Acute Vestibular Syndrome (AVS) Evaluation

HINTS: **H**ead **I**mpulse, **N**ystagmus, **T**est of **S**kew
A bedside battery to differentiate peripheral vs central lesions in acute vestibular syndrome (AVS)
HINTS positive-normal HIT, direction-changing nystagmus, skew deviation **(central)**
HINTS positive plus unilateral hearing loss **(central)**
HINTS negative-abnormal HIT, direction-fixed mixed horizontal/torsional nystagmus, no skew deviation (peripheral)

INFARCT – *Central lesions*:
Impulse **N**egative
Fast phase **A**lternating nystagmus
Vertical **R**efixation on **C**over **T**est (skew)
Unilateral change in hearing
Inability to walk

PICA–Ocular motor findings:
- Ipsipulsion of the eyes toward the lesion side in darkness, under closed lids, or with a blink
- Saccades: Hypermetric *Ipsilateral* to the lesion side and *hypometric* contralateral to the lesion side
- Smooth pursuit: Impaired contralateral to the lesion side
- Spontaneous nystagmus: Often mixed horizontal-torsional with slow phases toward or away from the lesion side
- Ocular tilt reaction: Skew deviation with ipsilateral HYPOtropia, head tilt toward the lesion side, ipsilateral cyclodeviation (top poles of eyes rolled ipsilaterally), and ipsilateral deviation of subjective visual vertical

AICA– Ocular motor findings:
- Abnormal head impulse (usually ipsilesional)
- Spontaneous nystagmus with slow phases towards the lesion side
- Gaze-evoked nystagmus
- Impaired smooth pursuit
- Perverted (cross-coupled) head shaking nystagmus: Vertical nystagmus with horizontal head shaking)

MLF- Ocular motor findings:
- Internuclear ophthalmoplegia: Limited adduction in the eye ipsilateral to the lesion
- Horizontal nystagmus greater in the contralesional eye
- Skew deviation/Ocular tilt reaction with ipsilateral HYPERtropia
- Dissociated vertical or torsional nystagmus

SEND HIM ON HOME SAFE- *Peripheral lesions:*
Straight **E**yes- **N**o New **D**eafness
Head **I**mpulse **M**isses
One-way **N**ystagmus
Healthy **O**tic and **M**astoid **E**xam
Stands **A**lone-**F**ace **E**ven

TeleHealth Dizzy Template

Key History Components

1- Symptoms
- **Dizziness: Sensation of impaired spatial orientation without a false or distorted sense of motion.**
- **Vertigo: Sensation of self-motion when no self-motion is occurring, or distorted self-motion during normal head movement**

2-Timing: Occurrence (Acute/Chronic/ Recurrent), Duration (Seconds/Hours/Days), Frequency (Transient/ Intermittent/ Persistent)
3-Triggers: Spontaneous or Triggered (e.g., Positional/Visual induced/ Head-motion induced/ Valsalva induced/Sound induced/ Orthostatic)
4- Risk Factors (e.g., Age/Gender/Vascular/ Recent head trauma)

Key Findings

Diagnosis	History	Virtual Exam
Vestibular neuritis	Spontaneous Vertigo No hearing symptoms	Spontaneous mixed horizontal-torsional nystagmus that Increases with fixation removal Contralaterally directed corrective saccades with HIT
Stroke	Spontaneous Vertigo/Dizziness Associated neurological symptoms Acute unilateral hearing loss/tinnitus Vascular risk factors	Direction-changing, gaze-evoked or pure vertical or pure torsional nystagmus Skew deviation or head tilt Normal/Abnormal HIT Unilateral hearing loss
Vestibular Migraine	Episodic vertigo/dizziness (spontaneous or triggered) Headache plus migrainous features Aural symptoms	Normal exam Persistent positional nystagmus
Ménière's Disease	Spontaneous recurrent vertigo Fluctuating hearing loss +/- other aural symptoms Lermoyez syndrome (hearing improves as vertigo begins) Drop attacks	Mixed spontaneous horizontal-torsional nystagmus that may change direction over time (excitation, inhibition, recovery phases)

Clinical Approach to the Dizzy Patient:
A Guide to History and Physical Examination

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ccdExamination	What to Look For	Interpretation
Alternate Cover Test	Vertical misalignment	Skew deviation – *Mostly* ***Central*** (Brainstem/Cerebellum)
Smooth Pursuit	Motion pattern	Mostly smooth– *Peripheral* Saccadic – ***Central***
Fixation Suppression of VOR	Fixation on rotation with a head-fixed target	Nystagmus – ***Central***
Saccade	Accuracy	Overshoots – ***Central*** (Cerebellum)
	Conjugacy	Disconjugate –***Central*** (MLF)
	Velocity	Slow – ***Central*** (Brainstem)
Head Impulse Test	Refixation/ Catch-up Saccades	Present – *Mostly Peripheral* Absent–***Central*** *(AVS)* / *Non-localizing*
Dynamic Visual Acuity	Drop in acuity with 2 Hz headshake	3 or more line drop – *Peripheral*
Subjective Visual Vertical (SVV bucket test)	> 2º tilt	Ipisversive – *Peripheral* Ipsi or contraversive **–** ***Central***
Spontaneous Nystagmus	Direction	Mixed horizontal torsional – *Peripheral* Pure vertical or pure torsional – ***Central***
	Visual fixation effect	Suppressed – Mostly *Peripheral* Not suppressed – ***Central***
Gaze-evoked Nystagmus	Direction	Fast phase alternating with gaze – ***Central*** (fast phase in gaze direction) Rebound or direction reversal with gaze back to midline – ***Central*** (fast phase in opposite previous gaze direction

Examination	What to Look For	Interpretation
Positional Nystagmus	Dix-Hallpike maneuver	Paroxysmal upbeat geotropic torsional nystagmus – *Peripheral* (PC BPPV) Pure vertical, especially downbeat – ***Central***
	Supine roll maneuver	Transient horizontal geotropic or apogeotropic nystagmus – usually *Peripheral* (HC BPPV) Sustained nystagmus – usually ***Central***
Headshake-induced Nystagmus	Direction	Fast phase towards the intact side– *Peripheral* Vertical with horizontal headshake – ***Central***
Vibration-induced Nystagmus	Direction	Same as headshake-induced nystagmus
Hyperventilation-induced Nystagmus	Direction	Fast phase away (paretic) or towards (excitatory) intact side – *Peripheral* Vertical – ***Central***
Pneumatic Otoscopy	Ocular deviation with positive pressure	Upward deviation– *Peripheral* (SCD)

Examination	What to Look For	Interpretation
Tuning Fork Exam (128/256/512Hz)	Rinne	256/512 Hz AirConduction>Bone Conduction (Normal)
	Weber	256/512 Hz Midline (Normal)
	Malleolus sign	256 Hz (Superior Canal Dehiscence)
	Foot/Hand	Abnormal (128 HZ) (Neuropathy, Myelopathy)
Gait/Stance	Step pattern	Wide base – *Peripheral or Central* Ataxic, shuffling, poor initiation, or festination – ***Central*** Inability to stand – ***Central***
Romberg Test	Balance	Excessive sway or fall– *Peripheral or central* Inability to stand – ***Central***
Limb Coordination	Accuracy	Dysmetria– ***Central*** (Cerebellum)
	Rhythm	Tremor– ***Central*** (Cerebellum/Basal Ganglia) Bradykinesia**-** ***Central*** (Basal Ganglia)

REMEMBER: 1) Full cranial nerve examination 2) Evaluate for orthostasis, and 3) Review medications

AVS: Acute Vestibular Syndrome

SCD: Superior Canal Dehiscence

MLF: Medial Longitudinal Fasciculus

PC BPPV: Posterior Canal BPPV

HC BPPV: Horizontal Canal BPPV

HIT: Head Impulse Test