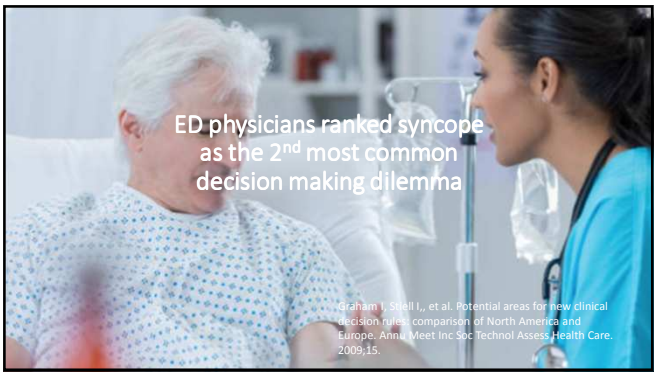
Syncope in ED- Risk Stratification

Ger McMahon

3- 8% of ED presentations – increasing with advancing age

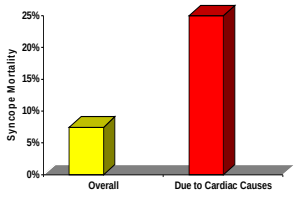
>50% are admitted
@ 75% of Healthcare Costs due to Syncope



Syncope 1yr Mortality

Cardiac causes of syncope have high mortality rates:
(1 year Mortality Rate of 30%)

Compared to non-cardiac syncope:
(1 year Mortality Rate of 0-12%)



Kapoor W. Medicine 1990;69:160-175.

Department of Emergency Medicine

ED Approach

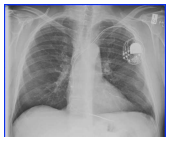
1. Assess for life threatening problems standard **ABC/PRIMARY SURVEY** approach
2. True syncope from "non-syncopal" disorders
   - Was LOC complete
   - Was LOC transient with a rapid onset and short duration
   - Did the patient recover spontaneously, completely without sequelae or post-ictal state
   - Did the patient lose postural tone

➢ **If yes to all then Syncope Likely**

Detailed History including witness account and physical examination can differentiate syncope from other forms of TLOC in > 60% of cases

Red Flags in **History**

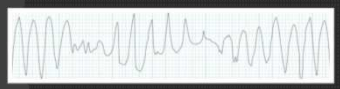
- Chest pain (CAD/PE), Dyspnoea, Palpitations preceding syncope
- Known severe structural or coronary heart disease
- Family Hx of sudden cardiac death
- Syncope during exercise or supine
- Frequent and/or injurious syncope
- Syncope while driving
- Prolonged unconsciousness
  - post-event confusion
  - lateral tongue biting



T-LOC Suspected Syncope

- Physical examination
  - Cardiovascular
  - Neurological
- 12-lead ECG
- Orthostatic BP measurements
- BM & Baseline lab investigations

12-lead ECG



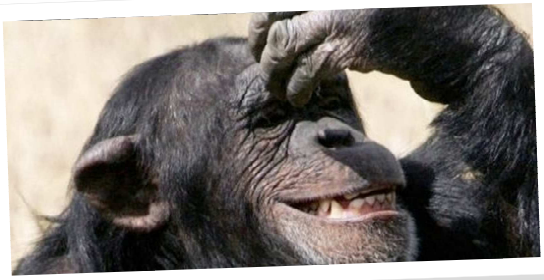
- **Normal or abnormal**
  - **Acute MI**
  - **Severe sinus bradycardia/pause**
  - **AV block**
  - **Tachyarrhythmia(SVT, VT)**
  - **Pre-excitation (WPW), Long QT, Brugada**
- **Short sampling window (12 seconds)**
- **May require extended ECG monitoring to improve diagnostic yield (ILR)**

4.1.2 Management of syncope in the ED based on risk stratification

ESC European Society of Cardiology

The management of TLOC of suspected syncopal nature in the ED should answer the following three key questions:

1) Is there a serious underlying cause that can be identified?
1) What is the risk of a serious outcome?
2) Should the patient be admitted to hospital?



Risk Stratification at the initial evaluation (I)

Low-risk	High-risk (red flag)
Syncopal event	
1. Associated with prodrome typical of reflex syncope (e.g. light-headedness, feeling of warmth, sweating, nausea, vomiting) 2. After sudden unexpected unpleasant sight, sound, smell, or pain 3. After prolonged standing or crowded, hot places 4. During a meal or postprandial 5. Triggered by cough, defaecation, or micturition 6. With head rotation or pressure on carotid sinus (e.g. tumour, shaving, tight collars) 7. Standing from supine/sitting position	**Major** 1. New onset of chest discomfort, breathlessness, abdominal pain, or headache 2. Syncope during exertion or when supine. 3. Sudden onset palpitation immediately followed by syncope **Minor** (high risk only if associated with structural heart disease or abnormal ECG): 1. No warning symptoms or short (<10 s) prodrome 2. Family history of SCD at young age 3. Syncope in the sitting position

Risk Stratification at the initial evaluation (II)

Low-risk	High-risk (red flag)
Past medical history	
1. Long history (years) of recurrent syncope with low-risk features with the same characteristics of the current episode 2. Absence of structural heart disease.	**Major** 1. Severe structural or coronary artery disease (heart failure, low LVEF or previous myocardial infarction)
Physical examination	
1. Normal examination.	**Major** 1. Unexplained systolic BP in the ED <90 mmHg 2. Suggestion of gastrointestinal bleed on rectal examination 3. Persistent bradycardia (<40 b.p.m.) in awake state and in absence of physical training 4. Undiagnosed systolic murmur

Risk Stratification at the initial evaluation (III)

Low-risk	High-risk (red flag)
ECG	
1. Normal ECG	**Major** 1. ECG changes consistent with acute ischaemia 2. Mobitz II second- and third-degree AV block 3. Slow AF (<40 b.p.m.) 4. Persistent sinus bradycardia (<40 b.p.m.) 5. Bundle branch block or IVCD 6. Q waves consistent with CAD or cardiomyopathy 7. Sustained and non-sustained VT 8. Dysfunction of a pacemaker or ICD 9. Type 1 Brugada pattern 10. Long QT

Risk Stratification at the initial evaluation (IV)

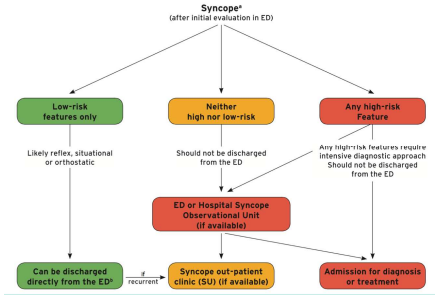
Low-risk	High-risk (red flag)
ECG	
1. Normal ECG	**Minor** (only if history suggests arrhythmic syncope): 1. Mobitz I second-degree AV block and 1° degree AV block with markedly prolonged PR interval 2. Asymptomatic inappropriate mild sinus bradycardia (40–50 b.p.m.), or slow AF (40–50 b.p.m.) 3. Paroxysmal SVT or atrial fibrillation 4. Pre-excited QRS complex 5. Short QTc interval (≤340 ms) 6. Atypical Brugada patterns 7. Negative T waves suggestive of ARVC

Management of syncope in the ED

Should the patient be admitted to hospital?

Favour initial management in ED observation unit and/or fast-track to syncope unit	Favour admission to hospital
High-risk features AND: • Stable, known structural heart disease • Severe chronic disease • Syncope during exertion • Syncope while supine or sitting • Syncope without prodrome • Palpitations at the time of syncope • Inadequate sinus bradycardia or sinoatrial block • Suspected device malfunction or inappropriate intervention • Pre-excited QRS complex • SVT or paroxysmal atrial fibrillation • ECG suggesting an inheritable arrhythmogenic disorders • ECG suggesting ARVC	**High-risk features AND:** • Any potentially severe coexisting disease that requires admission • Injury caused by syncope • Need of further urgent evaluation and treatment if it cannot be achieved in another way (i.e. observation unit), e.g. ECG monitoring, echocardiography, stress test, electrophysiological study, angiography, device malfunction, etc • Need for treatment of syncope

2018 ESC Guidelines on Syncope – Michele Brignole & Angel Moya
EHJ Doi:10.1093/eurheartj/ehy037



Cases & Traces

From the Emergency dept.

Case 1

68yr old taxi driver

BIBA: Collapse and scalp laceration.

"Standing in the kitchen talking to his son, last thing he remembers is his wife calling him..... came round on the kitchen floor.....denies any prodrome"

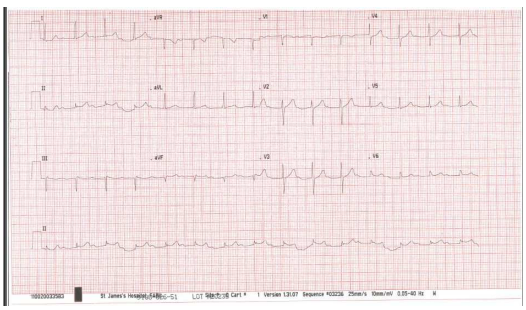
4 episodes in previous 12m

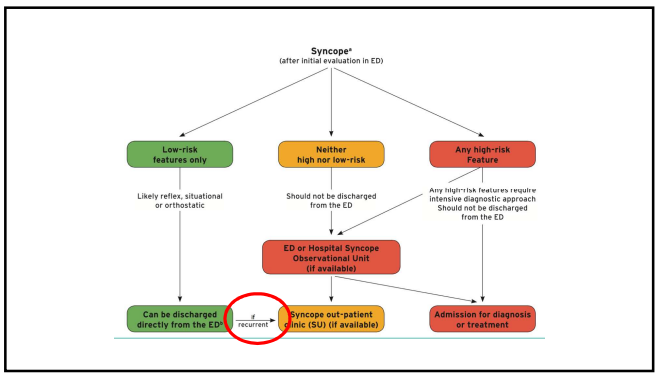
PMH: High cholesterol,

Meds: Lipitor 20mgs

Clinical Assessment

- Alert and Fully orientated, GCS15/15, no HI red flags
- Blood Sugar normal
- BP/HR normal : OH neg
- Clinical exam: Cardiac, Neurological NAD
- Lab investigations: NAD





Clinical Assessment

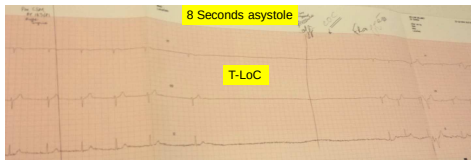
- Alert and Fully orientated, GCS15/15, no red flags for HI
- Blood Sugar normal
- BP/HR normal : OH negative
- Clinical exam: Cardiac, Neurological NAD
- Lab investigations: NAD
- 12 –lead: nil acute
- **Discharged to FASU**

Cardiac sinus massage

Recommendations	Class[a]	Level[b]
Indications		
CSM is indicated in patients >40 years of age with syncope of unknown origin compatible with a reflex mechanism.[92–94]	I	B
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]	I	B

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%.



CSM – Cardio-inhibitory CSS with Syncope & requiring Frappē

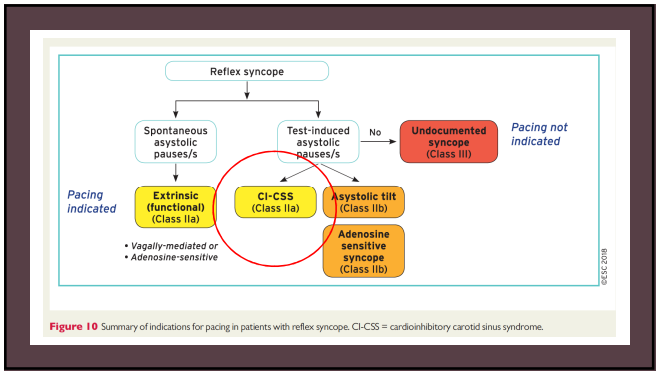
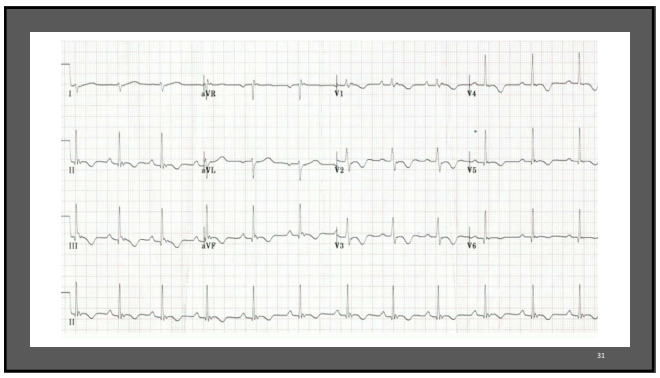


Figure 10 Summary of indications for pacing in patients with reflex syncope. CI-CSS = cardioinhibitory carotid sinus syndrome.

Case 2

- 26yr old male BIBA following a witnessed syncopal episode at work at his desk. Alert and orientated, in no acute distress on arrival
- **Clinical exam**: normal
- **History:**
- ✓ Prodrome of palpitations and weakness
- ✓ Previous episodes of dizzy spells no syncope
- ✓ No family hx SCD,
- ✓ No substance misuse

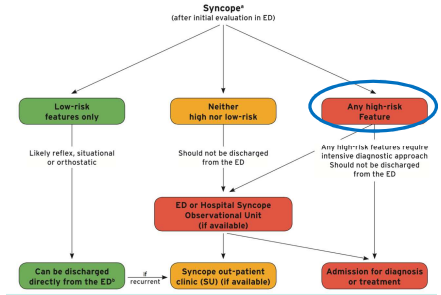


- Terminal notch in the QRS
- Present in approximately 50% of patients with ARVD
- Confirmed at Cardiac MRI

Arrythmogenic Right Ventricular Dysplasia (ARVD)

- First described in 1977
- Important cause of SCD
- True prevalence unknown
- May present as syncope
- Aetiology is linked to fatty myocardial infiltration

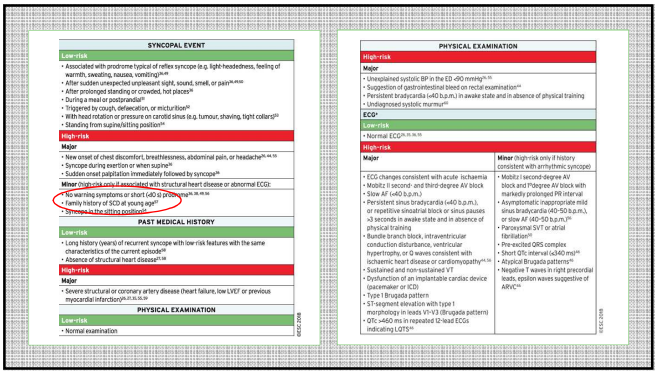
- AICD implantation
- Radiofrequency ablation
- Medical Management with B-blockers first line)

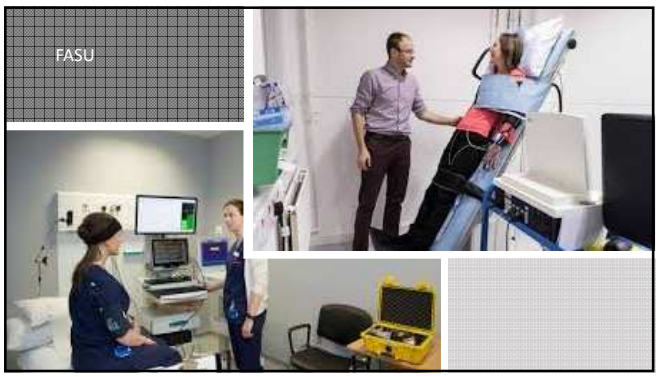


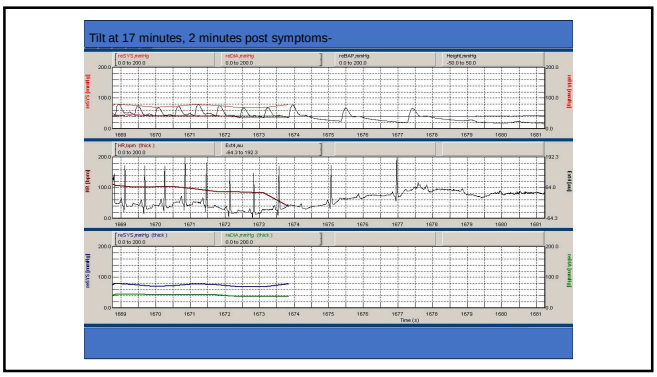
Case 3

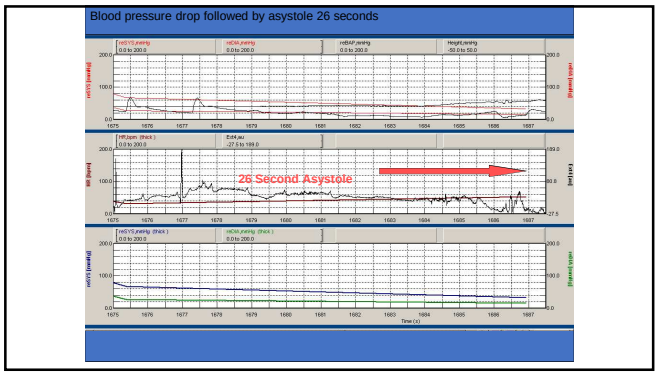
- 19 year old:
- Presented to ED following a syncope episode, had been at a concert, had a few drinks, standing for a long period, felt weak and dizzy for 2 minutes, then remembers waking up on the ground.
- Has had similar episodes previously (2 over the last year).
- Always upright, always prodromal, all episodes associated with prolonged standing.
- Clinical Examination, Lab investigations and ECG normal.
- Active Stand: Normal

Family history of sudden cardiac death (a first cousin maternal side, aged 30.



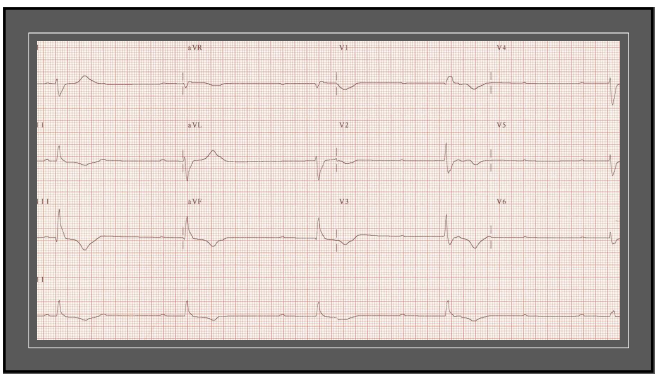






Case 6

- 78 yr. old presented to ED - fall at shop …. remembers tripping on the kerb
- Fallen 3 times in the last 2 months - tripped on a rug at home, fell going upstairs.
- Independent, lives alone, drives.
- PMhx: Mild asthma, TIA 6 years ago.
- Meds: Aspirin, Lipitor



Older Fallers presenting to ED

FUSE study Heart 2016

- **1/5** falls in older persons **are unexplained**.
- **1/5** of unexplained fallers had an **Arrythmogenic** cause.
- Arrhythmias are predictive of increased risk of future falls

Cough Syncope

Multiple injurious falls in past 10days secondary to cough syncope

- No Prodrome
- Clinical Examination, ECG no other red flags
- Referred for urgent assessment in FASU
- Advised against driving

R-Test Mobitz Type 2 with Ventricular standstill

Management

Multi-pronged

1. **Respiratory**
   - Smoking Cessation/ Cough Suppression + Education
   - Treatment of Underlying Chronic Pulmonary Disease
2. **Cardiac**
   - Pacemaker
3. **Driving Advice**

Mail Online

Woman driver who killed mother on bike walks free after claiming she fainted at the wheel

By Jaya Narain

Last updated at 3:14 AM on 12th January 2010

Advise against driving until full assessment is complete, unless recurrence whilst driving deemed unlikely

Management of syncope in the ED: Recommendations

Recommendations	Class	Level
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.	I	B
2. It is recommended that patients with high-risk features receive an early intensive prompt evaluation in a syncope unit or in an ED observation unit (if available), or are hospitalized.	I	B
3. It is recommended that patients who have neither high- nor low-risk features are observed in the ED or in a syncope unit instead of being hospitalized.	I	B
4. Risk stratification scores may be considered for risk stratification in the ED.	IIb	B

Management of syncope in the emergency department

Recommendations	Class[a]	Level[b]
It is recommended that patients with low-risk features, likely to have reflex or situational syncope, or syncope due to OH, are discharged from the ED.[27,35,36,49–54,58,62,69]	I	B
It is recommended that patients with high-risk features receive an early intensive and prompt evaluation in a syncope unit or in an ED observation unit (if available), or are hospitalized.[24,27,35,36,44–46,50,55–57,59,60,70–76]	I	B
It is recommended that patients who have neither high- nor low-risk features are observed in the ED or in a syncope unit instead of being hospitalized.[40,63–65,77]	I	B
Risk stratification scores may be considered for risk stratification in the ED.[78–84]	IIb	B

Additional advice and clinical perspectives

- In the ED, presyncope should be managed with the same accuracy as syncope as it carries the same prognosis.[66–69]
- Diagnostic radiology and laboratory tests such as chest X-ray, brain computed tomography, routine blood haematology, biochemistry, and D-dimer and cardiac markers have a low diagnostic yield, impact on risk stratification of patients with syncope, and should not routinely be used unless specifically suggested by clinical evaluation.
- Around 10% of patients with syncope in the ED will suffer from a serious outcome within 7–30 days of their visit, with just under half occurring after their stay in the ED (see *Supplementary Data* Table 4). It is crucial to identify these high-risk patients to ensure early, rapid, and intensive investigation.
- As syncope units are both effective and efficient, this early, rapid, and intensive investigation can be performed on an outpatient basis (either in a syncope unit or an ED observation unit) in most cases. Only patients with a risk of a short-term serious outcome should be considered for hospital admission.
- To reduce inappropriate admissions, patients who have a cardiac device and syncope should undergo prompt device interrogation.
- Risk stratification scores perform no better than good clinical judgement and should not be used alone to perform risk stratification in the ED.