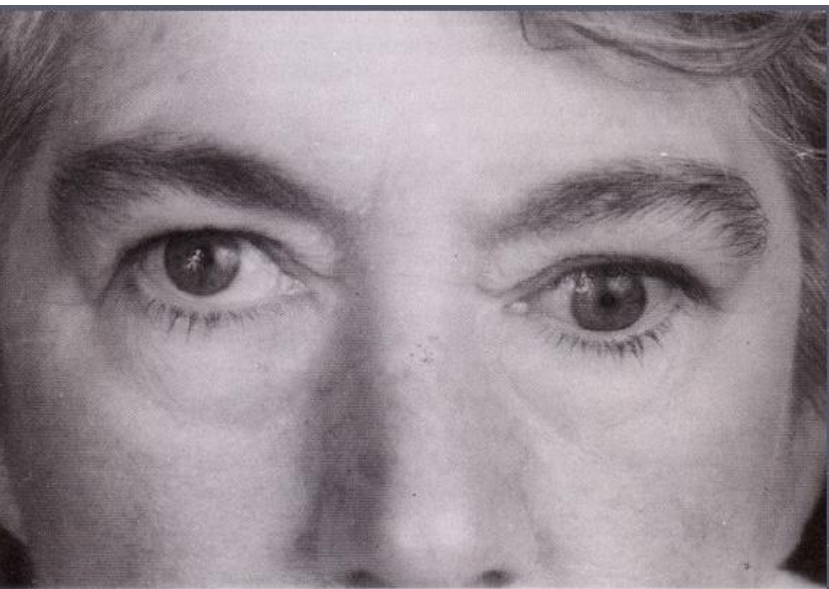
The direction of the arrows indicates the horizontal direction of the fast phase of the nystagmus (a torsional component is not shown). The thickness of the arrows represents the relative intensity of the nystagmus. Panel A shows findings typical of peripheral nystagmus, which remains in the same direction when the direction of gaze changes, and central nystagmus, which changes direction when the direction of gaze changes. Removal of visual fixation increases the intensity of peripheral nystagmus but not of central nystagmus. Panel B illustrates how removal of fixation helps to differentiate peripheral from central nystagmus when the nystagmus is predominantly in one direction of gaze during fixation. With removal of fixation, peripheral nystagmus may increase in intensity and become apparent in more than one direction of gaze. Techniques to remove fixation include using an ophthalmoscope (the fundus moves opposite the nystagmus) or looking at the eye movents through the closed eyelids).

Central Vertigo can also be caused by Drugs

TABLE 3-2 Medications and Drugs Known to Cause Eye Movement Abnormalities

Medications	Eye Movement Abnormality
Antiepileptic ^a	Gaze-evoked nystagmus, downbeat nystagmus, impaired smooth pursuit
Amiodarone	Downbeat nystagmus
Lithium	Gaze-evoked nystagmus, downbeat nystagmus, opsoclonus, impaired smooth pursuit
Tricyclic antidepressants	Opsoclonus
Benzodiazepines	Impaired smooth pursuit
Drugs	
Alcohol	Downbeat nystagmus, gaze-evoked nystagmus, positional nystagmus, impaired smooth pursuit
Tobacco and nicotine	Upbeat nystagmus in darkness, impaired smooth pursuit
Narcotics	Impaired smooth pursuit
Cocaine	Opsoclonus
Phencyclidine (PCP)	Nystagmus not otherwise specified

^a Typical examples include phenytoin, carbamazepine, and phenobarbital.



Cover Test for Skew deviation

Vertical misalignment of the eyes may be obvious. But more subtle abnormalities can be appreciated by having the patient fixate on a target across the room, then covering each eye in an alternating fashion looking for a vertical refixation when the cover is shifted.

References

Articles (both available free)

- Kattah JC et al. HINTS to diagnose stroke in the acute vestibular syndrome: three-step bedside oculomotor examination more sensitive than early MRI diffusion-weighted imaging. *Stroke* 2009;40:3504-10. doi: 10.1161/STROKEAHA.109.551234
- Carmona,S et al. The Diagnostic accuracy of Truncal Ataxia and HINTS as Cardinal Signs for Acute Vestibular Syndrome. *Front Neurol.* 2016;7:125-142. doi: 10.3389/fneur.2016.00125

Videos

Video examples are available at the *Stroke* journal website as supplements to the article:

- JC Kattah et al. *Stroke.* 2009;40:3504-3510
- Further Youtube examples of findings in the Head Impulse maneuver and Alternate Cover Test are available in the public domain –just search for videos of either