Syncope Guidelines
What’s new?

October 19th 2017
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Consultant Electrophysiologist - Mafraq Hospital
Case Presentation

• 35 Male presented with sudden loss of consciousness
• Fell from standing on his face fracturing 3 front teeth
• Symptoms were preceded by very brief dizziness
• Was walking to the water cooler in his office at work
• Suffering a viral illness and fevers for the previous 2 days
• Recovered immediately
• Went to ER to care for dental fractures
• Never had syncope before
Case Presentation

• PMH
  • Appendicitis 2005 s/p Lap Appendectomy
  • Post-operative DVT / PE treated with OAC

• Social Hx – occasional shisha, no EtOh,

• No family history of sudden cardiac death

• NKDA
• Medication – Paracetamol
Exam

• Vital Signs
• BP
  • 115/70 supine
  • 118/70 standing 0 minutes
  • 124/70 standing 1 minute
  • 125/70 standing 3 minutes
• HR 98 BPM Reg
• RR 20
• Sat 98%
Exam

- Anxious male, with 3 fractured incisors and small abrasion on forehead
- No JVD
- CVS exam RRR S1+2 no AS no M,R,G
- CTAB
- Soft nt BS+
- No LE Edema
- No focal neurological deficits
Syncope Guidelines What’s New

2017 ACC/AHA/HRS Guideline for the Evaluation and Management of Patients With Syncope

A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines and the Heart Rhythm Society

Developed in Collaboration With the American College of Emergency Physicians and Society for Academic Emergency Medicine

Endorsed by the Pediatric and Congenital Electrophysiology Society

ACC Conference Middle East 2017
Syncope Guidelines What’s New – Objectives

• Definition
• Epidemiology
• Etiology
• Clinical approach / Risk stratification
• Diagnostic testing – brief overview
Syncope – Definition

• Abrupt, transient, complete loss of consciousness
• Loss of postural tone
• Rapid and spontaneous recovery
• Mechanism - cerebral hypoperfusion
• No features of other causes of loss of consciousness

Shen et al. J A C C Aug 2017 vol. 7 0 ( 5 ) e 3 9 – 1 1 0
Syncope – Epidemiology

- Prevalence 41%
- Recurrent in 13.5%
- Female > Male
- Trimodal distribution peaks around 20, 60 and 80

Shen et al. JACC Aug 2017 vol. 70 (5) e39 – 110
Syncope – Epidemiology

- Reflex, 21%
- Cardiac, 10%
- Ortho, 9%
- Unknown, 37%
- Other, 22%

Soteriades et al. NEJM 2002 347:878-885
Syncope – prognosis

Soteriades et al. NEJM 2002 347:878-885
Syncope Etiology

**Cardiac**
- Bradycardia
- Tachycardia
- Hypotension due to low cardiac index
- Blood flow obstruction
- Vasodilatation
- Acute vascular dissection

**Non cardiac**
- Reflex syncope
- OH
- Volume depletion
- Dehydration blood loss
Syncope – Clinical evaluation

Transient loss of consciousness*

Suspected syncope

Yes

Evaluation as clinically indicated

No

Further evaluation

Treatment

Initial evaluation:

history, physical examination, and ECG (Class I)
Case Presentation

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• Recovered immediately
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Case Question 1

• What is the most effective diagnostic tool in determining the diagnosis and prognosis in a patient with syncope?

• 1- Electrocardiogram

• 2- History and physical exam

• 3- Tilt table testing

• 4- Invasive electrophysiology study
Case Question 1

• What is the most effective diagnostic tool in determining the diagnosis and prognosis in a patient with syncope?

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History and Physical Examination

<table>
<thead>
<tr>
<th>COR</th>
<th>LOE</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>B-NR</td>
<td>A detailed history and physical examination should be performed in patients with syncope.</td>
</tr>
</tbody>
</table>
History and Physical

• Goals
  • Determine diagnosis
  • Assess Prognosis
History

- Co-morbidities
- Medications
- Prodromal symptoms
- Triggers
- Witness history
- Family history
History Cardiac vs Non-cardiac

**Cardiac**
- Age > 60
- Male sex
- Presence of IHD or SHD
- Brief prodrome
- Syncope during exertion
- Syncope in the supine position
- Low number of syncope episodes (1 or 2)
- Abnormal cardiac examination
- Family history of inheritable conditions

**Non cardiac**
- Younger age
- No known cardiac disease
- Syncope only in the standing position
- Positional change
- Presence of prodrome
- Specific triggers
- Situational triggers
- Frequent recurrence and prolonged history
History Cardiac vs Non-cardiac

**Cardiac**
- Age > 60
- Male sex
- Presence of IHD or SHD
- Brief prodrome
- Syncope during exertion
- Syncope in the supine position
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- Abnormal cardiac examination
- Family history of inheritable conditions

**Non cardiac**
- Younger age
- No known cardiac disease
- Syncope only in the standing position
- Positional change
- Presence of prodrome: n/v, warmth
- Specific triggers
- Situational triggers
- Frequent recurrence and prolonged history
Physical

• Orthostatic BP
• Cardiovascular exam
• Brief neurological exam
Case Question 2

• What is the most appropriate investigation to assess this patient?

• 1- Electrocardiogram

• 2- Echocardiogram

• 3- Carotid Doppler US

• 4- Cardiac MRI
Case Question 2

• What is the most appropriate investigation to assess this patient?

• 1- Electrocardiogram
• 2- Echocardiogram
• 3- Carotid Doppler US
• 4- Cardiac MRI
Case ECG
Syncope ECG

- Conduction disorders
- Sinus node dysfunction
- Arrhythmogenic substrate
  - CAD
  - WPW
  - ARVC
  - Brugada
  - LQTS
  - HCM
- Worse prognosis – LVH, AF, IVCD, V Pacing
Syncope – Clinical evaluation

Initial evaluation:
- history, physical examination,
  and ECG (Class I)

Cause of syncope
- certain

- Treatment

Risk assessment

Cause of syncope
- uncertain

- Further evaluation
Case Question 3

- What aspects in the history may help risk stratify this patient?
  - 1- No previous history of syncope?
  - 2- Presence of viral illness?
  - 3- Presence of head injury?
  - 4- Absence of any family history for sudden cardiac death?
Case Question 3

• What aspects in the history may help risk stratify this patient?

• 1- No previous history of syncope?

• 2- Presence of viral illness?

• 3- Presence of head injury?

• 4- Absence of any family history for sudden cardiac death?
# Risk assessment

<table>
<thead>
<tr>
<th>Study/Reference</th>
<th>Year</th>
<th>Sample N</th>
<th>Events N (%)</th>
<th>Outcome Definition</th>
<th>ED Events</th>
<th>Predictors</th>
<th>NPV (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Martin (90)</td>
<td>1997</td>
<td>252</td>
<td>104 (41%)</td>
<td>1-y death/arrhythmia</td>
<td>Yes</td>
<td>Abnormal ECG; &gt;45 y of age; VA; HF</td>
<td>93</td>
</tr>
<tr>
<td>Sarasin (74)</td>
<td>2003</td>
<td>175</td>
<td>30 (17%)</td>
<td>Inpatient arrhythmia</td>
<td>Yes</td>
<td>Abnormal ECG; &gt;65 y of age; HF</td>
<td>98</td>
</tr>
<tr>
<td>OESIL (67)</td>
<td>2003</td>
<td>270</td>
<td>31 (11%)</td>
<td>1-y death</td>
<td>N/A</td>
<td>Abnormal ECG; &gt;65 y of age; no prodrome; cardiac history</td>
<td>100</td>
</tr>
<tr>
<td>SFSR (72)</td>
<td>2004</td>
<td>684</td>
<td>79 (12%)</td>
<td>7-d serious events$\delta$</td>
<td>Yes</td>
<td>Abnormal ECG; dyspnea; hematocrit; systolic BP &lt;90 mm Hg; HF</td>
<td>99</td>
</tr>
<tr>
<td>Boston Syncope Rule (70)</td>
<td>2007</td>
<td>293</td>
<td>68 (23%)</td>
<td>30-d serious events$</td>
<td></td>
<td>$</td>
<td>Yes</td>
</tr>
<tr>
<td>Del Rosso (69)</td>
<td>2008</td>
<td>260</td>
<td>44 (17%)</td>
<td>Cardiac etiology</td>
<td>N/A</td>
<td>Abnormal ECG$#$/cardiac history; palpitations; exertional; supine; precipitant (a low-risk factor); autonomic prodrome (low-risk factors)</td>
<td>99</td>
</tr>
<tr>
<td>STePS (68)</td>
<td>2008</td>
<td>676</td>
<td>41 (6%)</td>
<td>10-d serious events$\delta$</td>
<td>Yes</td>
<td>Abnormal ECG; trauma; no prodrome; male sex</td>
<td>—</td>
</tr>
<tr>
<td>Syncope Risk Score (75)</td>
<td>2009</td>
<td>2,584</td>
<td>173 (7%)</td>
<td>30-d serious events$#$</td>
<td>No</td>
<td>Abnormal ECG$#$; &gt;90 y of age; male sex; positive troponin; history of arrhythmia; systolic BP &gt;160 mm Hg; near-syncope (a low-risk factor)</td>
<td>97</td>
</tr>
<tr>
<td>ROSE (73)</td>
<td>2010</td>
<td>550</td>
<td>40 (7%)</td>
<td>30-d serious events$#$</td>
<td>Yes</td>
<td>Abnormal ECG$#$; B-natriuretic peptide; hemoglobin; O$_2$Sat; fecal occult blood</td>
<td>98</td>
</tr>
</tbody>
</table>
Risk assessment

30 day
Male sex
Older age > 60
No prodome
Palpitation precede LOC
Exertional syncope
Structural heart disease
Heart failure
Cerebrovascular disease
FHx of SCD
Evidence of bleeding
Persistent abnormal vital signs
Abnormal ECG
Positive troponin

1 Year
Male sex
Older age
Absence of N/V precede LOC
Ventricular arrhythmia
Cancer
Structural heart disease
Heart failure
Cerebrovascular disease
Diabetes mellitus
High CHADS
Low GFR
Abnormal ECG
Risk assessment

**30 day**
- Male sex
- Older age > 60
- No prodome
- Palpitation precede LOC
- Exertional syncope
- Structural heart disease
- Heart failure
- Cerebrovascular disease
- FHx of SCD
- Evidence of bleeding
- Persistent abnormal vital signs
- Abnormal ECG
- Positive troponin

**1 Year**
- Male sex
- Older age
- Absence of N/V precede LOC
- Ventricular arrhythmia
- Cancer
- Structural heart disease
- Heart failure
- Cerebrovascular disease
- Diabetes mellitus
- High CHADS
- Low GFR
- Abnormal ECG
Risk Assessment – Serious conditions
Arrhythmias

Sustained or symptomatic VT
Symptomatic conduction system disease
Symptomatic bradycardia or sinus pauses not neurally mediated
Symptomatic SVT
Pacemaker/ICD malfunction
Inheritable cardiovascular conditions predisposing to arrhythmias
Risk Assessment – Serious conditions

Structural

Cardiac ischemia
Severe aortic stenosis
Cardiac tamponade
HCM
Severe prosthetic valve dysfunction
Pulmonary embolism
Aortic dissection
Acute HF
Moderate-to-severe LV dysfunction
Risk Assessment – Serious conditions
Non-cardiac

Severe anemia/gastrointestinal bleeding
Major traumatic injury due to syncope
Persistent vital sign abnormalities
## Risk Assessment

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<td>B-NR</td>
<td>Evaluation of the cause and assessment for the short- and long-term morbidity and mortality risk of syncope are recommended.</td>
</tr>
<tr>
<td>IIb</td>
<td>B-NR</td>
<td>Use of risk stratification scores may be reasonable in the management of patients with syncope.</td>
</tr>
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</table>
Case Question 4

• What is the disposition of this patient?

• 1- Outpatient followup with an electrophysiologist

• 2- Inpatient admission and evaluation with telemetry for further evaluation

• 3- Discharge home with symptomatic treatment for URTI no followup needed

• 4- Monitor in ER for 24 hours then discharge if no further events
Case ECG – High chest leads
Case Question 4

• What is the disposition of this patient?

• 1- Outpatient followup with an electrophysiologist

• 2- Inpatient admission and evaluation with telemetry for further evaluation

• 3- Discharge home with symptomatic treatment for URTI no followup needed

• 4- Monitor in ER for 24 hours then discharge if no further events
Patient Disposition After Initial Evaluation for Syncope

Syncope initial evaluation

Serious medical conditions present? (Table 7)

Yes

Inpatient evaluation (Class I)

No

Manage presumptive reflex-mediated syncope in outpatient setting (Class IIa)

Structured ED observation protocol for intermediate-risk pts (Class IIa)

Manage selected pts with suspected cardiac syncope in outpatient setting (Class IIb)
Additional Evaluation and Diagnosis

Initial evaluation: history, physical exam, ECG (Class I)

- Initial evaluation clear
  - No additional evaluation needed*

- Initial evaluation unclear
  - Targeted blood testing (Class IIa)†
  - Initial evaluation suggests neurogenic OH
    - Referral for autonomic evaluation (Class IIa)†
  - Initial evaluation suggests reflex syncope
    - Tilt-table testing (Class IIa)†
  - Initial evaluation suggests CV abnormalities
    - Cardiac monitor selected based on frequency and nature (Class I)

Options
- Stress testing (Class IIa)†
- TTE (Class IIa)†
- EPS (Class IIa)†
- MRI or CT (Class IIb)†

Options
- Implantable cardiac monitor (Class IIa)†
- Ambulatory external cardiac monitor (Class IIa)†
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<tr>
<td>IIa</td>
<td>B-NR</td>
<td>Targeted blood tests are reasonable in the evaluation of selected patients with syncope identified on the basis of clinical assessment from history, physical examination, and ECG.</td>
</tr>
<tr>
<td>IIb</td>
<td>C-LD</td>
<td>Usefulness of brain natriuretic peptide and high-sensitivity troponin measurement is uncertain in patients for whom a cardiac cause of syncope is suspected.</td>
</tr>
<tr>
<td>III: No Benefit</td>
<td>B-R</td>
<td>Routine and comprehensive laboratory testing is not useful in the evaluation of patients with syncope.</td>
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# Cardiac Imaging

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<tr>
<td>IIa</td>
<td>B-NR</td>
<td>Transthoracic echocardiography can be useful in selected patients presenting with syncope if structural heart disease is suspected.</td>
</tr>
<tr>
<td>IIb</td>
<td>B-NR</td>
<td>CT or MRI may be useful in selected patients presenting with syncope of suspected cardiac etiology.</td>
</tr>
<tr>
<td>III: No Benefit</td>
<td>B-R</td>
<td>Routine cardiac imaging is not useful in the evaluation of patients with syncope unless cardiac etiology is suspected on the basis of an initial evaluation, including history, physical examination, or ECG.</td>
</tr>
</tbody>
</table>
The choice of a specific cardiac monitor should be determined on the basis of the frequency and nature of syncope events.

To evaluate selected ambulatory patients with syncope of suspected arrhythmic etiology, the following external cardiac monitoring approaches can be useful:
1. Holter monitor
2. Transtelephonic monitor
3. External loop recorder
4. Patch recorder
5. Mobile cardiac outpatient telemetry.

To evaluate selected ambulatory patients with syncope of suspected arrhythmic etiology, an ICM can be useful.
Continuous ECG monitoring is useful for hospitalized patients admitted for syncope evaluation with suspected cardiac etiology.
Electrophysiological Study

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<tr>
<td>IIa</td>
<td>B-NR</td>
<td>EPS can be useful for evaluation of selected patients with syncope of suspected arrhythmic etiology.</td>
</tr>
<tr>
<td>III: No Benefit</td>
<td>B-NR</td>
<td>EPS is not recommended for syncope evaluation in patients with a normal ECG and normal cardiac structure and function, unless an arrhythmic etiology is suspected.</td>
</tr>
</tbody>
</table>
### Neurological and Imaging Diagnostics

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<tr>
<td>IIa</td>
<td>C-LD</td>
<td>Simultaneous monitoring of an EEG and hemodynamic parameters during tilt-table testing can be useful to distinguish among syncope, pseudosyncope, and epilepsy.</td>
</tr>
<tr>
<td>III: No Benefit</td>
<td>B-NR</td>
<td>MRI and CT of the head are not recommended in the routine evaluation of patients with syncope in the absence of focal neurological findings or head injury that support further evaluation.</td>
</tr>
<tr>
<td>III: No Benefit</td>
<td>B-NR</td>
<td>Carotid artery imaging is not recommended in the routine evaluation of patients with syncope in the absence of focal neurological findings that support further evaluation.</td>
</tr>
<tr>
<td>III: No Benefit</td>
<td>B-NR</td>
<td>Routine recording of an EEG is not recommended in the evaluation of patients with syncope in the absence of specific neurological features suggestive of a seizure.</td>
</tr>
</tbody>
</table>
Thank you!