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EM:RAP C3
Continuous Core Content

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Dizziness

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* *Drug doses are a guide only, always check second source and follow local practice guidelines*

Take Home Points:

- **A-B-Cs**
- **Separate out sick patients with abnormal vital signs first**
- **Attempt to classify dizziness into a subcategory: vertigo, pre-syncope, disequilibrium, or non-specific dizziness**
- **Be careful not to push patient into a particular subtype if they don't quite fit, and be willing to move from one category to another as information changes**
- **Special attention to the associated symptoms, risk factors, triggers and timing are also important**

Introduction

Dizziness is a poorly defined symptom that plagues both patients and clinicians. It is one of the most common chief complaints in both emergency and outpatient settings, accounting for millions of visits to each annually in the U.S. alone. There is often uncertainty surrounding the clinical approach to the dizzy patient and the wide variation in practices is what makes it particularly difficult for new and seasoned practitioners alike.

We are taught that dizziness is a vague term - one that needs to be further qualified in order to be acted upon by the clinician. Specifically, the patient is asked, "What do you mean by dizzy?" Only after the patient's complaint is fit (or pushed!) into one of several categories or subtypes can the clinician begin to evaluate the problem — at least that is the traditional teaching.

The Classical Subcategories of Dizziness

The classical subcategories of dizziness are defined as follows:

1. VERTIGO: "Do you feel a sense of movement or spinning?" This is considered vertigo. Typically **vertigo** is due to a neurological disorder.
2. PRE-SYNCOPE: "Do you feel a sense of lightheadedness or that you are about to faint?" This is considered **pre-syncope or near syncope**. Typically pre-syncope is due to a cardiovascular disorder. Some clinicians separate pre-syncope from lightheadedness - pre-syncope being episodic and lightheadedness being continuous.
3. DISEQUILIBRIUM: "Do you feel that you have unsteadiness or trouble sensing your limbs in space (usually manifested by an unsteady gait)?" This is considered **disequilibrium**. Typically disequilibrium is due to a disorder of the spinal cord or peripheral nerves.
4. NON-SPECIFIC DIZZINESS: Some patients seem to defy these classical subcategories and don't really seem to fit into any of them well - so some clinicians add another subcategory - **non-specific dizziness**. This is a term that to some patients appears to overlap with other vague symptoms such as generalized malaise or weakness or simply feeling unwell. The causes of non-specific dizziness include disorders in all of the systems described above but also include just about every other system from endocrine and metabolic to psychiatric.

Sometimes the classical approach can fail us - we get stuck down the wrong path and miss an important diagnosis. For example, if we miscategorize a pre-syncope patient as vertigo we may miss a life-threatening arrhythmia.

In this episode of C3, we use this traditional approach for evaluation of dizziness but we also emphasize the importance of other critical clues: the associated symptoms, timing, triggers, and special physical examination tests.

Initial Steps

- Identify critically-ill patients (ABCs)
  - A minority of patients with dizziness will be critically ill, with abnormal vital signs and need for acute resuscitation
  - These may include patients with acute cardiac, respiratory, metabolic or neurologic emergencies as well as poisonings.
- Cardiac monitor, cardioversion paddles, IV access
  - Appropriate in selected patients with abnormal vital signs or who are at high risk for cardiac events
- Supplemental O_2
  - Appropriate if O_2 sat <94%
- ECG
  - Important in older patients, those with cardiac disease and in those with abnormal vital signs or presentation suggestive of a cardiac cause (e.g. pre-syncope)
- Medication for Symptoms
  - Ondansetron (4-8 mg IV, may repeat) or other anti-nausea medications may be necessary for nausea and vomiting
  - Meclizine 25-50 mg PO is often used for symptomatic treatment of vertigo

Life-Threatening Diagnoses to Consider

- Stroke
- Transient Ischemic Attack (TIA)
- Lethal Arrhythmia (e.g. V Tach)

Evaluation of Vertigo

1. Make sure that it's an **isolated** neurological feature
- Peripheral vertigo is generally more benign. It is isolated. If any other neurological features are present, we must assume that a central process, such as a stroke or CNS tumor, is present until proven otherwise.
- The most important thing that must be established in the evaluation of vertigo is that no other neurological symptoms or findings are present.
- This is because it is unlikely for a stroke or other central process to involve only central connections of the vestibular (8th cranial) nerve without also affecting the surrounding structures in the brain — these nerves are clustered close together in the brainstem.
- Check for:
  - Diplopia - any double vision on extraocular movement testing (CNs III, IV, VI)
  - Dysarthria - any difficulty in speaking or facial asymmetry (CN VII)
  - Dysphagia - any difficulty in swallowing (CNs IX and X)
  - Dysmetria - (e.g. ataxia) any cerebellar findings (finger-to-nose, heel-to-shin, postural instability)
  - Weakness/Sensory loss - any extremity findings from the descending tracts that pass through the brainstem en route to the body
  - Walking - patients with peripheral vertigo can present quite dramatically, with nausea and vomiting, and they may appear hesitant or a little unsteady when walking, but they should be able to walk
  - Patients with an ataxic gait or those who are unable to walk should be assumed to have a central process

2. The ABCs of isolated vertigo
- The ABC's of isolated vertigo is a mnemonic to remember the three causes of isolated vertigo, with Acute Vestibular Syndrome and Benign Paroxysmal Positional Vertigo being benign, and Central Vertigo being potentially life threatening
- Although most patients with isolated vertigo will be peripheral and safe to discharge home, a small minority will have a central process (e.g. stroke, multiple sclerosis)
- The following table helps distinguish the three main types of isolated vertigo

THE ABCs of ISOLATED VERTIGO

	A - Acute Vesti bular Syndromes (AVS)	B - Benign Paroxysmal Positional Vertigo (BPPV)	C - Central Vertigo (Stroke, tumor, multiple sclerosis)
Etiology	Viral infection	Otoliths (debris) in semicircular canals	Vascular embolus (stroke)
Symptoms	Gradual onset, preceding URI	Brief (<1 minute) episodes with change in head position	Sudden onset, non-fatiguing
Bedside Testing	Reassuring HINTS	Positive Dix-Hallpike Test	Concerning HINTS
Treatment	Corticosteroids, ENT follow-up	Epley or Semont maneuvers	MR, Neurology, Admit (possible tPA)

- By far the most common cause is BPPV. In order to confidently "rule in" this diagnosis, all of its classic features should be sought
  - A Dix-Hallpike test should only be performed in non-toxic appearing patients with positionally triggered episodic vertigo — not for patients with constant vertigo or for patients with nystagmus at baseline
  - To perform the maneuver the patient starts sitting upright. Their head is turned to one side and then the patient is brought to a supine position with their neck in slight extension. The examiner observes for 30 seconds for nystagmus. Horizontal or rotatory nystagmus is a positive test and helps to confirm the diagnosis of BPPV.
- More difficult to differentiate are AVS and Central Vertigo (stroke)
  - A sudden onset suggests stroke
  - The HINTS test helps differentiate acute vestibular syndrome from a central process (e.g. stroke).

The HINTS Test		
	Central	**Peripheral**
Head Impulse Turn the patient's head 10-20 degrees while they maintain a fixed gaze	"Normal" no saccade correction, stays fixed on you	Dolls eyes that have a saccade correction back to you
Nystagmus	Vertical Horizontal that changes direction	Horizontal in one direction only
Test of Skew Alternating covering one eye and then the other in rapid succession	Vertical eye saccade for correction	Normal vertical eye alignment

Evaluation of Pre-Syncope

- In general, the evaluation of pre-syncope is similar to that of syncope - covered in detail in our recent C3

Evaluation of Disequilibrium

- Disequilibrium is much less likely to present acutely to the ED compared to vertigo or pre-syncope because its causes are often chronic
- A loss of proprioception (e.g. a lack of a sense of the extremities in space) may result from a lesion in the posterior columns of the spinal cord or a severe peripheral neuropathy
- Diabetes, chronic vitamin deficiencies and chronic toxicities may all present with a disequilibrium syndrome

Other Important Causes

- ENT pathology
  - A good head and neck exam is important - even simple ear wax impaction can cause dizziness which resolves with cleaning
  - Ramsay-Hunt and Meniere's disease may present with hearing loss together with vertigo
- Medications
  - Medications, especially in the elderly, are a very common cause of dizziness
  - A careful medication history is important to identify recent changes that may be responsible for the patient's symptoms
  - Frequently implicated are:
    - Cardiac medications, antihypertensives, diuretics, ototoxic medications
- Orthostatic hypotension
  - Dehydration, chronic illness, and medications may all contribute to orthostatic hypotension
  - Dizziness with postural changes (not just a drop in BP or increase in pulse) are important to make this diagnosis

Timing and Triggers

- Even when characterization/categorization of the patient's symptoms is difficult, the timing and triggers of the symptoms can help hone in on the diagnosis

Consider the following serious diagnosis

Timing	
Continuous	Stroke
Intermittent	TIA Cardiac arrhythmia
Triggers	
No trigger (spontaneous)	Stroke TIA
Exertional trigger	Cardiac arrhythmia
Positional trigger	Serious causes of orthostatic hypotension

Imaging

- CT
  - The use of CT in the evaluation of dizziness is generally not indicated but should be considered in those with a new headache and in older, sicker patients
  - CT is important to rule out intracranial hemorrhage when it is considered clinically
  - CT is not sensitive enough to rule out a stroke in the posterior fossa (where the "dizziness" structures are located (e.g. cerebellum and brainstem)
- MR
  - MR imaging is generally necessary to diagnose acute stroke in the posterior fossa and may be obtained when clinical features are worrisome for stroke. However, MR cannot exclude a stroke diagnosis, particularly in the first 24-48 hours when the sensitivity is lower.

Therapy & Disposition

- Therapies, of course, will vary, depending on where the diagnostic work-up leads
- Most patients with the initial chief complaint of dizziness will be discharged home.
- Expedited work-up in an observation unit, or in lieu of admission, may be appropriate for well appearing patients when there is concern for serious pathology

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