ROUND TABLE C
The dos and don’ts of the new Guidelines of the European Society of Cardiology

On the diagnosis and management of Syncope

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Disclosures

No conflict of interest to declare
What if the criteria are NOT met?

Criteria
- Apparent LOC?
  - Abnormal motor control / fall
  - Not responsive
  - Amnesia
- Short duration?

Examples
- Falls without LOC
- Altered consciousness without fall (eg partial complex seizure)
- TIA, stroke
- Intoxications
- Hypoglycaemia

TLOC

[YES] [NO]
Syncope
(after initial evaluation in ED)

- Low-risk features only
  - Likely reflex, situational or orthostatic
  - Can be discharged directly from the ED if recurrent

- Neither high nor low-risk
  - Should not be discharged from the ED
  - Syncope out-patient clinic (SU) (if available)

- Any high-risk Feature
  - Any high-risk features require intensive diagnostic approach
  - Admission for diagnosis or treatment
  - Should not be discharged from the ED
Management of syncope in the ED: Recommendations

<table>
<thead>
<tr>
<th>Recommendations</th>
<th>Class</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. It is recommended that patients with low-risk features, likely to have reflex or situational syncope or syncope due to OH, are discharged from ED.</td>
<td>I</td>
<td>B</td>
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<tr>
<td>2. It is recommended that patients with high-risk features receive an early invasive prompt evaluation in a syncope unit or an ED observation unit (if available), or are hospitalized.</td>
<td>I</td>
<td>B</td>
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<td>3. It is recommended that patients who have neither high- nor low-risk features are observed in the ED in a syncope unit instead of being hospitalized.</td>
<td>I</td>
<td>B</td>
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<td>4. Risk stratification scores may be considered for risk stratification in the ED.</td>
<td>IIb</td>
<td>B</td>
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</tbody>
</table>
3. In all patients, perform a complete history taking, physical examination (including standing BP measurement), and standard ECG.

4. Perform immediate ECG monitoring (in bed or telemetry) in high risk patients when there is a suspicion of arrhythmic syncope.

5. Perform echocardiogram when there is previous known heart disease, or data suggestive of structural heart disease or syncope secondary to cardiovascular cause.
## Echocardiography

### Recommendations

<table>
<thead>
<tr>
<th>Indications</th>
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<tr>
<td>Echocardiography is indicated for diagnosis and risk stratification in patients with suspected structural heart disease.</td>
<td>I</td>
<td>B</td>
</tr>
<tr>
<td>Two-dimensional and Doppler echocardiography during exercise in the standing, sitting, or semi-supine position to detect provokable left ventricular outflow tract obstruction is indicated in patients with HCM, a history of syncope, and a resting or provoked peak instantaneous left ventricular outflow tract gradient &lt;50 mmHg.</td>
<td>I</td>
<td>B</td>
</tr>
</tbody>
</table>

### Diagnostic criteria

Aortic stenosis, obstructive cardiac tumours or thrombi, pericardial tamponade, and aortic dissection are the most probable causes of syncope when the ECG shows the typical features of these conditions.  

### Additional advice and clinical perspectives

- For patients without suspected cardiac disease after history taking, physical examination, and electrocardiography, the ECG does not provide additional useful information, suggesting that syncope alone is not an indication for echocardiography.
- Computed tomography or MRI should be considered in selected patients presenting with syncope of suspected cardiac structural origin when echocardiography is not diagnostic.
6. Perform CSM in patients >40 years of age with syncope of unknown origin compatible with a reflex mechanism.

7. Perform tilt testing in cases where there is suspicion of syncope due to reflex or an orthostatic cause.

8. Perform blood tests when clinically indicated, e.g. haematocrit and cell blood count when haemorrhage is suspected, oxygen saturation and blood gas analysis when hypoxic syndromes are suspected, troponin when cardiac ischaemia-related syncope is suspected, and D-dimer when pulmonary embolism is suspected, etc.
Cardiac sinus massage

### Recommendations

#### Indications

CSM is indicated in patients >40 years of age with syncope of known origin compatible with a reflex mechanism.\(^{92–94}\)

<table>
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</table>

#### Diagnostic criteria

CSS is confirmed if CSM causes bradycardia (asystole) and/or hypotension that reproduce spontaneous symptoms, and patients have clinical features compatible with a reflex mechanism of syncope.\(^{89,90,92,93,98–102}\)

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</table>

### Additional advice and clinical perspectives

- History of syncope and its reproduction by CSM defines CSS; positive CSM without a history of syncope defines carotid sinus hypersensitivity.\(^{89,90,92,93}\) Carotid sinus hypersensitivity in patients with unexplained syncope may be a non-specific finding because it is present in ≤40% of older populations and should be used with caution for diagnosis of the mechanism of syncope.
- CSM should be performed with the patient in the supine and upright positions and with continuous beat-to-beat BP monitoring. This may be more readily performed in the tilt laboratory.\(^{90}\)
- Although neurological complications are very rare,\(^{90,95–97}\) the risk of provocation of TIA with the massage suggests that CSM should be undertaken with caution in patients with previous TIA, stroke, or known carotid stenosis >70%.
Tilt testing

<table>
<thead>
<tr>
<th>Recommendations</th>
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<th>Level(^b)</th>
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</thead>
<tbody>
<tr>
<td><strong>Indications</strong></td>
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<tr>
<td>Tilt testing should be considered in patients with suspected reflex syncope, OH, POTS, or PPS.(^{23,24,105–109,111–117})</td>
<td>IIA</td>
<td>B</td>
</tr>
<tr>
<td>Tilt testing may be considered to educate patients to recognize symptoms and learn physical manoeuvres.(^{119–121})</td>
<td>IIb</td>
<td>B</td>
</tr>
<tr>
<td><strong>Diagnostic criteria</strong></td>
<td>IIA</td>
<td>B</td>
</tr>
<tr>
<td>Reflex syncope, OH, POTS, or PPS should be considered likely if tilt testing reproduces symptoms along with the characteristic circulatory pattern of these conditions.(^{23,24,105–109,111–117})</td>
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</table>

**Additional advice and clinical perspectives**

- A negative tilt table response does not exclude a diagnosis of reflex syncope.
- While sensitivity and specificity are at acceptable levels when measured in patients with VVS and healthy controls, in usual clinical settings of syncope of uncertain origin tilt testing suggests the presence of a hypotensive susceptibility, which may exist not only in reflex syncope but also with other causes of syncope including some forms of cardiac syncope. The concept of hypotensive susceptibility rather than diagnosis has important practical utility, because the presence or absence of hypotensive susceptibility plays a major role in guiding pacemaker therapy in patients affected by reflex syncope and in the management of hypotensive therapies, which are frequently present in the elderly with syncope (see sections 5.1 and 5.2).
- A positive cardioinhibitory response to tilt testing predicts, with high probability, asystolic spontaneous syncope; this finding is relevant for therapeutic implications when cardiac pacing is considered (see section 5.2). Conversely, the presence of a positive vasodepressor, a mixed response, or even a negative response does not exclude the presence of asystole during spontaneous syncope.\(^{122,123}\)
- Tilt testing may be helpful in separating syncope with abnormal movements from epilepsy.\(^{137}\)
- Tilt testing may have value in distinguishing syncope from falls.\(^{23}\)
- Tilt testing may be helpful in separating syncope from PPS. In suspected PPS, the tilt test should preferably be performed together with EEG monitoring; a normal EEG helps to confirm the diagnosis.\(^{116,117}\) In the absence of an EEG, a video recording will be helpful in confirming the diagnosis.
- Tilt testing should not be used to assess the efficacy of a drug treatment.\(^{118}\)
9. Perform prolonged ECG monitoring (external or implantable) in patients with recurrent severe unexplained syncope who have all of the following three features:

- Clinical or ECG features suggesting arrhythmic syncope.
- A high probability of recurrence of syncope in a reasonable time.
- Who may benefit from a specific therapy if a cause for syncope is found.
ECG monitoring: indications

T-LOC suspected syncope

- Certain diagnosis/mechanism
  - Treat appropriately

- Uncertain diagnosis/mechanism
  - Syncope
    - High risk, arrhythmia likely
      - In-hospital monitoring (Class I)
      - If negative
        - ILR (Class I)
        - ELR (Class IIa)
    - Low risk, arrhythmia likely & recurrent episodes
      - ILR (Class I)
    - Low risk, reflex likely & need for specific therapy
      - ILR (Class IIa)
    - Low risk & rare episodes
      - Not indicated
    - T-LOC non-syncopal
      - Unexplained epilepsy
      - Unexplained falls
        - ILR (Class IIb)

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EHJ Doi:10.1093/eurheartj/ehy037
<table>
<thead>
<tr>
<th>Do</th>
<th>Don’t</th>
<th></th>
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<tbody>
<tr>
<td><strong>EPS-guided therapy</strong></td>
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<tr>
<td>In patients with unexplained syncope and bifascicular BBB, a pacemaker is indicated in the presence of either a baseline H-V interval of ≥70 ms, second- or third-degree His-Purkinje block during incremental atrial pacing, or with pharmacological challenge.</td>
<td>I</td>
<td>B</td>
</tr>
<tr>
<td>In patients with unexplained syncope and previous myocardial infarction, or other scar-related conditions, it is recommended that induction of sustained monomorphic VT is managed according to the current ESC Guidelines for VA.</td>
<td>I</td>
<td>B</td>
</tr>
<tr>
<td>In patients without structural heart disease with syncope preceded by sudden and brief palpitations, it is recommended that the induction of rapid SVT or VT, which reproduce hypotensive or spontaneous symptoms, is managed with appropriate therapy according to the current ESC Guidelines.</td>
<td>I</td>
<td>C</td>
</tr>
<tr>
<td>In patients with syncope and asymptomatic sinus bradycardia, a pacemaker should be considered if a prolonged corrected SNRT is present.</td>
<td>Ila</td>
<td>B</td>
</tr>
</tbody>
</table>

**Additional advice and clinical perspectives**
- In general, whereas a positive EPS predicts the cause of syncope, a negative study is unable to exclude an arrhythmic syncope and further evaluation is warranted.
- The induction of polymorphic VT or VF in patients with ischaemic cardiomyopathy or DCM cannot be considered a diagnostic finding of the cause of syncope.
- EPS is generally not useful in patients with syncope, normal ECG, no heart disease, and no palpitations.
**Treatment syncope: Reflex syncope**

- **Reflex syncope**
  - **Education, life-style measures (Class I)**
  - **Severe/recurrent form**
    - **Low BP phenotype**
      - Younger
        - Fludrocortisone
        - Midodrine (Class IIb)
        - Counter-pressure manoeuvre (Class IIa)
        - Tilt training (Class IIb)
    - **Prodromes**
      - Yes
    - **Prodromes**
      - No or very short
    - **Hypotensive drugs**
      - Stop/reduce hypotensive drugs (Class IIa)
    - **Dominant cardioinhibition**
      - Cardiac pacing (Class IIa/IIb)
        - See figure 10
  - **Older**

[Source: www.escardio.org/guidelines]
Treatment of syncope: Orthostatic hypotension

Syncope due to orthostatic hypotension

Education, life-style measures (Class I)  
Adequate hydration and salt intakes (Class I)

Stop/reduce vasoactive drugs (Class IIa)

if symptoms persist

Counter-pressure manoeuvres (Class IIa)  
Compression garments (Class IIa)  
Head-up tilt sleeping (Class IIa)  
Midodrine (Class IIa)  
Fludrocortisone (Class IIa)

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Treatment of syncope: Cardiac arrhythmias

Syncope due to intrinsic cardiac SND or AV block

- ECG-documented bradycardia
  - Sympt. SND (Class I)
    - Established relationship between SB and synco
  - Asympt. SND (Class IIa)
    - Non-established relationship between SB and syncope
  - 2° and 3° AV block (Class I)
    - Persistent AVB
    - Paroxysmal AV block (narrow QRS and BBB)
    - AF with slow HR

- Bifascicular BBB (ECG-undocumented bradycardia)
  - EPS or ILR positive (Class I)
    - HV >70ms or induced AV block
    - Sympt. pause >3''
    - Asympt. pause >6''
  - EPS/ILR negative or not done (Class IIb)
    - Empiric pacing (mechanism uncertain)

Pacing indicated

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ΠΑΝΕΛΛΗΝΙΟ ΚΑΡΔΙΟΛΟΓΙΚΟ ΣΥΝΕΔΡΙΟ PANHELLENIC CONGRESS OF CARDIOLOGY
Treatment of syncope: Cardiac tachyarrhythmias

Cardiac tachyarrhythmia syncope

SVT
- Catheter ablation (Class I)
- AA drugs (Class IIa)

VT
- Catheter ablation (Class I)
- ICD (Class I Class IIa)
- AA drugs (Class IIa)

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### Recommendations

**Left ventricular systolic dysfunction**

<table>
<thead>
<tr>
<th>1. ICD therapy is recommended to reduce SCD in patients with symptomatic heart failure (NYHA class II–III) and LVEF ≤35% after ≥3 months of optimal medical therapy who are expected to survive for at least 1 year with good functional status</th>
<th>Class</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>A</td>
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</table>

<table>
<thead>
<tr>
<th>2. An ICD should be considered in patients with unexplained syncope with systolic impairment but without a current indication for ICD to reduce the risk of sudden death</th>
<th>Class</th>
<th>Level</th>
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<tbody>
<tr>
<td>IIa</td>
<td>C</td>
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<table>
<thead>
<tr>
<th>3. Instead of an ICD, an ILR may be considered in patients with recurrent episodes of unexplained syncope with systolic impairment but without a current indication for ICD</th>
<th>Class</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>IIb</td>
<td>C</td>
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</table>

### Additional advice and clinical perspectives

- The presence of syncope increases mortality irrespective of ICD implantation compared to patients without syncope.
- Treatment of syncope is based on the specific cause of syncope whereas treatment for the underlying cardiomyopathy impacts on the long-term prognosis.
- The decision to implant an ICD or to complete the investigation (e.g., ILR implantation) in patients with unexplained syncope depends on a global clinical evaluation of the patient’s conditions, the potential benefit and harm of such therapy, and the presence of other risk factors for SCD.
### Recommendations

#### Hypertrophic cardiomyopathy

<table>
<thead>
<tr>
<th>1. It is recommended that the decision for ICD implantation in patients with unexplained syncope is made according to the ESC HCM Risk-SCD score <a href="http://www.doc2do.com/hcm/webHCM.html">http://www.doc2do.com/hcm/webHCM.html</a></th>
<th>I</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Instead of an ICD, an ILR may be considered in patients with recurrent episodes of unexplained syncope with systolic impairment but without a current indication for ICD.</td>
<td>IIa</td>
<td>C</td>
</tr>
</tbody>
</table>

### Additional advice
- Unexplained syncope is a risk factor for SCD and should be considered with the other high-risk features when estimating future risk of SCD.
- Syncopal episodes within 6 months of evaluation may be more predictive of SCD.
<table>
<thead>
<tr>
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<tr>
<td><strong>Arrhythmogenic right ventricular cardiomyopathy</strong></td>
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<tr>
<td>1. ICD implantation may be considered in patients with ARVC and a history of unexplained syncope.</td>
<td>IIb</td>
<td>C</td>
</tr>
<tr>
<td>2. Instead of an ICD, an ILR may be considered in patients with recurrent episodes of unexplained syncope with but without a current indication for ICD.</td>
<td>IIa</td>
<td>C</td>
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</tbody>
</table>
What is new in 2018 syncope guidelines? (1)

<table>
<thead>
<tr>
<th>CHANGE IN RECOMMENDATIONS</th>
<th>2009</th>
<th>2018</th>
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</thead>
<tbody>
<tr>
<td>Contraindications to CSM</td>
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<tr>
<td>Tilt testing: indication for syncope</td>
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<tr>
<td>Tilt testing for educational purposes</td>
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<tr>
<td>Tilt testing: diagnostic criteria</td>
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<td>Tilt testing for assessing therapy</td>
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<tr>
<td>Holter for unexplained syncope</td>
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<tr>
<td>ECG Monitoring: presyncope &amp; asymptomatic arrhythmias</td>
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<tr>
<td>Adenosine trisphosphate test</td>
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<tr>
<td>EPS-guided pacemaker: prolonged SNRT</td>
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</table>
### Change in Recommendations from 2009 to 2018

<table>
<thead>
<tr>
<th>2009</th>
<th>2018</th>
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<tbody>
<tr>
<td><strong>EPS-guided pacemaker:</strong> HV &gt;70 ms</td>
<td></td>
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<tr>
<td>Empiric pacing in bifascicular block</td>
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<tr>
<td>Therapy of reflex syncope: PCM</td>
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<tr>
<td>Therapy of OH: PCM</td>
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<tr>
<td>Therapy of OH: abdominal binders</td>
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<td>Therapy of OH: head-up tilt sleeping</td>
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<td>Syncope &amp; SVT/VT: AA drugs</td>
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<tr>
<td>Syncope &amp; AF: catheter ablation</td>
<td>Expert opinion</td>
</tr>
<tr>
<td><strong>ICD:</strong> LVEF &gt;35% and syncope</td>
<td></td>
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<tr>
<td>Syncope &amp; high risk HCM: ICD</td>
<td></td>
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<tr>
<td>Syncope &amp; ARVC: ICD</td>
<td></td>
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<tr>
<td>Psychiatric consultation for PPS</td>
<td>Expert opinion</td>
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