

History & Examination of the Dizzy Patient

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Disclosures

- Dr. Fife has no financial or other conflicts of interest to disclose
- Dr. Fife will make no mention of off-label use of medications

Learning Objectives

1. Understand the historical context of approaching patients with dizziness
2. Be familiar with the examination of patients presenting with dizziness.
3. Be able to use the history and examination to formulate a working differential diagnosis

Key Message

- Obtaining the description, onset, periodicity, provoking events (if any), duration and accompanying symptoms of dizziness go a long way to establishing a likely diagnosis.
- The examination should particularly focus on gait balance, eye movements including nystagmus, VOR function (e.g., HIT), speech articulation and limb coordination.

ICVD Definitions

Vertigo = Sensation of self-motion when no self-motion is occurring or the sensation of distorted self-motion during an otherwise normal head movement.

- Spontaneous or Triggered

Dizziness = Sensation of disturbed or altered spatial orientation without the feeling of false motion

- Spontaneous or Triggered

Postural symptoms = Balance-related symptoms that occur when upright. For example, feeling unsteady or as if one could fall when standing or walking.

- Unsteady or Pulsion or Imminent fall sensation or Due to Vestibular symptoms*

*“vestibular symptoms” refers means sensations of motion, tilting, swaying, etc. but does not mean to imply that all conditions causing these symptom have a basis in vestibular pathways or mechanisms

Missing the Diagnosis in Dizzy Patients in the ED

Kerber KA, Newman-Toker DE. Misdiagnosing dizzy patients: Common pitfalls in Clinical Practice. *Neurol Clin* 2015;33:565-75.

- Misdiagnosis of dizziness in EDs in the USA is **74-81%**
- VN and BPPV are commonly confused and mixed up with stroke

Pitfall 1: Overreliance on descriptive word used to describe the dizziness to guide diagnostic inquiry

Pitfall 2: Underuse or misuse of timing and triggers to categorize dizziness

Pitfall 3: Underuse or misuse and misconception related to hallmark eye exam findings

Pitfall 4: Overweighting age, vascular risk factors

Pitfall 5: Overuse and overreliance of CT imaging to rule out neurological cause

Approaches

Pattern Recognition – Use history and examination and use data to identify the pattern or overlapping patterns that fit a known cause(s)

ICVD Scheme – Hx and exam to define Acute Vestibular Syndrome, Episodic Vestibular Syndrome (episodic or triggered), Chronic vestibular syndrome

TiTrATE and ATTEST - TiTrATE are acronyms for (1) **T**iming, **T**riggers, **A**ssociated symptoms and **T**argeted **E**xamination; (2) ATTEST is for **A**ssociated symptoms, **T**iming, **T**riggers, **E**xamination **S**igns and **T**esting

Symptom Description – categorize as vertigo, pre-syncope, imbalance without vertigo, non-specific dizziness

1. Newman Toker and Edlow. Neurol Clin 2015;33:577-99
2. Edlow JA, et al. J Emerg Med 2018;54:469-83.

The History

Start with open-ended questions such as “How did the dizziness begin?” or “What have you been experiencing?”

Symptom description - spinning, whirling, tilting, sinking or free falling may be defined as vertigo imply a higher likelihood of a vestibular process

Symptom triggered or not – Abrupt or gradual? After an event or in response to a trigger or certain situation? There may be clues to a trigger versus spontaneous onset.

Symptom timing – Episodic or constant? If episodic how long did it last, if triggered what was the duration?

Accompanying symptoms – focal numbness, unilateral hearing loss, slurred speech, etc.

The History

Triggers – this is an obvious reproducible events/activities that evokes spells of dizziness? Different from things that aggravate or mitigate symptom severity but those things are also helpful.

Impact on Quality of Life – How much is this impacting function? How concerned is the patient? Do they have a specific goal for the visit? This is generally more obvious in the ED. Do they just want reassurance they are okay or are they desperate for a treatment?

Prior treatments tried – this can include attempts at physical therapy, medication trials. How did they respond. What was done in physical therapy? What dosage of medications and for what diagnosis? did they get an adequate trial based on dosage and time?

The Exam

Observation – demeanor and affect? Did the patient come alone or with others? Assistive device? How long have they been using a cane or walker, for example?

Neurological - Horner's? Hemisensory loss? Unilateral facial weakness? Slurred speech? Limb clumsiness? Dysconjugate gaze? Abnormal reflexes? Orthostasis on vital signs? Gait is normal or abnormal? Able to tandem walk? Gait speed, ignition, floor clearance? Romberg?

Saccadic eye movements – saccade velocity, accuracy?

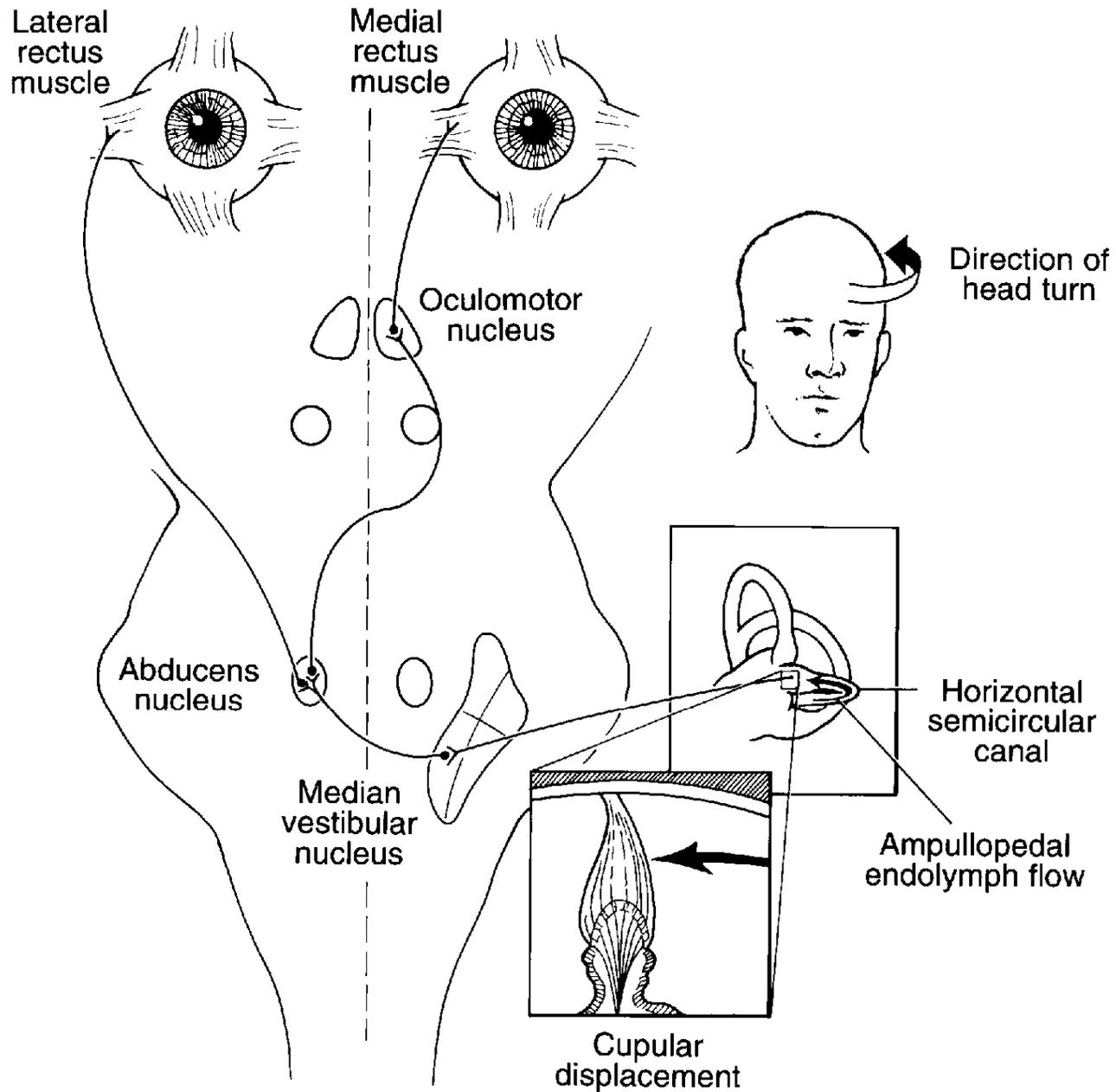
Nystagmus (describe, direction is of the fast phase, effect of gaze changes)

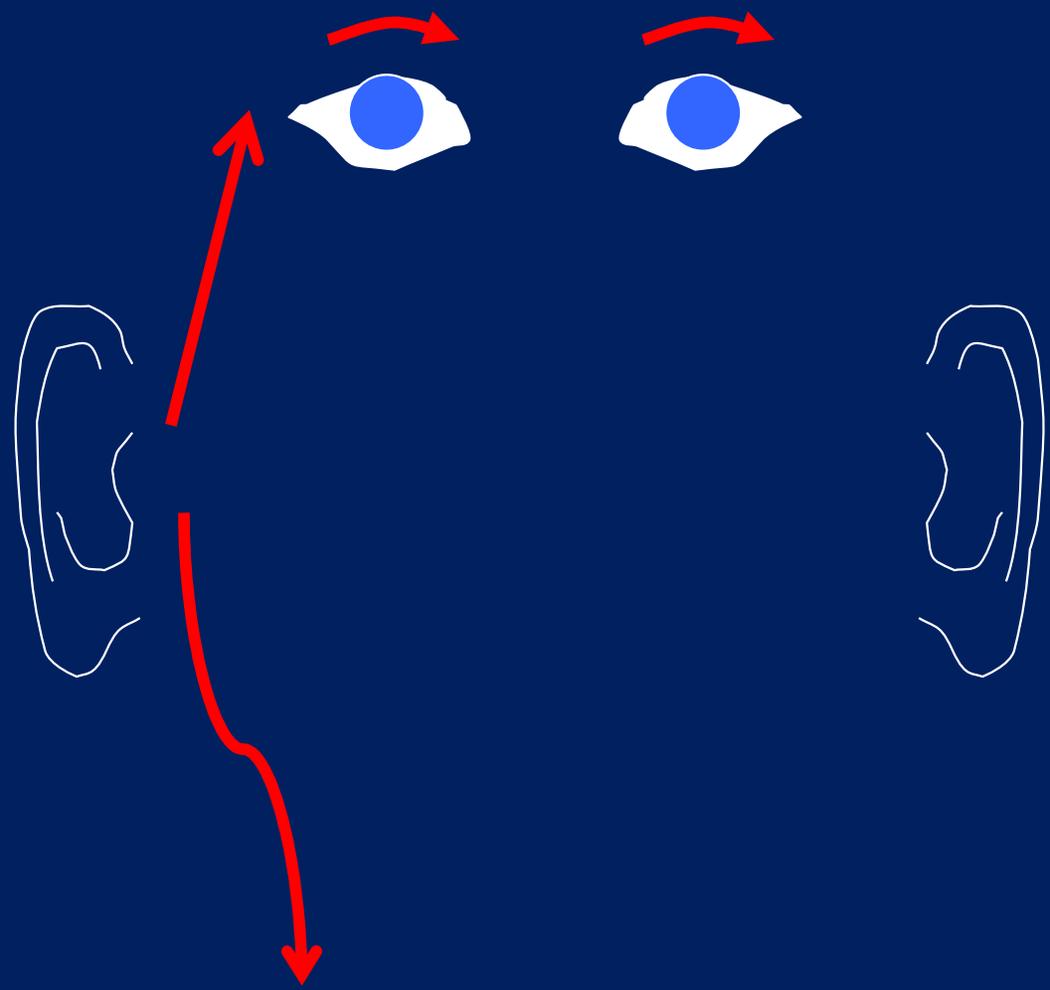
- Spontaneous
- Gaze-evoked
- Positional (is nystagmus evoked by a certain position change?)

Exam of VOR function

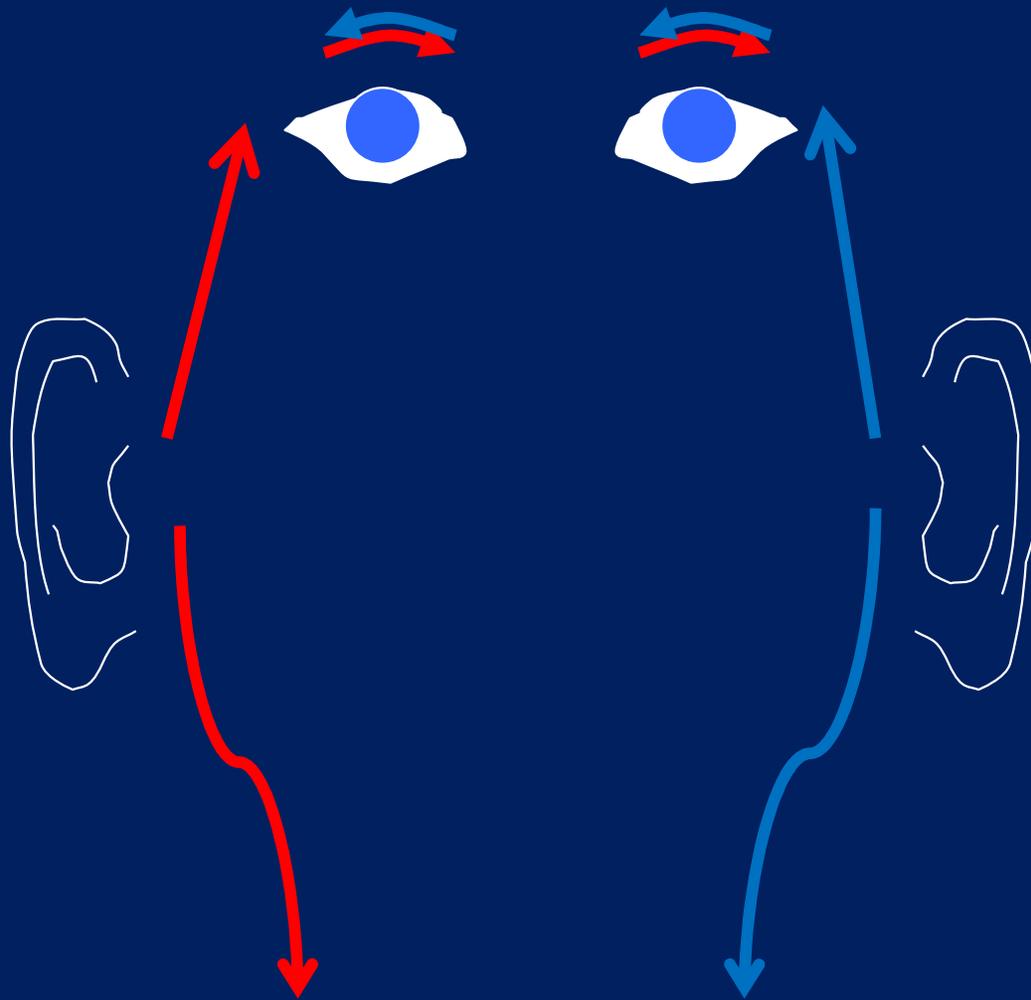
- Head impulse test (HIT), Dix Hallpike maneuver, post-head shaking nystagmus (others: Fukuda stepping test, Past-pointing; DVA)

Vestibulo-ocular (VOR) Pathway



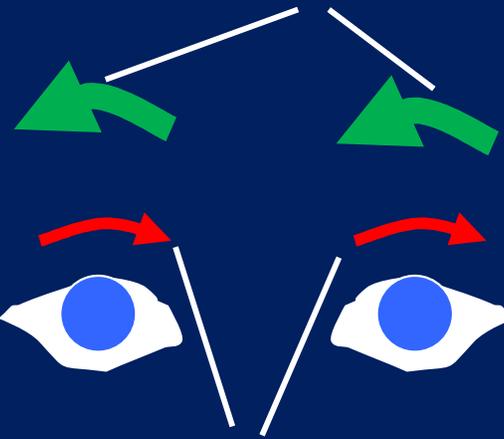


Increases muscle tone
to anti-gravity muscles



Increases muscle tone to anti-gravity muscles
Increases muscle tone to anti-gravity muscles

Fast phase of nystagmus is rightward



Slow drift of VOR is leftward



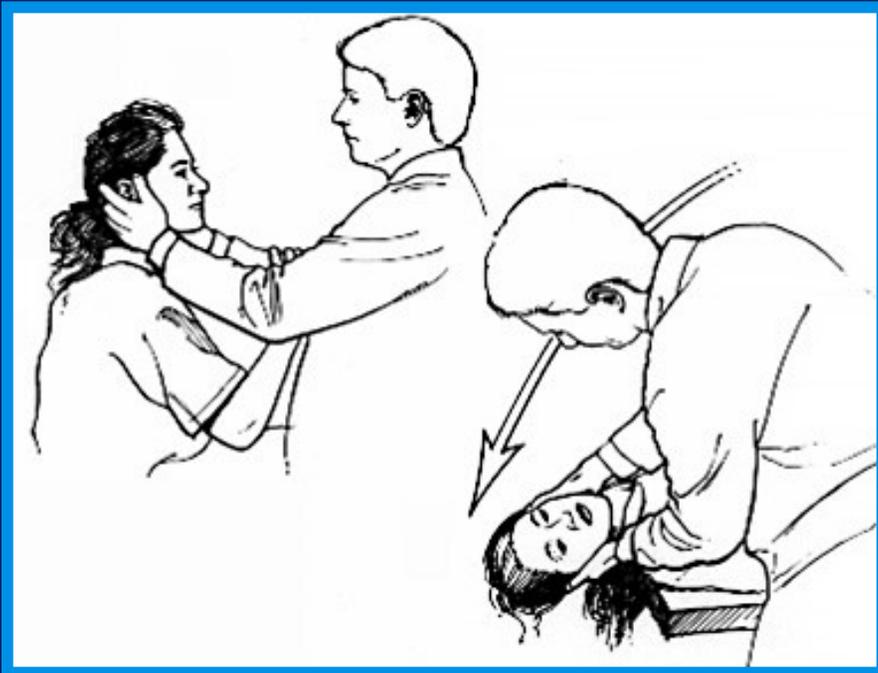
Increases muscle tone to anti-gravity muscles

HEAD IMPULSE (THRUST) TEST

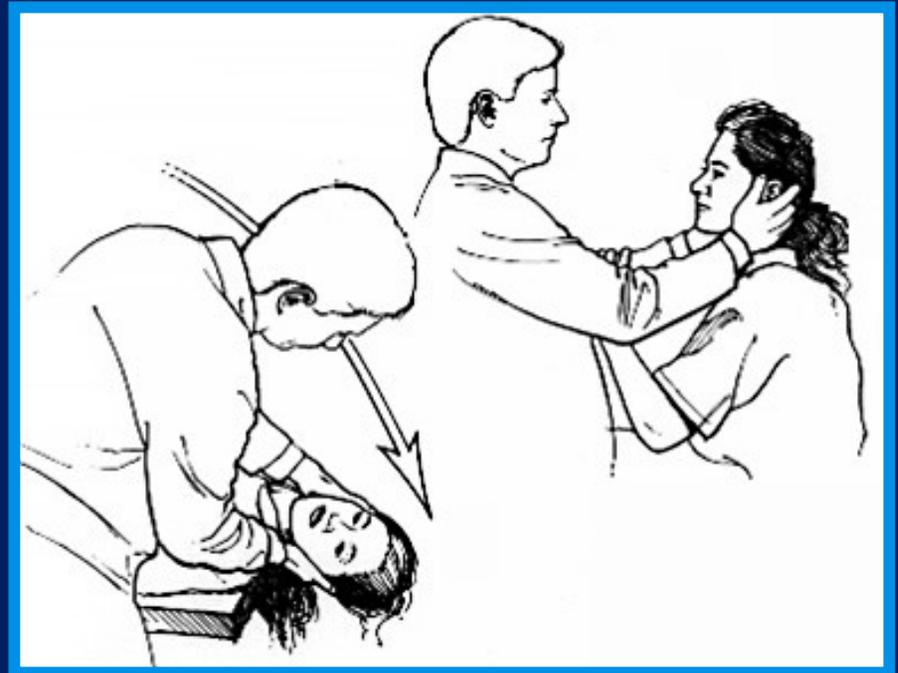
Halmagyi & Curthoys 1988



Dix-Hallpike maneuver

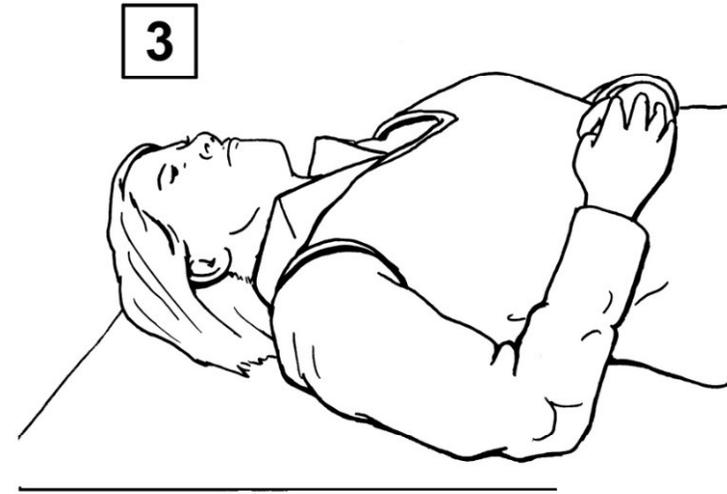
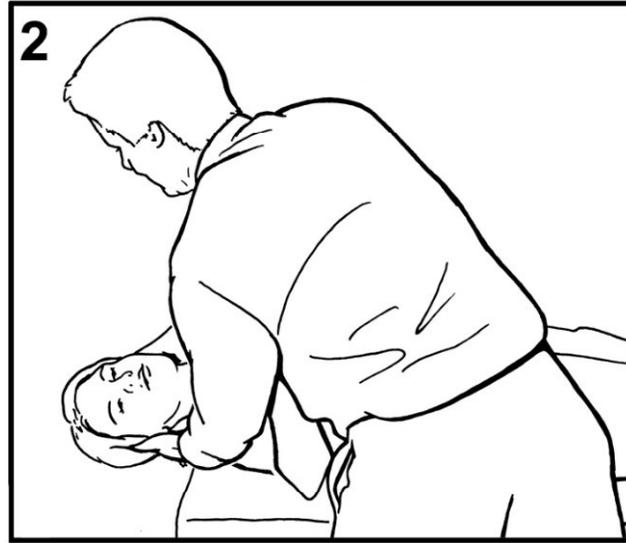


Dix Hallpike Right



Dix Hallpike Left

Epply



To distinguish AVS due to inner ear from stroke causes: “HINTS +”

	Vestibular neuritis	Isolated vertigo from stroke
<u>H</u>ead <u>I</u>mpulse test	Abnormal to the side affected by VN	Normal
<u>N</u>ystagmus	Spontaneous, beats away from the side of acute VN, always in the same direction regardless of gaze	Nystagmus more likely to change direction with changes in the direction of gaze
<u>T</u>est of <u>S</u>kew deviation	Rare	Skew deviation may be present
<u>±</u> Hearing	Present in vestibular neuritis in 10-20% (thus is labyrinthitis)	May be present in lateral pontine infarct due to AICA distribution infarct.

- ***Incorrect data.***

Remedy: Probe the answers and take a careful history. Take a repeat history upon follow up to reaffirm the diagnosis or revise the diagnosis. Recollection is itself influenced by prior questioning as patients begin to think about their prior responses and give somewhat different answers with sequential questioning.

- ***Lack of familiarity with the patterns.***

Remedy: Lack of familiarity with the pattern of a cause or encountering a rare pattern is part of training and experience and why lifelong learning is crucial. Be aware of and keep up with evidence-based guidelines where they exist to expand one's sphere of competence.

- ***Cognitive bias.***

Remedy: We all have a tendency to draw conclusions that reinforce our first impression or be influenced by the historian or by the way the history delivered (e.g., haphazard, tangential, fraught with an anxious affect, having an overly inclusive symptom list). There is definite value in observing the non-verbal cues but this also introduces the potential for making incorrect assumptions.

Lab Testing

CBC, CMP, AED levels, Vit B12, HbA1c, Thyroid studies, ANA screen, ESR, VDRL/RPR or FTA-Abs, anti-GAD65 antibodies, thiamine level

Cardiac/hemodynamic tests

- Cardiology consult
- ECG, Holter, Event monitor
- Tilt table

Audiovestibular testing

- Audiogram (hearing test)
- Videonystagmography (VNG)
- Vestibular evoked myogenic potential (VEMP)
- Video Head Impulse Test (vHIT)
- Posturography
- Rotational chair testing

Imaging Studies

CT in the ED for dizziness 0/200 identified a causative lesion (1)

Studies to screen: Brain MRI without contrast

Studies to consider depending on one's DDx:

- CT temporal bone
- CTA head/neck
- MRA head/neck
- Brain MRI w / wo IAC

1. Wasay M, et al. Emerg Med 2005;22:312.

Description	Onset	Timing	Trigger	Assoc. Feature	Dx
Spin, whirl, tilt, float	Sudden	5-60 sec	Tilt head, roll in bed	Occas. nausea	BPPV
Spin, whirl, tilt, float	Sudden	Days-wks	None	Worse with head movement; nystagmus; Abn HIT	Vestibular Neuritis
Spin, whirl, tilt, float	Sudden	30 min – 12 hrs	None	Tinnitus, muffled hearing one side	Meniere
Imbalance, oscillopsia	Subacute or gradual	Chronic	None	Bilat. Abn HIT, + Romberg; abn Dynamic VA	Bilat. Vestibulopathy
Near-syncope	Abrupt, usually upright	2-20 min	Upright position	Pallor, sweating, low BP/HR with spell	Orthostasis
Spin, tilt, float, VID, motion sensitive	Varies	Varies	None	Migraine hx; exam normal	Vestibular Migraine
Rocking, floating	Often gradual	Often constant	None	Prior vertigo/distress; distressing	PPPD

Conclusions

1. Take a detailed history, focus on the symptom features
2. Avoid getting lost in the tests and prior opinions
3. Know your patient's goal for the visit, their fear, their hope
4. On exam, understand basics of nystagmus
5. Know how to do Dix Hallpike and what BPPV nystagmus looks like
6. Learn how to do head impulse testing by practicing on normal patients
7. Try to always assess gait and describe it if abnormal
8. Learn the usual patterns of the various causes of vertigo and dizziness to improve your diagnostic skill set
9. When you find you miss a diagnosis, find out why, learn from it

References

1. Fife TD. Approach to the History and Evaluation of Vertigo and Dizziness. *Continuum (Minneap Minn)*. 2021 Apr 1;27(2):306-329.
2. Dommaraju S, Perera E. An approach to vertigo in general practice. *Aust Fam Physician*. 2016 Apr;45(4):190-4.
3. Steenerson KK, Hoskin J, Fife TD. Visually induced dizziness. *Curr Opin Neurol*. 2022 Feb 1;35(1):113-117.