

# Treatment modalities of vertigo

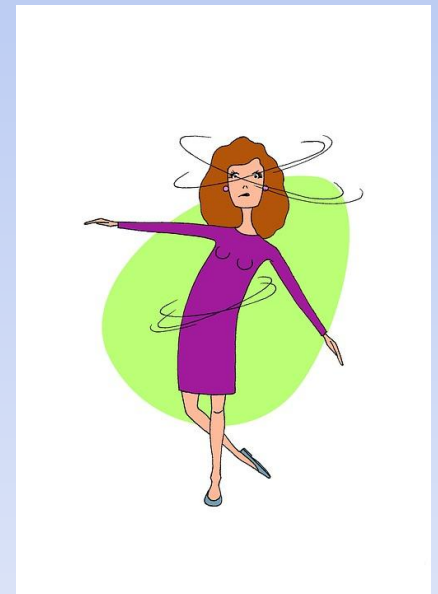
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# Common statements made by vertigo patients

- Doctor, you are my last hope!
- It's impossible to live without the dizziness medication!
- Is there a cure for vertigo?



The treatment sometimes requires collaboration of several specialties:

Family doctor  
ENT doctor  
Neurologist  
Rheumatologist  
Internist  
Psychiatrist



The coordinator should be the neurootologist.

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# Attitudes towards the patient

- Explain the nature of the neurootological disorder!
- Explain that vertigo and other types of dizziness of vestibular origin can be cured or managed with adequate treatment!
- Describe the treatment schedule and objectives!
- Make the patient aware of that his/her active participation is essential for the success of the treatment!
- Convey optimism and hope!

# Never forget

Recurrent attacks of dizziness lead to increasing anxiety.  
Depression commonly develops in a mild form.

Psychologic symptoms:

- affect the quality of life,
- decrease the chance of rehabilitation,
- intensify the complaints of the patient.

# Treatment objectives

Promote the functional recovery of body balance by means of mechanisms that lead to a vestibular compensation, aiming at the control or elimination of:

- dizziness,
- associated symptoms and signs, such as nausea or other neurovegetative conditions, presyncope, instability, falls etc.,
- anxiety, depression and fears resulting from physical insecurity,
- negative impact on the quality of life and consequences on household, familiar, social and economic activities,
- recurrences.

# Treatment possibilities of dizziness/vertigo

## Drug therapy/medication

- intravenous
- oral
- intratympanic administration

## Physical exercises for body balance rehabilitation

- vestibular training (*exercises for the eye, head and/or body to stimulate vestibular compensation*)
- specific reposition maneuvers (*BPPV – Epley, Semont etc.*)

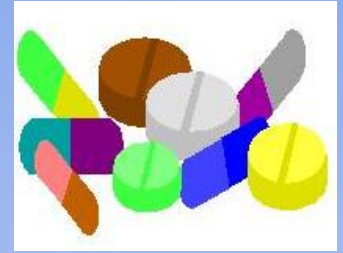
## Surgery

## Psychological treatment (*avoidance of anxiety, depression etc.*)

Combination of the above usually results in greater therapeutic efficacy when compared with the use of each procedure alone.

# Drug therapy I.

## Vasoactive drugs I.



### **piracetam** (Nootropil, Lucetam, Memoril..)

*improves glucose and oxigen metabolism of nerve cells,  
microcirculation and erythrocyte flexibility*

12g/day i.v. infusion for 10 days

800-2400 mg., 1-1-0 tabl./day

### **vinpocetin** (Cavinton)

*improves microcirculation and oxigen metabolism of nerve cells,  
erythrocyte flexibility, inhibits aggregation of platelets*

1mg/kg body weight increising-decreasing dose, max. 10 amp./day  
i.v. infusion or 3 x 10 mg orally /tablets/ (Cavinton Forte)



# Drug therapy II.

## Vasoactive drugs II.

### **pentoxifylline** (Chinotal, Trental..)

*reduces blood viscosity and improves erythrocyte flexibility, microcirculation and tissue oxygen concentrations*

2 x 100-600 mg/day i.v. infusion for 7-10 days

2 x 400 mg tabl./day

### **gingko biloba** (Tebofortan, Bilobil..)

*vasoregulatory properties*

3 x 40-80 mg, 2 x 120 mg /day orally

# Drug therapy III.

## Vasoactive and vestibular suppressant drugs

### **betahistin** (Betaserc, Betagen..)

*it has an antagonistic effect on  $H_3$  receptors and an agonistic effect on  $H_1$  receptors, it causes vasodilation in the inner ear and facilitates vestibular compensation without a sedative effect*

3 x 16 mg, 2 x 24 mg tabl./day orally – or more –up to 120 mg/day

### **cinnarizine** (Stugeron)

*$H_1$  histamine antagonist with sedative and calcium-channel blocking activity*

3 x 25 mg /day orally

### **flunarizine** (Sibelium)

*anti-histamine, sedative and calcium-blocking activity*

10 mg/day at night orally

# Drug therapy IV.

## Vestibular suppressant drugs (benzodiazepine)

### **diazepam** (Seduxen)

*anxiolytic, sedative, anti-convulsant and muscle relaxation properties, enhances the activity GABA, the major neurotransmitter in the CNS*

10 mg i.m. or i.v. every 8 or 12 hours or 5-20 mg/day orally

### **clonazepam** (Rivotril)

*similar to diazepam, with marked antiepileptic properties*

1 or 2 x 0.5 mg/day orally

### **alprazolam** (Frontin, Xanax)

*anxiolytic, sedative, anti-convulsant and muscle relaxation properties*

2-3 x 0.25-0.5 mg/day orally

# Drug therapy V.

## Vestibular suppressant and/or anti-emetic drugs

### **dimenhydrinate** (Daedalon)

*antihistamine with muscarinic, anti-emetic sedative effects, used to control nausea and vomiting*

5mg/kg body weight every 4 hours, up to 400 mg/day

### **dimenhydrinate + cinnarizine** (Arlevert)

3 x 1 tabl. (60 mg)/day orally

### **ondansetron** (Zofran, Emetron)

*blocking the signal to the vomiting center in the brain, preventing nausea and vomiting*

4-8 mg i.m. every 8 hours or i.v. single dose

# Drug therapy VI.

## Adjuvant therapy I.

### **analgetics**

(naproxen, diclofenac etc.)

*usually against headache and neck pain*

### **muscle relaxant agents**

(meprobamat, diazepam, tolperison)

*usually against neck muscle tension*

# Drug therapy VII.

## Adjuvant therapy II.



### anxiolytics

alprazolam (Xanax, Frontin) 2-3 x 0.25-0.5 mg orally

carbamazepine (Stazepine, Tegretol) 2-3 x 200-400 mg orally

clonazepam (Rivotril) 0.5-2 mg/day orally

diazepam (Seduxen) 5-20 mg/day orally

*anxiolytic, sedative, anti-convulsant properties*

***They decrease the duration of vestibular rehabilitation!***

***It is recommended to use them only for some days at the beginning of vertigo attack!***

***Addiction!***

# Drug therapy VIII.

## Adjuvant therapy III.



### **antidepressant**

*selective serotonin reuptake inhibitor (SSRI)*

*fluvoxamin (Fevarin)*

fluoxetine (Floxet, Prozac)

paroxetine (Paroxát, Rexetin)

amitriptyline (Teperin)

citalopram (Seropram)

Consultation with psychiatrist is suggested to choose the adequate medication.

# Drug therapy IX.

## Adjuvant therapy IV.

### Medication for concomitant diseases:

- antihypertensive drug
- antidiabetic medicine
- cholesterol and triglycerid reducer
- agents reducing fibrinogen level (pentosan- polysulfate)

### Prevention:

- thrombocyte-aggregation inhibitor therapy:  
(acetylsalicylic acid, ticlopidin, clopidogrel, dipyridamol...)



# Intratympanic medication

## **steroid**

For the treatment of Menière's disease.

For the treatment of acute hearing loss and tinnitus.

*0.5-1 ml dexamethason inj. intratympanically*

*4 mg/day for 4-5 days (Sakata)*

## **gentamycin**

For the treatment of Menière's disease intratympanic injection and perfusion into the inner ear.

Two doses of 0.5-1.0 ml gentamycin solution, injected once a week with a drug concentration of 40 mg/ml.



# Therapy of acute vertigo attack with spontaneous nystagmus

Vertigo is severe and is usually followed by nausea, vomiting and other neurovegetative symptoms.

Medical care is urgently required and patient needs hospitalisation.

Drug therapy:

- hydrate the patient, if necessary
- diazepam 10 mg i.m./i.v.
- and/or dimenhydrinate 50 mg i.m. - repeat it, if necessary
- in cases of refractory nausea and vomiting: ondansetron 4-8 mg i.m./i.v.
- bed rest at the beginning
- after: follow the antivertiginous and antiemetic therapy, early mobilisation – probe not to use any sedative drug therapy

# Therapy of acute vertigo with positioning nystagmus /BPPV

When the patient reports severe dizziness and difficulty with walking or standing up, or neurovegetative symptoms without spontaneous nystagmus, but presents vertigo and positional or positioning nystagmus suggestive of BPPV, usually suggest:

- benzodiazepine (diazepam, clonazepam) dimenhydrinate or ondansetron
- then start the reposition maneuvers

After BPPV diagnosis, when the patient cannot perform the BPPV maneuvers due to neurovegetative symptoms, previous administration suggest:

- cinnarizine /flunarizine, benzodiazepine (diazepam, clonazepam) or dimenhydrinate

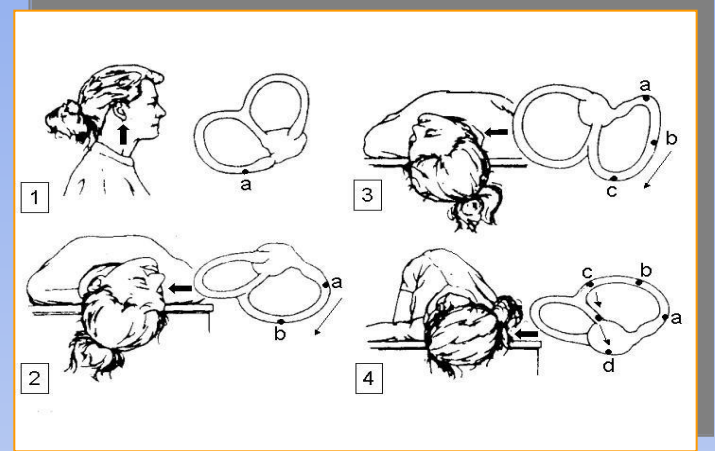
# Reposition maneuvers of BPPV

- Maneuvers performed in BPPV patients aim to dislodge statoconial debris from the semicircular canals and return it back to the utricle from where it originates.
- Such procedures should be individualized according to the affected canal, the pathophysiology of each case, the clinical evolution of the patient and any existing contraindications to the maneuvers
  - vertebral column disorders,
  - decreased cervical mobility etc.

# Reposition maneuvers of BPPV

Posterior SCC BPPV:

Epley (Epley, 1992), Semont (Semont et al., 1988)



Right post SCC/Epley

Horizontal SCC BPPV

BBQ (Lempert 1996)

Type 2 BPPV (Büki, Otol Neurotol. 2013)

Dix-Hallpike up/down



Left / Dix-Hallpike

**Therapy:** vitamin D<sub>3</sub> 2000 IU/day (Büki et al. Med. Hypot. 2013)

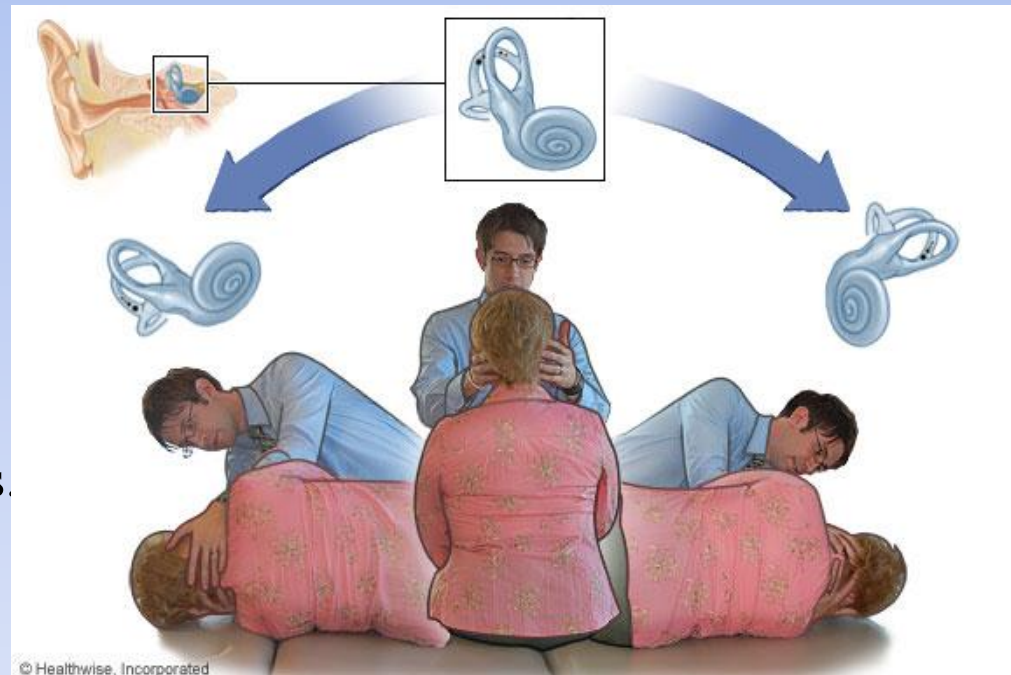
# Epley maneuver

- Sitting position, turning the head with  $45^\circ$  into the involved side.
  - Laying down into Hallpike position, waiting for 30 seconds – until the vertigo stops.
  - Turning the head slowly into the opposite side ( $90^\circ$ )-waiting until the vertigo stops again.
  - Rolling the body slowly into the same direction, all in all  $135^\circ$ .
  - Slowly moving into sitting position with fixed head position.
- Particulums are in the utricle.



# Semont maneuver

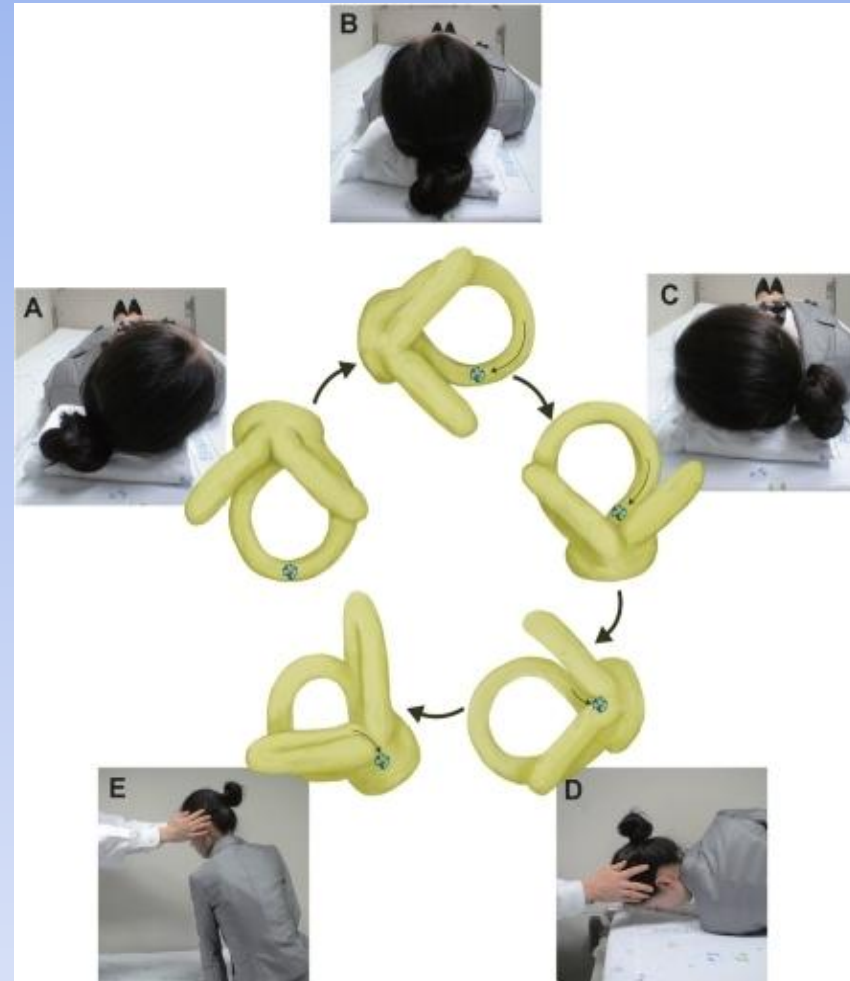
- First, the patient is sitting on the exam table with the legs hanging off the edge.
- The doctor turns the patient's head so that it is halfway between looking straight ahead and looking away from the side that causes the worst vertigo.
- The doctor then lowers the patient's upper body quickly to the side that causes the worst vertigo. When the patient's head is on the table, the patient is looking up at the ceiling. This position is held for 30 seconds.
- The doctor then quickly moves the patient to the opposite side of the table, without stopping in the upright position. When the head is on the table, the patient is looking down at the table. This position is held for 30 seconds.
- The doctor then helps the patient sit up.





# Barbeque roll (BBQ) maneuver

- right HC-BPPV
- first turning the head toward the effected ear (A), then  $270^{\circ}$  toward the unaffected side through a series of  $90^{\circ}$  steps (B-D) and then returning to the sitting position (E)
- each position should be maintained for at least 1 or 2 minutes, or until the provoked nystagmus and vertigo are resolved



# Type 2 BPPV

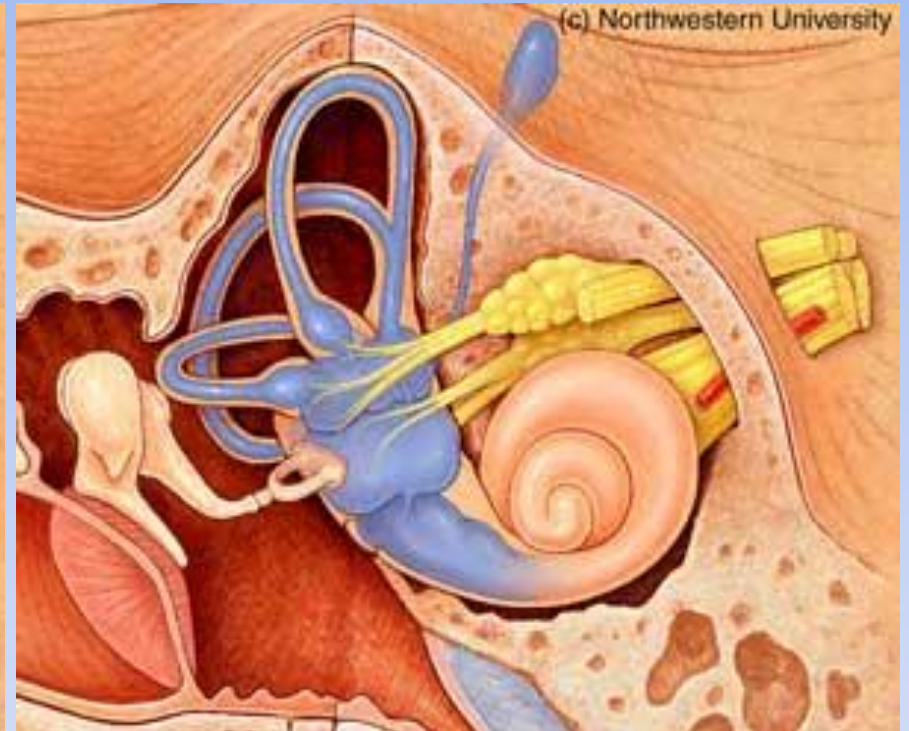
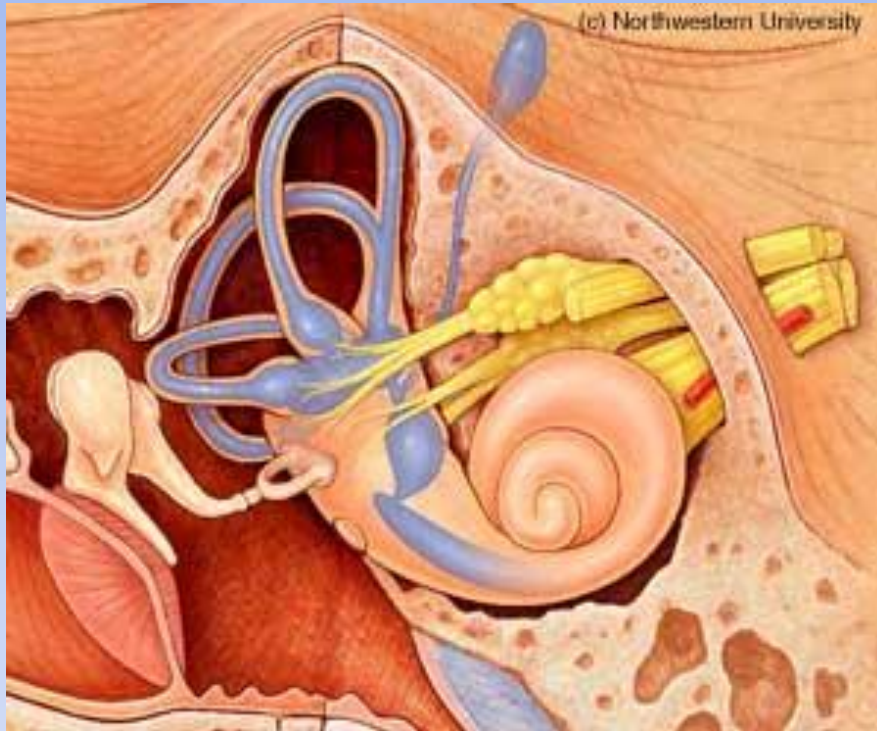
- In Dix-Hallpike position/provocation method:  
No nystagmus can be seen in the lying position, but a vertical nystagmus can be detected in some cases when the patient returns to the sitting position.

But at the end of this movement - in the sitting end position -, patient usually feels antepulsion-retropulsion sensation of the body.

- Therapy maneuver:  
Dix-Hallpike position repeat.



# Menière's disease endolymphatic hydrops



# Therapy of Menière's disease

Stepwise approach of the most commonly used therapeutic alternatives

- life style and dietary changes – avoidance of coffee/salt/chocolate
- drug treatment
  - betahistin
  - cinnarizine, flunarizine, dimenhydrinate + cinnarizine
  - diuretics: hydrochlorothiazide, amiloride 1-2x1 /tabl./orally
  - improvement of microcirculation: vinpocetin, pyracetam, pentoxifyllin p.o., i.v.

in vertigo attacks: antiemetics, sedatives, dimenhydrinate

- intratympanic dexamethason injection /acute hearing loss and tinnitus/
- middle ear pressure applications (Meniett)
- chemical labyrinthectomy (intratympanic Gentamycin)
- surgical therapy
  - endolymphatic sac decompression/sacotomy
  - vestibular neurectomy
  - labyrinthectomy

# Middle ear pressure applications (Meniett)

## Objective

- restore the equilibrium of the inner ear fluid pressure

## Mechanism

- pressure pulses produced by the device are applied to the external ear through a catheter, the positive pressure is transmitted to the middle ear through the ventilation tube and to the inner ear through the round window membrane

# Chemical labyrinthectomy (intratympanic Gentamycin)

## Objectives:

- to damage vestibular hair cells without damaging cochlear hair cells
- to inactivate the vestibular dark cells responsible for endolymph production, so as to reduce the endolymphatic hydrops

Indication: - average hearing loss more than 40 dB HL,  
- max. 55 years of age,  
- well functioning of brain stem,  
- intolerable vertigo attacks.

Method: - intratympanic injection of 0.5-1.0 ml gentamycin, drug concentration of 40 mg/ml, once a week  
- monitoring of the hearing capacity throughout the administration period

# Therapy of neuronitis vestibularis

## Symptomatic therapy at the beginning:

- antivertiginous and antiemetic drug therapy
- sedative drug therapy for 2-3 days
- bed rest
- methylprednisolone 1 mg/kg body weight i.v. then p.o. for 15 days

## To support the central vestibular compensation (2-3 months)

- mobilisation after 3 days
- piracetam i.v. infusion (12g/day)
- vestibular training

Sedative drugs inhibit the central vestibular compensation and hinder the vestibular rehabilitation!

**Thank you  
for your attention!**

