Definition

- Syncope is a Transient Loss of Consciousness (T-LOC) due to transient global cerebral hypoperfusion characterized by:
  - rapid onset,
  - short duration,
  - and spontaneous complete recovery.
Conditions incorrectly diagnosed as syncope

- Disorders with partial or complete (LOC) but without cerebral hypoperfusion:
  - Epilepsy,
  - Metabolic disorders including hypoglycemia, hypoxia, hyperventilation with hypocapnia,
  - Intoxication,
  - Vertebrobasilar TIA (Transient Ischemic Attack).

- Disorders without impairment of consciousness:
  - Cataplexy,
  - Drop attacks,
  - Falls,
  - Functional (psychogenic pseudosyncope),
  - TIA of carotid origin.
Classification of syncope

Reflex (neurally-mediated) syncope
- Vasovagal:
  - Mediated by emotional distress: fear, pain, instrumentation, blood phobia.
  - Mediated by orthostatic stress.
- Situational:
  - Cough, sneeze.
  - Gastrointestinal stimulation (swallow, defaecation, visceral pain).
  - Micturition (post-micturition).
  - Post-exercise.
  - Post-prandial.
  - Others (e.g., laughter, brass instrument playing, weightlifting).

Carotid sinus syncope
- Atypical forms (without apparent triggers and/or atypical presentation).

Syncope due to orthostatic hypotension
- Primary autonomic failure:
  - Pure autonomic failure, multiple system atrophy, Parkinson's disease with autonomic failure, Lewy body dementia.
- Secondary autonomic failure:
  - Diabetes, amyloidosis, uraemia, spinal cord injuries.
- Drug-induced orthostatic hypotension:
  - Alcohol, vasodilators, diuretics, phenothiazines, antidepressants.
- Volume depletion:
  - Haemorrhage, diarrhoea, vomiting, etc.

Cardiac syncope (cardiovascular)
- Arrhythmia as primary cause:
  - Bradycardia:
    - Sinus node dysfunction (including brady-cardia/tachycardia syndrome).
    - Atrioventricular conduction system disease.
    - Implanted device malfunction.
  - Tachycardia:
    - Supraventricular.
    - Ventricular (idiopathic, secondary to structural heart disease or to channelopathies).
- Drug induced bradycardia and tachyarrhythmias
- Structural disease:
  - Cardiac: cardiac valvular disease, acute myocardial infarction/ischaemia, hypertrophic cardiomyopathy, cardiac masses (atrial myxoma, tumors, etc), pericardial disease/tamponade, congenital anomalies of coronary arteries, prosthetic valves dysfunction.
  - Others: pulmonary embolus, acute aortic dissection, pulmonary hypertension.

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European Heart Journal 2009;30:2631-2671
Epidemiology

Schematic presentation of the distribution of age and cumulative incidence of first episode of syncope in the general population from subjects up to 80 years is shown.

Ganzeboom et al. Am J Cardiol 2003

European Heart Journal 2009;30:2631-2671
Referral from the general population to medical settings

- ED: 0.7
- General practice: 9.3
- General population: 18.1-39.7


European Heart Journal 2009;30:2631-2671

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## Frequency of the causes of syncope according to age

<table>
<thead>
<tr>
<th>Age</th>
<th>Source</th>
<th>Reflex %</th>
<th>OH %</th>
<th>CV %</th>
<th>Non-Sync. %</th>
<th>Unexplained %</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 40 yrs</td>
<td>†</td>
<td>51</td>
<td>2.5</td>
<td>1.1</td>
<td>18</td>
<td>27</td>
<td>ED &amp; CPU</td>
</tr>
<tr>
<td>40-60 yrs</td>
<td>†</td>
<td>37</td>
<td>6</td>
<td>3</td>
<td>19</td>
<td>34</td>
<td>ED &amp; CPU</td>
</tr>
<tr>
<td>&lt; 65 years</td>
<td>‡</td>
<td>68.5</td>
<td>0.5</td>
<td>12</td>
<td></td>
<td>19</td>
<td>CD</td>
</tr>
<tr>
<td>60/65 yrs</td>
<td>‡</td>
<td>52</td>
<td>3</td>
<td>34</td>
<td></td>
<td>11</td>
<td>CD</td>
</tr>
<tr>
<td></td>
<td>§</td>
<td>62</td>
<td>8</td>
<td>11</td>
<td></td>
<td>14</td>
<td>GD</td>
</tr>
<tr>
<td></td>
<td>†</td>
<td>25</td>
<td>8.5</td>
<td>13</td>
<td>12.5</td>
<td>41</td>
<td>ED &amp; CPU</td>
</tr>
<tr>
<td>&gt; 75 yrs</td>
<td>§</td>
<td>36</td>
<td>30</td>
<td>16</td>
<td></td>
<td>9</td>
<td>GD</td>
</tr>
</tbody>
</table>

† = Olde Norkamp
‡ = Del Rosso
§ = Ungar

ED = emergency department
CPU = chest pain unit
CD = cardiology department
GD = geriatric department
Initial evaluation

- The initial evaluation of a patient presenting with T-LOC consists of careful history, physical examination, including orthostatic BP measurements, and electrocardiogram (ECG).

- Based on these findings, additional examinations may be performed.
Additional examinations

- CSM in patients ≥ 40 years.
- Echocardiogram when there is previous known heart disease or data suggestive of structural heart disease or syncope secondary to cardiovascular cause.
- Immediate ECG monitoring when there is a suspicion of arrhythmic syncope.
- Orthostatic challenge (lying-to-standing orthostatic test and/or head-up tilt testing) when syncope is related to the standing position or there is a suspicion of a reflex mechanism.
- Other less specific tests such as neurological evaluation or blood tests are only indicated when there is suspicion of nonsyncopal T-LOC.
Initial evaluation

The initial evaluation should answer three key questions:

1. Is it a syncopal episode or not?
2. Has the aetiological diagnosis been determined?
3. Are there data suggestive of a high risk of cardiovascular events or death?
Syncope in the context of T-LOC

Clinical presentation

- Loss of consciousness?
- Transient?
- Rapid onset?
- Short duration?
- Spontaneous recovery?

No

Yes

Falls

Altered consciousness

No

Coma

Aborted SCD

Yes

Other

T-LOC

Non-traumatic

Syncope

Epileptic seizure

Psychogenic

Traumatic

Rare causes

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Diagnostic criteria with initial evaluation

- Vasovagal syncope is diagnosed if syncope is precipitated by emotional distress or orthostatic stress and is associated with typical prodrome.

- Situational syncope is diagnosed if syncope occurs during or immediately after specific triggers (cough, sneeze, GI stimulation, micturition, post-exercise, post-prandial).

- Orthostatic syncope is diagnosed when it occurs after standing up and there is documentation of orthostatic hypotension.

- Arrhythmia related syncope is diagnosed by ECG when there is:
  - Persistent sinus bradycardia < 40 bpm in awake or repetitive sinoatrial block or sinus pauses > 3 s.
  - Mobitz II 2nd or 3rd degree atrioventricular block.
  - Alternating left and right BBB.
  - VT or rapid paroxysmal SVT.
  - Non-sustained episodes of polymorphic VT and long or short QT interval.
  - Pacemaker or ICD malfunction with cardiac pauses.

- Cardiac ischaemia related syncope is diagnosed when syncope presents with ECG evidence of acute ischaemia with or without myocardial infarction.

- Cardiovascular syncope is diagnosed when syncope presents in patients with prolapsing atrial myxoma, severe aortic stenosis, pulmonary hypertension, pulmonary embolus or acute aortic dissection.

Class | Level
-----|-----
I     | C   
I     | C   
I     | C   
I     | C   

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Diagnostic flowchart in patients with suspected T-LOC

T-LOC – suspected syncope

Initial evaluation

Syncope
- Certain diagnosis
  - Treatment
- Uncertain diagnosis
  - Risk stratification
    - High risk**
      - Early evaluation & treatment
    - Low risk recurrent syncopes
      - Cardiac or neurally-mediated tests as appropriate
      - Delayed treatment guided by ECG documentation
- Low risk non-syncopal
  - Confirm with specific test or specific consultation
  - Treatment

Risk stratification

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Risk stratification

- Short-term high-risk criteria requiring prompt hospitalization or intensive evaluation:
  - Severe structural or coronary artery disease (HF, low EF or prior MI).
  - Clinical or ECG features suggesting arrhythmic syncope:
    - Syncope during exercise or supine.
    - Palpitations at the time of syncope.
    - Family history of Sudden cardiac death (SCD).
    - Non-sustained VT.
    - Bifascicular block (LBBB or RBBB combined with left anterior or left posterior fascicular block or other intraventricular conduction abnormalities with QRS duration ≥ 120 ms).
    - Inadequate sinus bradycardia (< 50 bpm) or sino-atrial block in absence of negative chronotropic medications or physical training.
    - Pre-excited QRS complex.
    - Prolonged or short QT interval.
    - RBBB pattern with ST-elevation in leads V1-V3 (Brugada pattern).
    - Negative T waves in right precordial leads, epsilon waves and ventricular late potentials suggestive of ARVC.
    - Family history of SCD.
  - Important co-morbidities (severe anemia, electrolyte disturbance).
Blackouts And Their Causes

Blackouts, Collapses, Faints or Fits are commonly the result of either:

- a reduction in blood flow to the brain
  - or
  - a seizure.

**Syncope** is the medical word for a blackout faint or collapse caused by a brief reduction in brain perfusion.

This is usually the result of:

- A blood pressure control problem.
- A problem with the heart structure or function; or
- An abnormal fast or slow heart beat

This web site contains information on syncope and similar problems for patients and doctors.

**Seizures** are due to an electrical disturbance of the brain. More information on seizures can be found at [Epilepsy Action Australia](http://www.epilepsy.org.au).

Syncope can be mistaken for a seizure. Sometimes when people faint, they make jerking movements for a short time, as if they were having a seizure. This occurs due to the temporary reduction in blood flow to the brain.

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