

CLINICIAN CHEAT SHEET: BILATERAL VESTIBULOPATHY (BVP)

1. EPIDEMIOLOGY & DEFINITIONS

- **Incidence & Prevalence**
 - **Adults:** Estimated ~28 per 100,000; rises markedly with age (up to 81 per 100,000 in elderly).
 - **Paediatric:** Rare; prevalence poorly established but affects ~23% of children with sensorineural hearing loss.
 - **Demographics:** Slight female predominance; onset typically mid-to-late adulthood (mean 50–60y).
- **Definitions**
 - **Bilateral Vestibulopathy (BVP):** Bilaterally reduced/absent vestibular function (labyrinths/nerves/central) causing imbalance and oscillopsia.
 - **Oscillopsia:** Visual blurring/bouncing of environment during head motion due to VOR loss.
 - **Presbyvestibulopathy:** Mild bilateral loss in age >60; distinct entity from BVP.
- **Morbidity**
 - High fall risk (25–50% incidence prior to diagnosis/rehab).
 - Significant impact on driving, working, and spatial memory/cognition.

2. RISK FACTOR DOMAINS (Multifactorial)

Domain	Pathologies / Aetiologies
Ototoxic (Major)	Aminoglycosides (Gentamicin/Streptomycin esp. in renal failure/NICU), Chemotherapy (Cisplatin), high-dose Loop Diuretics, Industrial solvents (Styrene).
Genetic	DFNA9 (COCH gene, midlife onset), Usher Syndrome (deafness + retinitis pigmentosa), CHARGE, Waardenburg.
Infectious	Meningitis (labyrinthitis ossificans), Bilateral Vestibular Neuritis, Syphilis, Lyme, Congenital CMV.
Autoimmune	Cogan's Syndrome (interstitial keratitis), AIED, Systemic (Lupus, Sjögren's, Vasculitis).
Neurologic	CANVAS (Cerebellar Ataxia, Neuropathy, Vestibular Areflexia), Spinocerebellar Ataxias (SCA3, SCA6), NF2 (bilateral schwannomas).
Vascular/Other	Vertebrobasilar dolichoectasia, Bilateral Ménière's (end-stage), Idiopathic (20–50% of cases).

3. CLINICAL ASSESSMENT PROTOCOL

A. History

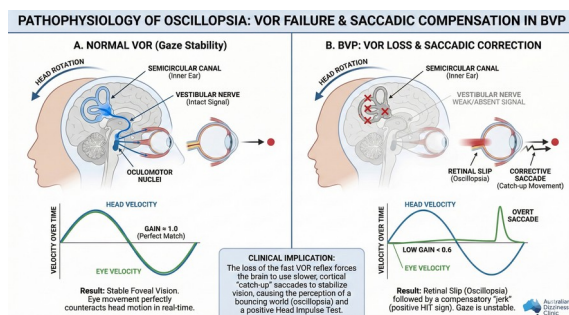
- **Key Symptoms:**
 - **Unsteadiness:** Worse in dark, on uneven ground (loss of visual/proprioceptive cues).
 - **Oscillopsia:** Blurring when walking, riding in cars, or turning head quickly.
 - **NO Vertigo:** Chronic state is imbalance without spinning vertigo/nystagmus (due to symmetry of loss).
 - **Paediatric:** Motor delay (late walking ~18–24mo), "bum-shuffling" (no crawl), clumsiness.

B. Physical Exam

- **Head Impulse Test (HIT): Positive Bilaterally.** Corrective saccades observed after thrusts to *both* left and right.
- **Dynamic Visual Acuity:** Patient reads chart while head oscillates (~2Hz). Acuity drops markedly compared to static.
- **Romberg:** Unstable/Falls with **eyes closed** (Sensory Ataxia).
- **Gait:** Broad-based, cautious; Tandem gait impaired.
- **Ocular Motor:** Spontaneous nystagmus is **absent**. Saccades/Pursuit normal (unless central/cerebellar pathology).

C. Objective Diagnostic Criteria (Bárány Society, 2017)

1. **Symptoms:** Chronic vestibular syndrome (Imbalance + Oscillopsia/worsening in dark).
2. **Observation:** No symptoms at rest.
3. **Lab Confirmation (Need at least one):**
 - **vHIT:** Horizontal VOR gain < 0.6 bilaterally.



- o **Calorics:** Sum of max slow-phase velocity < 6°/s (bithermal, each ear).
- o **Rotational Chair:** VOR gain < 0.1 (0.1 Hz) + Phase lead > 68°.

D. Diagnostic Workup

- **Vestibular Lab:** vHIT (first-line), Caloric, Rotational Chair (gold standard for global function), VEMPs (otolith check).
- **Audiometry:** Mandatory. Bilateral SNHL suggests ototoxicity/meningitis/genetic; Asymmetry suggests NF2.
- **Imaging:** MRI Brain/IAC with contrast. Rule out NF2, cerebellar atrophy (CANVAS), white matter changes.
- **Labs (Targeted):** Syphilis serology, Autoimmune panel (if suspect AIED), B12, Genetic panel (e.g., DFNA9).

4. DIFFERENTIAL DIAGNOSIS

Feature	Bilateral Vestibulopathy (BVP)	Cerebellar Ataxia	Peripheral Neuropathy	PPPD
1° Symptom	Oscillopsia + Imbalance (worse in dark)	Global incoordination, slurred speech	Unsteadiness (worse in dark), numb feet	Chronic "dizziness" / swaying, Anxiety
Eye Signs	+ Bilateral HIT , No resting nystagmus	Gaze-evoked / Downbeat nystagmus, Dysmetria	Normal VOR/Eye movements	Normal VOR/Eye movements
Sitting	Normal stability	Truncal instability common	Normal stability	Swaying (subjective)
Diagnostic	Low VOR gain (vHIT/Caloric)	MRI (atrophy), Genetic tests	EMG/NCS, Reduced reflexes	Normal vestibular tests, anxiety triggers

5. MANAGEMENT & PREVENTION

Non-Pharmacological (Mainstay)

- **Vestibular Rehabilitation (VRT): First-line.** Focus on gaze stability (VOR adaptation/substitution) and balance training (sensory re-weighting).
 - o *Effect:* Moderate/strong evidence for reduced falls and oscillopsia.
 - o *Paediatric:* Play-based therapy, gross motor milestones.
- **Safety/Adaptation:** Night lights (vision dependence), remove trip hazards, cane for uneven ground.
- **Investigational:** Vestibular Implants (improves posture/gaze stability), Noisy Galvanic Stimulation (nGVS).

Pharmacological Management

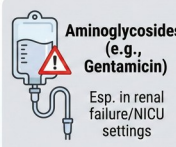
Indication	Drug / Class	Dosing & Pearls
Autoimmune (AIED)	Corticosteroids (Prednisone)	High dose (e.g., 60mg/day) tapered over weeks. Treat early to salvage function.
Ménière's (Bilateral)	Betahistine	16–24mg TID. Used to reduce frequency of attacks; may preserve residual function.
Cerebellar / CANVAS	4-Aminopyridine (Off-label)	5–10mg TID. May improve downbeat nystagmus/gait in cerebellar subtypes.
Acute Vertigo	Vestibular Suppressants (Benzos)	Acute use only (days). CONTRAINDICATED in chronic BVP (impedes compensation, worsens imbalance).
Prevention	Stop Offenders	Discontinue/swap Gentamicin, Cisplatin. Monitor levels strictly.

6. FOLLOW-UP & RED FLAGS

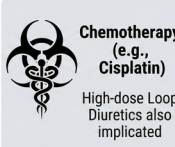
- **Follow-Up:**
 - o Monitor fall risk and VRT compliance periodically.
 - o Repeat Audiometry: Monitor for progressive hearing loss (common in genetic/autoimmune forms).
 - o Paediatrics: Track developmental milestones; early intervention is critical for motor acquisition.
- **Red Flags (Referral/Imaging):**
 - o **Asymmetric Hearing/Vestibular Loss:** Suspect NF2 (Schwannomas) or CPA tumour -MRI.
 - o **CNS Signs:** Dysmetria, slurred speech, resting nystagmus -Suspect Cerebellar/CANVAS/MSA.
 - o **Acute Vertigo:** Suggests superimposed episodic disorder (Ménière's) or acute unilateral event; BVP itself is non-vertiginous.

⚠ CAUTION: MAJOR OTOTOXIC RISKS ⚠


Preventable Causes of Bilateral Vestibulopathy (BVP)



Aminoglycosides
(e.g., Gentamicin)
Esp. in renal failure/NICU settings



Chemotherapy
(e.g., Cisplatin)
High-dose Loop Diuretics also implicated



Industrial Solvents
(e.g., Styrene)
Occupational exposure risk

CLINICAL ACTION: Monitor levels strictly. Discontinue or swap offenders whenever possible to prevent permanent vestibular loss.

Australian Dizziness Clinic