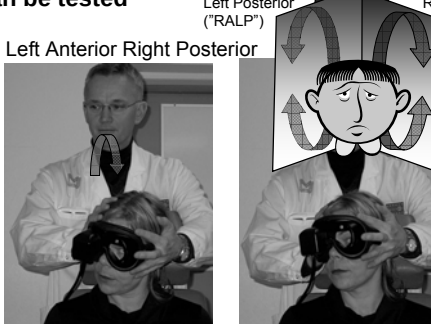


Vertical canals can be tested

LARP - Left Anterior Right Posterior

Right Anterior
Left Posterior
("RALP")

Left Anterior
Right Posterior
("LARP")



Left Anterior

Right Posterior

Otolith organ

Känner av
tyngdkraften

The diagram illustrates the human vestibular system, specifically the utricle and saccule. The utricle is shown as a larger, more complex structure, while the saccule is smaller and more rounded. A scanning electron micrograph (SEM) of the utricle shows its internal structure, including the utricle and saccule. A cross-section of the saccule shows the internal structure, including the utricle and saccule. The utricle is labeled 'Utriculus' and the saccule is labeled 'Sacculus'. Below the utricle, a diagram shows the utricle with a horizontal bar and a vertical bar, with arrows indicating 'FORCE' and 'ACCELERATION'. Below the saccule, a diagram shows the saccule with a horizontal bar and a vertical bar, with arrows indicating 'FORCE' and 'ACCELERATION'.

Otoliths

Gelatinous Layer

Supporting Cells

Receptors

Nerve

www.med-ed.virginia.edu

Otolith organs
-linear acceleration
and gravity

A

Sacculus (a) and Utriculus (b)

B

Note asymmetry, utricle more sensitive to leaning to the ipsilateral side

Fig. 2.11. Structural organization of the (A) sacculus and (B) utricle: anterior and distal ends. Regional differences in shape of maculae (distance, size of maculae, and types and orientation of sensory cells (Lindstrom, 1973))

Otolith-information

Controls muscle tone in postural muscles

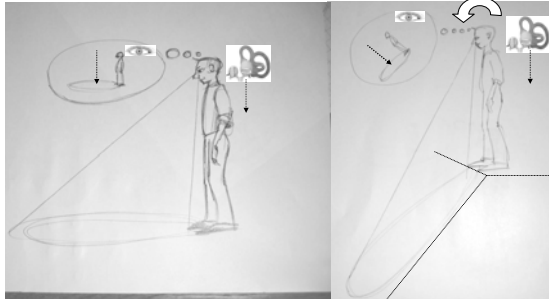
Fall due to otolith malfunction?

The diagram illustrates the vestibular system and its neural pathways. At the top, the 'Vestibularisärkärnor' (vestibular nuclei) are shown, including the 's' (semicircular canals), 'm' (maculae), and 'd' (utricle). The 'VIII' (vestibulocochlear nerve) is shown entering the brainstem. The 'MLF' (medial longitudinal fasciculus) is shown as a dashed line running down the brainstem. The 'MVST' (medial vestibular tract) is shown as a solid line running down the brainstem. The 'Cervical cord' and 'Lumbal cord' are shown as solid lines running down the spinal cord. The 'LVST' (lateral vestibular tract) is shown as a solid line running down the spinal cord. The 'motor neuron' is shown as a solid line running down the spinal cord. The 'ar' (afferent root) is shown as a solid line running up the spinal cord. The diagram is labeled with '=> control of Muscle tone'.

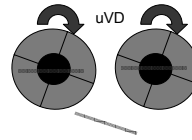
From: Natural History 8/89

Height vertigo

Static visual and otolith mismatch

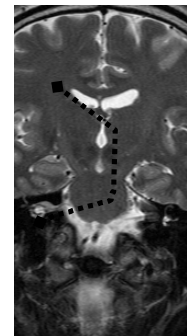


Subjective horizontal

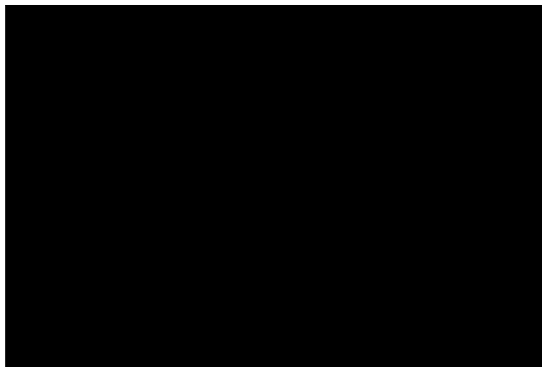


Ipsilesional
•Labyrinth
•Thalamus

Contralesional
•Medulla
•Pons
•Midbrain



Subjectiv visual vertical or horizontal test utricular function



Some special disorders – considerations & controversies

- BPPV
- Mb Meniere - Alternobar vertigo
- Vestibular Neuritis
- Labyrinthitis



BPPV

Robert Bárány 1876-1936

John Karlefors 1891-1932

Acta Otolaryngol 1921;2:434-437
27-y female, 2 v pos vertigo, normal hearing, normal caloric

"My assistant, Dr Karlefors, was the first to notice that
These attacks only appeared when the patient was on her right side

Linjea-rotatory nystagmus, short duration, fatiguing
But missed: latency, reversed nystagmus when sitting up

Benign Positionell Paroxysmal Vertigo=BPPV

- The most common dizzy disorder (20-30%)
- 1-y incidence approx 0,6 %
- Incidence increase with age
- Lifetime incidence approx 2,5 - 10 % at age of 80
- Gender: f/m = 2:1

Idiopathic: 75% - Right side most common!

migraine!, osteopeni?, temporal arteritis?

sekundary/symptomatic: trauma, other inner ear malady

Etiology: free otoliths in canals (posterior most common)

BPPV

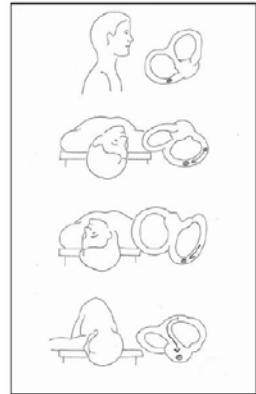
- The most common cause of vertigo
- 9% of 'senior citizens' (2001).
- 1/3 of all elderly seeking advice for dizziness
- Effective treatments for all canals

BUT

- ..some do not get well
- .. additional ailments
- .. cupulolithiasis

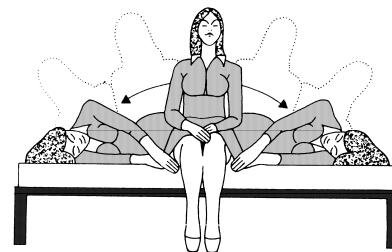
(review: Magnusson Karlberg Curr Op Neurol 2002)

BPPV – Posterior canal Dix-Hallpike -> Epley manovuer



5. The patient is helped up to a sitting position, avoiding to turn the head backwards

34



Brandt – Daroff exercises

35



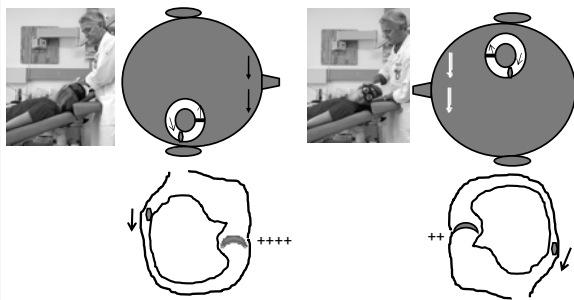
Semont's
manoeuvre



Test for lateral canal BPPV



Lateral (dx) canalolithiasis



Lateral - utriculopetal

Geotropic nystagmus

You need two tests



• Dix-Hallpike – Vertical Canals

– Posterior canal

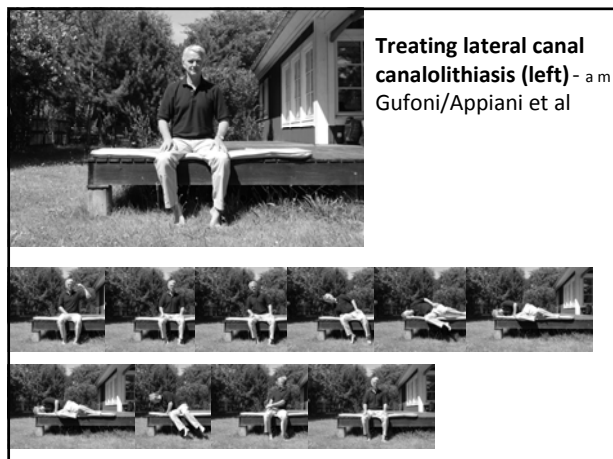
Torsional or beating to upper eyelid, when head turned to the affected side

– Anterior canal

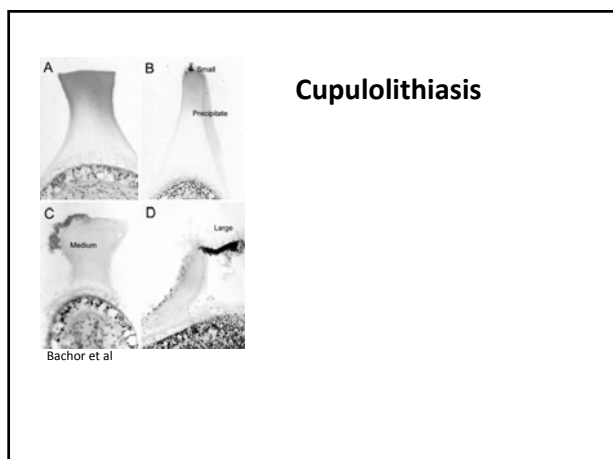
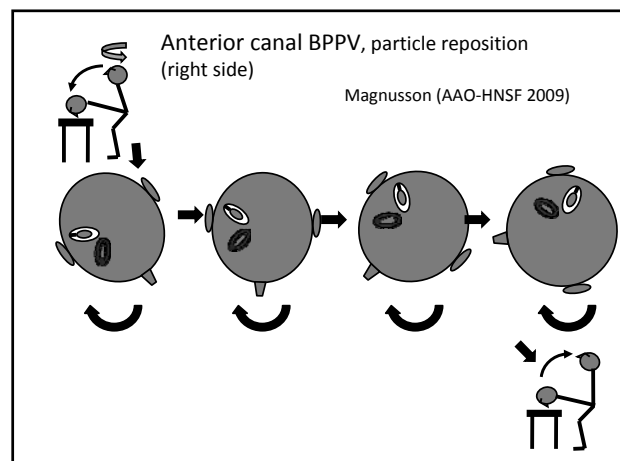
Beating to lower eyelid when head turned to the non-affected side

• Lateral positioning test

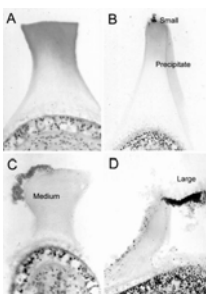
- Geotropic nystagmus in canalolithiasis and
- Apogeotropic nystagmus in cupulolithiasis



Treating lateral canalolithiasis (left) - a m
Gufoni/Appiani et al



Cupulolithiasis



Bachor et al

BPPV - Cupulolithiasis

Lateral Canal:

Cupulolithiasis: Apogeotropic nystagmus, in both side positions, stronger to not-affected side, do not fatigue.

Anterior Canal:

Cupulolithiasis: Down beat nystagmus that do not fatigue after Dix-Hallpike to healthy side

Posterior Canal:

Cupulolithiasis: upbeat or 'windwiper' nystagmus that do not fatigue after Dix-Hallpike to lesioned side



Canal: Cupulo

HC in	11.9%	41.9%
AC in	21.2%	27.3%
PC in	66.9%	6.3%

N=260 Jackson et al Otol Neurotol. 2007