

Syncope

“A Symptom not a Diagnosis”

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Objectives

- **Define**
- **Review Impact**
- **Review Initial evaluations**
- **Risk Stratification**
- **Review Categories of syncope**
- **Review Work-up & Additional Studies**

Syncope



“A symptom that presents with an abrupt, transient, complete loss of consciousness, associated with inability to maintain postural tone with rapid and spontaneous recovery.” ¹

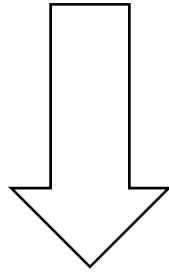
Impact

- **40% will experience syncope in his/her lifetime ²**
- **5% of hospital admissions ³**
- **1% of emergency room visits per year ³**

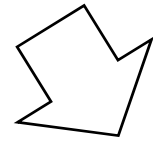


Syncope

Neurally Mediated



Orthostatic
Hypotension

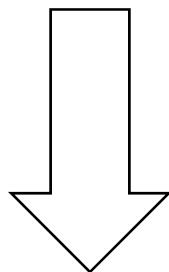


Cardiac
Syncope

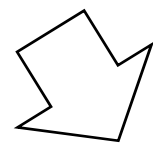
Syncope

Neurally Mediated

- Vasovagal
- Situational
- Carotid Sinus Hypersensitivity



Orthostatic
Hypotension



Cardiac
Syncope

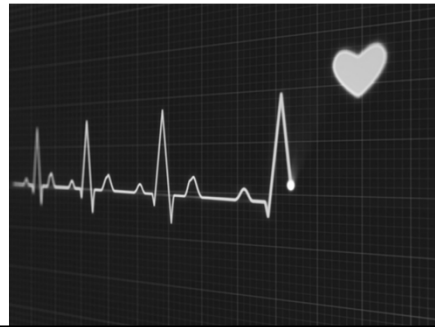
A Patient presents with Syncope. Now what?



Take a good history!

- **“5 P’s”**
 - **Precipitants**
 - **Prodrome**
 - **Palpitations**
 - **Position**
 - **Post-event Phenomena**
- **Appearance**
- **Abnormal Movements**
- **Eyes open or closed**
- **Mental State**
- **Incontinence/Tongue Biting**
- **Chronic medical issues**
- **Family history of SCD**
- **Ingestions/Medications**

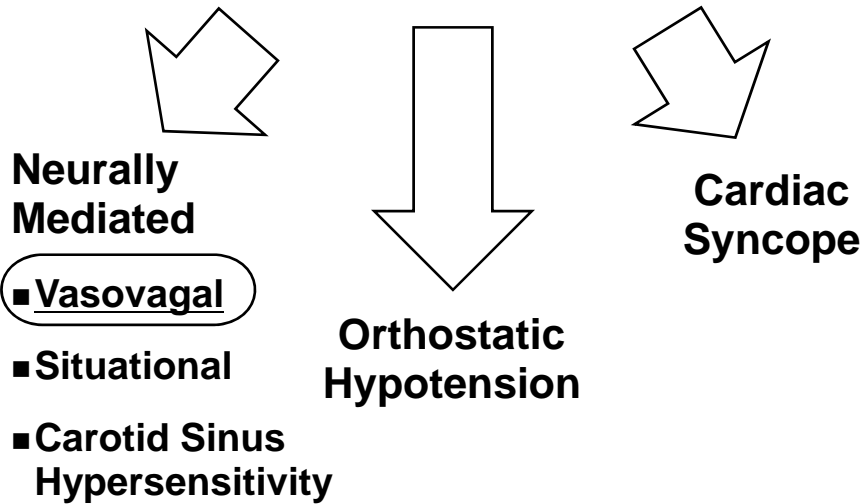
Diagnostic Workup



Quick Review

- **Standard Diagnostic Work-up for Syncope**
 - **Comprehensive history**
 - **Review of medications**
 - **Detailed physical examination**
 - **Including Cardiac & Neurology examination**
 - **Orthostatic blood pressure measurements**
 - **ECG**

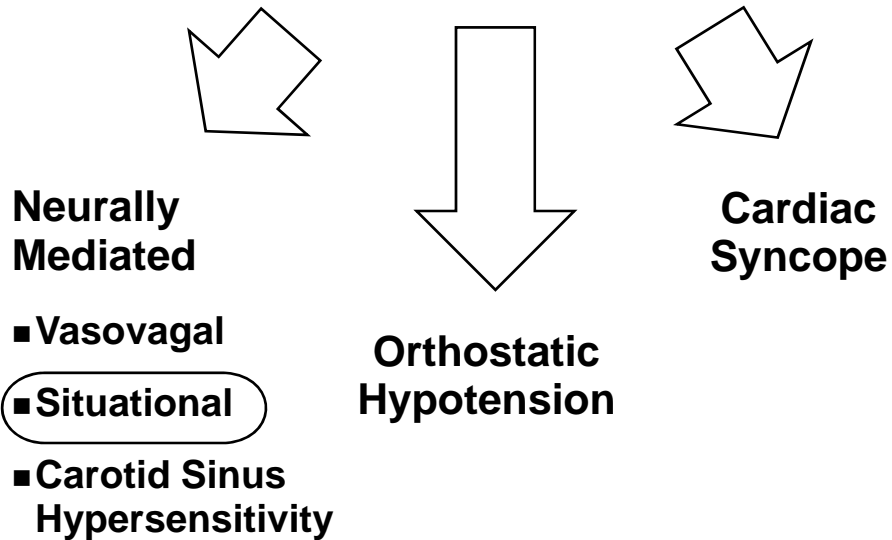
Syncope



Neurally Mediated: Vasovagal

- Occurs in warm or crowded conditions
- Emotional Distress, Pain, or Fear
- Prodrome: Lightheadedness, blurred vision, dizziness
- Occurs after exertion
- Brief Disorientation following event
- History of Recurrent Syncope
- No history of Heart Disease

Syncope



Neurally Mediated: Situational

- Occur during:
 - Coughing
 - Urinating
 - Defecating
 - Laughing
 - After a heavy meal

Syncope



The diagram is titled 'Syncope' at the top. Below the title, there are three main categories of syncope, each with a corresponding arrow pointing towards it. On the left, a left-pointing arrow points to 'Neurally Mediated'. In the center, a large downward-pointing arrow points to 'Orthostatic Hypotension'. On the right, a right-pointing arrow points to 'Cardiac Syncope'. Under 'Neurally Mediated', there is a list of three items: 'Vasovagal', 'Situational', and 'Carotid Sinus Hypersensitivity' (which is enclosed in an oval). 'Orthostatic Hypotension' is listed below the central arrow. 'Cardiac Syncope' is listed to the right of the right-pointing arrow.

Neurally Mediated

- Vasovagal
- Situational
- Carotid Sinus Hypersensitivity

Orthostatic Hypotension

Cardiac Syncope

Neurally Mediated: Carotid Hypersensitivity

- Occur with:
 - Head movements
 - During Shaving
 - A Tight Collar

Syncope



The diagram is enclosed in a rectangular box. At the top, the word 'Syncope' is centered in a large, bold, black font. Below this, the box is divided into three sections. On the left, the text 'Neurally Mediated' is followed by a bulleted list of three items: 'Vasovagal', 'Situational', and 'Carotid Sinus Hypersensitivity'. In the center, a large, hollow downward-pointing arrow points to a rounded rectangular box containing the text 'Orthostatic Hypotension'. On the right, the text 'Cardiac Syncope' is displayed. Above the 'Neurally Mediated' text is a hollow arrow pointing towards the center. Above the 'Cardiac Syncope' text is a hollow arrow pointing towards the center.

Neurally Mediated

- Vasovagal
- Situational
- Carotid Sinus Hypersensitivity

Orthostatic Hypotension

Cardiac Syncope

Orthostatic Hypotension

- Change in posture or standing after prolonged sitting
- History of diabetes, alcohol use, Parkinson's
- History of new or adjusted medication/anti-hypertensive
- Recent history of volume loss

Syncope



The diagram shows three categories of syncope branching from a central point. On the left, 'Neurally Mediated' is accompanied by a left-pointing arrow. In the center, 'Orthostatic Hypotension' is accompanied by a downward-pointing arrow. On the right, 'Cardiac Syncope' is accompanied by a right-pointing arrow and is enclosed in a rounded rectangle.

Neurally Mediated

- Vasovagal
- Situational
- Carotid Sinus Hypersensitivity

Orthostatic Hypotension

Cardiac Syncope

Cardiac Syncope

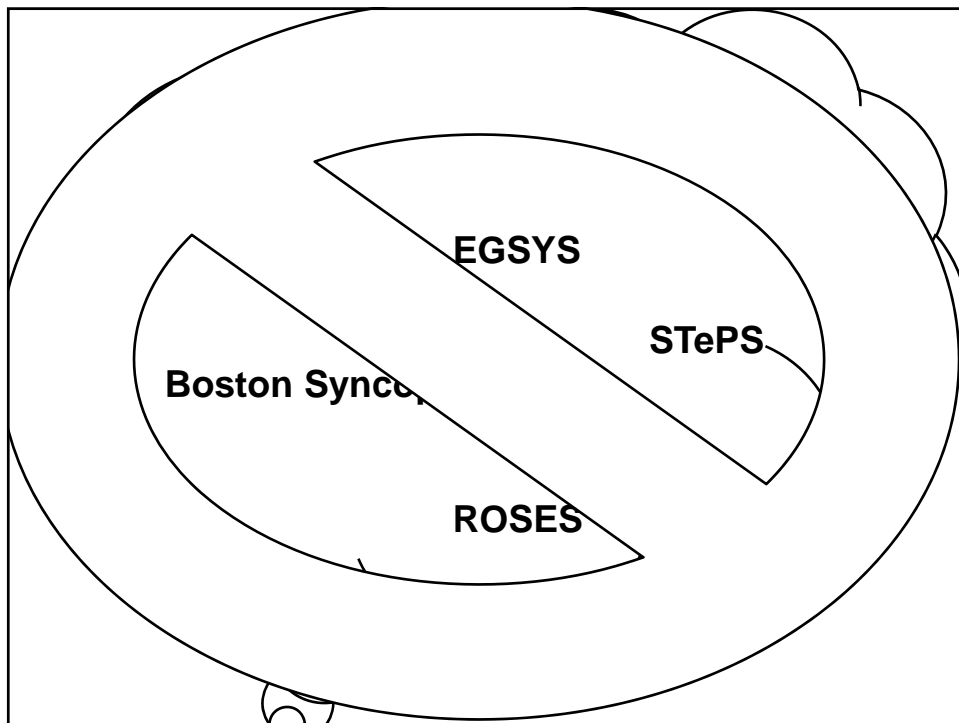
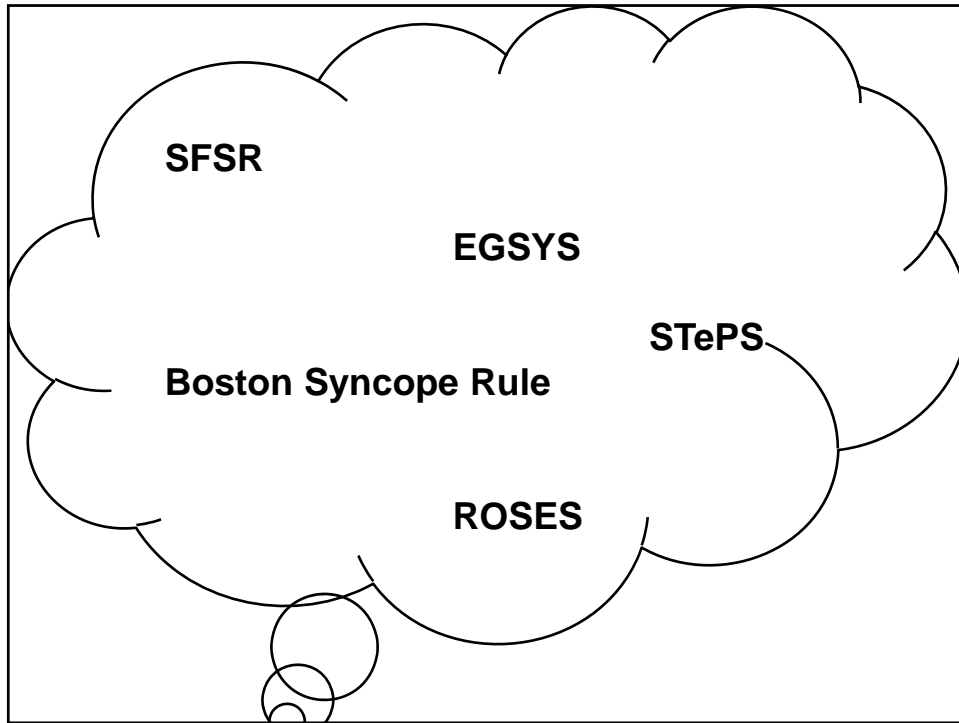
- Occurs during exercise
- Occurs when Supine
- Accompanied or followed by chest pain
- Palpitations or no prodrome
- History of heart disease
- Family history of Sudden Cardiac Death
- Abnormal EKG

Back to the Case

- **20 year old Male Student Athlete**
- **Syncope during football practice**
- **Was pushing a 300 lb weighted sled when he syncope**
- **Had tunnel vision and nausea prior to event**
- **Orthostatic vitals are negative**
- **EKG is without abnormalities**

Triage – Now What?

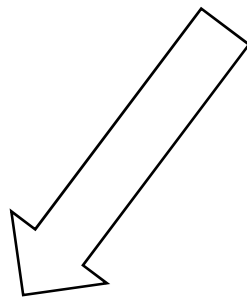




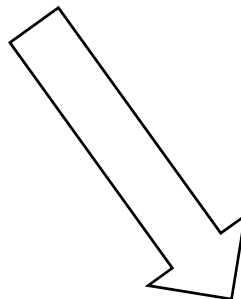
Admit or Not?

- **Cardiac Arrhythmic Conditions**
 - Sustained or symptomatic VT
 - Conduction system disease
 - Pauses not due to neurally mediated syncope
 - ICD/PPM malfunctions
- **Cardiac/Vascular non-arrhythmic conditions**
 - Ischemia
 - Severe AS
 - Cardiac Tamponade
- **Non-cardiac conditions**
 - PE
 - Aortic Dissection

Admitted



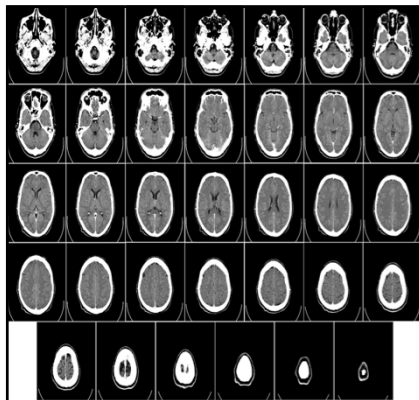
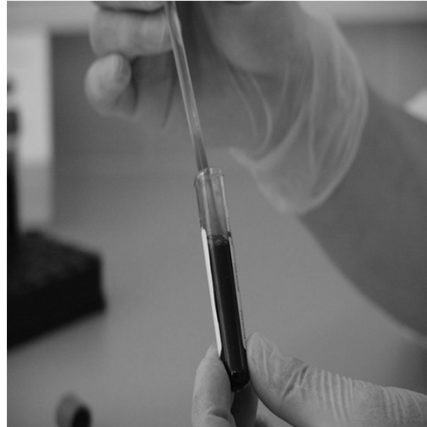
Labs

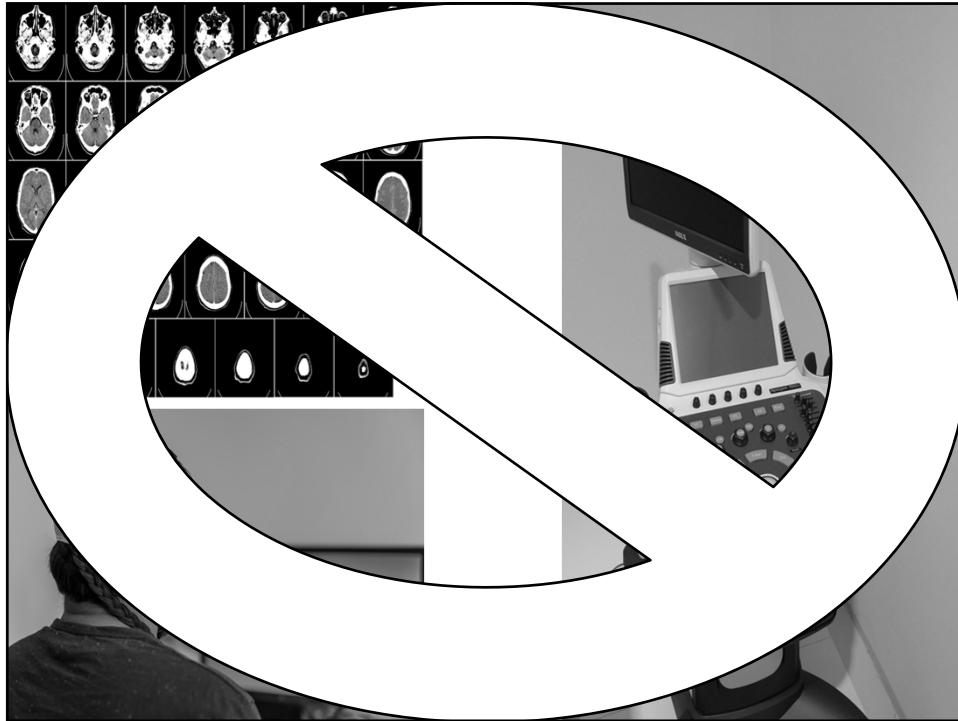


**Imaging/Further
Testing**

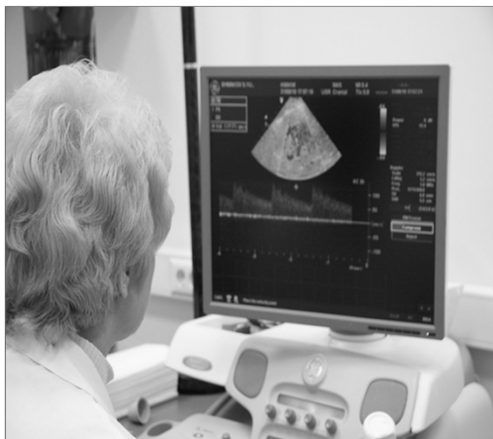
Labs

- Do Not routinely order comprehensive bloodwork
- Do order targeted blood work
- Unclear if patients with possible cardiac syncope benefit from:
 - BNP
 - Troponin





Echo



- **Do Not routinely order cardiac imaging**
- **Do order Echo if suspecting**
 - **Valvular disease**
 - **HCM**
 - **LV Dysfunction**

Other Imaging Modalities

CT

- Pulmonary Embolism

MRI

- Arrhythmogenic Right ventricular Cardiomyopathy
- Sarcoidosis



Stress Testing

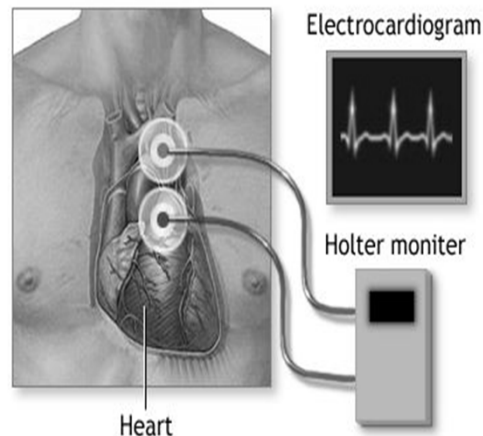
- If concern for ischemia
- Use Caution or seek Consultative services prior to stress for:
 - Structural lesions
 - Anomalous coronary arteries with pulmonary hypertension
 - Channelopathies
 - VT

Cardiac Monitoring

- **Admitted + Suspected Cardiac Syncope = Continuous Cardiac monitor**
- **Outpatient Cardiac Monitors - Multiple types**
 - **Holter**
 - **Event Monitor**
 - **External Loop Recorder**
 - **Patch**
 - **Mobile Cardiac Outpatient Telemetry**
 - **ICM**

Holter Monitor

- **24-72 hours of continuous recording**
- **Requires patient diary**
- **For patients with frequent symptoms**



Event Monitor

- 2-6 weeks of use
- Patient Triggered
- Can transmit via analog phone line or Wi-Fi
- Not suited for patients with sudden incapacitation

External Loop Recorder

- 2-6 weeks of use
- Patient activated or Auto-triggered
- Records prior to, during, and after being triggered



Patch Recorders

- 7-14 days of use
- Patient activated or auto-triggered
- Leadless & water-resistant
- Only records 1 lead



Mobile Cardiac Outpatient Telemetry

- 30 days of use
- Auto-transmits data to central monitoring station
- Provides real-time feedback loop with healthcare
- Great for patient with sudden incapacitation

Implantable Cardiac Monitoring

- 2-3 years of use
- Triggered by Patient/Family
- Automatically detect significant arrhythmias
- Best for recurrent, but infrequent, unexplained syncope



EP Study

- Do Not perform in patients with normal EKG & normal cardiac structure/function
- Do perform in patients with syncope & suspected arrhythmic etiology

Tilt-Table Testing

- **Grade 2A recommendation when initial workup is non-diagnostic to:**
 - **Diagnose Vasovagal syncope**
 - **Diagnose Delayed Orthostatic Hypotension**
 - **Differentiate Convulsive Movements from Epilepsy**
 - **Establish a Diagnosis of Pseudo-syncope**
- **Not recommended to predict medical response to treatment**

Treatment - Vasovagal

- **Education**
 - **Regarding Diagnosis**
 - **Avoidance of Triggers**
- **Increase Salt and Fluid intake**
- **Medications**
 - **Midodrine**
 - **Fludrocortisone**
 - **SSRI**
 - **Beta-Blocker**

Treatment - Situational

- **Education**
 - **Regarding Diagnosis**
 - **Avoidance of Triggers**
- **Increase Salt and Fluid intake**

Treatment – Carotid Sinus Hypersensitivity

- **Limited Non-invasive Treatment Options**
- **Consider Permanent Cardiac Pacing**

Treatment – Orthostatic Hypotension

- **Education**
 - **Regarding Diagnosis**
- **Increase Salt and Fluid intake**
- **Perform physical counter-pressure measures**
- **Compression Garments**
- **Medications**
 - **Midodrine**
 - **Fludrocortisone**
 - **Droxidopa**
 - **Pyridostigmine**
 - **Octeotride**

Treatment – Cardiac Syncope

- **Education**
 - **Regarding Diagnosis**
- **Treat the underlying cause**



Do's and Don't



- **Do every time:**
 - H&P, Postural Blood Pressure, EKG
- **Try to avoid:**
 - EEG, Cardiac Enzymes, Head CT, Carotid US
- **Other testing as indicated based on findings**
 - Try to avoid the shot gun approach



Echocardiogram



- **Do order if suspecting :**
 - **valvular disease, HCM, LV dysfunction**
- **Try to avoid:**
 - **Routine ordering without suspicion of cardiac syncope**



Advanced Cardiac Testing



- **Do order:**
 - **Stress Test or LHC if suspecting ischemia**
 - **Prolonged Cardiac monitoring if suspecting arrhythmia**
 - **EP study if suspecting arrhythmia**
 - **Tilt Table Test for diagnostic dilemma or if it will affect treatment**
- **Try to avoid:**
 - **Stress Testing if no worry for ischemia**
 - **EP study in patients with normal EKG & normal cardiac function/structure**
 - **Tilt Table tests to predict medical response to treatment**

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