FRASER HEALTH LONG TERM CARE ROUNDS
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From Benign to Dangerous: A Clinical Approach to Dizziness, Presyncope & Resistant Hypertension

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PRESENTER DISCLOSURE

None

DISCLOSURE OF FINANCIAL SUPPORT

None

LEARNING OBJECTIVES

Identify key diagnostic questions to guide nursing staff when assessing dizziness

Review cause, severity and complications of presyncope

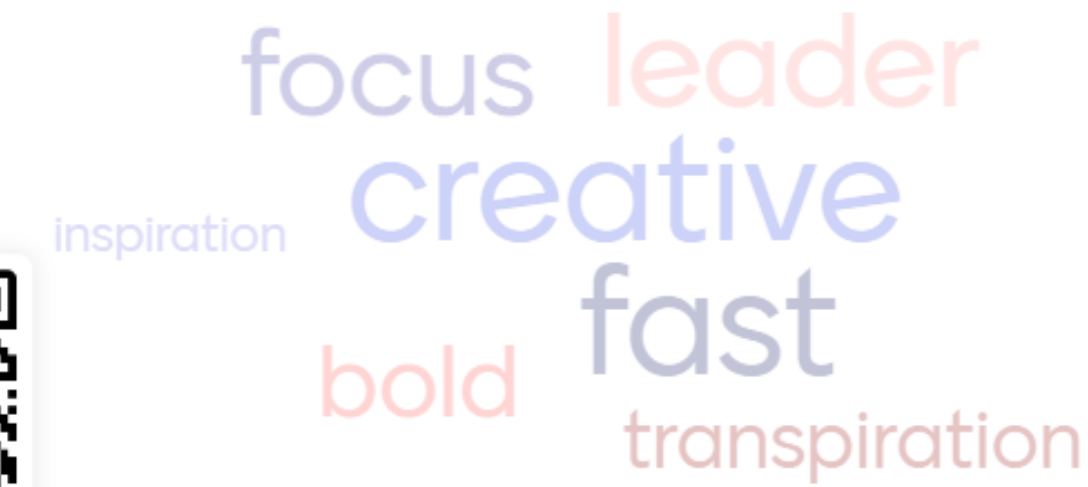
Understand the prevalence and treatment of resistant hypertension

Dizziness

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How do your patients describe dizziness



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How do your patients d...

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HOW PATIENTS DESCRIBE DIZZINESS

Room spinning	> vertigo
Feeling faint, blacking out	> presyncope
Floating/ off balance/ unsteadiness	> disequilibrium
I am just dizzy	> non-specific

PROBLEM WITH RELYING ON PATIENT DESCRIPTIONS

Patients' dizziness descriptors overlap and change when reassessed even when just a few minutes later

- Newman-Toker et al. Mayo Clinic Proceedings. Nov2007
- 872 patients with dizziness interviewed at ER
- 218 patient did not identify vertigo, spinning or motion, then subsequently when re-asked
  - 70% then report spinning or motion
- 52% picked a different dizziness descriptor on a 6 min re-test

PREVALENCE IN NURSING HOMES

Tinetti et al. Ann Intern Med. 2000

1087 subjects at least 72yo living in the community, 24% reported dizziness

Colledge et al. Age Ageing. 1994

890 subjects living in community, 28-35% age >75yo

CAUSES OF PERSISTENT DIZZINESS IN ELDERLY PATIENTS

Maarsingh et al. Annals of Family Medicine. 2010

- 417 patients aged 65-95yo with persistent dizziness
  - 57% due to cardiovascular disease
  - 14% peripheral vestibular disease
  - 10% psychiatric illness

SOME OF THE CRITICAL DIAGNOSIS

Neurological

- Intracranial bleed
- Posterior stroke/ TIA

Cardiac

- arrhythmia
- acute myocardial infarction

Hypotension related

- Sepsis/ infection
- Gastrointestinal bleeding

TRIAGING

Altered mental status

- Delirium, stroke, infection, seizure, intoxication

Focal neurological deficits:

- Stroke

Headache or neck pain

- Hemorrhagic stroke, intra-cranial bleed, craniocervical vascular dissection, meningitis

Chest/ back pain/ abdominal pain

- Acute coronary syndrome, aortic dissection

Syncope

- Arrhythmia, acute coronary syndrome, aortic dissection, pulmonary embolism, vasovagal syncope, hypovolemia, stroke, intra-cranial bleed, seizures

TRIAGING

Dyspnea

- Pulmonary embolism, pneumonia

Palpitations

- Arrhythmia, vasovagal syncope

Bleeding or fluid losses

- Hypovolemia, anemia

Fever

- Infection/ sepsis

Abnormal glucose

- Hypoglycemia, DKA

Abnormal vital signs (hypotension, orthostasis, tachycardia)

- Sepsis, hemorrhage, hypovolemia, excessive anti-hypertensive medications

TRADITIONAL CLASSIFICATION

Vertigo

Pre-syncope

Disequilibrium

Non-specific

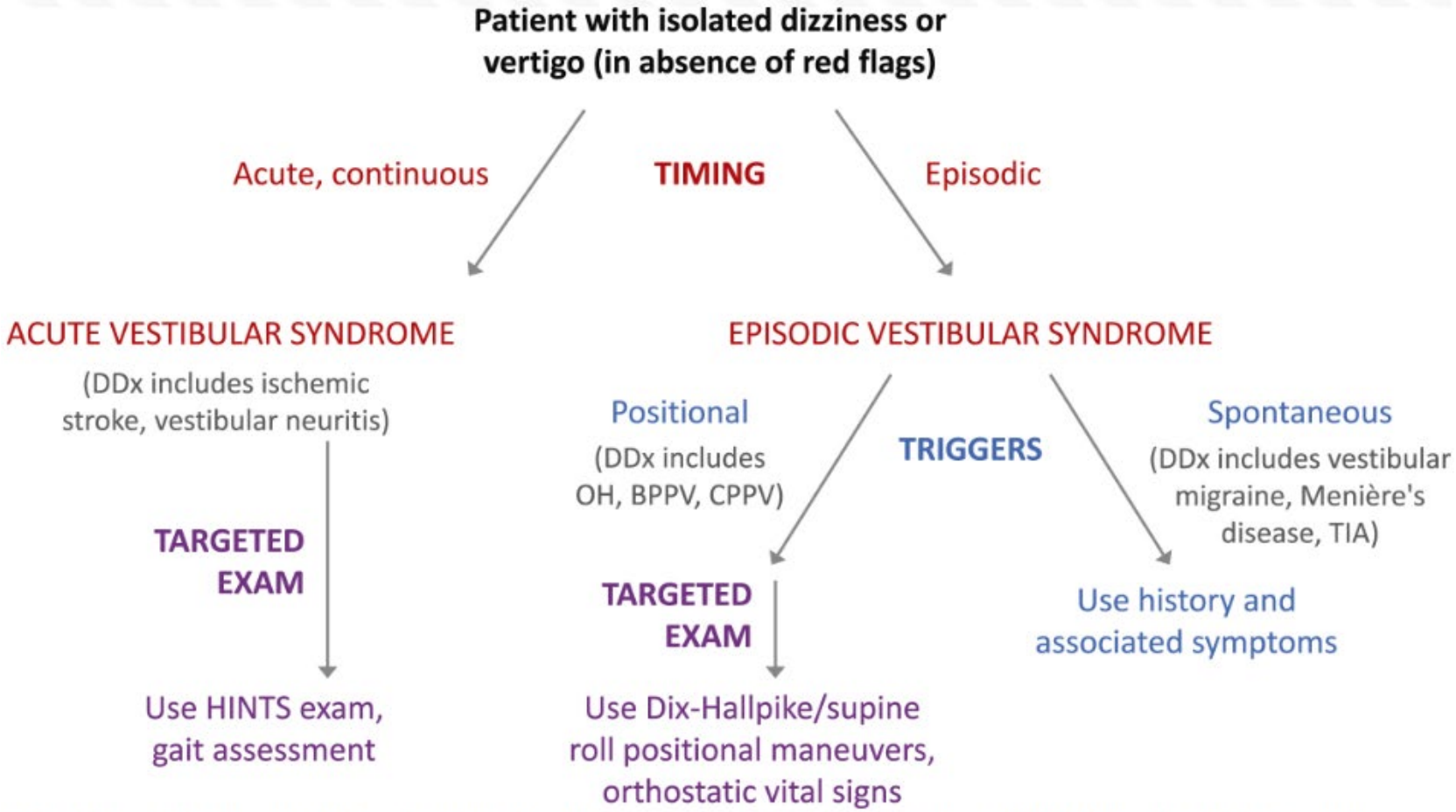
ERP'S APPROACH TO DIZZINESS

Guidelines for reasonable and appropriate care in the emergency department 3 (GRACE-3). Acad Emerg Med. 2023:

Acute vestibular syndrome (AVS) - acute onset of persistent, continuous dizziness lasting longer than 24 hours

Spontaneous episodic vestibular syndrome (s-EVS) - episodes of dizziness not brought on by any clear trigger

Triggered episodic vestibular syndrome (t-EVS) - brief episodes of dizziness clearly triggered by something, e.g., moving the head



An evidence-based approach to diagnosis of acute dizziness or vertigo emphasizing TiTrATE (timing, triggers, and targeted examination). [1] The history (timing, triggers) crucially informs the targeted examination that will provide the highest diagnostic yield. For example, HINTS is used in acute, continuous vertigo. Similarly, positional maneuvers such as the Dix-Hallpike test are used in triggered, positional, episodic vertigo. BPPV, benign paroxysmal positional vertigo; CPPV, central paroxysmal positional vertigo; DDx, differential diagnosis; OH, orthostatic hypotension; TIA, transient ischemic attack.

Bery et al. Medical Clinics of North America. 2025.

CLINICAL VIGNETTE

82yo woman with severe dementia, recently transferred to long term care due to care needs. She has CHF with reduced LVEF30%, and recently had her cardiac medications adjusted by her specialist, switching from ramipril to Entresto. Since then, her resting sBP is 90 and she feels “woozy” with positional change.

CLINICAL VIGNETTE

90yo woman who has been off anticoagulation for her known permanent atrial flutter due to recent GI bleed, complaints of acute onset, continuous sensation of herself “whirling” or moving even at rest. On careful history, she also endorses new headache and double vision.

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Afib dizzy

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BOX 2

The "Deadly D's" that can indicate a central-localizing cause of vestibular symptoms

1. *Diplopia* : the patient is experiencing double vision
2. *Dysarthria* : the patient has slurring of speech
3. *Dysphonia* : the patient has voice hoarseness or change in quality of voice
4. *Dysphagia* : the patient has difficulty swallowing
5. *Dysmetria* : the patient has a lack of coordination with finger to nose or heel to shin testing

Bery et al. Medical Clinics of North America. 2025.

CLINICAL VIGNETTE

82yo woman recently put on empagliflozin for diabetes, with recent dysuria completed a course of nitrofurantoin, complains of nearing blackening out episodes. She is mildly disoriented. In addition, she has been nauseous and unable to keep fluid down. Vitals down by nursing staff shows a T38, BP110/70, HR130. What should be the next best step?

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Urosepsis dizzy

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0
Do a Dix-Hallpike

0
Prescribe another course of nitrofurantoin

0
Consider transfer to the hospital if aligned with goals of care

Pre-syncope

PRE-SYNCOPE

near-faint episode that happens just before true syncope (transient loss of consciousness) but stops short of a complete black

“I feel like I was about to pass out”

“Everything went dim and my ears were ringing”

“My vision tunneled and I broke out in a sweat”

TRANSIENT DROP IN GLOBAL CEREBRAL PREFUSION

- Hypotension
  - Orthostasis
  - Hypovolemia/ hemorrhage or bleeds
  - Drugs
  - Autonomic dysfunction
- Cardiac
  - Arrhythmia (slow or fast)
  - Structural heart disease (valvular stenosis, HOCM)
  - Acute coronary syndrome
  - Tamponade
- Pulmonary embolism
- Vasovagal/ Carotid sinus hypersensitivity

SYNCOPE MIMIC

Seizure

Delirium

Hypoxia

metabolic causes

brainstem stroke

AGE RELATED CHANGES PREDISPOSING TO SYNCOPE

Table 1. Age-related and age-associated changes predisposing to syncope.

AGE-RELATED CHANGES	AGE-ASSOCIATED CHANGES
CARDIAC • Δ in autonomic function ↓ Baroreceptor sensitivity ↑ Vascular tone • Blunted ↑ in heart rate response to cough, postural Δ, exercise • ↑ Vascular stiffness • ↓ Coronary vasodilation (↓ endothelial NO) • Impaired diastolic filling (myocyte hypertrophy, ↑ LV afterload) • Impaired LV relaxation due to abnormal Ca handling in SR	• ↑ Incidence of cardiac disease • ↑ Incidence of co-morbid illness • ↑ Use of medication • ↑ Incidence of bed rest and cardiovascular deconditioning • ↑ Incidence of venous insufficiency
NON-CARDIAC • ↓Thirst perception • ↓Ability of kidney to conserve Na and water	

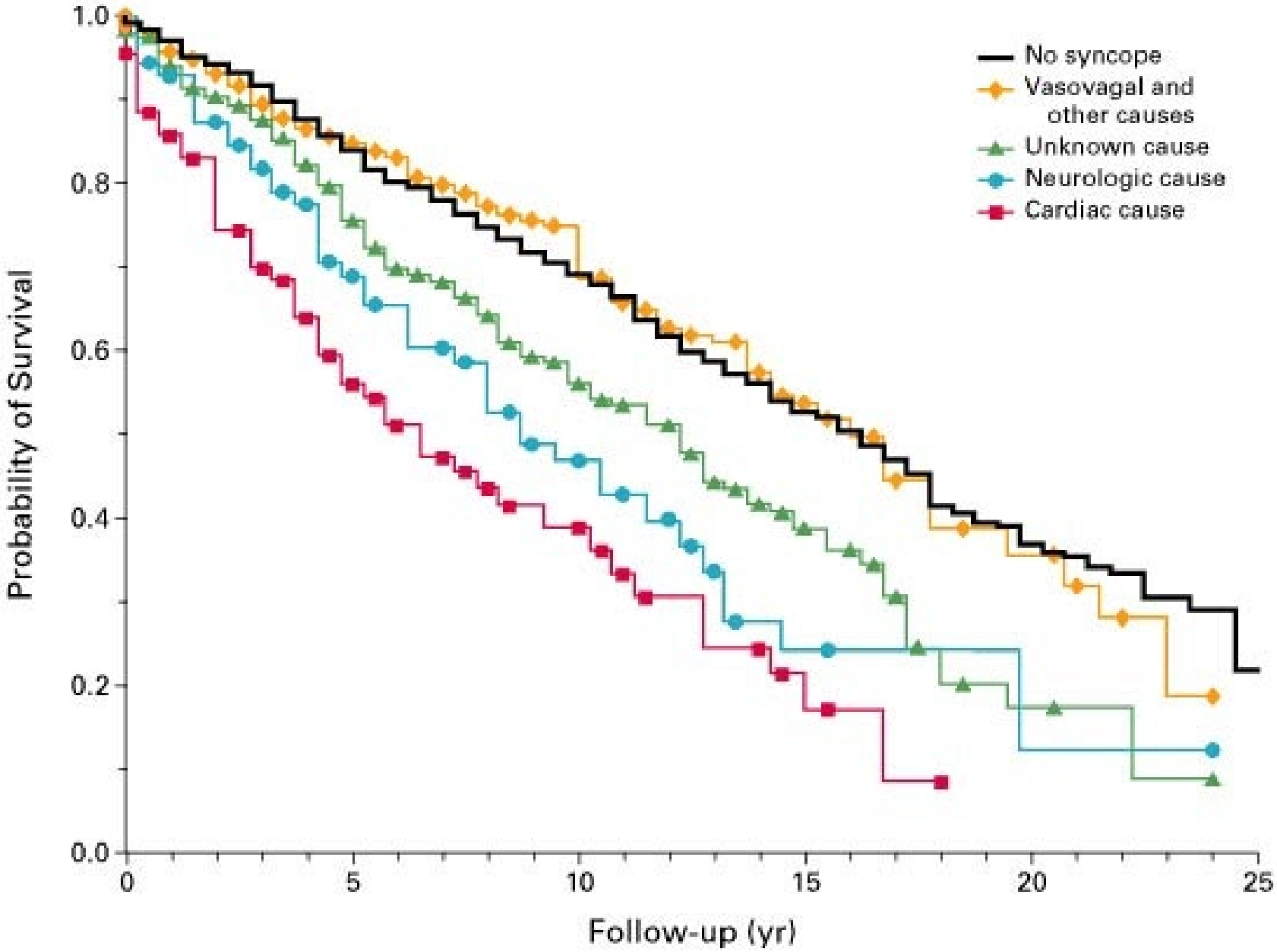
Legend: Δ=change, ↓=decreased, ↑=increased, NO=nitric oxide, LV=left ventricle, Ca=calcium, SR=sarcoplasmic reticulum, Na=sodium.

Didyk et al. Falls, Dizziness, and Syncope in the Very Old. 2004

PROGNOSIS OF SYNCOPE

Soteriades et al. New England Journal Of Medicine. 2002

- 7814 subjects with 822 reported syncope
- Followed for 17 years
- Categorized into 4 major categories
  - Cardiac cause
  - Vasovagal and other cause
    - vasovagal syncope, orthostatic syncope, medication-induced syncope, and syncope due to other identified causes
  - Neurologic cause
    - stroke, transient ischemic attack, and seizure
  - Unknown cause



Soteriades et al. New England Journal Of Medicine. 2002

RISK STRATIFICATION

Costantino et al. European Heart Journal. 2016

Characteristics of syncope:

Low-risk factors	High-risk factors
Only while in standing position	During exertion
Standing from a supine/ sitting position	In supine position
Nausea/ vomiting before syncope	New onset of chest discomfort
Feeling of warmth before syncope	
Triggered by painful/emotionally distressing stimulus	
Triggered by cough/defecation/micturition	

RISK STRATIFICATION

Costantino et al. European Heart Journal. 2016

Factors present in the history of the patient:

Low-risk factors	High-risk factors
Prolonged history (years) of syncope with the same characteristics of the current episode	Family history of sudden death
	Congestive heart failure/ LVEF<35%/ dilated cardiomyopathy/ hypertrophic cardiomyopathy/ ARVC
	Aortic stenosis/ left ventricular outflow tract disease
	Previously documented ventricular arrhythmia/ Previous ICD implantation
	Coronary artery disease/ previous myocardial infarction
	Pulmonary hypertension

RISK STRATIFICATION

Costantino et al. European Heart Journal. 2016

Symptoms, signs, or variables associated with the syncopal episode:

Low-risk factors	High-risk factors
	Anemia (Hb < 90 g/L)
	Lowest systolic blood pressure <90 mmHg
	Sinus bradycardia (<40 bpm)

CLINICAL VIGNETTE

It was June 28, 2021, in the middle of the heat wave and the AC was broken! 85yo man with end stage vascular dementia, longstanding hypertension, who takes valsartan, felodipine, indapamide starts experiencing “feeling off and unsteady”. His BP is 140/90, HR105. What should be the next step?

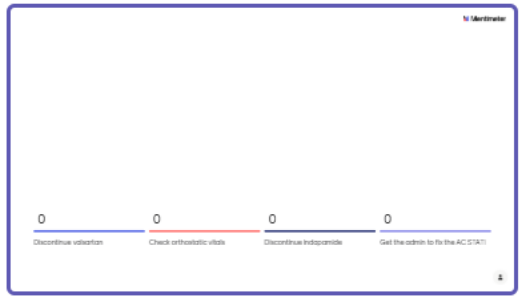
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Heat wave syncope

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Discontinue valsartan	Check orthostatic vitals	Discontinue indapamide	Get the admin to fix the AC STAT!

CLINICAL VIGNETTE

86yo man with hypertension, CHF, severe aortic stenosis reports feeling “faint” and caregiver notices periods of non-responsiveness while sitting in his chart that spontaneously recovers. He is on bisoprolol 10mg and ramipril 10mg. His BP110/60, HR60. What should be the next step?

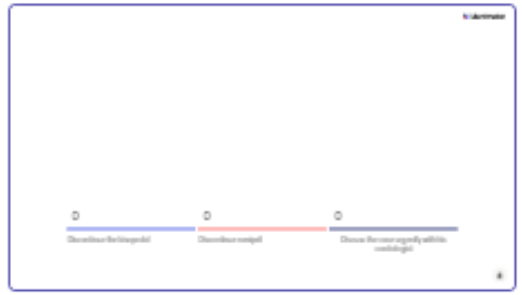
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AS syncope

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0

Discontinue the bisoprolol

0

Discontinue ramipril

0

Discuss the case urgently with his cardiologist

Resistant hypertension

RESISTANT HYPERTENSION

Carey et al. Resistant Hypertension: Detection, Evaluation, and Management: A Scientific Statement From the American Heart Association. Hypertension. 2018.

- BP of a hypertensive patient that remains elevated above goal despite the concurrent use of 3 antihypertensive agents of different classes
- All agents should be administered at maximum or maximally tolerated doses and at the appropriate dosing frequency.

PSEUDO-RESISTANT HYPERTENSION

Poor BP Measurement Technique

Medication non-adherence

White-coat

Under treatment

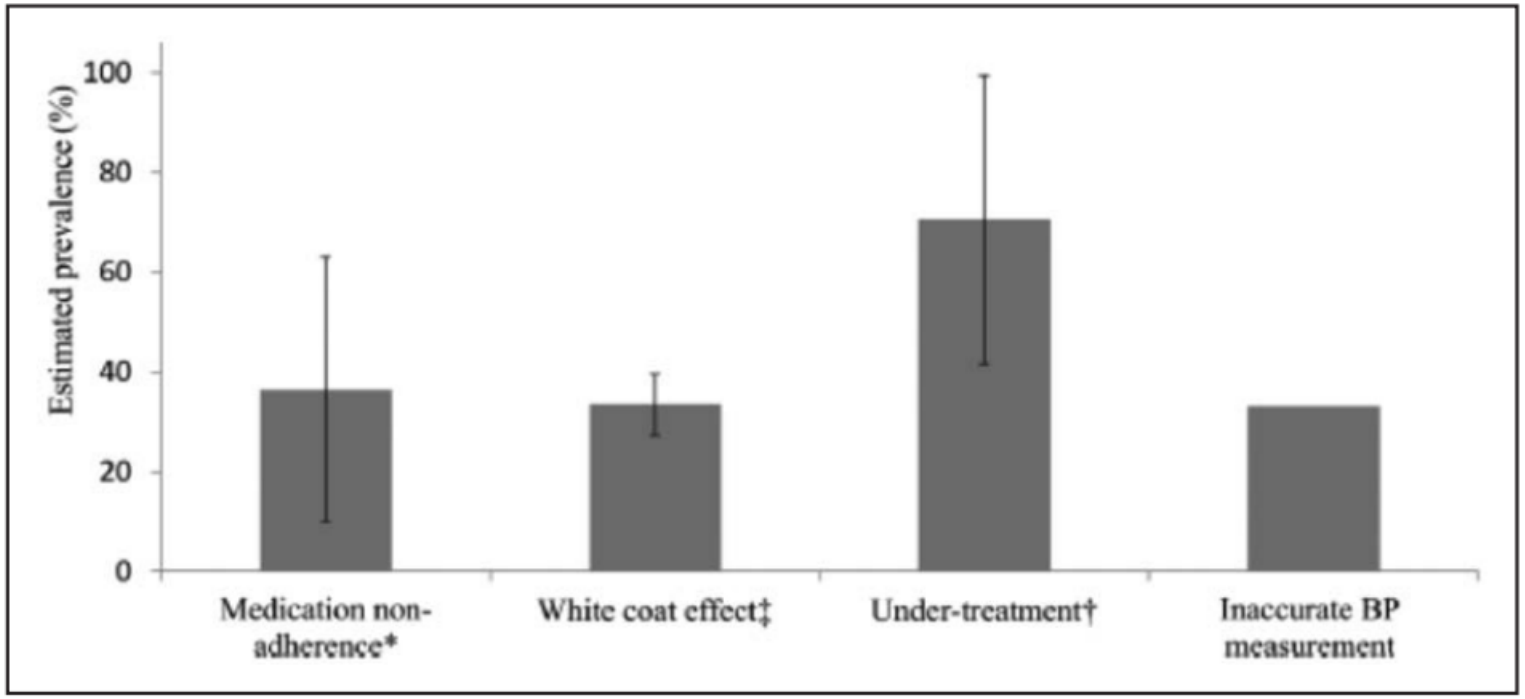


Figure 1. Estimated prevalence of each of the causes of pseudoresistant hypertension. BP indicates blood pressure. Modified from Bhatt et al[140] with permission from the American Society of Hypertension. Copyright © 2016, American Society of Hypertension. *Indicates reference 102. †Indicates references 20 and 140. ‡Indicates references 18, 32, and 145.

Carey et al. Resistant Hypertension: Detection, Evaluation, and Management: A Scientific Statement From the American Heart Association. Hypertension. 2018.

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How much can the systolic BP go up with the following?

1st Talking or active listening

2nd Distended bladder

3rd Cuff over clothing

4th Cuff too small

5th Smoking within 30mins

6th Paralyzed arm

7th Back supported

8th Arm unsupported, sitting

9th Arm unsupported, standing

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How much can the sBP ...

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PROPER BP MEASUREMENT

Table 1. Factors affecting accuracy of blood pressure measure	
Factor	**Magnitude of systolic/ diastolic blood pressure discrepancy (mm Hg)**
Talking or active listening	10/10
Distended bladder	15/10
Cuff over clothing	5–50/
Cuff too small	10/2–8
Smoking within 30 minutes of measurement	6–20/
Paralyzed arm	2–5/
Back unsupported	6–10/
Arm unsupported, sitting	1–7/5–11
Arm unsupported, standing	6–8/

Handler et al. The Permanente Journal. 2009

REVERSIBLE CAUSES

Pain

Agitation/ anxiety

Salt

Alcohol

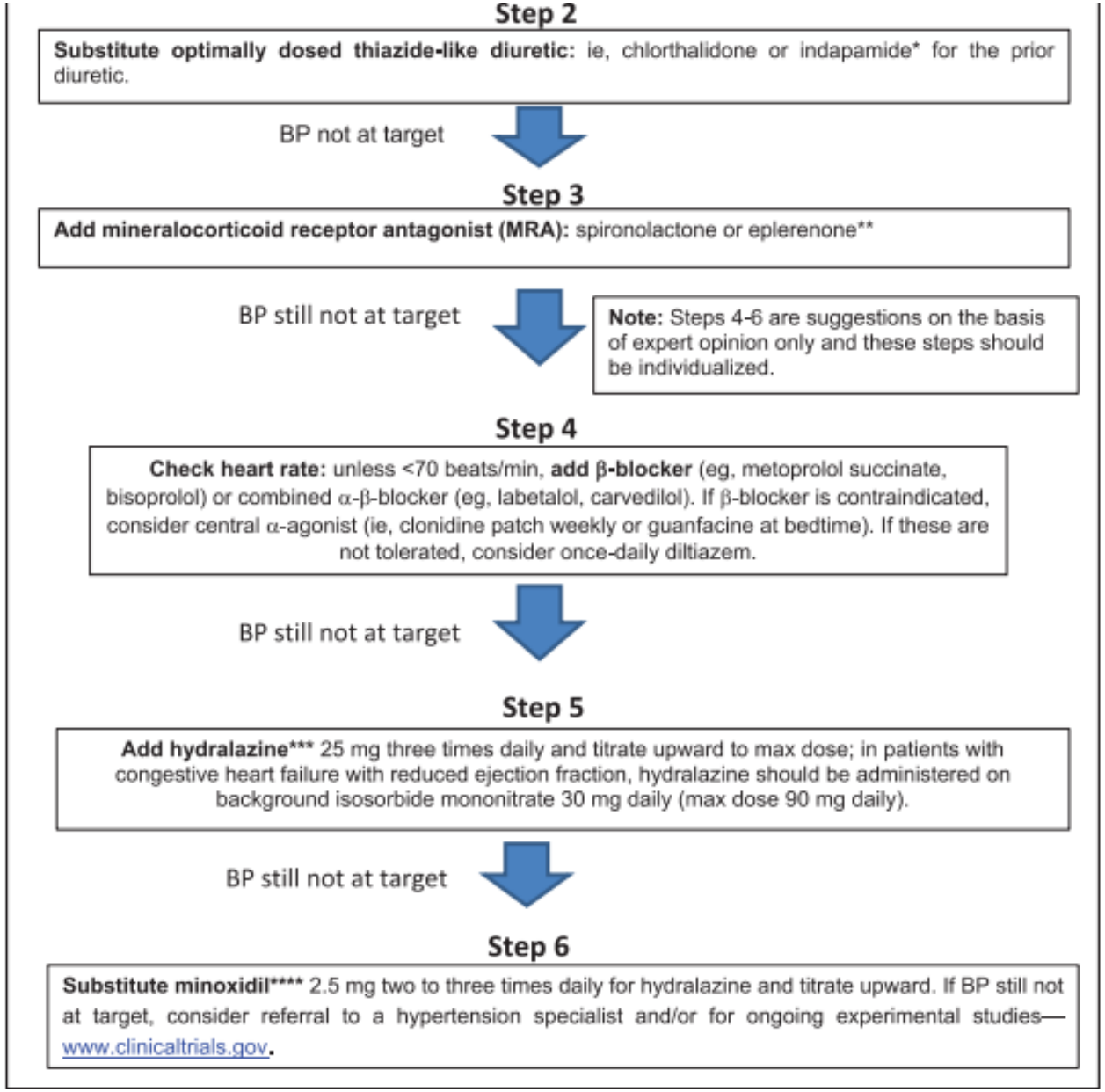
Recent new medications (NSAIDs, steroid, pseudoephedrine)

Volume overload

OPTIONS FOR RESISTANT HYPERTENSION

Assuming not pseudo-resistant hypertension

Assuming reversible causes addressed



Carey et al. Resistant Hypertension: Detection, Evaluation, and Management: A Scientific Statement From the American Heart Association. Hypertension. 2018.

CLINICAL VIGNETTE

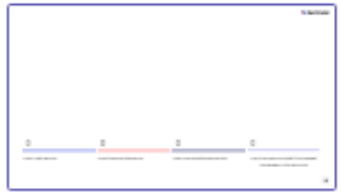
87yo man with hypertension, CHF, ESRD on IHD M/ W/ F has a BP190/90, HR60 consistently the past two days. He is compliant with his regiment of bisoprolol 10mg, ramipril 10mg, amlodipine 10mg. He denies any dyspnea or orthopnea symptoms but does notice pitting edema up to the shins symmetrical, and a weight gain of 5kg over the past week. What should we do next?

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ESRD HTN

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Add Lasix 40mg	Add indapamide 5mg	Add hydralazine 25mg qid	Call the Nephrologist to suggest increased fluid removal

CLINICAL VIGNETTE

89yo woman with end stage Alzheimer dementia and hypertension, is on amlodipine 10mg, indapamide 5mg, candesartan 16mg bid. Nursing staff noticed that at night time, BP is consistently high 180/90 whereas daytime BP is 140/70. In the evenings, her confusion and agitation is also more pronounced. What should be the next step?

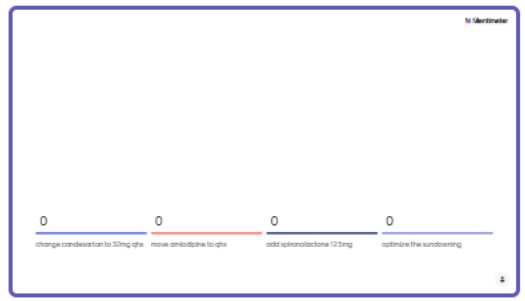
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Alzheimer HTN

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change candesartan to 32mg qhs	move amlodipine to qhs	add spironolactone 12.5mg	optimize the sundowning

CLINICAL VIGNETTE

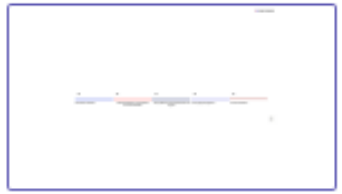
82yo man with longstanding Parkinson's Disease and related autonomic dysfunction causing orthostasis, has a consistent BP190/90 at night in bed. During the day, especially when he gets up to standing, his BP drops to 100/70. He is on midodrine tid. What should we do?

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Parkinson's

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0	0	0	0	0
Discontinue midodrine	Avoid administration of midodrine few hours before bedtime	Sleep with head of bed raised to 30 to 45 degrees	Add captopril at night time	Increase salt intake

Summary/ Key Take-Home Messages 1

- Clarify “I’m dizzy.” but don’t overly rely on patient’s description
- Screen for “can’t-miss” diagnoses first. Look for Red-flags
- Use the TiTRATE framework (Timing, Triggers, And Targeted Exam)

Summary/ Key Take-Home Messages 2

- Presyncope ≠ benign
- Think hypotension/orthostasis, volume loss, drugs, and cardiac causes (arrhythmia, structural, ACS, PE, tamponade)
- Risk-stratify based on history

Summary/ Key Take-Home Messages 3

- Resistant hypertension: verify before you intensify.
  - Confirm accurate BP
- Exclude pseudo-resistance
- Address reversible factors

REFERENCES

1. Caplan LR. Imprecision in patient reports of dizziness symptom quality. Mayo Clin Proc. 2007;82(11):1329–40.
2. Tinetti ME, Williams CS, Gill TM. Dizziness among older adults: a possible geriatric syndrome. Ann Intern Med. 2000;132(5):337–44.
3. Colledge NR, Wilson JA, Macintyre CC, MacLennan WJ. The prevalence and characteristics of dizziness in an elderly community. Age Ageing. 1994;23(2):117–20.
4. Maarsingh OR, Dros J, Schellevis FG, et al. Causes of persistent dizziness in elderly patients in primary care. Ann Fam Med. 2010;8(3):196–205.
5. Newman-Toker DE, Edlow JA. TiTrATE: a novel, evidence-based approach to diagnosing acute dizziness and vertigo. Neurol Clin. 2015;33(3):577–99, viii.
6. Jeong SS, Simpson KN, Johnson JM, Rizk HG. Acute dizziness and vertigo in the emergency department. Front Stroke. 2024;[Epub ahead of print].
7. Bery AK. Evaluation of Acute Dizziness and Vertigo. In: Medical Clinics of North America. Philadelphia: W.B. Saunders; 2025.
8. Didyk A, et al. Falls, dizziness, and syncope in the very old. In: Falls, Dizziness, and Syncope in the Very Old. New York: Springer; 2004. Chapter 6.
9. Soteriades ES, Evans JC, Larson MG, Chen MH, Chen LC, Levy D. Incidence and prognosis of syncope. N Engl J Med. 2002 Sep 19;347(12):878–85.
10. Costantino G, et al. Syncope clinical management in the emergency department: a consensus from the first international workshop on syncope risk stratification in the emergency department. Eur Heart J. 2016.
11. Carey RM, et al. Resistant hypertension: detection, evaluation, and management: a scientific statement from the American Heart Association. Hypertension. 2018.
12. Handler J. The Importance of Accurate Blood Pressure Measurement. Perm J. 2009;13(3).