Syncope

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Defining Syncope

*Transient LOC*

- Global cerebral hypoperfusion
- Loss of postural tone
- Rapid onset
- Short duration
- Complete and spontaneous recovery
- Bimodal prevalence: 10-30 yo; > 65yo
Syncope is NOT...

- There should not be clinical features of other nonsyncope causes of LOC such as seizure, antecedent head trauma, or apparent LOC (i.e., pseudosyncope)

[ESC. Eur Heart J 2009]
Pre-Syncope

• Symptoms before syncope, could progress to syncope, or it could abort without syncope.

Symptoms may include:
• Extreme lightheadedness
• Visual sensations, such as “tunnel vision” or “graying out”
• Variable degrees of altered consciousness without complete loss of consciousness
# Non-Cardiac causes of Syncope

<table>
<thead>
<tr>
<th>Classification of syncope</th>
<th>Synonyms and suggested diagnoses</th>
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<tbody>
<tr>
<td>Neurally mediated syncope:*</td>
<td>Reflex syncope, neurocardiogenic syncope, neurocardiovascular syncope, neurogenic syncope</td>
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<tr>
<td>Vasovagal syncope</td>
<td>Simple faint, swoon, vasovagal attack, vasodepressor syncope, reflex anoxic seizures</td>
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<tr>
<td>Situational syncope</td>
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<tr>
<td>Needle or blood phobia</td>
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<tr>
<td>Respiratory (cough, sneeze) syncope</td>
<td>Cough syncope</td>
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<tr>
<td>Urinary (micturition) syncope</td>
<td>Micturition syncope, postmicturition syncope</td>
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<tr>
<td>Gastrointestinal (defecation, swallowing, visceral pain) syncope</td>
<td>Defecation syncope, deglutition syncope, swallow syncope, syncopal dysphagia</td>
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<tr>
<td>Postexertional syncope</td>
<td>Exercise syncope</td>
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<tr>
<td>Postprandial syncope</td>
<td>Postprandial hypotension</td>
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<tr>
<td>Laughter syncope</td>
<td>Laugh or laughter induced syncope, gelastic syncope</td>
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<tr>
<td>Valsalva induced (for example, weightlifting, brass instrument playing) syncope</td>
<td>Weightlifter’s syncope; trumpet blower’s syncope</td>
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<tr>
<td>Carotid sinus syndrome</td>
<td>Carotid sinus syncope</td>
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<tr>
<td>Carotid sinus hypersensitivity with syncope</td>
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<tr>
<td>Orthostatic hypotension:</td>
<td></td>
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<tr>
<td>Primary autonomic failure</td>
<td>Pure autonomic failure, Bradbury-Eggleston syndrome, idiopathic orthostatic hypotension, multiple systems atrophy, Shy-Drager syndrome, Parkinson’s plus syndromes</td>
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<tr>
<td>Secondary autonomic failure</td>
<td>Autonomic neuropathy (for example, diabetic, alcohol related, and amyloid)</td>
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<tr>
<td>Volume depletion</td>
<td>Diuretics, dehydration, haemorrhage, addisonism</td>
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*All may have vasodepressor, cardioinhibitory, and mixed components.
ED Evaluation

• Starts with H & P and EKG
• Rule in/out dangerous causes
• Certain cause ID in ED
• Uncertain cause after ED evaluation
• Assess prognostic risk for disposition decision
Dangerous Causes of Syncope

**Cardiac:** Brady/tachydysrhythmias, AMI, structural heart disease, valvular disease

**Circulatory:** Aortic dissection, PE, GIB, ruptured AAA, ruptured ectopic

**Neurologic:** SAH, TIA/CVA
Figure 1. Syncope Initial Evaluation

- Transient loss of consciousness*
  
  - Suspected syncope
    - No: Evaluation as clinically indicated
    - Yes: Initial evaluation: history, physical examination, and ECG (Class I)
      
      - Cause of syncope certain
      - Risk assessment
      - Cause of syncope uncertain
        - Further evaluation
        - Treatment
Who should go to the OU?

- Evidence for Intermediate risk pts
- Physician judgment part of RCTs
- Require further monitoring or testing to rule in/rule out a serious diagnosis
- Require further treatment for suspected syncope cause – ex. Orthostatic pts, medication effects/changes
- **Should not go to CDU: High risk and Low Risk with no f/u concerns**
Evidence for Protocol-driven OU

Prospective and randomized (OU vs standard care)

- [Prospective cohort study]: Numeroso F. Short-term prognosis and current mgmt of syncopal pts at intermediate risk: results of IRiS study. AcadEmergMed 2016;23:941
Intermediate RF

• ≥50 years of age
• PMH of cardiac disease
• Cardiac device without dysfunction
• Concerning but not high risk EKG findings
• Family history of early SCD
• Symptoms not consistent with reflex-mediated syncope
• Physician judgment
Physician Judgement - Considerations

- Suspicion for cardiac syncope – exertional, supine, palpitations
- Risk of injury +/- have poor follow-up
  - Absence of prodrome esp in older pts
  - Recurrent syncope
  - With clinical injury
Initial Evaluation: H & P, EKG

History
• Aim to identify prognosis, diagnosis, reversible or ameliorable factors, comorbidities, med use, PMH

Physical Exam
• Orthostatics: lying/sitting/immed standing/after 3 min upright
• Cardiac auscultation
• Neuro exam: focal defects/abnormalities needing further eval

EKG
• No conclusions re: prognostic value of abnl EKG
Table 4. Historical Characteristics Associated With Increased Probability of Cardiac and Noncardiac Causes of Syncope (60,67-75)

<table>
<thead>
<tr>
<th>More Often Associated With Cardiac Causes of Syncope</th>
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<tbody>
<tr>
<td>Older age (&gt;60 y)</td>
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<tr>
<td>Male sex</td>
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<tr>
<td>Presence of known ischemic heart disease, structural heart disease, previous arrhythmias, or reduced ventricular function</td>
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<tr>
<td>Brief prodrome, such as palpitations, or sudden loss of consciousness without prodrome</td>
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<tr>
<td>Syncope during exertion</td>
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<tr>
<td>Syncope in the supine position</td>
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<tr>
<td>Low number of syncope episodes (1 or 2)</td>
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<tr>
<td>Abnormal cardiac examination</td>
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<tr>
<td>Family history of inheritable conditions or premature SCD (&lt;50 y of age)</td>
</tr>
<tr>
<td>Presence of known congenital heart disease</td>
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<tr>
<td>More Often Associated With Noncardiac Causes of Syncope</td>
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<tr>
<td>---------------------------------------------------------</td>
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<tr>
<td>Younger age</td>
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<tr>
<td>No known cardiac disease</td>
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<tr>
<td>Syncope only in the standing position</td>
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<tr>
<td>Positional change from supine or sitting to standing</td>
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<tr>
<td>Presence of prodrome: nausea, vomiting, feeling warmth</td>
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<tr>
<td>Presence of specific triggers: dehydration, pain, distressful stimulus, medical environment</td>
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<tr>
<td>Situational triggers: cough, laugh, micturition, defecation, deglutition</td>
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<td>Frequent recurrence and prolonged history of syncope with similar characteristics</td>
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Orthostatics

• Drop in SBP $\geq 20\text{mmHg}$ or DBP $\geq 10\text{mmHg}$ or SBP $<90\text{mmHg}$ within 3 min of standing

• Clinically important if original symptoms are reproduced during active or passive standing

• HR should rise with standing:
  - Rise $>30 \text{ bpm}$ or rate $>120 \text{ bpm}$ diagnostic of postural orthostatic tachycardia syndrome
  - Lack of HR response suggests autonomic failure, rate-limiting drugs or chronotropic incompetence
EKG – Look out for these...

• Bradyarrhythmia - sinus pauses, high-grade AV Blocks, ventricular tachyarrhythmia

• Brugada, Long QT Syndrome, Wolff Parkinson White, Hypertrophic Cardiomyopathy
Name that Block...
WPW

Type A: Dominant R wave in VI

Type B: Dominant S wave in VI
Bad Ones Not to Miss...

**Hypertrophic Cardiomyopathy**: deep, narrow (“dagger-like”) Q waves in the lateral (V5-6, I, aVL) and inferior (II, III, aVF) leads.
Signs that Cause of Syncope may be Serious

**Cause**

**Cardiac:** Brady/tachydysrhythmias, AMI, structural heart disease, valvular disease

**Circulatory:** Aortic dissection, PE, GIB, ruptured AAA, ruptured ectopic

**Neurologic:** SAH, TIA/CVA

**Signs**

- An abnormal EKG
- Positive Troponin
- Persistent abnormal Vital Signs
- Evidence of Bleeding
- Altered Mental Status
## Risk Assessment

### Short-Term Risk Factors (≤30 d)

**History: Outpatient Clinic or ED Evaluation**

<table>
<thead>
<tr>
<th>Factor</th>
<th>References</th>
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<tbody>
<tr>
<td>Male sex</td>
<td>74, 85, 101, 102</td>
</tr>
<tr>
<td>Older age (&gt;60 y)</td>
<td>88</td>
</tr>
<tr>
<td>No prodrome</td>
<td>68</td>
</tr>
<tr>
<td>Palpitations preceding loss of consciousness</td>
<td>83</td>
</tr>
<tr>
<td>Exertional syncope</td>
<td>83</td>
</tr>
<tr>
<td>Structural heart disease</td>
<td>70, 83, 88, 101, 103</td>
</tr>
<tr>
<td>HF</td>
<td>74, 83, 85, 88</td>
</tr>
<tr>
<td>Cerebrovascular disease</td>
<td>70</td>
</tr>
<tr>
<td>Family history of SCD</td>
<td>70</td>
</tr>
<tr>
<td>Trauma</td>
<td>68, 101</td>
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Syncope OU Management PRN

• Telemetry - ALL
• Serial VS, Orthostatics - ALL
• IVF hydration
• Laboratory studies, imaging (CT, MRI)
• Cardiac studies: echo +/- bubble study, stress echo stress test
• Consults: Cardiology, Electrophysiology, Neurology
**Echocardiogram**

- Useful when concerned about presence of valvular disease (e.g. AS), HCM, or LV dysfunction

- Indications: **Positive cardiac hx, concerning Physical exam (e.g. murmur)** and/or abnormal ECG

- Echo with bubble study if < 55yo and unexplained syncope (ex. No PMH of cardiac disease)
Stress testing

• Indications: *Syncope with exertion*

• Exertion can result in syncope in a variety of conditions: structural lesions – Hypertrophic CM, Aortic Stenosis, pulmonary HTN, V-tach

• Want to reproduce symptoms or evaluate the hemodynamic response to exertion
Echocardiogram Indications

**Transthoracic Echocardiogram if:**
- Abnormal cardiac exam (murmur)
- Abnormal ECG
- History of cardiac disease

**Stress echo if:**
- Syncope with exertion or suspicion for cardiac ischemia
Tilt Table Testing Indications Class IIa

• Unexplained syncope in high risk setting (risk of injury, occupation)
• Tilt-table testing can be useful for patients with syncope and suspected delayed OH when initial evaluation is not diagnostic
• If the diagnosis is unclear after initial evaluation, TTT can be useful for patients with suspected VVS
• Recurrent episodes when cardiac causes have been ruled out
Consults or Follow-up: Cardiology, EP, Neurology

- Patients with recurrent syncope, unexplained falls and negative CDU evaluation
- Clinical or ECG features suggestive of arrhythmic syncope
- Holter monitor (24-48 h), event recorders (30 - 60 days, implantable loop recorders (2-6 wks, mos), AICD (esp with low EF)
- Suspicion for vertebrobasilar TIA, severe bilateral carotid artery disease, neuro s/s
Take-Home Points

• Everyone get a good H & P, EKG and Orthostatics
• R/o life-threatening causes in ED
• Intermediate Risk Patients good for CDU
• Echo only if abnormal EKG or cardiac exam or PMH CV disease (bubble if <55yo and no cause ID)
• Stress echo if exertional syncope
• Many need only 6-8 hours of tele-monitoring in CDU to r/o arrhythmia