TREATMENT OF VERTIGO

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What is Vertigo?

- Vertigo is a type of dizziness and refers to a false sensation that oneself or the surroundings are moving or spinning (usually accompanied by nausea and loss of balance) that is a result of a mismatch between vestibular, visual and somatosensory systems

Why vertigo is important in primary care setting?

- Suffering
- Difficult to locate the disorders
- Fear of missing serious pathology
- Little I can do

CAUSES OF DIZZINESS

- CVS- e.g hypotention, arrhythmia, MI
- Neurological- e.g stroke, trauma
- Metabolic, eg hypoglycaemia
- Haematological eg anaemia
- Psycological
- Otological- e.g BPPV, A/c Vestibular neuritis / labrythitis, Meniere's ds

Assessments should be made for any serious underlying disorder requiring urgent treatment - eg, ischaemic heart disease, cerebrovascular disease.

ASSESSMENT: ASSESS THE NATURE OF THE DIZZINESS

D/D	Presentation	Common causes
Vertigo	False sense of motion possibly spinning sensation	
Disequilibrium	Off-balance or wobbly	Peripheral neuropathy, eye disease or peripheral vestibular disease
Presyncope	Feeling of LOC or blacking out, vague /S possibly	cardiovascular disorders or anemia
Lightheadedness	Feeling disconnected with the environment	Panic attack with hyperventilation

ASSESSMENT: ANY ASSOCIATED SYMPTOMS

EAR SYMPTOMS - eg, hearing loss, ear discharge, tinnitus, aural fullness, facial weakness

NEUROLOGICAL SYMPTOMS - eg, headache, diplopia, visual disturbance, dysarthria or dysphagia, paraesthesia, muscle weakness or ataxia.

AUTONOMIC SYMPTOMS - eg, nausea and vomiting, sweating or palpitations.

SYMPTOMS SUGGESTING MIGRAINE AURA - eg, visual or olfactory symptoms.

EXAMINATION

- Neurological examination, including gait and their ability to stand unaided, cranial nerves, cerebellar function, signs of peripheral neuropathy and any indication of a cerebrovascular event.
- Ear examination, including signs of infection, discharge and cholesteatoma.
- Eye examination: nystagmus (common in acute vertigo), fundoscopy.

SPECIFIC CLINICAL TESTS

Romberg's test - test on proprioception or vestibular function. Romberg's test can also be positive in neuromuscular disorders and may not be reliable in very elderly people

Dix-Hallpike manoeuvre - Can be used to confirm BPPV

Head impulse test- to determine whether the cause of vertigo is peripheral or central

Unterberger's test - to identify damage to one of the labyrinths

INVESTIGATIONS

- No investigations are likely to be performed in primary care.
- Secondary care investigations include:
  - Audiometry for cochlear function.
  - Vestibular function: electronystagmography, calorimetry and brain stem-evoked responses.
  - Possible neurological cause: CT or MRI.
  - Electroencephalography (EEG): epilepsy.
  - Lumbar puncture: possible multiple sclerosis.
  - Syphilis serology.

MANAGEMENT

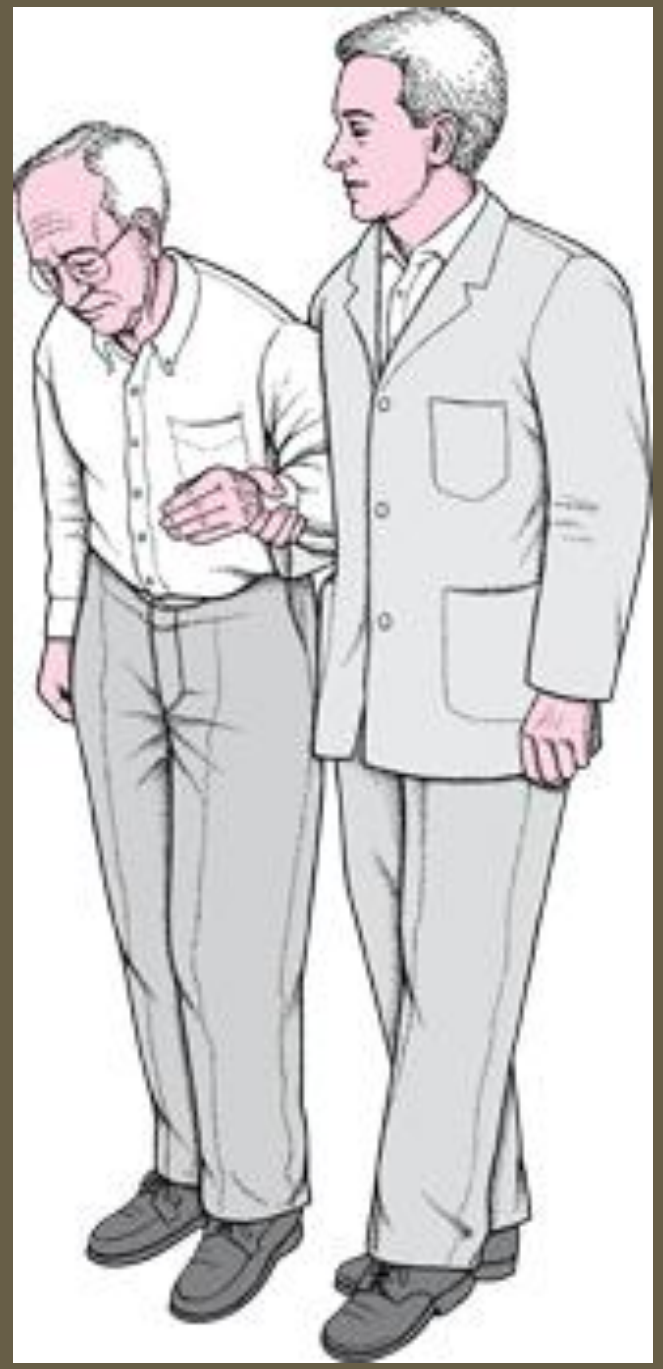
- Explanation and reassurance are important as anxiety exacerbates vertigo.

MANAGEMENT: REEFERRAL

- Severe nausea and vomiting and inability to tolerate oral fluids or symptomatic drug treatment (admit to hospital).
- Very sudden onset of vertigo (within seconds) that is not provoked by positional change and is persistent (admit or urgently refer to a neurologist or ENT Specialist)
- Central neurological S/S - eg, a new type of headache (especially occipital), gait disturbance, truncal ataxia (admit or urgently refer to a neurologist).
- Acute deafness without other typical features of Ménière's disease (admit or urgently refer to ENT specialist)

Common central vertigo

- TIA or stroke
- Migrainous vertigo
- Multiple sclerosis
- Cerebellopontine angle tumour



Cerebellopontine angle tumour

- Symptoms: Violent headache, Nausea and Vomiting, Difficult speech, Swallowing and voice production , Facial numbness on the affected side and Unilateral hearing loss
- Physical Examination: Unilateral or asymmetric SNHL(Lower word recognition scores, Blink reflex, 50 % reduced the reflex, Ataxic gait, Walking or moving defecits
- Investigation: CT, MRI, ABR

CEREBROPONTINE ANGLE TUMOUR: TREATMENT

Surgical treatment

- Hearing preservation surgery
- Early diagnosis-small tumor size
- Intraoperative ABR and facial nerve monitoring

Destructive surgery

- Poor pre-op hearing
- Tumor size >1.0-1.5cm

COMMON PERIPHERAL VERTIGO

- BPPV
- Acute Labrythitis /Acute vestibular neuronitis
- Meniere’s disease
- Perilymph fistula
- Cholesteatoma erosion
- Herpes zoster oticus
- Superior canal dehecience syndrome

BENIGN PAROXYSMAL POSITIONAL VERTIGO

PRESENTATION:

Triggered by changes in head or body position attacks of rotatory vertigo

Duration < 1 minutes with nausea, vomiting & oscilopsia

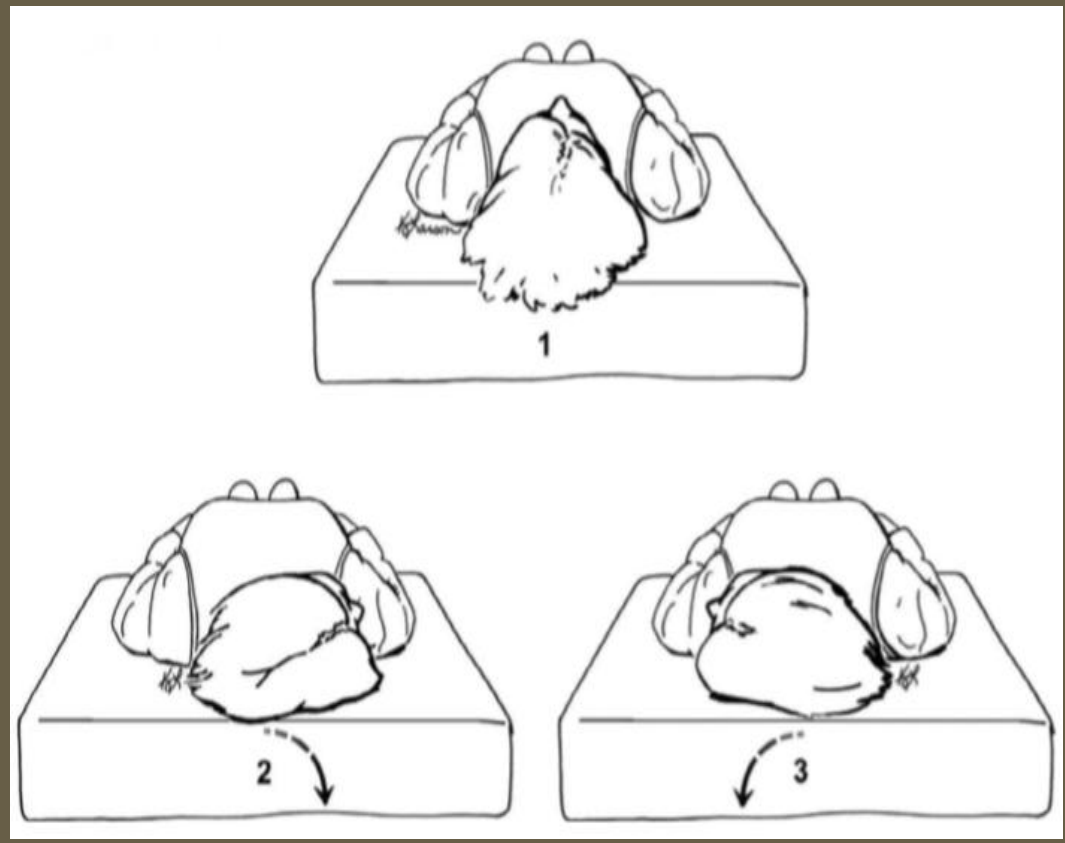
FINDING:

Pure Tone Audiogram - Normal

Caloric test - Normal

BPPV diagnosis: Dix-Hallpike manoeuvre

supine roll test



BPPV : TREATMENT

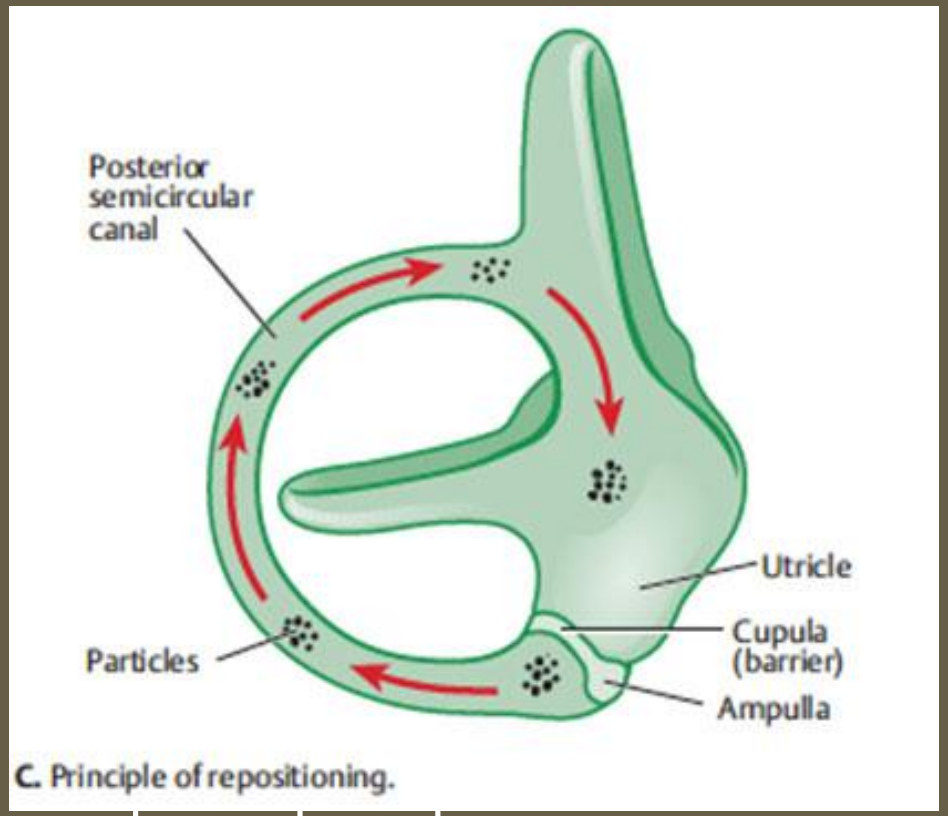
Office-based treatment

Treatment of choice for posterior canal BPPV

- ✓ The Epley maneuver and modified Epley maneuver

http://www.neurology.org/content/70/22/2067/suppl/DC2. 098

- ✓ The Semont maneuver and modified Semont maneuver



C. Principle of repositioning.

Self-treatment at home

- ✓ Based on the same principles, exercises for self-treatment at home have been developed:
- ✓ Brandt-Daroff exercises, modified Epley maneuver, modified Semont maneuver

https://www.uptodate.com/contents/benign-paroxysmalpositionalvertigo?source=see_link#H18

TREATMENT OF BPPV

Maneuvers for other BPPV variants : Anterior canal BPPV

- reverse Epley" maneuver & prolonged forced position" procedure

Maneuvers for other BPPV variants : Horizontal canal BPPV

- stepwise rotations of the non-tilted head in the supine position moving 360° from the affected to the unaffected ear
- barbecue rotation" maneuver
- Gufoni maneuver,
- Vannucchi’s forced prolonged position
- Lempert maneuver

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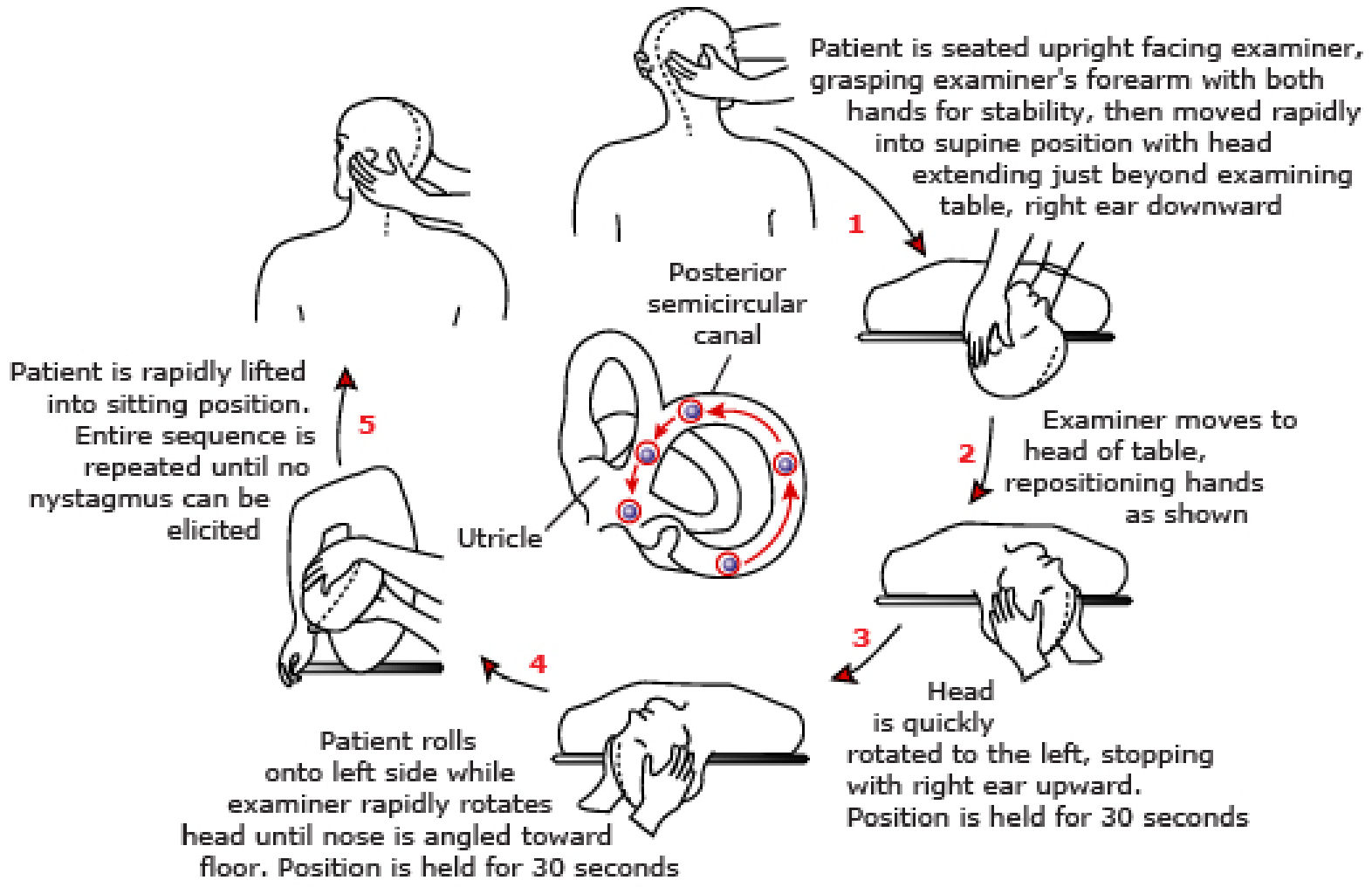
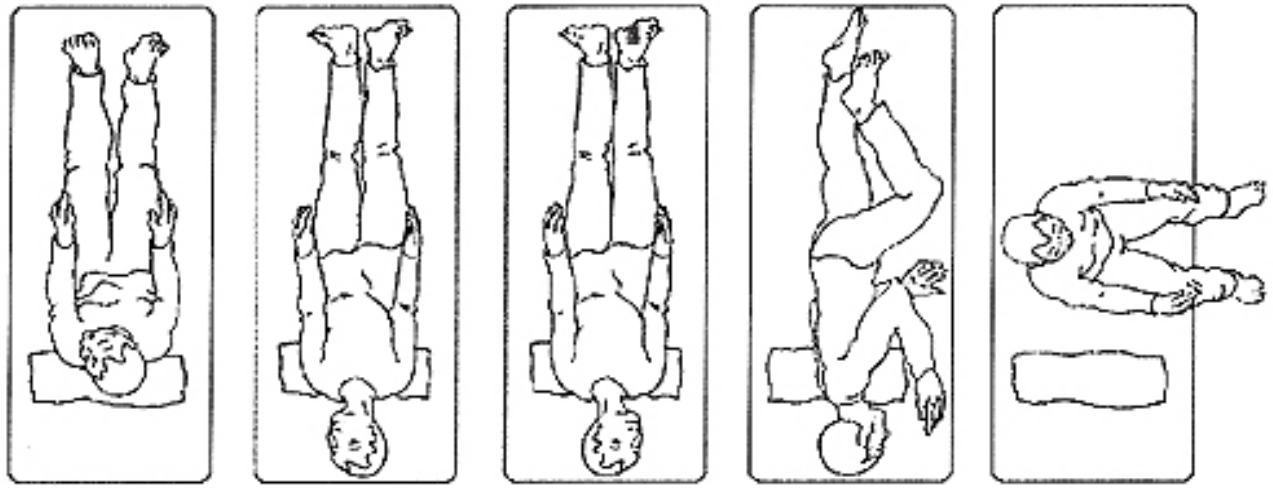
Treatment : BPPV's Epley maneuver

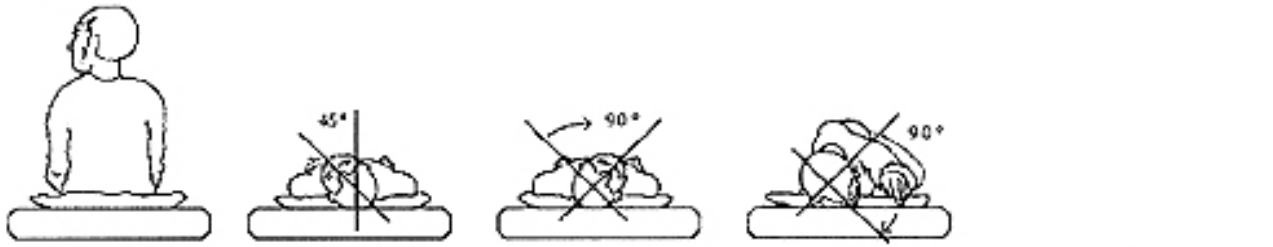
Particle repositioning maneuver



Treatment : BPPV's Mordified Epley maneuver

Modified Epley maneuver for self-treatment of benign positional vertigo (left)





Start sitting on a bed and turn your head 45 degrees to the left. Place a pillow behind you so that on lying back it will be under your shoulders.

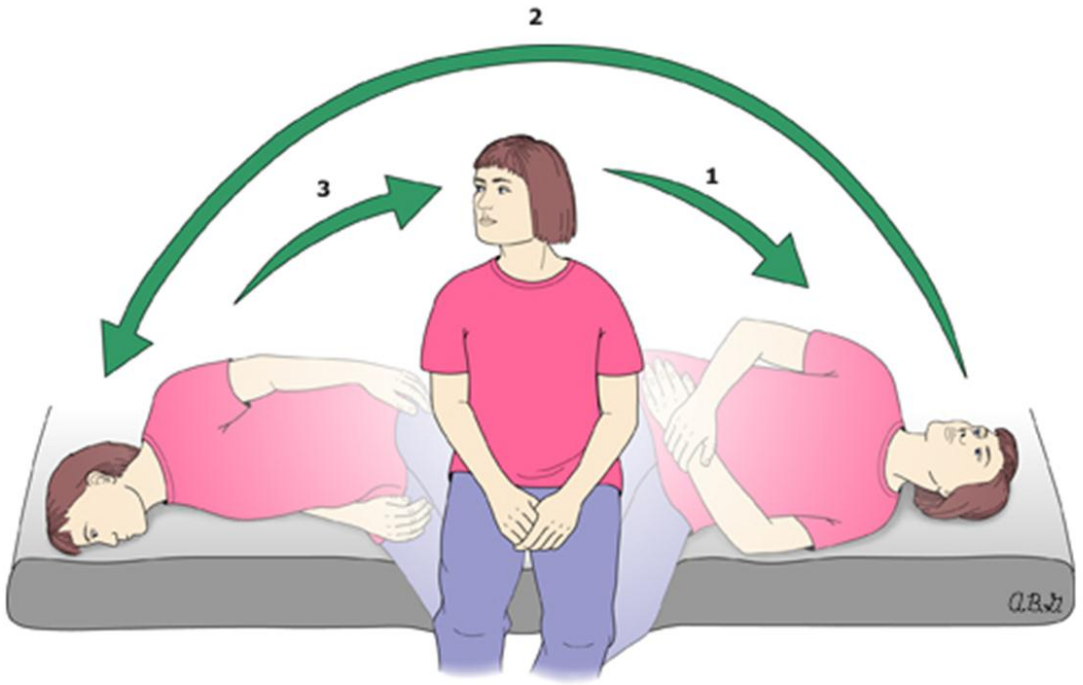
Lie back quickly with shoulders on the pillow and head reclined onto the bed. Wait for 30 seconds.

Turn your head 90 degrees to the right (without raising it) and wait again for 30 seconds.

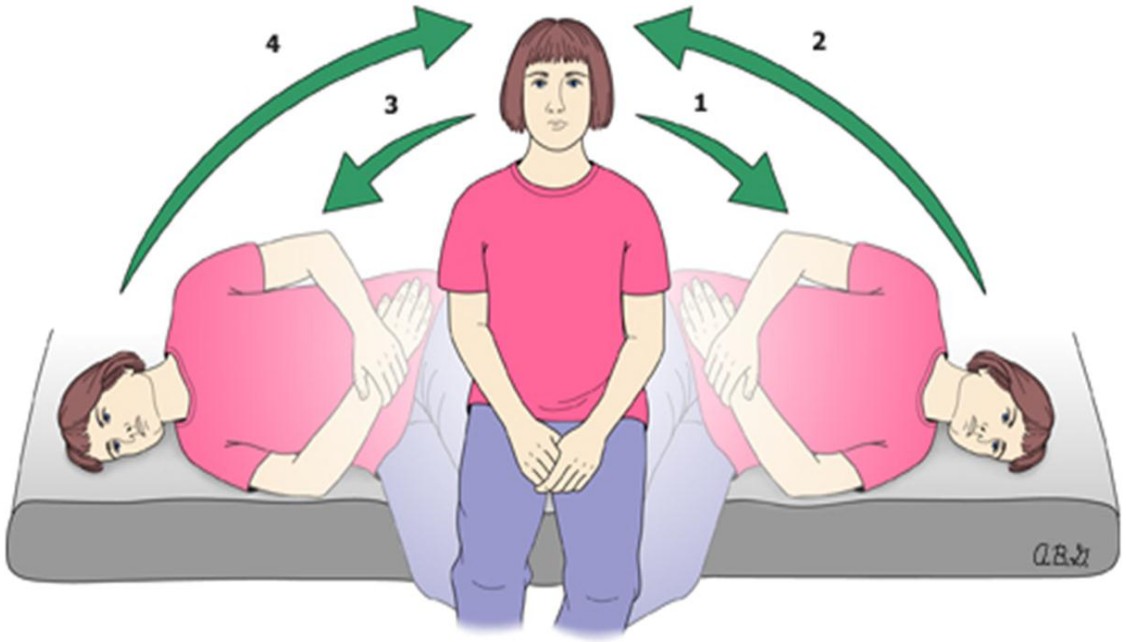
Turn your body and head another 90 degrees to the right and wait for another 30 seconds.

Sit up on the right side.

Modified Semont maneuver



Brandt-Daroff maneuver



TREATMENT : REFRACTORY BPPV

Disabled patients with their symptoms

- Surgical occlusion of the posterior canal with bony plugs

–Success rates approx 90 %

–Transient postoperative hearing loss and dizziness are very common.

–Persistent hearing loss occurs in less than 5 %

- Argon laser - to induce ossification of the posterior canal

–Transection of the posterior ampullary nerve

–Sensorineural hearing loss occurs in 4 to 40 percent of patients

The following points list the level of evidence as based on Oxford Centre for Evidence-Based Medicine

- BPPV is the most common diagnosis of vertigo (Level 4)
- Dix-Hallpike maneuver is the diagnostic test for posterior canal BPPV (Level 1)
- Supine roll test is the diagnostic test for lateral canal BPPV (Level 2)
- Epley maneuver is the first-line treatment for posterior canal BPPV (Level 1)
- Posterior semicircular canal occlusion is an effective treatment for recalcitrant posterior canal BPPV. (Level 4)
- Lateral canal BPPV can be treated with a variety of repositioning maneuvers (Level 2)

Otolaryngol Clin North Am . Author manuscript; available in PMC 2013 October 01.

ACUTE LABYRINTHITIS & VESTIBULAR NEURONITIS

Etiology: Post Viral infection

Patient history Sudden vertigo with unsteadiness, nausea or vomiting

Persistent vertigo(days-weeks) , (-)auditory deficits , (-) other neurologic

Clinical findings: Horizontal rotatory nystagmus(the direction of the fast component is away from the side of lesion), pathological head impulse test (Halmagyi's test) & pathological Romberg test

ENG: unilaterally reduced / absent caloric response

MANAGEMENT

Symptomatic treatments

Acute disease-corticosteroids and antiviral

Vestibular rehabilitation

ACUTE LABYRINTHITIS & VESTIBULAR NEURONITIS: SYMPTOMATIC TREATMENTS

- antiemetics
- antihistamines
- anticholinergics
- benzodiazepines

- Non-oral route is generally preferred.
- lower doses should be attempted, with upward titration as needed.
- vestibular rehabilitation.

ACUTE LABYRINTHITIS & VESTIBULAR NEURONITIS :VESTIBULAR REHABILITATION

- Vestibular exercises are believed to be helpful in hastening recovery and improving disability in patients with permanent vestibular injury.
- Most studies of vestibular rehabilitation have not been specific to etiology

MENIERE'S DISEASE

Definite Meniere’s disease

Two or more attacks of vertigo, each lasting at least 20 min

Audiometrically documented hearing loss in at least one examination becoming d/w fluctuation

Tinnitus or aural fullness in the affected ear

Other causes excluded

Certain Meniere’s disease

Histological confirmation of endolymphatic hydrops

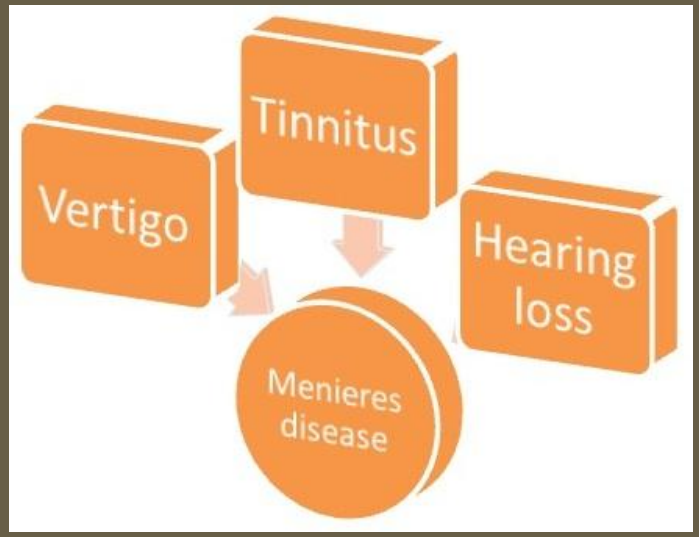
Symptoms as in definite Meniere’s disease

Diagnosis

By exclusion

American Academy of Otolaryngology -- Head and Neck Surgery. "Dizziness, Vertigo Treatment Options: National Guideline On Treatment For Meniere’s disease." 1995

MENIERE'S DISEASE: TREATMENTS



NONINTERVENTIONAL TREATMENT

•lifestyle adjustments

Symptomatic treatment

•Vestibular suppressants, antihistamines and anticholinergics

may be used for the acute treatment of severe nausea and vomiting

•Doses should be started low and increased to positive effect or side effects

•Diuretics and betahistine have been thought to reduce the degree of endolymphatic hydrops

•Rest and, if appropriate, volume repletion are important adjuvant therapies in the acute setting.

https://www.uptodate.com/contents/meniere-disease-the-basics?source=see_link

MENIERE'S DISEASE: VESTIBULAR **REHABILITATION**

VESTIBULAR REHABILITATION : can be considered

Other Interventions: Positive pressure therapy uses device(such as the Meniett) placed in the external ear to generate a sequence of low pressure pulses. Theses pulses are thought to be tranmitted to the vestibulae system of the inner ear and then influence the inner ear pressure.

https://www.uptodate.com/contents/meniere-disease-the-basics?source=see_link

INTERVENTIONAL TREATMENTS : MENIERE'S DISEASE

- Destructive therapies, which act to reduce or eliminate signals from the affected labyrinthine system to the brain. (intratympanic gentainjection, surgical labyrinthectomy, and vestibular nerve section)
- Nondestructive surgical treatments, whose mechanisms of action are unknown, but perhaps reduce the accumulation of fluid in the endolymphatic spaces or otherwise alter fluid and electrolyte physiology.
- There is no agreement on which procedures are first-line therapy. The degree of labyrinthine function and the level of hearing determine the best initial interventional treatment for an individual patient.

https://www.uptodate.com/contents/meniere-disease-the-basics?source=see_link

PERILYMPHATIC FISTULA

Patient history: clinical syndrome of episodic vertigo and/or hearing loss provoked by sneezing, lifting, straining, coughing, and loud sounds.

Finding: Tullio phenomenon, occurs because sound-induced pressure waves are abnormally distributed through the inner ear.

Computed tomography (CT) scanning may show fluid in the region of the round window recess

Therapy: Treatment with bed rest, head elevation, and avoidance of straining is the first step; failure to resolve after several weeks of conservative therapy is an indication to consider a surgical patch

Recurrences occur in 10 percent.

CHOLESTEATOMA

Patient history: long standing ear discharge with hearing defect

Finding: Otorrhea, Tympanic membrane perforation and conductive deafness

Therapy: regular examination under microscope & suction toilet to drain cholesteatoma

mastoid operation for uncontrolled case

VARICELLA-ZOSTER VIRUS INFECTION

Patient history:

- The rash of herpes zoster starts as erythematous papules, which quickly evolve into grouped vesicles or bullae
- Fewer than 20 percent of patients have significant systemic symptoms, such as headache, fever, malaise, or fatigue
- Prodromal pain (Acute neuritis)
- The major otologic complication of VZV reactivation is the Ramsay Hunt syndrome, which typically includes the triad of ipsilateral facial paralysis, ear pain, and vesicles in the auditory canal and auricle (**Ramsay Hunt syndrome (Herpes zoster oticus)**

Diagnosis is usually established based solely on the clinical presentation, available diagnostic techniques include viral culture, direct fluorescent antibody testing, and the polymerase chain reaction assay

Superior Semicircular Canal Dehiscence

- Superior Canal Dehiscence is a recent diagnosis in the field of Otolaryngology
- Characterized by pressure and/or sound induced vertigo (Tullio Phenomenon) and oscillopscia
- Physical exam findings include increased bone conduction, Weber lateralizing to affected ear, pseudo-conductive hearing loss
- Surgical options are still being explored
- High-resolution (0.5mm) CT scans with reconstructions within the plane of (plane of Poschel) the superior canal and orthogonal to (plane of Stenver) the superior canal should be done to confirm the diagnosis.

SUMMARY

Genaral symptomatic treatment: Alleviation of vertigo

Specific treatment: According to causes of vertigo (pharmacologically, rehabilitation & surgically)

Support treatment: Vestibular rehabilitation to decrease central sedating or vestibular suppressant drugs

When & How

Sleep with it

Play with it

Stay with it

WHEN TO SLEEP WITH VERTIGO

- Acute vertigo that lasts a few hours to seven days initially and thereafter tapers gradually to maximum of two weeks

WHEN TO PLAY WITH VERTIGO

- Vertigo lasting more than a few days is suggestive of permanent vestibular injury ie stroke and medication shoud be stoped to allow the brain to adapt to new vestibular input

STAY WITH VERTIGO

THANK YOU

Treatment for acute vertigo

Class of drug	Drug	Dosage
Antihistamine	Promethazine	12.5-25 mg orally im or rectally every 4-12h
	Betahistine	4-6mg 8h per day
Benzodiazepines	Diazepam	2-10 mg orally or iv every 4-8h
	Lorazepam	0,5-2 mg orally, im or ev every 4-8h
Antiemetics	Prochlorperazine	5-10mg orally or im every 6-8h or 25mg rectally every 12h
	Metoclopramide	10-20mg orally every 6h or 10-20mg by slow ev ery 6-8hv

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Vestibular suppressant

Drug	Dose	Adverse Reactions	Precautions	Pharmacologic Class
Meclizine (Antivert, Bonine)	25 mg q 4-6h	sedating	anticholinergic precautions if prostatic enlargement	antihistamine
Lorazepam (Ativan)	0.5 mg BID	mildly sedating	drug dependency	benzodiazepine
Clonazepam (Klonopin)	0.5 mg BID	mildly sedating	drug dependency	benzodiazepine
Dimenhydrinate (Dramamine)	50 mg q 4-6h	same as Meclizine	anticholinergic	antihistamine
Diazepam (Valium)	2 bid PO5 mg IV (1 dose)	sedating	drug dependency; precaution in glaucoma	benzodiazepine
Amitriptyline (Elavil)	10-50 hs	sedating, in overdose cardiac arrhythmia		anticholinergic tricyclic antihistamine

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Antiemetics

Drug	Usual Dose (Adults)	Adverse Reactions	Pharmacologic Class
granisetron (Kytril)	1 mg PO BID 10 ug/kg IV daily	headache; sedation	5HT3 antagonist
meclizine (Antivert, Bonine)	12.5-25 mg q4-6h PO	sedating; precautions in glaucoma; prostate enlargement	antihistamine anticholinergic
metoclopramide(Reglan)	10 mg PO TID or 10 mg IM	restlessness or drowsiness; extrapyramidal	dopamine antagonist stimulates upper gastrointestinal motility
ondansetron (Zofran)	4-8 mg PO TID32 mg IV one dose	precaution in hepatic dysfunction	5HT3 antagonist
perphenazine (Trilafon)	2 – 4 mg PO, up to QID or 5 mg IM, up to TID	sedating extrapyramidal	phenothiazine
prochlorperazine (Compazine)	5 mg or 10 mg IM or PO q6-8 hr.25 rectal q12h	sedating extrapyramidal	phenothiazine
promethazine (Phenergan)	12.5 mg PO q6-8h or 12.5 mg IM q 6-8h	sedating extrapyramidal	phenothiazine
trimethobenzamide (Tigan)	200 mg IM TID	extrapyramidal sedating	similar to phenothiazine
thiethylperazine (Torecan)	10 mg PO, up to TID or 2 ml IM, up to TID	sedating extrapyramidal	phenothiazine

Drug	Dose
Antihistamines	
Dimenhydrinate	50 mg every four to six hours
Diphenhydramine	25 to 50 mg every four to six hours
Meclizine	25 to 50 mg every six hours
Benzodiazepines	
Alprazolam	0.5 mg immediate release every eight hours
Clonazepam	0.25 to 0.5 mg every eight hours
Diazepam	5 to 10 mg every twelve hours
Lorazepam	1 to 2 mg every eight hours
Antiemetics	
Domperidone	10 to 20 mg every six to eight hours
Metoclopramide	5 to 10 mg every six hours
Ondansetron	8 mg every twelve hours
Prochlorperazine	5 to 10 mg every six hours

Antihistamines	
Diphenhydramine	10 to 50 mg IM or IV
Antiemetics	
Metoclopramide	10 to 20 mg IM
Ondansetron	4 mg IM or IV
Prochlorperazine	5 to 10 mg IM or IV
Promethazine	10 to 50 mg IM or IV