

HINTS



"A Quick Glance", oil on canvas, Gustave Jean Jacquet, (1846-1909)

SIR,

THERE is a young Woman in our Neighbourhood that makes it her Business to disturb everybody that passes by with her Beauty.

She runs to the Window when she has a mind to do Mischief, and then when a Body looks up at her, she runs back, as though she had not a mind to be seen, though she came there on purpose.

Her Hands and Arms you must know are very fine, for that reason she never lets them be unemployed, but is feeding a Squirrel, and catching People that pass by all Day long.

She has a way of heaving out of the Window to see something, so that one who stands in the Street just over against her, is taken with her side Face; one that is coming down fixes his Eyes at the Pole of her Neck till he stumbles; and one coming up the Street is fixed Stock-still by her Eyes:

She won't let anybody go by in Peace. I am confident if you went that way yourself, she would pretend to get you from Mrs Page!

As for my own part, I fear her not; but there are several of our Neighbours whose Sons are taken in her Chains, and several good Women's Husbands are always talking of her, and there is no quiet.

I beg of you Sir, to take some Course with her, for she takes a delight in doing all this Mischief.

It would be right to lay down some Rules against her; or if you please to appoint a time to come and speak to her, it would be a great Charity to our Street, especially to, SIR,

*Your most Humble Servant,
ANTHONY EYELID*

Letter to the authorities concerning a Coquette, Sir Richard Steele, 1712.

The civic minded Sir Richard Steele has taken it upon himself to send an outraged anonymous complaint to the authorities about a shameless coquette that lives in his very street! He has no doubt that she comes to her window on purpose in order to give out her subtle hints - but alas unsuspecting and dull-witted sons and husbands appear all too oblivious to her mischievous machinations.

When we examine our patients with vertigo we must not be dull witted - we must, like Sir Richard, be ever alert to the subtle hints of serious underlying mischief!

HINTS

Introduction

The **3 step HINTS exam** aims to detect the more clinically subtle signs of **central brainstem/ cerebellar stroke syndromes**.

The 3 steps are:

- **HI = Head Impulse Testing**
- **N = Nystagmus**
- **TS = Test for Skew**

This combination of clinical findings (done under optimal conditions) can be even more sensitive at detecting stroke, than MRI **at presentation**. Ischemic stroke findings may be delayed up to 48 hours post the stroke event.

The HINTs examination, however has some caveats:

1. It must be done by a skilled clinician
2. The patient needs to be comprehending of instructions and able to cooperate
 - Communication barriers may render the test useless
 - A patient with severe cervical spine degenerative disease may not be able to cooperate and may be put at risk of a vertebral artery injury.
3. The HINTS examination was not specifically designed for an undifferentiated ED “dizzy” or “vertiginous” population - rather it was carried out on high risk (for stroke) patients by expert neurologists.

History

The HINTS study was published in 2009.

It described 101 patients assessed by **neurologists** after referral for **acute vestibular syndrome** (vertigo, nystagmus, nausea/vomiting, head-motion intolerance, unsteady gait) in the presence of **≥1 stroke risk factors**.

The 3 “HINTS” examinations were found to have a sensitivity of 100% and specificity of 96% for a central lesion using diffusion-weighted imaging MRI at up to 48 hours as the gold standard.

Method

The testing is carried out on patients who have **acute** and **persisting nystagmus** and an **otherwise normal neurological exam**.

Head Impulse testing:

Patient fixes on the examiner's nose - examiner rapidly turns the patient's head 20 degrees to the side - then brings the head back to center.

Repeat above to the opposite side.

Normal response = eyes stay fixed on nose (i.e demonstrates a **normal vestibulo-ocular reflex**) = **This could mean there is a central cause for the vertigo!, (i.e the peripheral vestibular system is intact** - If the head impulse test is abnormal this is a vestibular nerve problem).

Abnormal response = eyes follow the direction of head turn, then eyes try to re-orientate (i.e **catch-up saccades**) = a peripheral problem

(See also Appendix 1 below).

Nystagmus:

Get the patient to look left, look right, and look up and down.

Vertical nystagmus = central cause.

Unidirectional nystagmus = a benign peripheral cause (always beats to the same side no matter which direction the patient looks)

If the patient looks left and nystagmus beats left - then the patient looks right and nystagmus beats right - this is *direction beating nystagmus* - this indicates a **central cause**

Test of Skew:

Looking for a **vertically dysconjugate** gaze

This may be obvious from inspection - if not then the Test of Skew will be necessary.

The patient fixes gaze on the examiner's nose - then the examiner covers one eye of the patient - then uncovers it - a positive result - for a central cause - is when the covered eye becomes misaligned and then tries to realign once again once the cover is removed

Do the same for the other eye.

Interpretation

Test	Peripheral	Central
Head Impulse	Abnormal response = eyes follow the direction of head turn , then eyes try to re-orientate (i.e catch-up saccades) = a peripheral problem	Eyes stay fixed on nose (i.e demonstrates a normal vestibulo-ocular reflex) = This could mean there is a central cause for the vertigo
Nystagmus	Unidirectional nystagmus = a benign peripheral cause (always beats to the same side no matter which direction the patient looks)	Vertical nystagmus = central cause. <i>Or</i> If the patient looks left and nystagmus beats left - then the patient looks right and nystagmus beats right - this is <i>direction changing</i> (or " <i>bidirectional</i> ") nystagmus - this indicates a central cause
Test of Skew	A normal result is when the covered eye does <i>not</i> become misaligned - i.e no change in position occurs when the eye is uncovered.	A positive result - for a central cause - is when the covered eye becomes misaligned and then tries to realign once again once the cover is removed

If all 3 tests suggest a peripheral cause, then a benign peripheral cause is likely.

If one or more tests are abnormal then a central cause must be assumed.

If the testing cannot be undertaken or is inconclusive; then neuroimaging will be necessary - with lower thresholds for the greater the CVS risk profile of the patient.

Appendix 1

Frenzel goggles:

Frenzel goggles and video Frenzel goggles are diagnostic aids used by Ophthalmologists, ENTs or Neurologists when assessing patients with nystagmus.

The patient wears the goggles when being examined for nystagmus.

The purpose of the goggles is to disable the patient's ability to visually fixate on an object while at the same time allowing the examiner to adequately visualize the eye. This is done by using high-powered (+20 diopters) magnifying glasses with an illumination system.

With the high-powered lens, it is unlikely that the patient will be able to adequately focus and visually fixate on an object and so *intentionally* suppress nystagmus.

References

1. Kattah J.C "HINTS to Diagnose Stroke in the Acute Vestibular Syndrome: Three- Step Bedside Oculomotor Examination More Sensitive Than Early MRI Diffusion-Weighted Imaging". Stroke, November 2009, p.3504-3510.

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