DISTINGUISHING PERIPHERAL FROM CENTRAL DISORDERS

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A Practical Guide to Dizziness and Disequilibrium
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PERIPHERAL VS CENTRAL

• Peripheral
  ◦ Coming from the inner ear
    ◦ Abnormal activation of the inner ear
    ◦ Abnormal inhibition / loss of function in the inner ear
    ◦ Chronic weakness / loss of function in the inner ear

• Central
  ◦ Coming from the brain
    ◦ Neurological disease
    ◦ Brain trauma or insult
    ◦ Psychological disorder
    ◦ Functional condition

WHAT TYPE OF EPISODE/DIZZINESS

• Acute
• Recurrent
• Chronic

Over 50% of referrals to MCW ENT for dizziness are not peripheral or ear-related (Friedland et al., JAMA Otolaryngology, 2016)
ACUTE DIZZINESS

• Stroke or no stroke?

The patient is experiencing, or just experienced, an attack of dizziness while you are examining or talking to them.

The patient had a single well-defined attack of dizziness.

DISTINGUISHING PERIPHERAL FROM CENTRAL ACUTE VESTIBULAR DISORDERS

• HINTS (HI – N – TS)
  - Three tests to assess vestibular system
• INFARCT (IN – FA – RCT)
  - Way to remember how to interpret the HINTS tests
**HINTS**

- **Head Impulse**
  - Positive in peripheral
  - Negative in central

- **Nystagmus**
  - Unidirectional in peripheral
  - Direction changing in central
  - Horizontal in peripheral
  - Vertical in central

- **Test of Skew**
  - Absent in peripheral
  - Present in central

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**Ear Related Issue**

- Positive head thrust
- Unidirectional horizontal nystagmus
- No skew deviation

**Stroke**

- Negative head thrust
- Direction changing or vertical nystagmus
- Skew deviation

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**HEAD IMPULSE TEST**

- Corrective mechanism
  - Rapidly bring eyes back to where they belong

- Named for the fast direction of motion
  - Left / right; up / down
  - Rotary: clockwise / counterclockwise

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**NYSTAGMUS**

- Corrective mechanism
  - Rapidly bring eyes back to where they belong

- Named for the fast direction of motion
  - Left / right; up / down
  - Rotary: clockwise / counterclockwise
HORIZONTAL NYSTAGMUS: 
BEATS TOWARD STRONGER EAR

HINTS
• Head Impulse
• Nystagmus
• Test of Skew

NYSTAGMUS

HINTS
• Head Impulse
• Nystagmus
• Test of Skew

NYSTAGMUS
ALEXANDER’S LAW

Gaze in the direction of the fast phase of nystagmus increases amplitude and frequency

HINTS
- Head Impulse
- Nystagmus
- Test of Skew

ALEXANDER’S LAW

HINTS
- Head Impulse
- Nystagmus
- Test of Skew

TEST OF SKEW

• Alternate Cover Test
  - Focus on fixed point
  - Alternate covering one eye then the other
  - Observe for refixation when uncover eye
  - Abnormal skew represents brainstem or cerebellar misinterpretation of otolith signals

HINTS
- Head Impulse
- Nystagmus
- Test of Skew
TEST OF SKEW

HINTS
- Head Impulse
- Nystagmus
- Test of Skew

INFARCT

- Impulse Normal
- Fast-phase Alternating
- Refixation with Cover Test

HINTS TEST: OVERVIEW

HINTS
- Head Impulse
- Nystagmus
- Test of Skew
RECURRENT DIZZINESS

- Repeated attacks/spells/episodes
- Nature: what is it like?
- Duration: how long does it last?
- Triggers: when does it occur?
- Associated symptoms
- Associated conditions

The patient has experienced more than one attack of dizziness. Attacks have a beginning and end with no dizziness between attacks.

RECURRENT DIZZINESS: PERIPHERAL

- BPPV
- Meniere’s disease
- Superior canal dehiscence; fistula
  - Sound or pressure induced dizziness; hear “eyes move”
- Vestibular neuritis; acoustic neuroma
  - Very rare to cause recurrent episodes
- Ear disease: cholesteatoma, otitis media

PERIPHERAL: OTOLOGIC SYMPTOMS

• Hearing Loss
  - Actual hearing loss = can’t detect sound
  - Not: being overwhelmed by sound, trouble understanding, not sure
  - Bilateral symptoms are rarely from peripheral conditions
  - Fluctuations
    - Unilateral, recurrent, actual hearing loss: Meniere’s disease
    - Associated with the dizzy attacks
      > Occur in similar time-frame vs longstanding

PERIPHERAL: OTOLOGIC SYMPTOMS

• Ear Pain
  - Not a feature of otologic related dizziness
  - Common in migraine (think TMJ or headache)
  - Ear pain with no other ear symptoms (e.g., hearing loss) is not an ear infection

• Ear Drainage
  - Pus, purulence, visible: suggestive of infection/cholesteatoma
  - Feels like there’s water in there, my finger is moist: not suggestive of ear issue

PERIPHERAL: OTOLOGIC SYMPTOMS

• Tinnitus
  - Ear-related dizziness (i.e., Meniere’s disease)
    - low humm, ocean, truck idling, wind, rushing, buzzing
      - unilateral
  - Not ear-related dizziness
    - high-pitched, ringing, insects, tone
      - bilateral
  - Autophony
    - Special case of tinnitus: internal body sounds
RECURRENT DIZZINESS: NON-OTOLOGIC

- Neurological signs and symptoms
  - Parasthesia, weakness, visual scotomas/loss, headache
  - Multiple sclerosis, Parkinson’s, Alzheimer’s, etc.
- Behavioral health conditions: active
  - Depression, anxiety, medication changes (psychiatric)
- Medical conditions: active
  - Labile blood pressure, thyroid issues, cancer, chemotherapy, autoimmune disease, neuropathy, arrythmia
- Physical conditions
  - Head trauma, knee/hip replacement, frailty

CHRONIC DIZZINESS

- Persistent dizziness or imbalance
- Nature: what is it like?
- Duration: how long has it lasted?
- Triggers: when does it occur?
- Associated symptoms
- Associated conditions

The patient is experiencing dizziness or imbalance which is always present to some extent for 3+ months.

Distinguish from a single attack of dizziness with prolonged course or recovery.
CHRONIC DIZZINESS: PERIPHERAL

- Vertigo (peripheral)
  - Impossible to have persistent vertigo for months
  - Get a better history and sense of the patient’s perception
- Imbalance
  - The main chronic vestibular disorder is imbalance
- Other sensations of motion (not peripheral)
  - Swaying, rocking, “on a boat”
- Gait Disorder (not peripheral)

CHRONIC DIZZINESS: PERIPHERAL

- Imbalance
  - Weak or absent peripheral vestibular function
  - Oscillopsia: bilateral hypofunction
  - Trouble in the dark, uneven ground, soft ground, inclines
  - Wide-based gait, reduced speed, unable to recover
- Not peripheral
  - Ataxia, shuffling, foot drop

CHRONIC DIZZINESS: NON-OTOLOGIC

- Motion sensitivity (common with hx/o migraine)
  - Cars, boats, rides
- Visual sensitivity (visual vertigo)
  - Grocery store aisles, tunnels, video games, news ticker, scrolling on phone, crowds, malls
- Rocking, swaying
  - Mal de Debarquement: worse if still, better if moving
  - 3PD: better if still, worse with moving, or upright
CHRONIC DIZZINESS: NON-OTOLOGIC

• Faint Sensation / Lightheaded
  - Standing in one place
  - Changing posture: lying to sitting to standing
• Head Fullness / Pressure
  - Allergy, headache condition, muscle tension, stress
• Just Not Right
  - Elderly, post-trauma, anxiety, vision-related

SUMMARY

• Acute, recurrent or chronic dizziness
• Acute: HINTS
• Recurrent
  - BPPV or Meniere’s if peripheral
  - Look for associated signs and symptoms
• Chronic
  - Imbalance is most common peripheral
  - Assess nature of the sensation