Objectives

- DDx
- Diagnostics
- Treatment

Why?

- In the United States:
- 3% of ED visits (~4.3 million per year)[1]
- 3 – 6% serious central causes[1-3]
- 0.14 – 0.5% discharged and return with CVA[4-7]
  - ~5000 – 17,500 patients per year

Differential Diagnosis

Peripheral

- Vestibular neuritis
- Benign paroxysmal positional vertigo
- Herpes zoster oticus
- Meniere's disease
- Labyrinthine concussion
- Perilymphatic fistula
- Semicircular canal dehiscence syndrome
- Recurrent vestibulopathy
- Acoustic neuroma
- Otitis media / cerumen impaction

Central (10-20%)[1,2]

- Brainstem ischemia
- Cerebellar ischemia / hemorrhage
- Multiple sclerosis
- Epileptic vertigo
- Chiari malformation
- Vestibular migraine
- Post-concussive

Descriptives

- Dizzy
- Lightheaded
- Faint
- Vertigo
- Room spinning
- Unsteady
- Imbalanced

#1

Nobody Cares!

Diagnostics

Development of a Clinical Risk Score to Risk Stratify for a Serious Cause of Vertigo in Patients Presenting to the Emergency Department

Ohle, et. al., Annals of EM Feb 2025

- Sudbury Vertigo Risk Score

Predictor	Points
Male	1
Age > 65 years	1
Diabetes	1
Hypertension	3
Motor / Sensory deficit	5
Cerebellar deficit	6
BPPV diagnosis believed	- 5

Score < 5 = 1 %

Score 5 – 8 = 2 %

#2

Screening Exam

Don't forget to do a

good screening physical exam!

General Neurologic Exam

	Posttest Probability of Stroke Following Negative Test		
Pretest Probability of Stroke	Lower 95% CI of NLR	Pooled Point Estimate of NLR	Upper 95% CI of NLR
General Neurological Examination (sensitivity 46.8%; specificity 92.8%) NLR 0.57 (95% CI 0.45–0.73)			
10% (low)	4.8%	6%	7.5%
25% (average)	13%	**16%**	19.6%
50% (high)	31%	36.3%	42.2%

Assessment of Truncal/Gait Ataxia

	Posttest Probability of Stroke Following Negative Test		
Pretest Probability of Stroke	Lower 95% CI of NLR	Pooled Point Estimate of NLR	Upper 95% CI of NLR
Assessment of Truncal/Gait Ataxia (sensitivity 69.7%; specificity 83.7%) NLR 0.36 (95% CI 0.20–0.67)			
10% (low)	2.2%	3.8%	6.9%
25% (average)	6.3%	**10.7%**	18.3%
50% (high)	16.7%	26.5%	40.1%

Computed Tomography

	Posttest Probability of Stroke Following Negative Test		
Pretest Probability of Stroke	Lower 95% CI of NLR	Pooled Point Estimate of NLR	Upper 95% CI of NLR
CT (sensitivity 28.5; specificity 98.9%) NLR 0.72 (95% CI 0.58– 0.91)			
10% (low)	6.1%	7.4%	9.2%
25% (average)	16.2%	**19.4%**	23.3%
50% (high)	36.7%	41.9%	47.6%

CT Angiography

- 2 of 153 (1.3%) etiology of dizziness[1]
- 3 of 228 (1.3%) changed management[2]

Magnetic Resonance Imaging

	Posttest Probability of Stroke Following Negative Test		
Pretest Probability of Stroke	Lower 95% CI of NLR	Pooled Point Estimate of NLR	Upper 95% CI of NLR
MRI (sensitivity 79.8%; specificity 98.8%) NLR 0.20 (95% CI 0.14–0.30)			
10% (low)	1.5%	2.2%	3.2%
25% (average)	4.5%	**6.3%**	9.1%
50% (high)	12.3%	16.7%	23.1%

HINTS

	Posttest Probability of Stroke Following Negative Test		
Pretest Probability of Stroke	Lower 95% CI of NLR	Pooled Point Estimate of NLR	Upper 95% CI of NLR
HINTS battery (sensitivity 92.9%; specificity 83.4%) NLR 0.08 (95% CI 0.03–0.27)			
10% (low)	0.3%	0.9%	2.9%
25% (average)	1%	**2.6%**	8.3%
50% (high)	2.9%	7.4%	21.3%

HINTS + Acoustic

	Posttest Probability of Stroke Following Negative Test		
Pretest Probability of Stroke	Lower 95% CI of NLR	Pooled Point Estimate of NLR	Upper 95% CI of NLR
HINTS plus battery (sensitivity 99%; specificity 84.8%) NLR 0.01 (95% CI 0–0.40)			
10% (low)	N/A	0.1%	4.3%
25% (average)	N/A	**0.3%**	11.8%
50% (high)	N/A	1%	28.6%

HINTS

#3

3 Components to HINTS Exam

- Nystagmus
- Test of (vertical) Skew
- Head Impulse Test

https://www.youtube.com/watch?v=1q-VTKPweuk

Nystagmus

Peripheral

- Unidirectional
- Horizontal or Rotational
- Visual fixation: suppression
- Fatigable

Central

- Multi-directional (Reverses)
- Horizontal, Vertical, Rotational
- Visual fixation: minimal suppression
- Non-Fatigable

Exam Documentation

- Screening exam plus:
- Head Impulse: negative for peripheral lesion (no delayed saccade)
- Nystagmus: none
- Test of Skew: negative
- Hearing: finger rub symmetric bilaterally
- No saccadic pursuit on eyes ROM
- Finger to nose: normal bilaterally
- Gait: normal (standard, tandem, on heels, on toes)
- Neck: no carotid bruit
- Ears: no cerumen impaction and tympanic membrane normal bilaterally

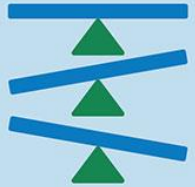
#4

Treatment  #5

Vestibular Rehabilitation

Studies show vestibular rehabilitation therapy helps:

Improve your ability to stabilize your vision.



Improve your balance.

Reduce your dizziness symptoms.

Increase your body strength.

Reduce your risk of falling.

https://my.clevelandclinic.org/health/treatments/15298-vestibular-rehabilitation

Meclizine

Diazepam

Steroids[1]

Droperidol[2]

BPPV Maneuvers

- Epley
- Semont
- BBQ Roll
- Gufoni
- Casani
- https://www.healingvertigo.ca/bppv-instructional-videos/

Key Points

1. Don't waste time on descriptors
2. Good screening exam necessary
3. HINTS + Acoustic = NLR 0.01 (know how to perform)
4. Document thorough exam
5. Treat appropriately and give follow up

What questions can I answer?