

Schwindel: Vom Symptom zur Diagnose

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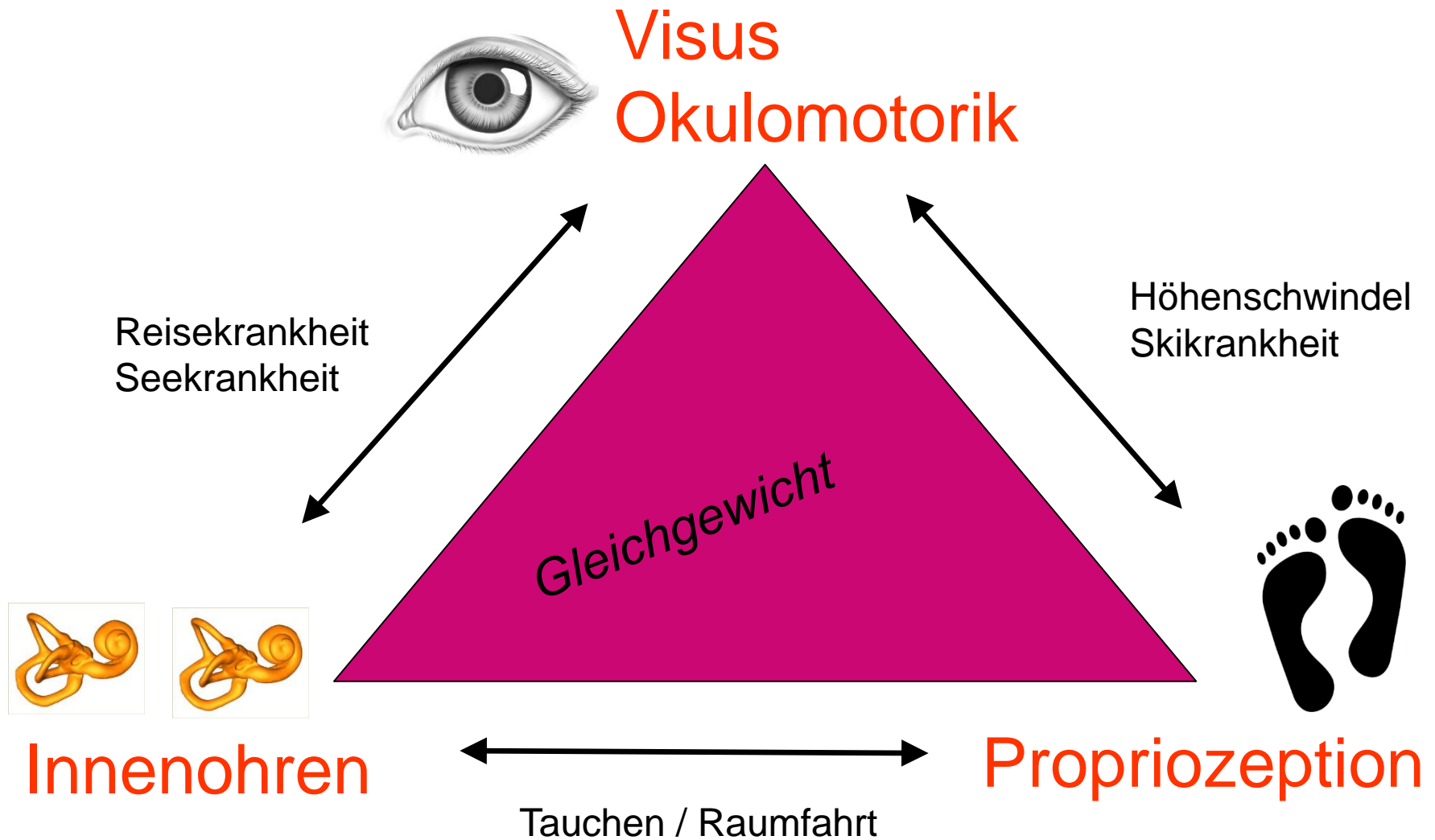
Schwindel:

Vom Symptom zur Diagnose





Schwindel: Definition





Wieso braucht es das vestibuläre System?





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Bildstabilisation: Blickfolgebewegungen (Smooth pursuit)

Schwindel

Bewegung <70 grad/s

Schwindel

Bewegung >70 grad/s



Bildstabilisation

Oszillopsie bei fehlender vestibulärer Funktion



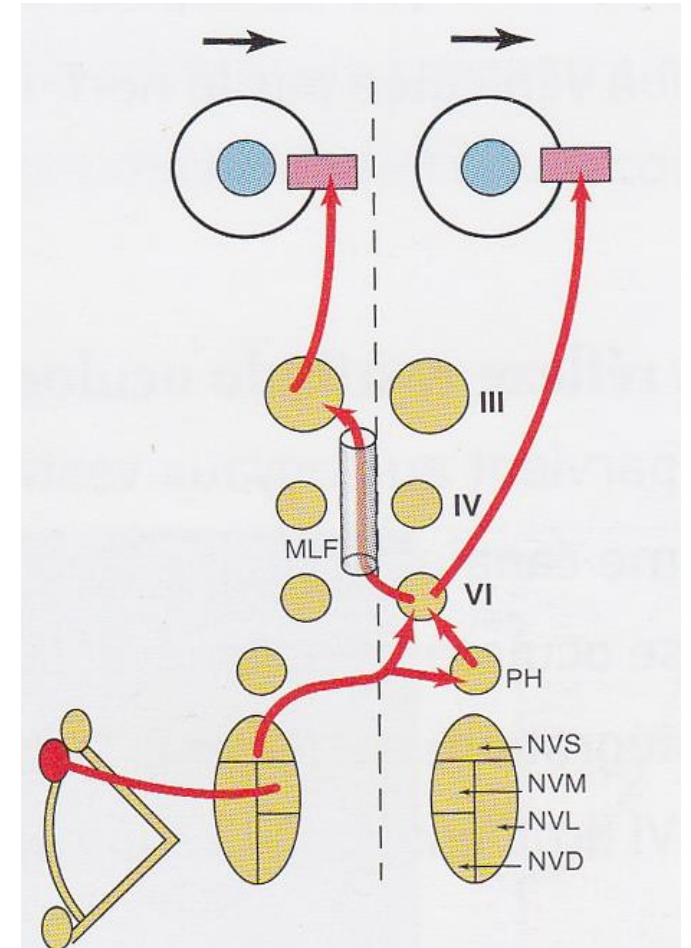
Video: David S. Zee and Timothy C. Hain



Kopfstabilisation beim Huhn



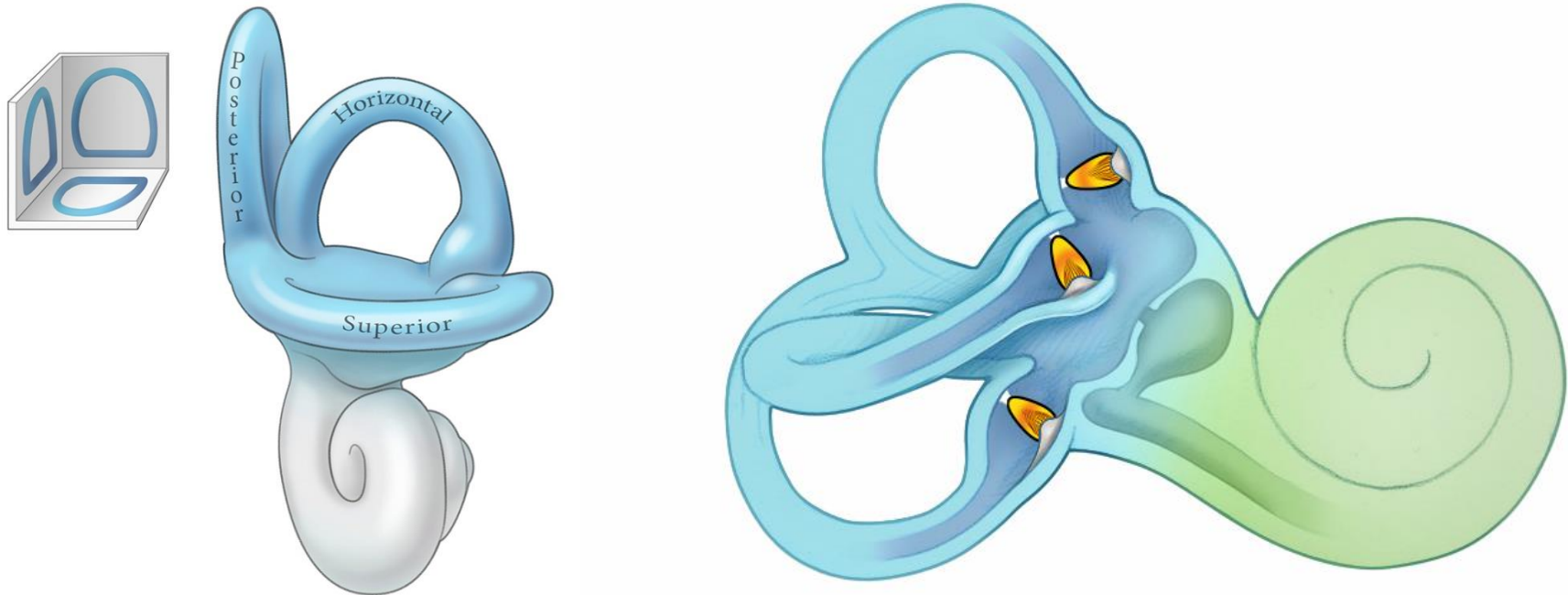
Der vestibulo-okuläre Reflex (VOR)



Ito M. et al., 1976 Exp Brain Res, Jan 26; 24: 257-71



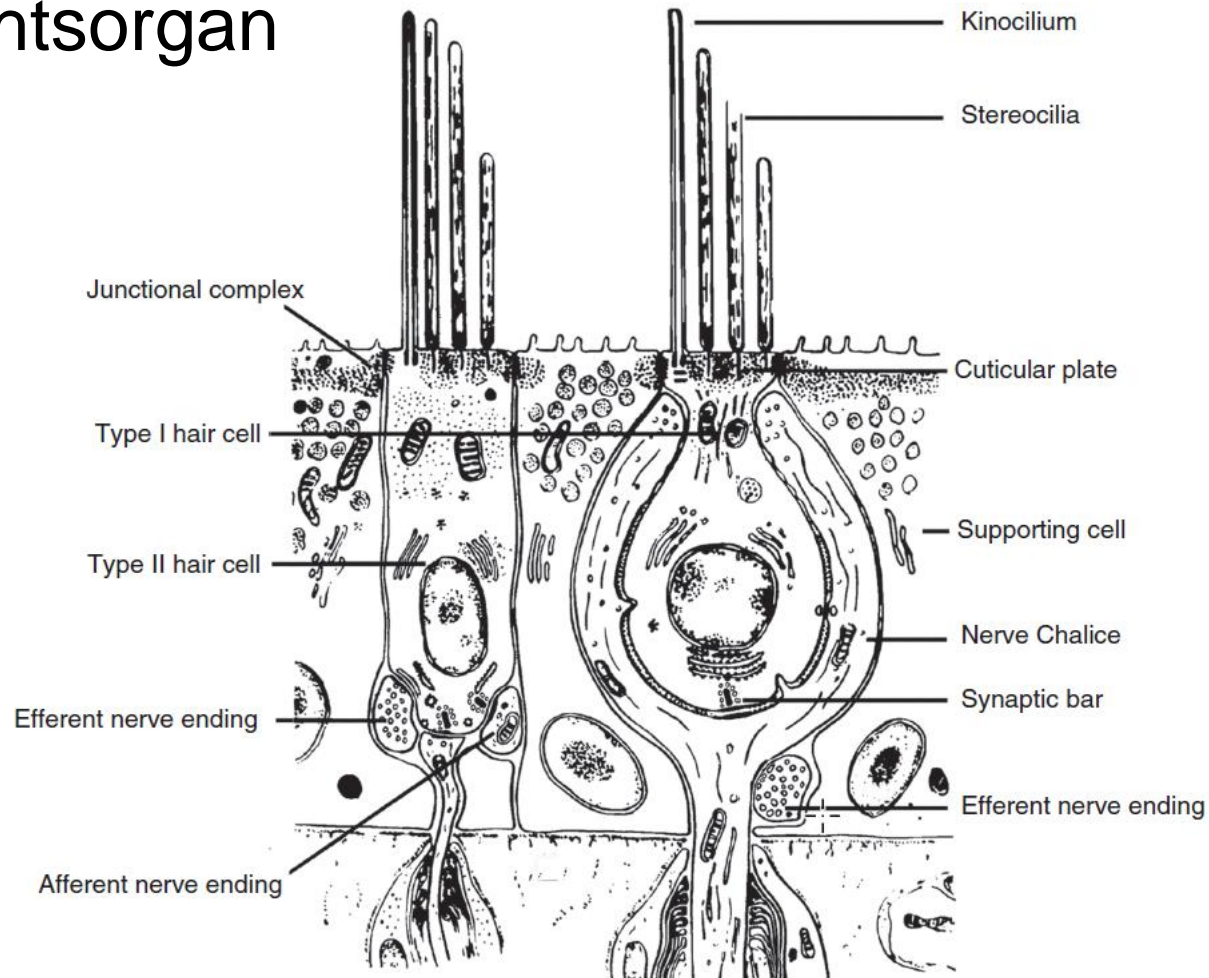
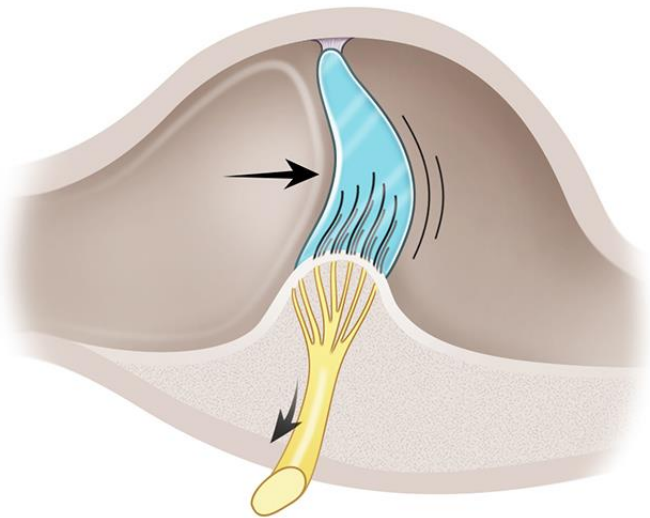
Das Gleichgewichtsorgan - Bogengänge



Robert K. Jackler, MD, Department of Otolaryngology-Head & Neck Surgery, Stanford University School of Medicine
Illustrator: Christine Galapp, MA



Das Gleichgewichtsorgan



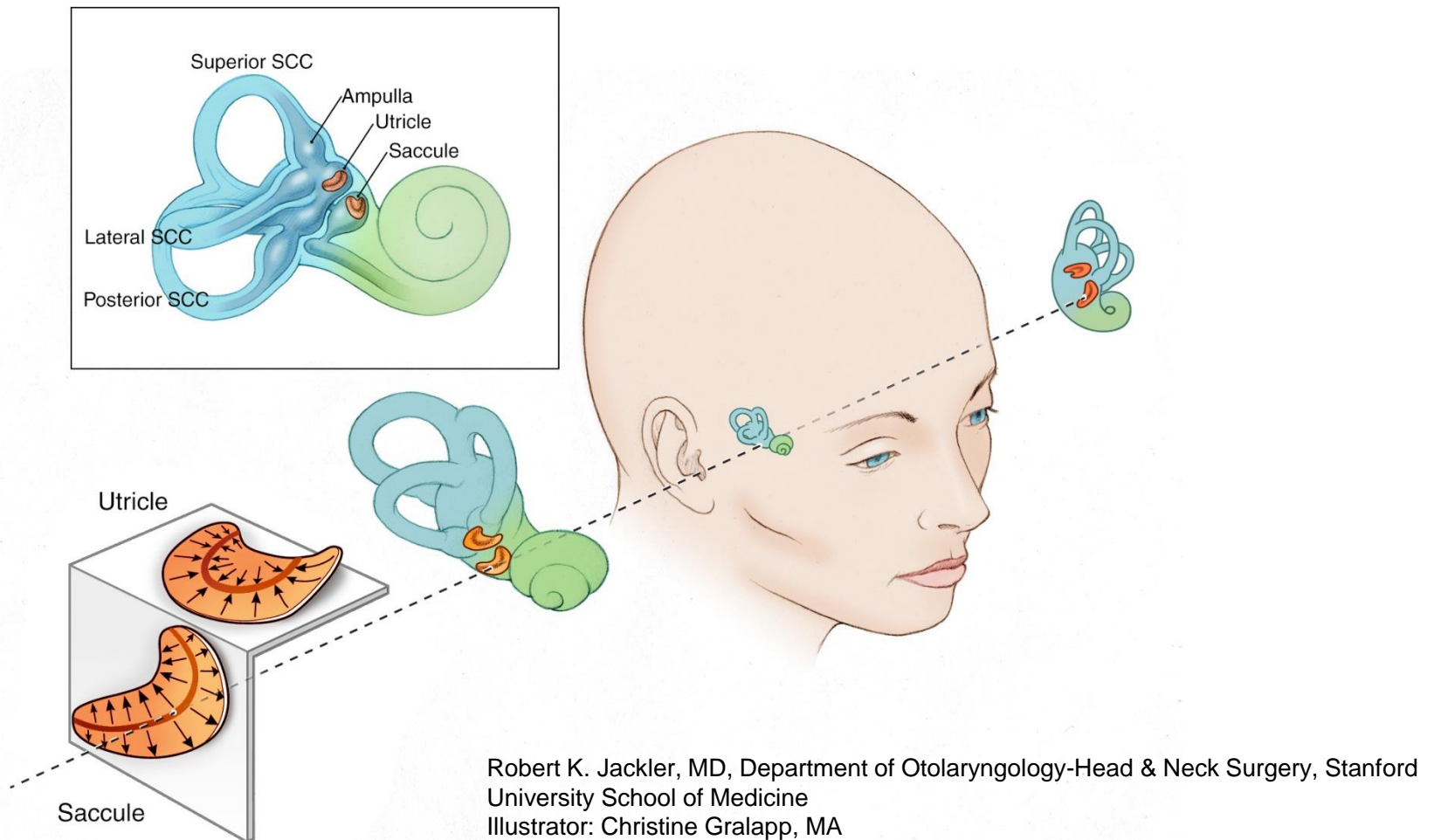
Robert K. Jackler, MD, Department of Otolaryngology-Head & Neck Surgery, Stanford University School of Medicine

Illustrator: Christine Gralapp, MA

Wersall J , Bagger-Sjoberg D (1974) Morphology of the vestibular sense organ . In: Handbook of Sensory Physiology, Vestibular System. Basic Mechanisms (Kornhuber HH , ed), pp. 123 – 170. Berlin : Springer-Verlag .

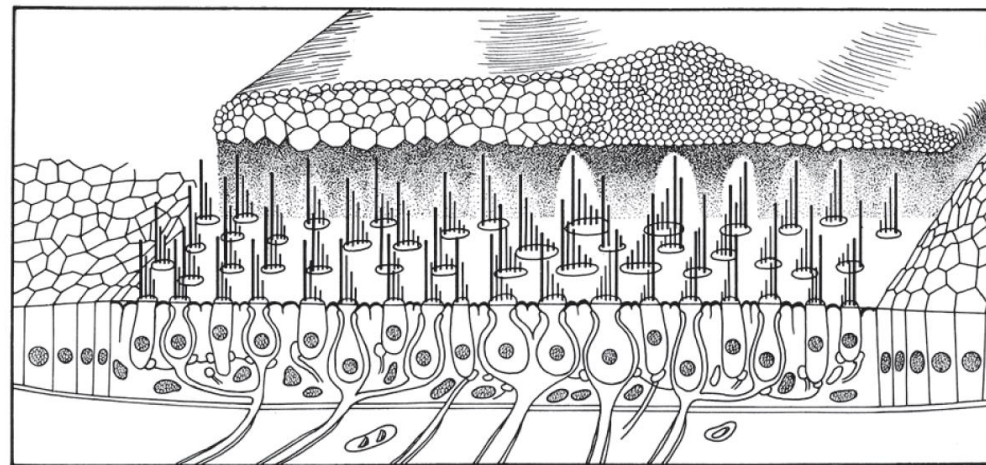
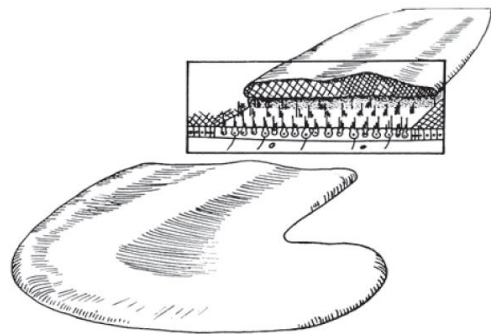
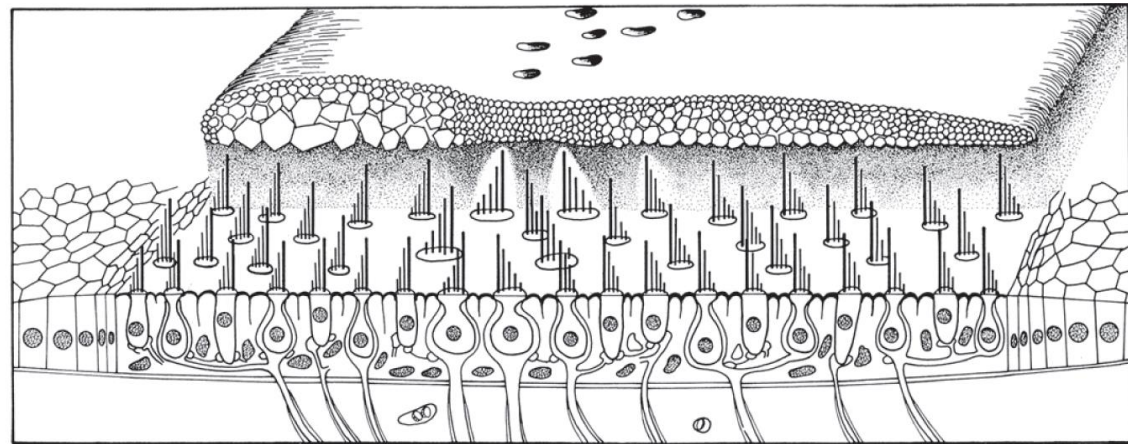
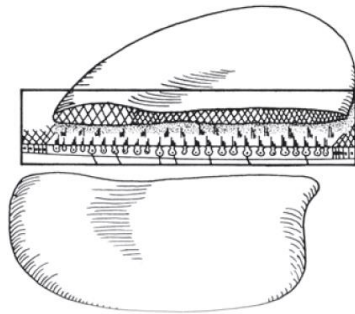


Das Gleichgewichtsorgan – Die Otolithenorgane





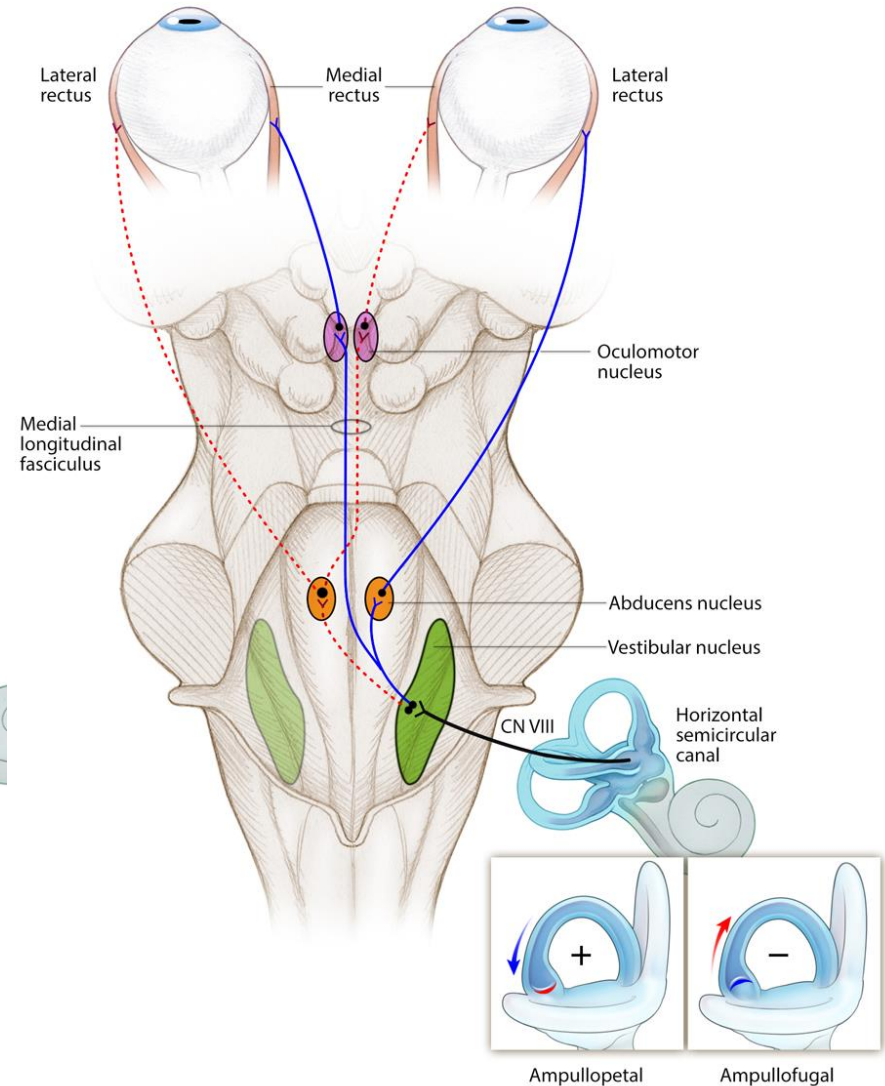
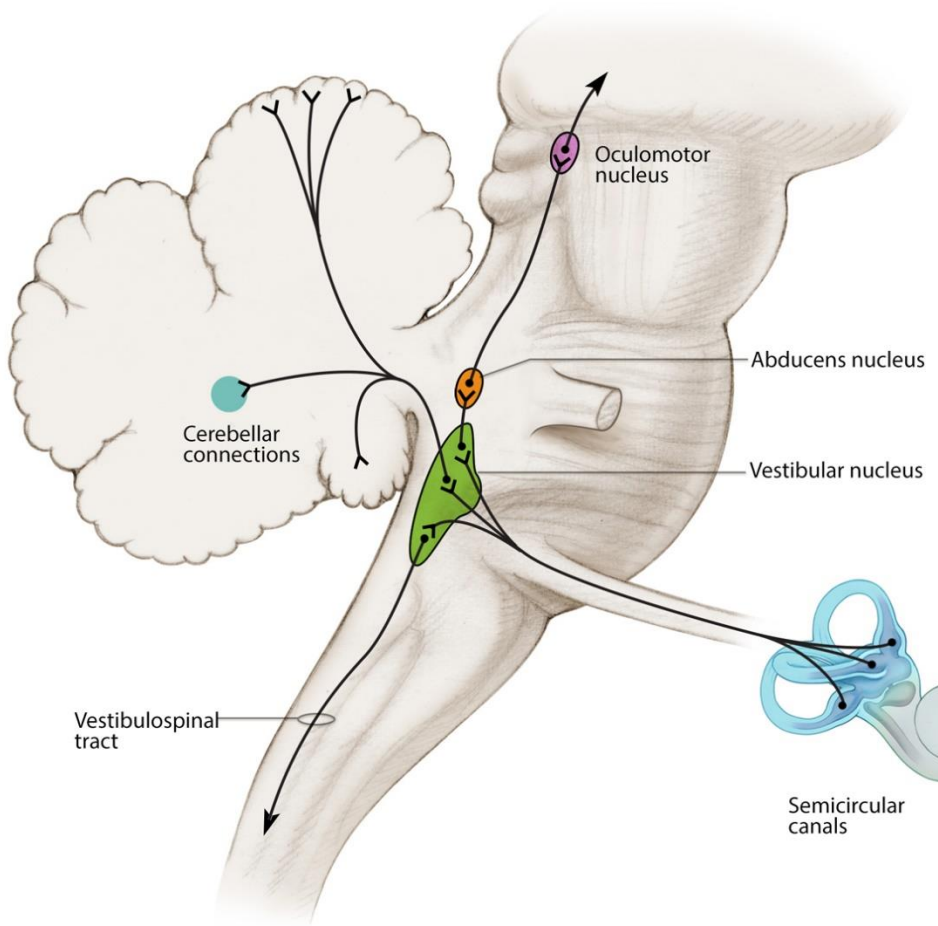
Das Gleichgewichtsorgan – Die Otolithenorgane



Lindeman HH (1969) Studies on the morphology of the sensory regions of the vestibular apparatus
. Ergebnisse Anatomie Entwicklungsgeschichte 42 : 1 – 113 .

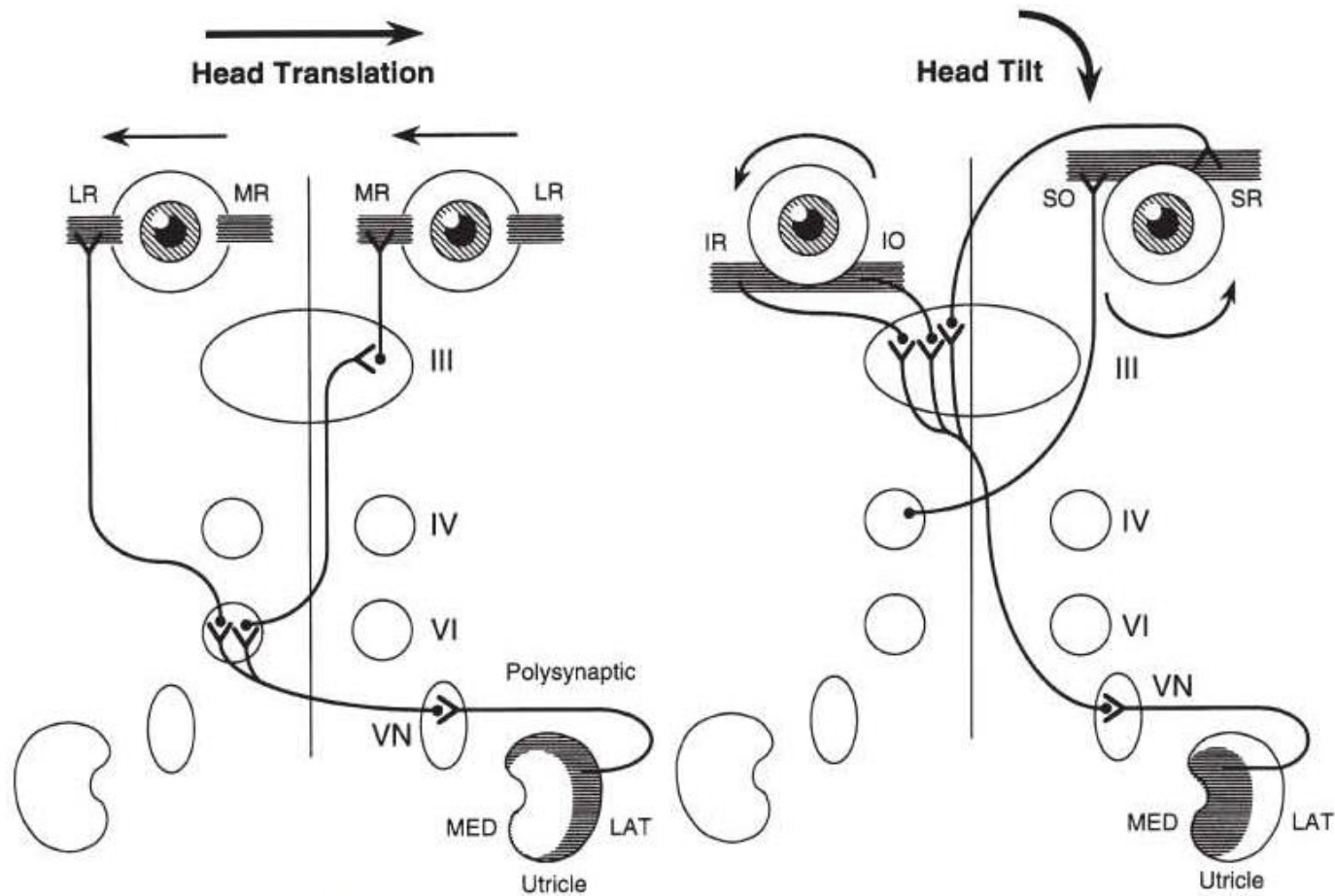


Zentralvestibuläre Bahnen





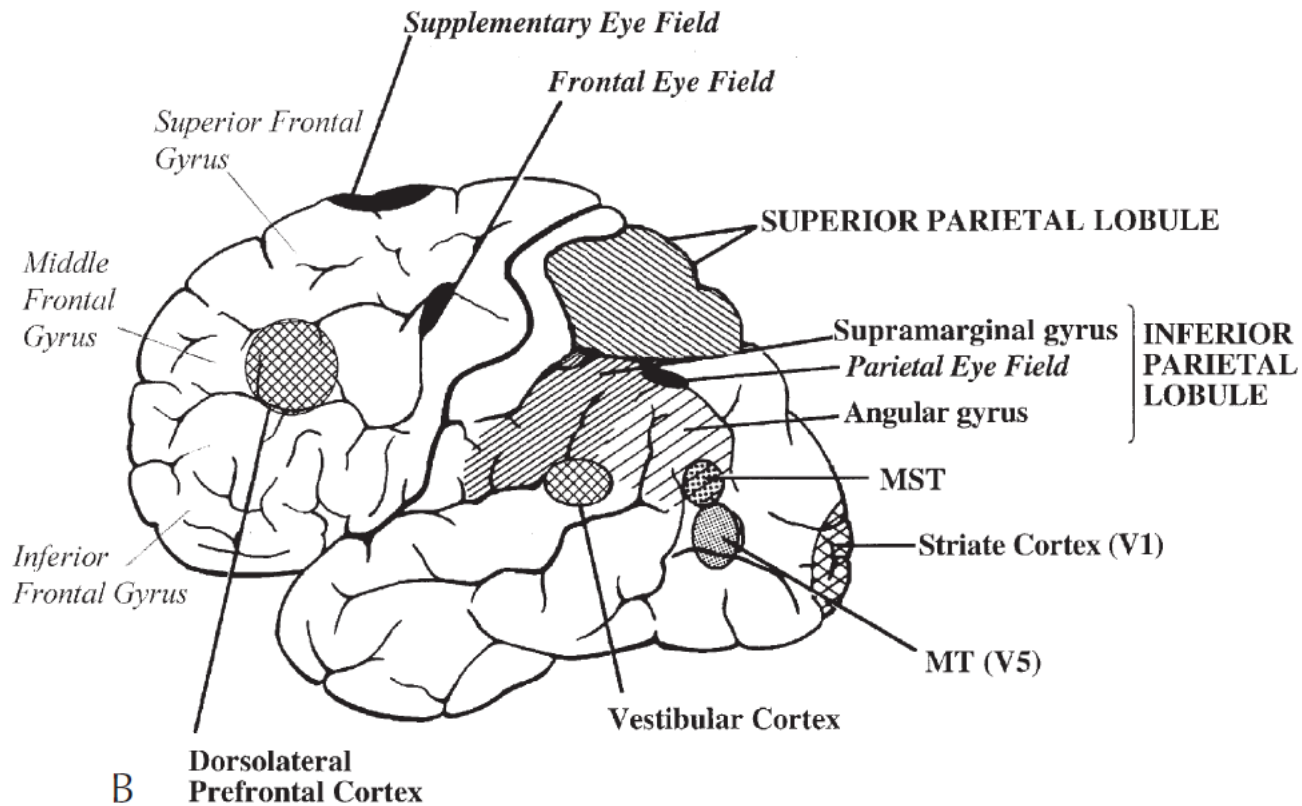
Zentralvestibuläre Bahnen



Leigh, Zee. The neurology of eye movements, Oxford press



Kortikale Zentren



Büttner-Ennever, JA, Horn AK, Curr. Opin Neurobiol. 7, 1997

Schwindel-Ursachen



ZNS Erkrankungen

(extrapyramidal, zerebellär, etc.)

**Polyneuropathie, Hinterstrang
-affektion**

Psychiatrische Erkrankungen
(Angststörungen)

Hyperventilation

Kardiovaskuläre Erkrankungen

Anämie, Schilddrüsenfunktionsstörung,
Diabetes mellitus

Multifaktorielle Gleichgewichtsstörung

Peripher

Benigner parox.

Lagerungsschw.

Neuritis vest.

Herpes zoster otic.

M. Menière

Perilymphfistel

Akustikusneurinom

Trauma

etc.

Zentral

TIA / CVI

Multiple Sklerose

Arnold Chiari -

Malformation

Migräne

Episodische Ataxie

Tumore



Die 3 vestibulären Hauptsyndrome

1. Akutes vestibuläres Syndrom (AVS)

- Permanenter Schwindel (**>24h**, Tage bis Wochen)
- Nausea/Erbrechen/Gangunsicherheit/Bewegungsintoleranz/Nystagmus

2. Episodisches vestibuläres Syndrom (EVS)

- Transient (**<24h**), evtl. repetitiv
- Nausea, Erbrechen, Nystagmus, Gangunsicherheit, Stürze etc.
- Keine Trigger (wie Kopfbewegung/Lage)

➤ Position-abhängiges vestibuläres Syndrom (PVS)

- Wie EVS, jedoch **Auslöser** vorhanden (Kopfbewegung – und Lage)

3. Chronisches vestibuläres Syndrom (CVS)

- Permanenter Schwindel (Monate bis Jahre)
 - Oszillopsien, Nystagmus, Gangunsicherheit etc.
-



Klinische Untersuchung



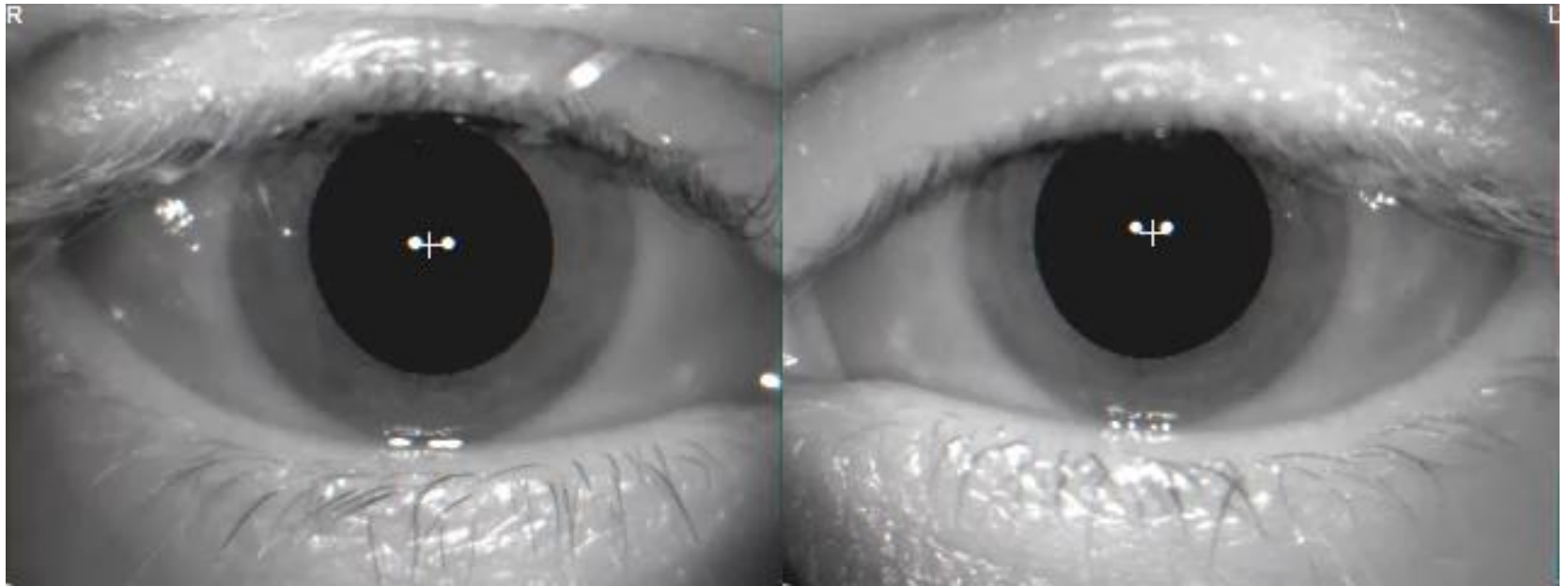
Klinische Untersuchung

Hallpike-Dix Manöver bei Lagerungsschwindel



Fife et al, Neurology. 2008 May 27;70(22):2067-74.

Klinische Untersuchung bei Lagerungsschwindel

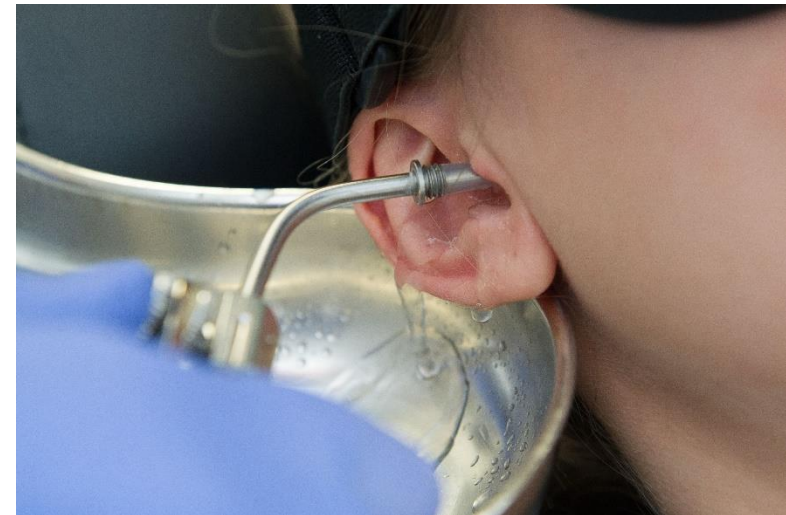
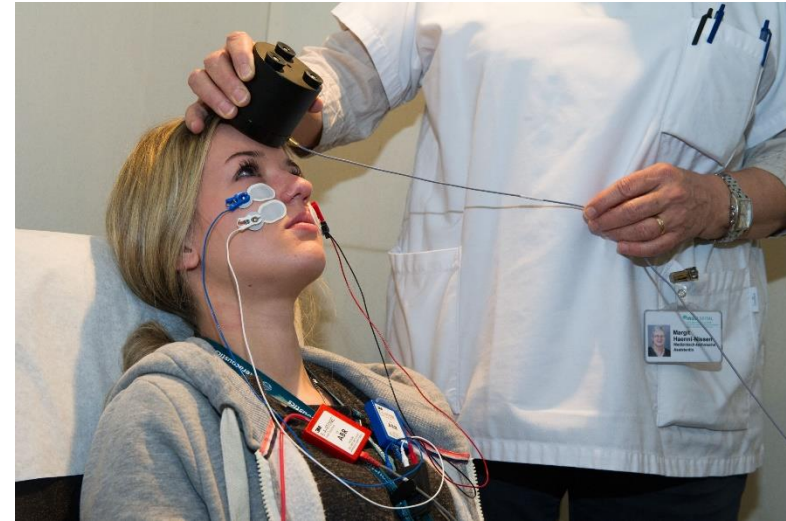


Hallpike-Dix Manöver bei Lagerungsschwindel



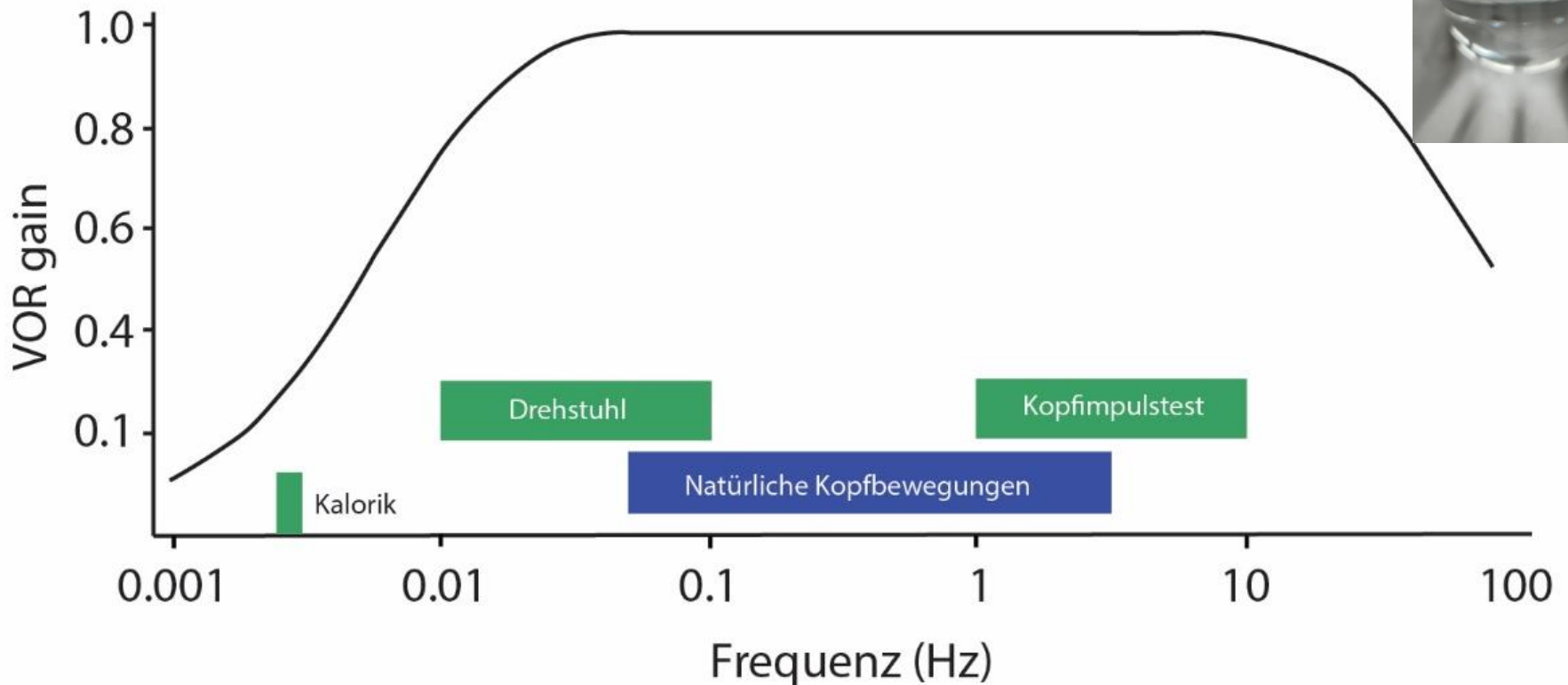
Stimulation des vestibulären Systems

- Wärme / Kälte
- Akustische Reize
- Vibration / Shaker
- Kopf- und Körperbewegungen
- Galvanisch
- Magnetfeld





Frequenzantworten des vestibulären Systems



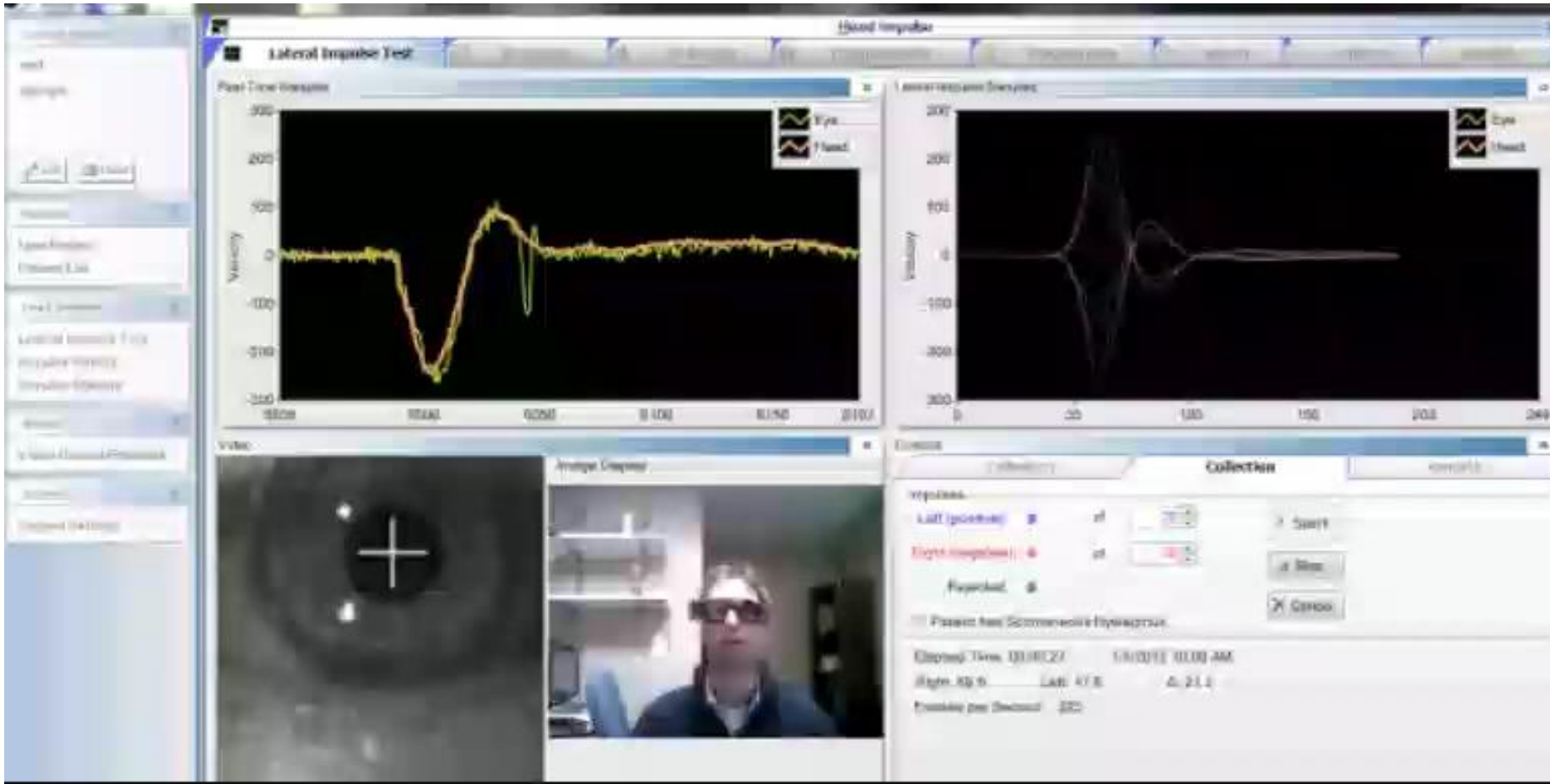
Vestibuläre Tests

Video-okulographie

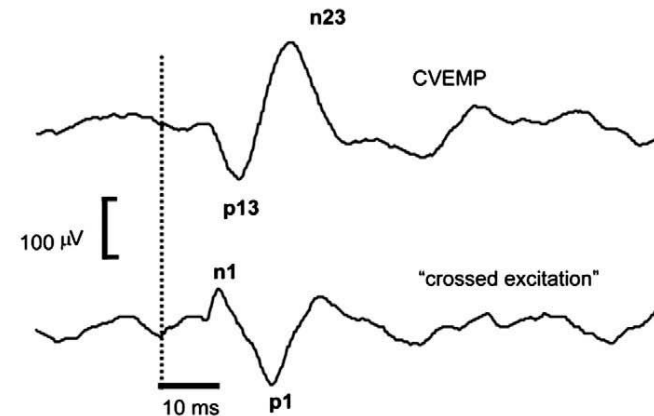


Vestibuläre Tests

Video-okulographie



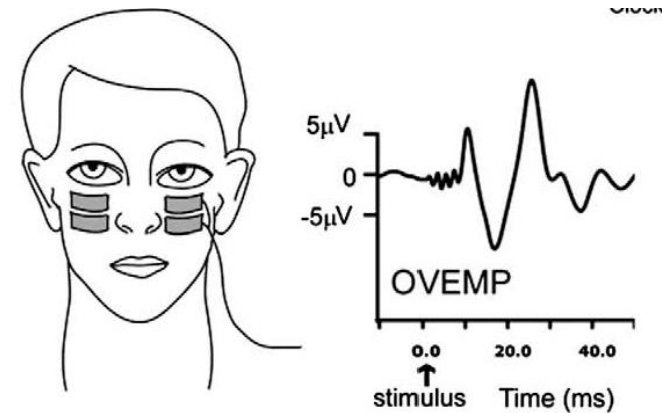
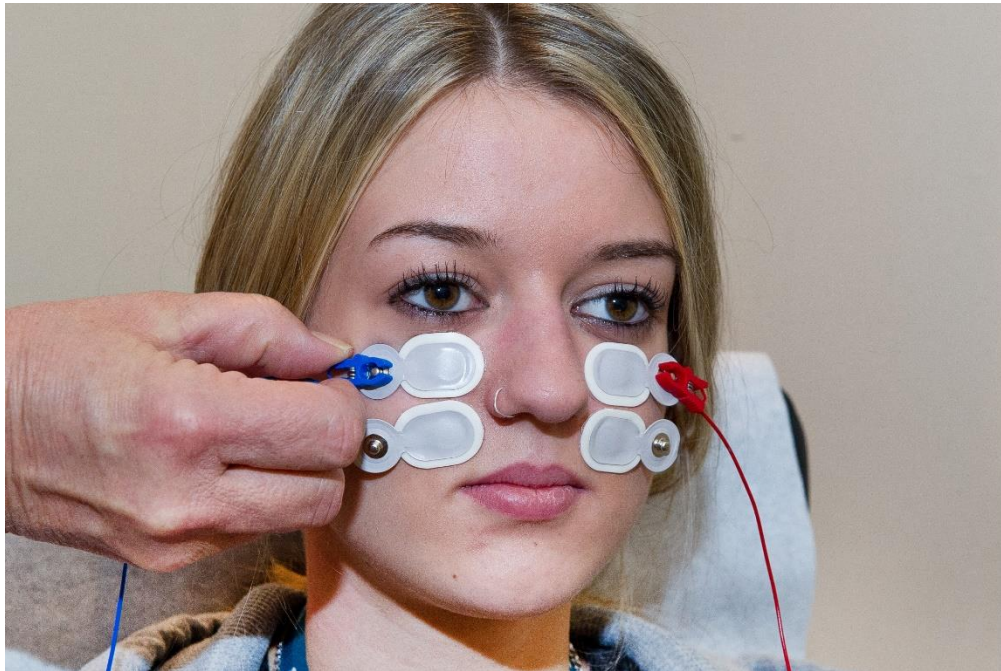
Zervikal evozierte myogene Potentiale



Rosengren, Clinical Neurophysiology, 2010

Testung der Otolithenorgane: Sakkulus

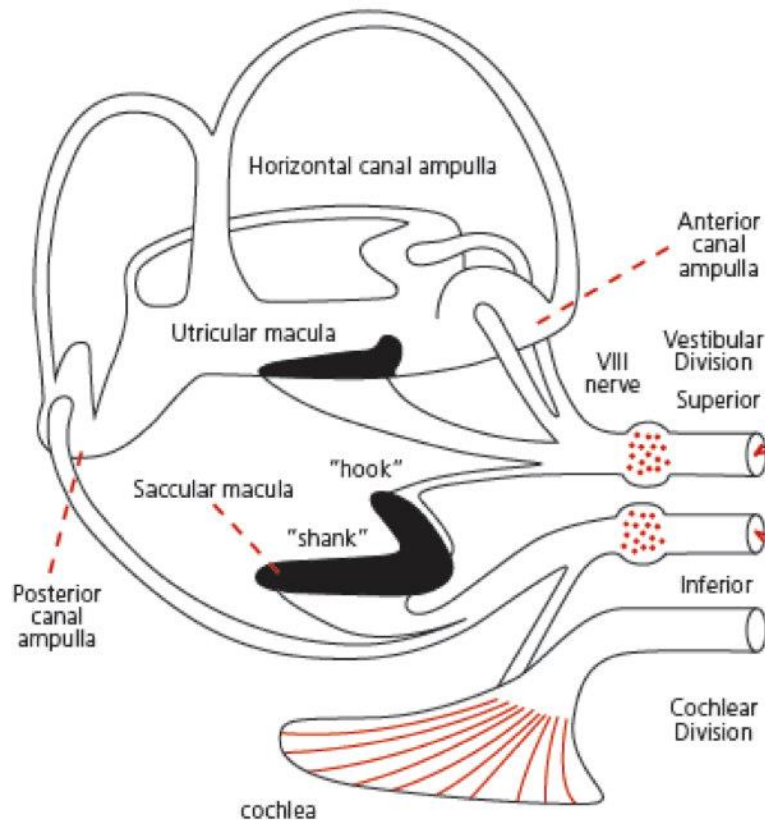
Okulär evozierte myogene Potentiale



Testung der Otolithenorgane: Utrikulus

Rosengren, Clinical Neurophysiology, 2010

Vestibuläre Tests



| Clinical Test* | Healthy Subjects | Superior Vestibular Neuritis | Inferior Vestibular Neuritis | Unilateral Vestibular Loss |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|------------------------------|------------------------------|----------------------------|
| Horizontal head turn to ipsilateral horizontal canal | ✓ | ✗ | ✓ | ✗ |
| Pitch head impulse test in the plane of the ipsilateral anterior canal, head turn nose down - tests ipsilateral anterior canal | ✓ | ✗ | ✓ | ✗ |
| oVEMP n10 beneath the contralateral eye to bone conducted vibration at Fz, or air-conducted sound of one ear - tests utricular macula of the ear opposite to the eye | ✓ | ✗ | ✓ | ✗ |
| cVEMP p13-n23 over ipsilateral sternocleidomastoid (SCM) muscle to bone conducted vibration at Fz, or air-conducted sound of one ear - tests saccular macula of the ear on the same side | ✓ | ✓ | ✗ | ✗ |
| Pitch head impulse in the plane of the ipsilateral posterior canal, head turn nose up - tests ipsilateral posterior canal | ✓ | ✓ | ✗ | ✗ |

✓ = Normal Response ✗ = Abnormal Response

ICS Impulse – Revolutionizing Vestibular Assessment
 Wendy Crumley-Welsh, MS, CCC-A, audiology online, 07/2013



Therapie bei vestibulärem Ausfall

Im akuten Stadium: Antiemetika i.v. / Suppositorien

- Metoclopramid (Primperan®)
- Thiethylperazin (Torecan®)

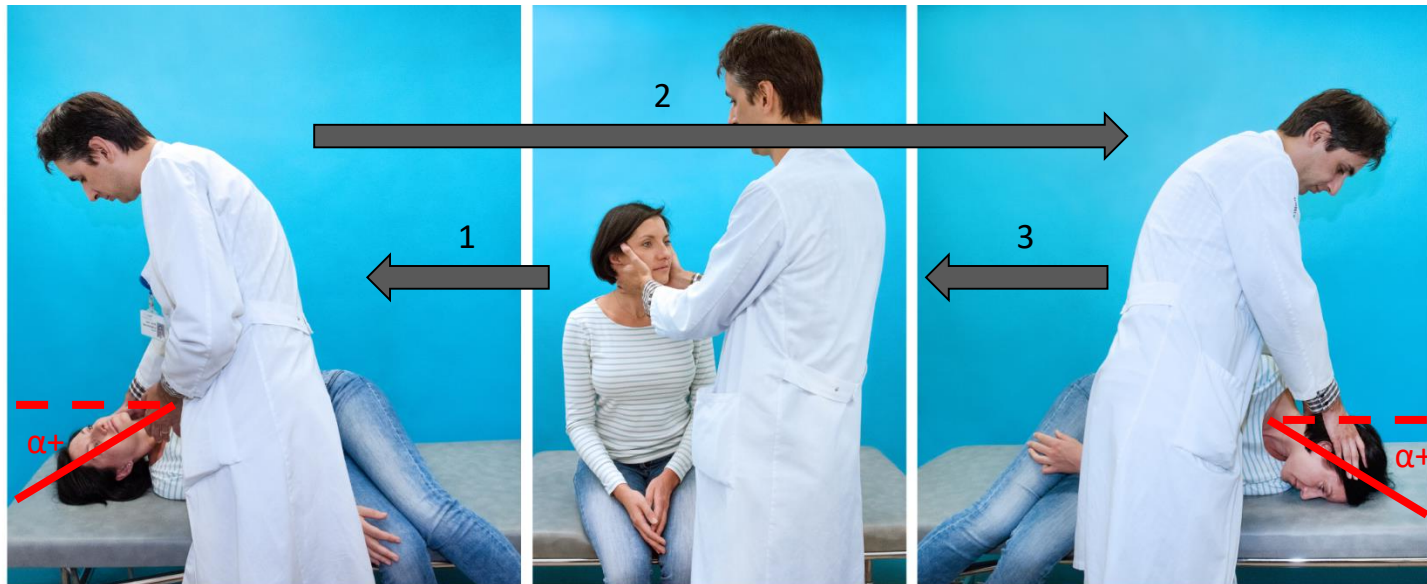
Kortison (Evidenzgrad 2b)

Förderung der zentralen Kompensationsmechanismen

Vestibuläre Physiotherapie (Evidenzgrad 1)



Therapie bei Lagerungsschwindel



Sémont Manöver bei BPLS (posteriorer BG rechts)



Therapie bei Lagerungsschwindel



