Syncope
“A Symptom not a Diagnosis”

Vijay Duggirala, MD
Assistant Professor-Clinical
Department of Internal Medicine
Division of Hospital Medicine
The Ohio State University Wexner Medical Center

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.”

Impact

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

Neurally Mediated

Orthostatic Hypotension

Cardiac 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
- Situational
- Carotid Sinus Hypersensitivity

Orthostatic Hypotension

Cardiac 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
- Vasovagal
- Situational
- Carotid Sinus Hypersensitivity

Orthostatic Hypotension

Cardiac Syncope

Neurally Mediated: Situational

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

Neurally Mediated
- Vasovagal
- Situational

Orthostatic Hypotension
- Carotid Sinus Hypersensitivity

Cardiac Syncope

Neurally Mediated: Carotid Hypersensitivity

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

Neurally Mediated
- Vasovagal
- Situational
- Carotid Sinus Hypersensitivity

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**

Neurally Mediated
- Vasovagal
- Situational
- Carotid Sinus Hypersensitivity

Orthostatic Hypotension

**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 syncopized
- 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

<table>
<thead>
<tr>
<th>CT</th>
<th>MRI</th>
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<tbody>
<tr>
<td>Pulmonary Embolism</td>
<td>Arrhythmogenic Right ventricular Cardiomyopathy</td>
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<tr>
<td></td>
<td>Sarcoidosis</td>
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### 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
- Trigged 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
References