

# How to diagnose and manage episodic vertigo

Marianne Dieterich, MD, FANA, FEAN



Department of Neurology &  
German Center for Vertigo and Balance Disorders  
Ludwig- Maximilians University, Munich, Germany



# Frequency of different vestibular diseases in **37,328** patients seen in an outpatient dizziness unit

Diagnosis	Frequency	
	n	%
1. Functional dizziness	6465	17.3
2. BPPV	5228	14.0
3. Central-vestibular syndromes	4977	13.3
4. Vestibular migraine	4631	12.4
5. Menière's disease	3772	10.1
6. Unilateral vestibulopathy	3406	9.1
7. Bilateral vestibulopathy	2461	6.6
8. Vestibular paroxysmia	1180	3.2
9. Third mobile window syndrome	178	0.5
Unknown vertigo syndromes	1723	4.6
Other disorders (PNP, orthostatic)	3307	8.8

episodic  
vertigo  
in red

# Episodic vertigo

	<b>Disease</b>	<b>Attack Duration</b>
<i>Peripheral vestibular</i>		
Labyrinth	Meniere's disease Vestibular migraine Third mobile window	20 min – 12 h 5 min – 72 h min
Vestibular nerv	Vestibular paroxysmia	sec (< 5 min)
<i>Central vestibular</i>		
Brainstem, cortex	Vestibular migraine	5 min – 72 h
Cerebellum	Episodic ataxia	hours

# Signs of central deficits

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## Ocular motor examination

- **Gaze evoked nystagmus:**  
in both horizontal directions, esp. vertical
- **Vertical misalignment:**  
skew deviation
- **Disorder of fixation suppression of the VOR**
  
- **Disorders of saccades:**  
hypermetric, hypometric, reduced velocity
- **Disorders of smooth pursuit:**  
saccadic, esp. of horizontal gaze

vestibular  
ocular  
motor  
signs

ocular  
motor  
signs

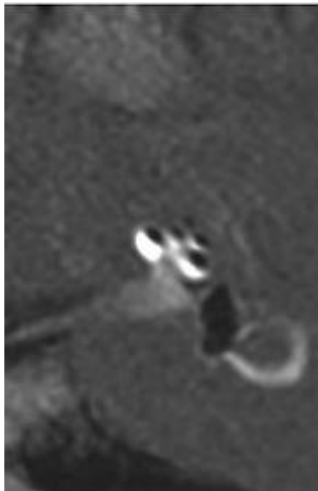
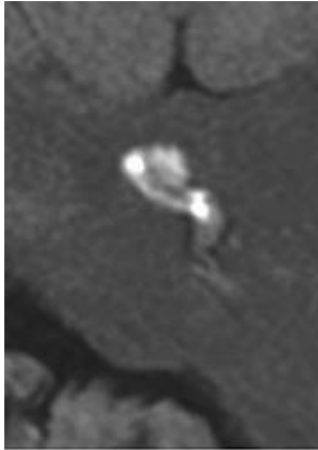
### → **Central ocular motor signs**

(necessary for the differentiation of a central  
from a peripheral vestibular disorder)

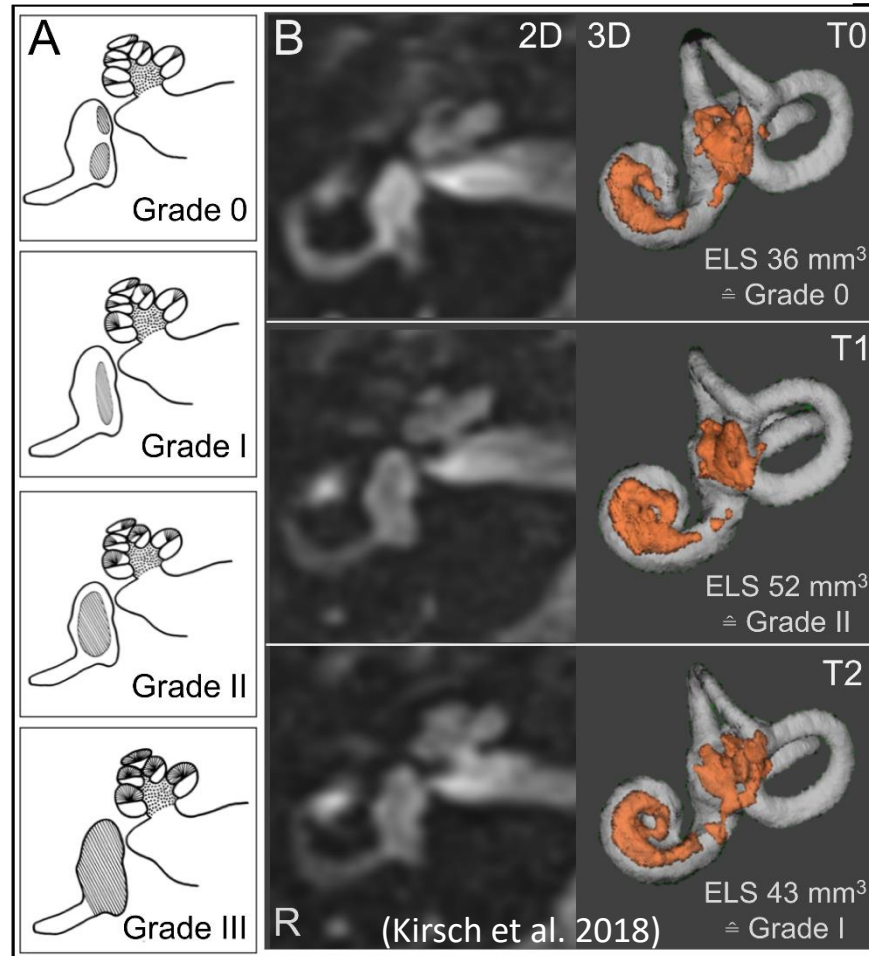
# How to image the endolymphatic space ?

## Actual studies on in-vivo imaging of the ELH

**Invasive**



**Non Invasive (iv)**



Inner ear MRI 4h after **iv** application of Gadolinium (standard dosage):

3-D volume analysis allows the **quantification** of ELH (grade 0 – III)

← Here T0 – T2:  
Endolymphatic space (ELS)  
before and after a **VM attack**

Nakashima et al. 2007  
Gürkov, Berman et al. 2014

Nakada et al. 2014, Naganawa and Nakashima 2014,  
Kirsch et al. 2018, Gerb et al. 2020, Oh et al. 2021

# Conclusion: episodic vertigo

- **Detailed history taking**  
(frequency & duration of attacks, duration of disease, age of onset, ear symptoms, central neurological signs, provoking factors)
- **Detailed neurological examination**
- **Detailed neuro-otological and ocular motor examination**  
(for differentiation of central from peripheral vestibular syndrome, central ocular motor signs, HINTS plus)
- **Additional testing** (if necessary)  
(audiogram, vHIT, calorics, test of subjective visual vertical, c/oVEMPs, MRI of the inner ear, cranial MRI, CT scan petrous bone)
- **Testing of medication** in Vestibular Paroxysmia