Setting the scene - overview Syncope

Prof Rose Anne Kenny
MISA and TCD

Definition (1)

Syncope is a TLOC, due to transient global cerebral hypoperfusion, characterized by rapid onset, short duration and spontaneous complete recovery.

Classification

Syncope

- TLOC
- Nontraumatic TLOC
- TLOC due to head trauma
- Epileptic seizures
- Psychogenic
- Orthostatic hypotension
- Cardiac
- Neurally mediated
- Vasovagal
- Situational
- Carotid sinus syndrome
- Non-classical forms

Definition (2)

Transient loss of consciousness (TLOC) is a state of real or apparent loss of consciousness with loss of awareness, characterized by amnesia for the period of unconsciousness, abnormal motor control, loss of responsiveness, and a short duration.

TLOC is syncope when there is:
- a) presence of features specific for reflex, orthostatic hypotension, or cardiac syncope, and:
- b) absence of features specific for other forms of TLOC.

Classification (neurally-mediated syncope)

- Vasovagal:
  - orthostatic: WS, standing, less common: sitting,
  - emotional: fear, pain (psychosis or visceral), instrumentation, blood phobia.
- Situational:
  - standing,
  - postural/medial stimulation (posturally, defecation),
  - cough, sneeze,
  - post-exercise,
  - others (e.g. laughing, brass instrument playing).
- Carotid sinus syndrome.
- Non-classical forms (without prodromes and/or without apparent triggers and/or physical presentation).
Incidence of seizures in different age groups

Linda J Stephen, Martin J Brodie
Epilepsy in elderly people Volume 355, Issue 9213, 2000, 1441–1446

Classification

Syncope due to orthostatic hypotension
- Drug-induced OH (most common cause of OH):
  - e.g. antihypertensives, antidepressants.
- Volume depletion:
  - haemorrhage, diarrhea, vomiting, etc.
- Primary autonomic failure (neurogenic OH):
  - pure autonomous failure, multiple system atrophy, Parkinson’s disease, dementia with Lewy bodies.
- Secondary autonomic failure (neurogenic OH):
  - diabetics, amyotrophic, syphilitic, syphilitic, autoimmune autonomic neuropathy, paraneoplastic autonomic neuropathy, kidney failure.

Not: Hypotension may be exacerbated by suddenly standing during exercise (exercise-induced hypotension) and after prolonged heat and cold conditioning.

Classification

Cardiac syncope
- Arrhythmia as primary cause
  - Bradyarrhythmia:
    - sinus node dysfunction (including bradycardia/tachyarrhythmia syndrome),
    - sino-atrial nodal automaticity/atrio-ventricular node disease.
  - Tachycardia:
    - supraventricular, ventricular.
- Structural cardiac:
  - aortic stenosis, acute myocardial infarction/ ischemia, hypertrophic cardiomyopathy, cardiac masses (atrial myxoma, tumours, etc.), pericardial disease/tamponade, congenital anomalies of coronary arteries, prosthetic valves, dysrhythmia.
- Cardiovascular and great vessels:
  - pulmonary embolus, acute aortic dissection, pulmonary hypertension.

Classification

Conditions (of real or apparent LOC) which may be incorrectly diagnosed as syncope
- Generalized seizures, complex partial seizures, absence epilepsy.
- Psychogenic pseudoseizure.
- Falls without TLOC.
- Intracerebral or subarachnoid haemorrhage.
- Vertebrobasilar TIAs.
- Cardiac arrest.

Pathophysiology

Epidemiology

Age of first faint

Incidence of seizures in different age groups
Case 1

19 y.o. female
TLOC in toilet
Hyperventilating, can't stop it
RR 35 SO2 98% BP 120/80 HF 120 Temp 37.4 ºC

What would you do?

Question 1

A. Instructions to cope with hyperventilation
B. Do a D-dimer or chest CT for PE
C. CXR
D. Refer to SU as outpatient

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What would you do?

Question 1

A. Instructions to cope with hyperventilation
B. Analyze for PE
C. Do a CXR
D. Refer to SU as outpatient
**Definition of a Syncope Unit**

An SU is a facility featuring a standardized approach to the diagnosis and management of T-LOC and related symptoms, with dedicated staff and access to appropriate diagnostics and therapies. The SU should also take the lead in educating and training clinicians who encounter syncope.

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**Rationale Syncope Unit**

- wide variation in practice of syncope evaluation
- wide variation in adoption of recommendations from published guidelines
- evidence benefit systematic approach

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**Organizational aspects: Syncope Unit**

Key components:

- The syncope unit should take the lead in service delivery for syncope, and in education and training of healthcare professionals who encounter syncope.
- The syncope unit should be led by a clinician with specific knowledge of TLOC and additional necessary team members (i.e., clinical nurse specialist) depending on the local model of service delivery.
- The syncope unit should provide minimum core treatments for reflex syncope and OH, and treatments or preferential access for cardiac syncope, falls, psychogenic pseudosyncope, and epilepsy.
- Referrals should be directly from family practitioners, EDs, in-hospital and out-hospital services, or self-referral depending on the risk stratification of referrals. Fast-track access, with a separate waiting list and scheduled follow-up visits, should be recommended.
- Syncope units should employ quality indicators, process indicators, and desirable outcome targets.

www.escardio.org/guidelines

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**Organizational aspects: Structure of the SU**

Staffing of an SU is composed of:

1. One or more physicians of any specialty who are syncope specialists.
2. A team comprised of professionals who will advance the care of syncope patients.

Equipment:

1. Essential equipment/tests:
   - 12-lead ECG and 3-lead ECG monitoring,
   - non-invasive beat-to-beat blood pressure monitor,
   - tilt-table,
   - Holter monitors,
   - external loop recorders,
   - follow-up of implantable loop recorders (*),
   - 24-hour blood pressure monitoring,
   - basic autonomic function tests.
2. Established procedures for:
   - Echocardiography
   - Electrophysiological studies
   - Stress test
   - Neuroimaging tests
3. Specialists' consultancies (cardiology, neurology, internal medicine, geriatric medicine, psychology)

www.escardio.org/guidelines
**NEW / REVISED CLINICAL SETTINGS AND TESTS:**

- **Tilt testing:** concepts of hypotensive susceptibility
- Increased role of prolonged ECG monitoring
- Video recording in suspected syncope
- "Syncope without prodrome, normal ECG and normal heart" (adenosine sensitive syncope)
- "Ictal asystole"

**NEW / REVISED INDICATIONS FOR TREATMENT:**

- Reflex syncope: algorithms for selection of appropriate therapy based on age, severity of syncope and clinical forms
- Reflex syncope: algorithms for selection of best candidates for pacemaker therapy
- Patients at risk of SCD: definition of unexplained syncope and indication for ICD
- Implantable loop recorder as alternative to ICD in selected cases

**2018 NEW/REVISED CONCEPTS in management of syncope**

**MANAGEMENT IN EMERGENCY DEPARTMENT:**

- List of low- and high-risk features
- Risk stratification flowchart
- Management in ED Observation Unit and/or Syncope Unit
- Restricted admission criteria
- Limited usefulness of risk stratification scores

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### Table 3

<table>
<thead>
<tr>
<th>Procedure or test</th>
<th>SU Physician</th>
<th>SU Staff</th>
<th>Non-SU personnel</th>
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<tbody>
<tr>
<td>History taking</td>
<td>x</td>
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<td>x</td>
</tr>
<tr>
<td>Tilt testing</td>
<td>x</td>
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<tr>
<td>12-lead ECG</td>
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<td></td>
<td>x</td>
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<tr>
<td>Event recorder</td>
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<tr>
<td>Intracranial pressure monitoring</td>
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<td>x</td>
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<tr>
<td>Computerized neurodiagnostic test</td>
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<td></td>
<td>x</td>
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<tr>
<td>Basic echocardiogram, function test</td>
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<tr>
<td>ESC/Heart Failure Alliance QRS, atrial and ventricular</td>
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<tr>
<td>Implantable loop recorder</td>
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<td>Anticoagulation</td>
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<td>Diagnosis - ischemia, pharmacological study, angiograms</td>
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<td>Neurological causes:</td>
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<td>&quot;Ictal asystole&quot;</td>
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<tr>
<td>Initial report and clinical notes</td>
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<td>x</td>
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<tr>
<td>Re-gathering information, notifying physicians</td>
<td>x</td>
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<td>x</td>
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**Education patients**

- [www.escardio.org/guidelines](http://www.escardio.org/guidelines)
- 2018 ESC Guidelines on Syncope
  - Michele Brignole & Angel Moya
  - EHJ Doi: 10.1093/eurheartj/ehy037

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**Tilt testing: positivity rate**

- 92% Typical VVS, emotional trigger (Coml)
- 78% Typical VVS, situational trigger (TNG)
- 73%-65% Typical VVS, miscellaneous (Coml) (TNG)
- 56%-51% Likely reflex, atypical (TNG)
- 47% Cardiac syncope (TNG)
- 45% Likely tachycardic, syncopable (Passive)
- 36%-30% Unexplained syncope (TNG)
- 33%-6% Subjects without syncope (Passive) (Coml) (TNG)
**Table 3 cont.** Comparison between systematic evaluation and conventional management

<table>
<thead>
<tr>
<th>16/17 Benefit Cost/LOS/Diagnosis</th>
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**Case 3**
- A 50 y.o. woman
- Collapsed while playing bridge
- Back to baseline in ED
- Past medical Hx not significant
- After thorough Hx, physical examination and ECG there is no clear cause
- What is the most appropriate action?

**Question 3**
A. Admit on telemetry  
B. Discharge without follow-up  
C. Discharge with follow-up in SU

**FIT F...?**
FIT
FAINT
FALL
FUNNY DOS

**Falls /Syncope males ED**
- Admitted
- Discharged

McMahon G personal communication 2017
**Age profile**

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Count</th>
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<tbody>
<tr>
<td>Under 18</td>
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<tr>
<td>18-21</td>
<td>34</td>
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<tr>
<td>21-30</td>
<td>1135</td>
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<tr>
<td>30-39</td>
<td>178</td>
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<tr>
<td>50-59</td>
<td>560</td>
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<tr>
<td>60-69</td>
<td>785</td>
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<tr>
<td>70-79</td>
<td>1135</td>
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<tr>
<td>80-89</td>
<td>637</td>
</tr>
<tr>
<td>90+</td>
<td>48</td>
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</table>

**400 attendances 2018**
New patients – 58%
Return – 42%
Acute Care General Physicians,

Under 18
18-30
31-40
41-50
51-60
61-70
71-80
81-90
91+

47% <65y
53% >65y

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The prevalence of unexplained falls and syncope in older adults presenting to an Irish urban emergency department

Jacqueline Shanahan, Patricia Hall, Naomh Devaney, Kathleen Bennett, Laura Carroll, Rose-Anne Kenny and C. Geraldine McMahon

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**Patient characteristics**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Explained</th>
<th>Unexplained</th>
<th>Syncope</th>
<th>Medical causes</th>
<th>Total</th>
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<tbody>
<tr>
<td>Age group</td>
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<td>50-59</td>
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<td>Sex</td>
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<tr>
<td>Female</td>
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**Secondary outcomes**

- Admissions: 130 (41)
- Radiography: 285 (90)
- Brain scanning: 104 (33)
- Previous ED attendance: 79 (25)
- Injury from fall: 141 (44)
- Recurrent falls: 51 (16)

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**Costs**

<table>
<thead>
<tr>
<th>Category</th>
<th>Cost (€)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>3,658,113.16</td>
</tr>
</tbody>
</table>

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561 patients 50 and over presenting to the ED following a fall or collapse episode over a 6-month period.


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**Syncope in patients with comorbidity and frailty**

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**Recommendations**

1. A multifactorial evaluation and management plan may be necessary in older patients because more than one possible cause for syncope and unexplained fall may be present. (1a) I

2. Medication history should be considered. (1a) I

3. Modification or discontinuation of possible culprit medications, particularly hypotensive drugs and psychotropic drugs, should be considered in older patients with syncope or unexplained fall. (1a) IIa

4. In patients with unexplained fall, the same assessment as for unexplained syncope should be considered. (1a) IIa

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2018 ESC Guidelines on Syncope – Michele Brignole & Angel Moya

EHJ Doi: 10.1093/eurheartj/ehy037
Syncope in patients with comorbidity and frailty

Setting the scene - overview Syncope

- Arrhythmia – important / small contribution
- Syncope – QOL
- Related symptoms
- CGA – Physiological adjunct

The Role of a Syncope Unit
Rationale
Requirements – staff/equipment
EHRA/ESC Guidelines
TIME
Clinical Nurse Specialist