How to Survive Syncope

Steve Greer, MD, FHRSA, FACC, CCDS

Disclosures

• Lundbeck Pharmaceuticals—Speaker’s Bureau, Research Support
• Amgen—Research Support
• NIH—Research Support
Syncope and Sudden Death are the same, except in one you wake up.

Anonymous

**Definition**

- Syndrome characterized by loss of consciousness that is typically
  - Relatively sudden
  - Temporary
  - Self-terminating
  - Rapid recovery
- Due to inadequate cerebral perfusion
- Triggered by rapid fall in systemic arterial blood pressure
- Up to 50% of population will experience at least 1 episode of syncope during lifetime
Syncope: Economics

- Emergency Department visits
  - Primary diagnosis ~1.13 million
  - Among all listed diagnoses >1.35 million
- Hospital admission rate ~36%
- 23-hour observation ~4%
- Transfer to different facility ~1.4%
- Approximately 0.1% of US healthcare budget

Transient Loss of Consciousness

- Trauma-induced
  - Concussion
- Not Trauma-induced
  - Syncope
  - Seizures
  - Intoxications
  - Metabolic disorders
- Not True TLOC
  - TLOC mimics, without true loss of consciousness e.g.,
    - psychogenic “pseudo-syncope”
    - ‘drop attacks’
    - cataplexy
Causes of True Syncope

<table>
<thead>
<tr>
<th>Neurally-Mediated Reflex</th>
<th>Orthostatic</th>
<th>Cardiac Arrhythmia</th>
<th>Structural Cardio-Pulmonary</th>
</tr>
</thead>
<tbody>
<tr>
<td>VVS, CSH, Situational Cough, Post-mic</td>
<td>Drug-Induced ANS Failure Primary Secondary</td>
<td>Bradycardia Sinus pause/arrest AV block Tachycardia VT SVT Long QT Syn</td>
<td>Aortic Stenosis HCM Pulmonary Hypertension Aortic Dissection</td>
</tr>
</tbody>
</table>

Unexplained Causes = Approximately 10%

Impact of Syncope on Mortality Risk

- Vasovagal Syncope has low mortality risk
  - But recurrences are a concern
- Syncope of presumed cardiac cause is associated with high mortality risk
  - Most evidence suggests that risk is similar to that of patients without syncope but with similar severity of heart disease

Syncope and Collapse: Avoiding Inappropriate Admissions

- 2011 study found that 58% of admissions inappropriate
- Only 6% (8/136) discharges inappropriate
- 52% reduction in admission with guideline-based criteria (no increase in serious events)
- Utah clinic (FF) had 4% admissions with guideline versus 20% without
- Careful evaluation produced higher rate of diagnosis: 57% vs 39%

What to Do When They Come to You

- Key is history of illness
  - How old at time of first episode and total number of episodes?
  - How long from onset of symptoms to loss of consciousness?
  - What were you doing when symptoms started? Standing, seated, lying down, exerting?
  - What symptoms were noted before fainting?
    - Did you experience nausea, bloated sensation in stomach, sweating, flushing, hot or cold sensation, palpitations, yawning, tingling in extremities, or altered vision?
What to Do When They Come to You

• History (continued)
  – Any predisposition to “motion sickness”?
  – Any issues with blood draws or donation?
  – Did you sustain any injury with an episode?
  – How did you feel when you awakened?
  – Was there any urinary or fecal incontinence?

What to Do When They Come to You

• History of Witness also of benefit
  – Were any symptoms noted prior to LOC?
  – How did the patient appear?
  – How long did the episode last?
  – Did the patient demonstrate any seizure-like activity?
  – Was the patient stiff or flaccid during event?
  – Did the patient utter any involuntary sounds?
What to Do When They Come to You

• Witness history (continued)
  – Did the patient become incontinent?
  – How did the patient act when he awoke?
    • Did they recover quickly?

Why is the History so Important?

• Certain features are virtually diagnostic of certain etiologies
  – Neurogenic syncope
    • Young age
    • Multiple episodes often in clusters
    • Warm environments
    • After exertion but not during
    • Not supine
    • Prodrome typically more than 30 seconds
    • Rarely produces bodily injury
    • Limp or flaccid
### Why is the History so Important?

- Diagnostic Features (continued)
  - Arrhythmic
    - Older onset (usually >50yo)
    - History of heart disease
    - Abrupt loss of consciousness
    - Bodily injury
    - Brief duration (<30-45 sec) with spontaneous recovery

### Syncope: Clinical Features
Differences in Older & Younger Patients

<table>
<thead>
<tr>
<th>Feature</th>
<th>NMS &lt;65</th>
<th>NMS ≥65</th>
<th>Cardiac &lt;65</th>
<th>Cardiac ≥65</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injury</td>
<td>34%</td>
<td>48%</td>
<td>44%</td>
<td>42%</td>
</tr>
<tr>
<td>Any Prodrome</td>
<td>84%</td>
<td>59%</td>
<td>63%</td>
<td>53%</td>
</tr>
<tr>
<td>Myoclonic jerks</td>
<td>16%</td>
<td>1%</td>
<td>14%</td>
<td>9%</td>
</tr>
<tr>
<td>Feeling ‘cold’</td>
<td>26%</td>
<td>8%</td>
<td>11%</td>
<td>1%</td>
</tr>
</tbody>
</table>

*Del Rosso, Alboni et al Am J Cardiol 2005*
Physical Exam

• Orthostatic BP with HR
  – Lying
  – Seated
  – Standing for at least 3 minutes
• BP in both arms
• Carotid sinus massage
• Cardiac exam
  – Valvular stenosis
  – Pulmonary HBP
  – Obstructive lesions (myxoma)

ECG

• Bradycardia
  – Sinus pause
  – Sinus bradycardia with junctional rhythm
  – Bundle branch block (LBBB, RBBB+FB)
  – AV block of varying degree
  – Pacemaker malfunction
ECG

• Tachycardia
  – SVT
  – VT
  – AF with preexcitation
  – Prior MI
  – Abnormalities of QT interval

Finished, So What Now?

• Who do you send home or send to hospital?
Low Risk Patient Population

- Age less than 50 years
- No history of cardiovascular disease
- Normal ECG
- Symptoms consistent with NMS or OH
- Unremarkable cardiovascular findings
High Risk Patients

- Clinical history consistent with arrhythmic syncope
- Comorbidities
- ECG suggestive of arrhythmic syncope
- Family history of sudden death
- Hypotension
- Older age
- Severe structural heart disease

Specialized Diagnostic Tests:
Selected Use Based on Initial Examination and Risk Stratification

- Head-Up Tilt Test (usually combined with CSM)
- Event Monitoring
  - External
    - “Loop” Holter
  - Internal
    - Implantable loop recorder (ILR)
- Electrophysiologic Testing (EPS)
Head-Up Tilt Test (HUT)

- Protocols vary
- Performed with or without provocative drugs
- Goals:
  - Unmask VVS susceptibility
  - Reproduce symptoms
  - Patient learns VVS warning symptoms
  - Patient more confident of diagnosis
- Not useful for predicting treatment benefit

Induction of NMS with HUT

From Wieling W et al. (with permission)
Event Monitoring-External

• Used for extended period (30 days)
• Can be removed for bathing/sleep
• Capable of auto-trigger/patient activation
• Reasonable option if episodes not rare

Event Monitoring-Internal

• Requires minimal surgical implant (“Injectable”)
• Capable of beat-to-beat monitoring for at least 3 years
• Data like external shared via Internet link
Recommendations for Neuro Testing

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Sponsoring organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avoid computed tomography of the head in asymptomatic adult patients in the emergency department with syncope, insignificant trauma, and a normal neurologic evaluation.</td>
<td>American College of Emergency Physicians</td>
</tr>
<tr>
<td>In the evaluation of simple syncope and a normal neurologic evaluation, do not obtain brain imaging studies (computed tomography or magnetic resonance imaging).</td>
<td>American College of Physicians</td>
</tr>
<tr>
<td>Do not perform imaging of the carotid arteries for simple syncope without other neurologic symptoms.</td>
<td>American Academy of Neurology</td>
</tr>
</tbody>
</table>

Source: For more information on the Choosing Wisely Campaign, see http://www.choosingwisely.org. For supporting citations and to search Choosing Wisely recommendations relevant to primary care, see http://www.aafp.org/afp/recommendations/search.htm.
Thank You