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11-1-2019

Is the Patient Having a Stroke or Just Dizzy?

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Recommended Citation

Lewandowski, Christopher, "Is the Patient Having a Stroke or Just Dizzy?" (2019). *Detroit Stroke Conference 2019*. 7.

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Is the Patient Having a Stroke or Just Dizzy?

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November 1, 2019
Detroit Stroke Conference 2019

Disclosures

- NIH /NINDS Research Support
- NETT/SIREN

Goals

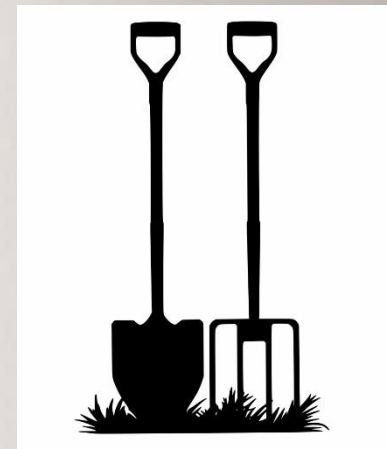
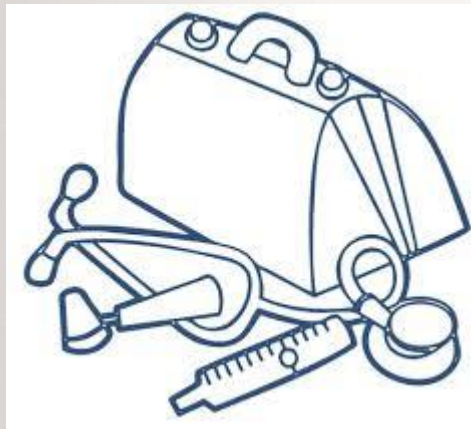
- To discuss a reasonable approach to the dizzy ED patient
- To do it in 15 minutes

The Problem

- Dizziness can be a sign of a posterior circulation stroke which carries a 1 month mortality of 3-11 %
- The peripheral and central systems share nerves and blood vessels (labyrinth artery form the AICA)
- There are 400,000 to 800,000 patients that present with a chief complaint of DIZZINESS
- Only about 3 % have a posterior circulation stroke

TOOLS

- History
- Physical Exam
- Tests
- Imaging



History

- What do you mean by dizziness?
 - Very inconsistent description by patients
 - 50% change their description within 5-10 min
 - Patient descriptions are not well connected to a diagnosis
- Vestibular symptoms = dizziness, vertigo, imbalance, light headed
- Change the focus to:
 - Timing and Duration
 - Triggers
 - Associated symptoms

History

Timing and Duration of Dizziness	Triggers	Associated Symptoms	Syndrome
Acute Onset, Continuous Sx Lasting days	Head movement	Nausea, vomiting, unsteady gait nystagmus	Acute Vestibular Syndrome AVS
Episodic, spontaneous Lasting minutes to hours	none		Spontaneous Episodic Vestibular Syndrome s-EVS
Episodic, Short duration < 1 minute	Head movement Body position (rolling over)		Triggered Episodic Vestibular Syndrome t-EVS

The History connects to the DDx

Syndrome	Common Benign Causes	Serious Causes
AVS Acute Vestibular Syndrome (Symptomatic in the ED)	Vestibular Neuritis, Labyrinthitis	Posterior Circulation Stroke
s-EVS Spontaneous Episodic Vestibular Syndrome	Vestibular migraine, Meniere's disease	Posterior Circulation TIA
t-EVS Triggered Episodic Vestibular Syndrome	BPPV, (benign paroxysmal positional vertigo) Orthostatic hypotension	CPPV (rare) (central paroxysmal positional vertigo) Orthostatic hypotension with serious underlying disease

Physical Exam

- LOC
- Vital Signs, orthostatic BP, P
- Cranial Nerves
 - Dysarthria, dysphagia, visual fields
 - hearing loss, ptosis
- Nystagmus
- Motor, Sensory – crossed findings from CN
- Cerebellar
 - Coordination,
 - Ataxia: sit and walk without assistance

Physical Exam in AVS

■ HINTS

- Head Impulse, **N**ystagmus, **T**est of **S**kew
- Used on patients with vertigo and nystagmus

- Check Nystagmus first
- Check Skew second
- Lastly do the head impulse test

HINTS

Nystagmus

- Peripheral Nystagmus
 - the fast component of nystagmus that is always in the same direction when the patient looks left or right
- Central Nystagmus (brainstem and cerebellar lesions)
 - nystagmus that changes direction with different positions of gaze
 - pure vertical nystagmus or torsional.
 - no fatigue, no latency, no inhibition with visual fixation

Test for Skew

- cover one eye and observe for vertical shift in the eye when uncovered or track eyes as they move up and down
- Brainstem and cerebellar lesions cause a skew deviation



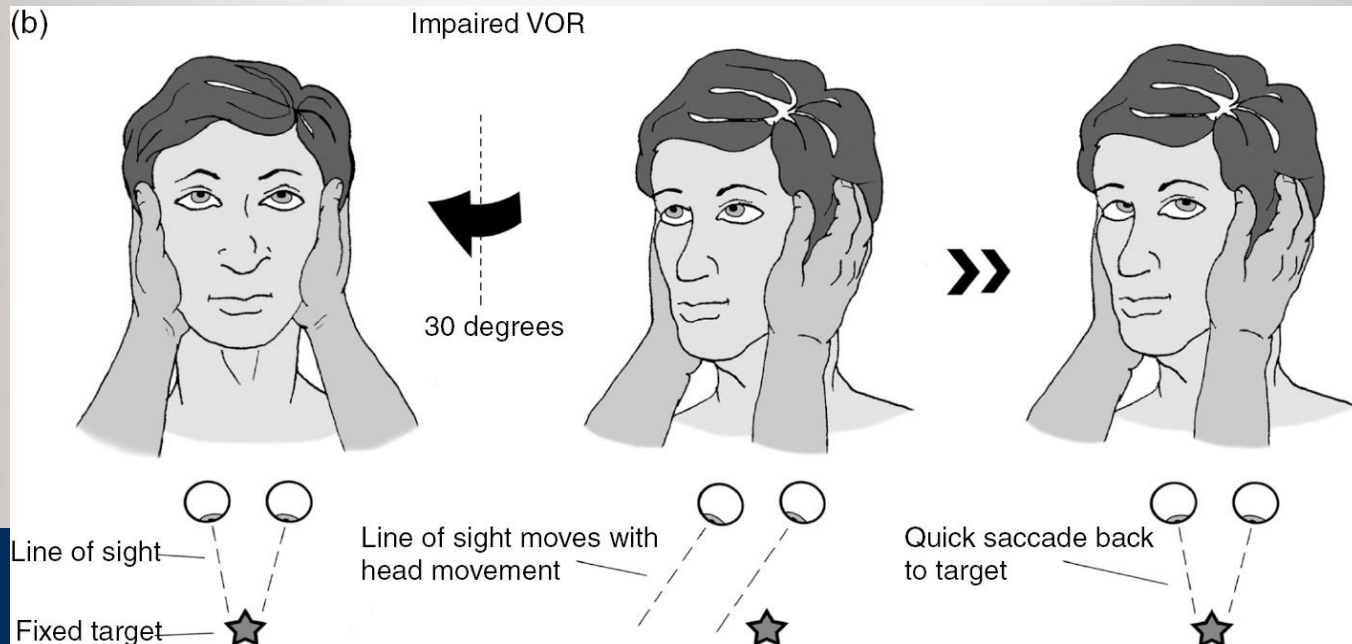
■ Head Impulse Test (head thrust test)

– Normal response (bad)

- eyes remain on the target
- preserved in central lesions.

– Abnormal response: “corrective saccade”

- eyes are dragged off of the target by the head turn , followed by a saccade back to the target;
- c/w peripheral vestibular lesion, impaired vestibulo-ocular reflex on the side of the head turn



HINTS

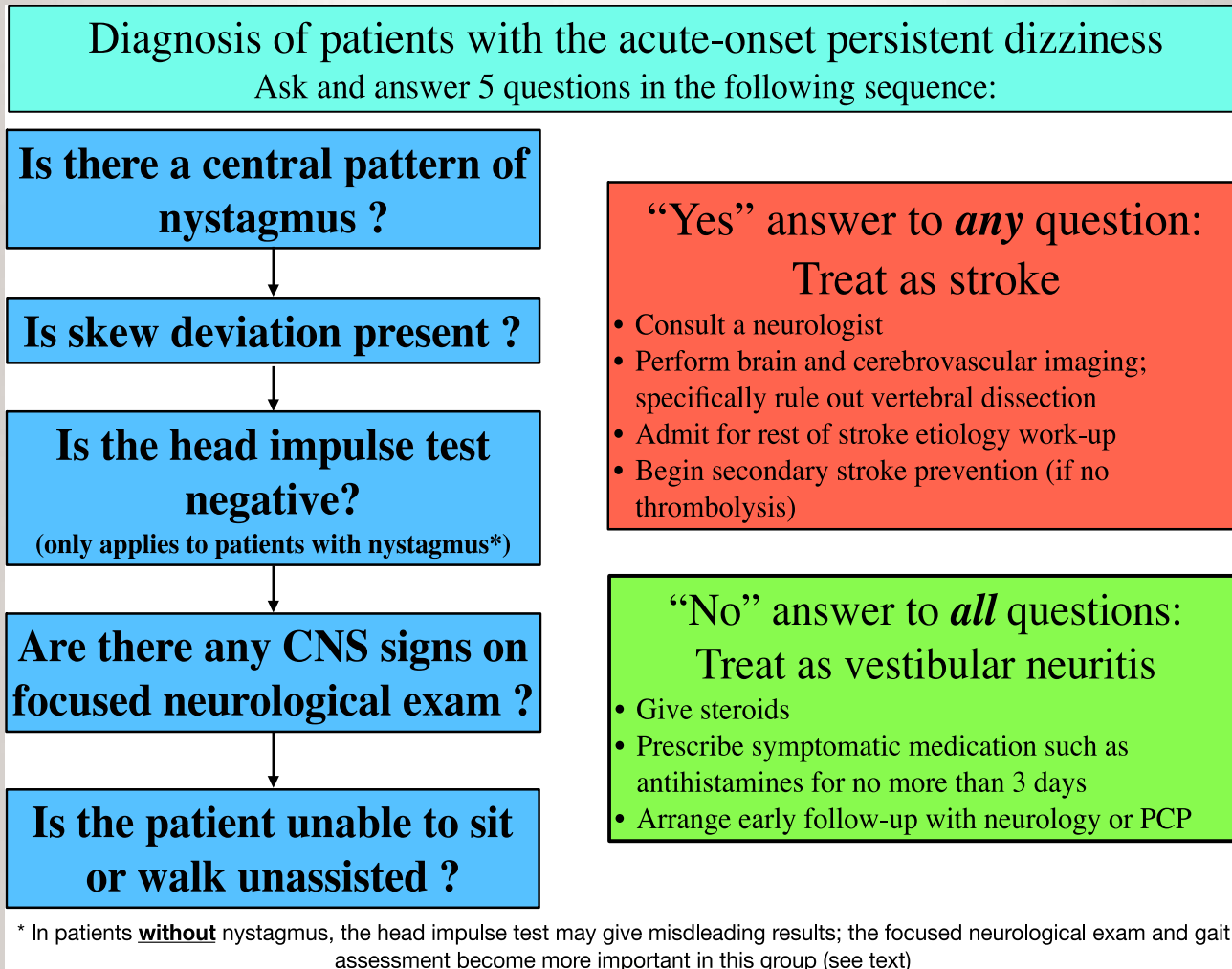
Brainstem or cerebellar lesion :

- any of the following, whether present or untestable
 - Normal head impulse test on both sides
 - Direction-changing nystagmus
 - Skew deviation

Peripheral lesion:

- presence of ALL of the following
 - An abnormal head impulse test on one side
 - Unidirectional, horizontal, torsional nystagmus that increases in intensity with gaze toward the fast phase
 - Absent skew

Diagnostic Evaluation of Patients With an AVS



Edlow JA. Managing Patients With Acute Episodic Dizziness. Ann Emerg Med. 2018;72(5):602-610.

s-EVS

spontaneous episodic vestibular syndrome

- Usually dizziness not present at time of exam
- Can't use the HINTS test
- DDx:
 - vestibular migraine
 - Associated with headache (classic sx, photophobia, phonophobia, aura, etc.)
 - Similar episodes before
 - Hx of migraines
 - TIA, VBI
 - ABCD2 score, risk factors, treat with ASA
 - Meniere's disease
 - Tinnitus, hearing loss

t-EVS

triggered episodic vestibular syndrome

DDX

- Orthostatic hypotension
- BPPV, benign paroxysmal positional vertigo
- CPPV, central paroxysmal positional vertigo
 - Very rare, cerebellar source
 - Associated with medulloblastoma in cerebellar nodulus.
- Dix-Hallpike test
 - Elicits endolymph movement in the posterior semi-circular canal
 - Produces nystagmus that could be vertical or torsional
 - Which is not seen in AVS
 - Reproduces symptoms
- Supine Head Roll
 - Like rolling over in bed

Further Risk Stratification for AVS

- HINTS plus
 - HINTS test (c/w central cause) and new unilateral hearing loss
 - 99.9% sens, 97% specific for Posterior Circulation Infarct
 - Benign HINTS Plus more sens for PCI than MRI (w/in 48 hrs)
 - Newman-Toker Acad Emerg Med 2013;20:986-996
- Benign HINTS and ABCD2 score < 4
 - PCI rate 0-1%
 - Kerber, Neurology 2015;85:1869–1878

Imaging

- Non Contrast CT-Head
 - Useful if HEADACHE is prominent
 - Cannot exclude PCI
 - Relevant in 0-1.6% of cases
 - Sensitivity -16% (Kattah, STROKE 2009;40:3504)
- MRI
 - DWI: False Negative rate -7-15%
 - Worst in first 48 hours
 - Newman-Toker, Ann Neurol 2016;79:27-31

TIPS

- Base the history on timing, duration, assoc sx, triggers
- Spend the time to do a careful neurologic exam
 - CN, nystagmus
 - HINTS
 - Walk the patient
- We aren't doing that badly
 - 0.14 -0.5% of dizzy patients DC'd with peripheral cause are later found to have a posterior circulation infarct
 - Morgenstern 2006

