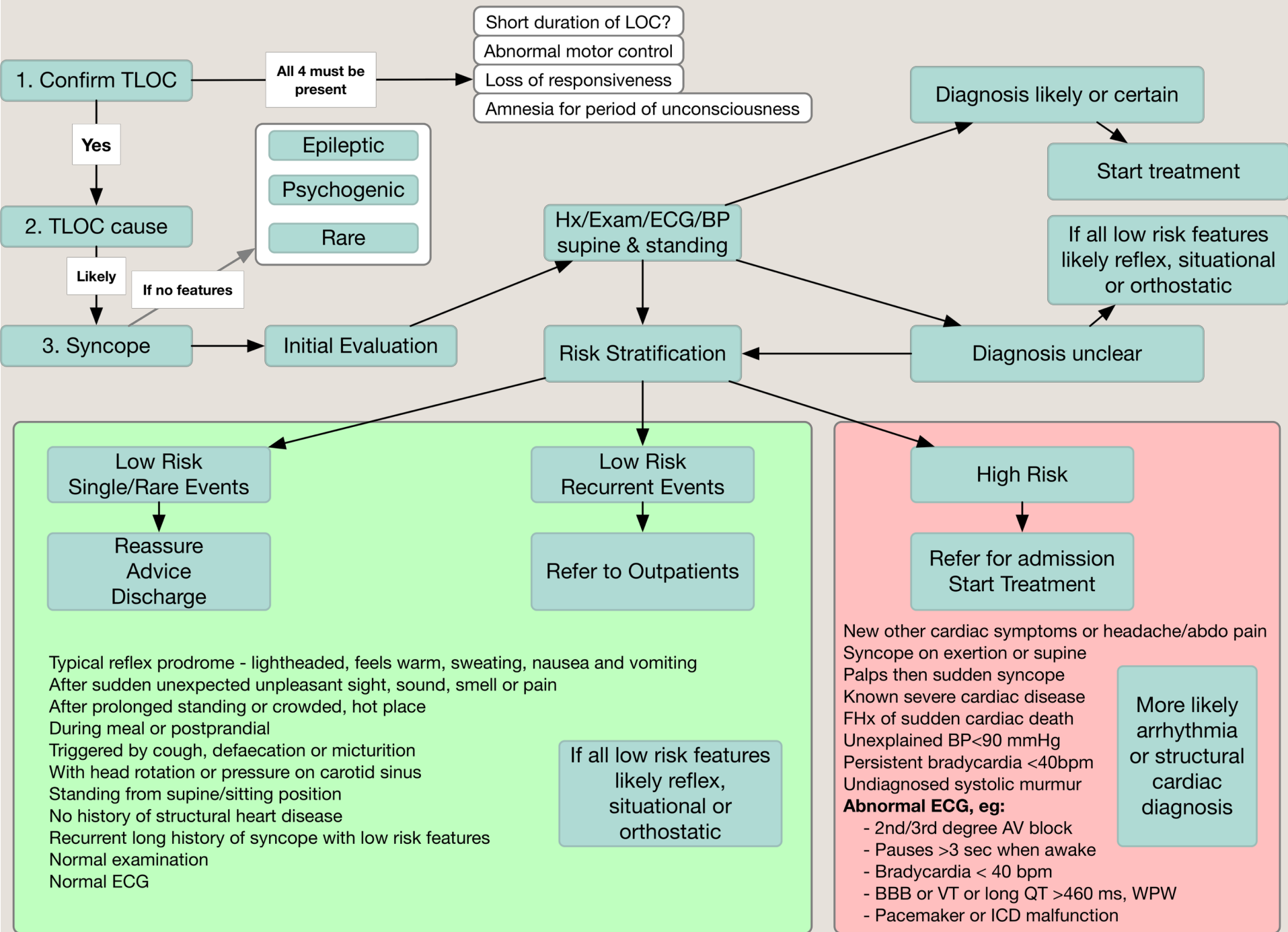




Syncope Update

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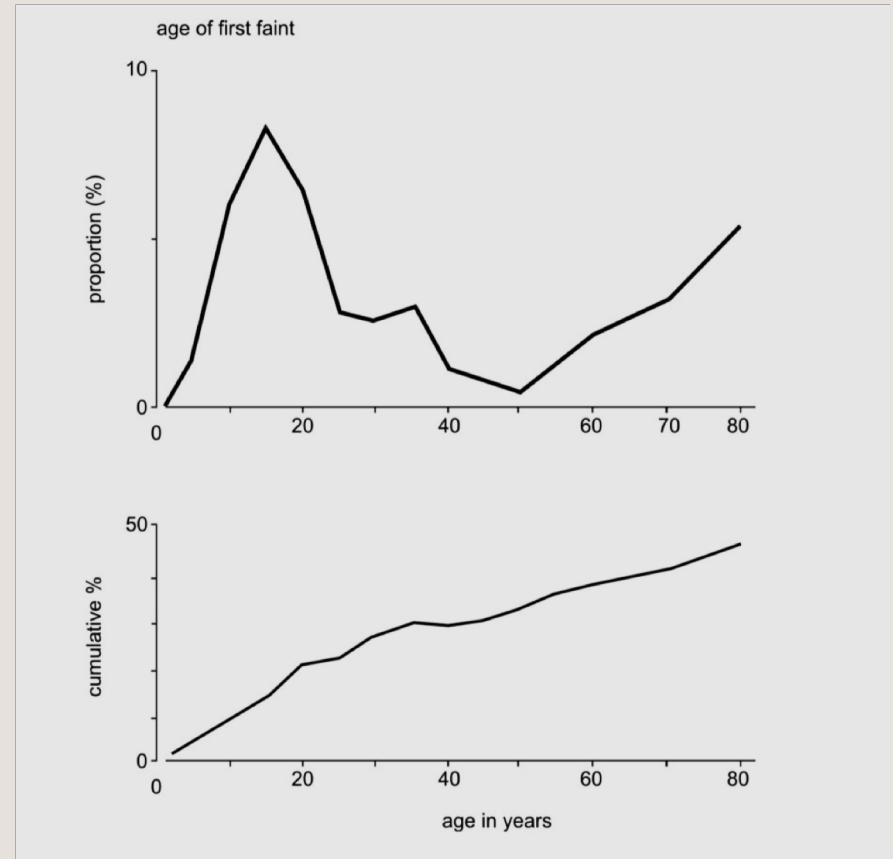


Definition of Syncope

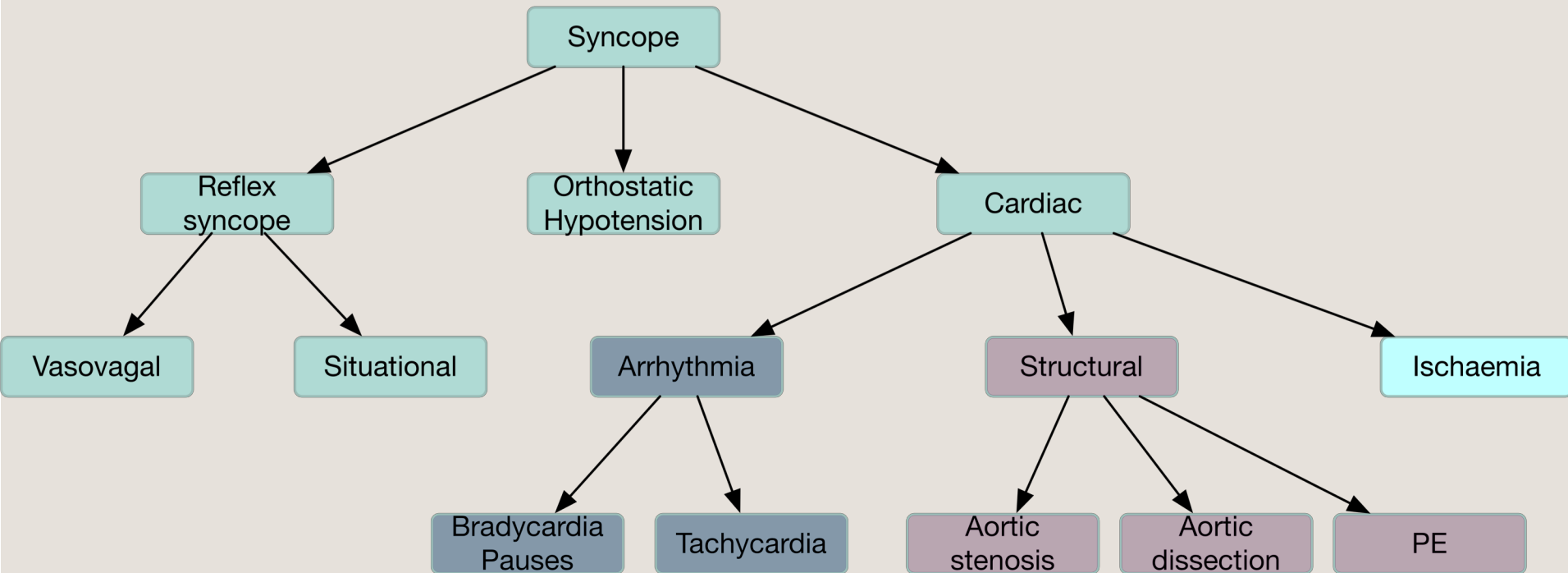
- Syncope is defined as TLOC due to **cerebral hypoperfusion**
- Characterized by a rapid onset, short duration, and spontaneous complete recovery

Incidence and Occurrence of Syncope

- Bimodal age distribution
- Cumulative risk about 1 in 2 during life
- Prevalence 1 in 100/yr



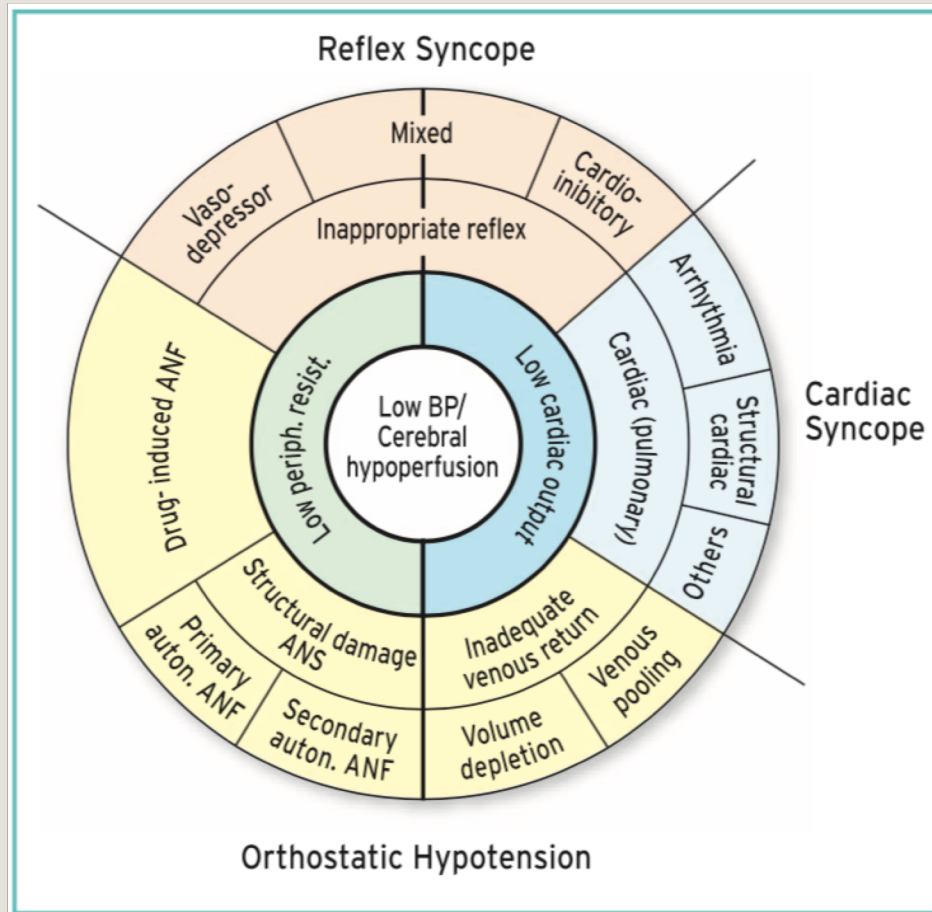
Syncope Differentials



Frequency of Causes of Syncope

Setting	Source	Reflex (%)	Orthostatic hypotension (%)	Cardiac (%)	Non-syncopal TLOC (%)	Unexplained (%)	Notes
General population	Framingham studies ⁴	21	9.4	9.5	9	37	Mean age at entry of 51 ± 14 years, adolescents excluded. Other causes of syncope (medication, etc.) were found in 14.3% of the population. Furthermore, 44% of population did not seek a medical visit

Physiology of reflex, OH and cardiac syncope



Diagnostic Tests

- History
- Examination and ECG
- BP supine and standing

Primary Care

- Echocardiogram
- Rhythm monitoring
- Tilt test/Autonomic tests/CSM
- Exercise Test
- Electrophysiology study

Secondary Care

TLOC and History Taking

- History can be seen as a diagnostic test
- No other independent gold/reference standard to diagnose syncope
- Most cases proves to be the only 'test' necessary
- Other than physical examination
- And an electrocardiogram (ECG)

TLOC and History Taking Success

- Following Hx alone certain diagnosis or high likely diagnosis achieved 50-80% of patients
- Initial diagnosis accuracy 90-91%
- Dangerous diagnosis not missed

TLOC - Four Specific Characteristics

- Short duration
- Abnormal motor control
- Loss of responsiveness
- Amnesia for the period of LOC

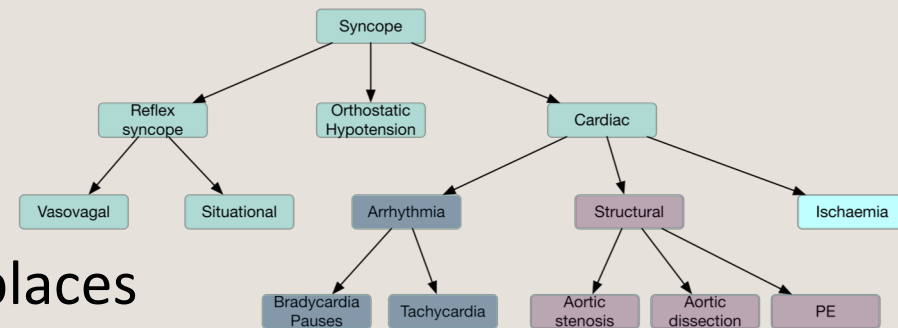
TLOC is certain when all four clinical features are present

General Features of Syncopal Attacks

- Trigger often present
- Nature of trigger pain/emotion/situational
- Prodrome not aura
- Myoclonus – <10, irreg, asynchronous, asymmetric
- Return of consciousness 10-30 seconds
- Confusion post attack < 10 seconds
- May be incontinent/ may have eyes open

Initial Evaluation - Reflex Syncope

- Long history of recurrent syncope, esp <40 years
- After unpleasant sight, sound, smell, or pain
- Prolonged standing
- During meal
- Being in crowded and/or hot places
- Autonomic activation before syncope: pallor, sweating, and/or nausea/vomiting
- With head rotation or pressure on carotid sinus (as in tumours, shaving, tight collars)
- Absence of heart disease/Normal exam and ECG



VVS and Situational Reflex Syncope

- VVS is highly probable if syncope is precipitated by pain, fear, or standing, and is associated with typical progressive prodrome (pallor, sweating, and/or nausea)
- Situational reflex syncope is highly probable if syncope occurs during or immediately after specific triggers

Clinical features that can suggest a diagnosis due to OH

- While or after standing
- Prolonged standing
- Standing after exertion
- Post-prandial hypotension
- Temporal relationship with start or changes of dosage of vasodepressive drugs or diuretics leading to hypotension
- Presence of autonomic neuropathy or parkinsonism

Orthostatic Hypotension

- Syncope occurs while standing and there is concomitant significant OH
- Systolic drop 20 mmHg
- Diastolic drop 10 mmHg
- Absolute systolic <90 mmHg

Cardiac Syncope

- During exertion or when supine
- Sudden onset palpitation immediately followed by syncope
- Family history of unexplained sudden death at young age
- Presence of structural heart disease or coronary artery disease -> PMHx/Murmur/CCF

ECGs suggesting arrhythmic syncope

- Bifascicular block
- Other intraventricular conduction abnormalities (QRS duration > 0.12 ms)
- Mobitz I second degree AV block and 1st degree AV block with markedly prolonged PR interval
- Asymptomatic mild inappropriate sinus bradycardia (40–50 b.p.m.) or slow atrial fibrillation (40–50 b.p.m.) in the absence of negatively chronotropic medications
- Non-sustained VT, Pre-excited QRS complexes
- Long or short QT intervals, Early repolarization
- Brugada pattern
- Negative T waves in right precordial leads, epsilon waves suggestive of ARVC
- LVH suggesting hypertrophic cardiomyopathy

Hx – Low Risk Indicators

SYNCOPE
Low-risk
• Associated with prodrome typical of reflex syncope (e.g. light-headedness, feeling of warmth, sweating, nausea, vomiting)^{36,49} • After sudden unexpected unpleasant sight, sound, smell, or pain^{36,49,50} • After prolonged standing or crowded, hot places³⁶ • During a meal or postprandial⁵¹ • Triggered by cough, defaecation, or micturition⁵² • With head rotation or pressure on carotid sinus (e.g. tumour, shaving, tight collars)⁵³ • Standing from supine/sitting position⁵⁴
PAST MEDICAL HISTORY
Low-risk
• Long history (years) of recurrent syncope with low-risk features with the same characteristics of the current episode⁵⁸ • Absence of structural heart disease^{27, 58}

History – High Risk

High-risk

Major

- New onset of chest discomfort, breathlessness, abdominal pain, or headache^{26, 44, 55}
- Syncope during exertion or when supine³⁶
- Sudden onset palpitation immediately followed by syncope³⁶

Minor (high-risk only if associated with structural heart disease or abnormal ECG):

- No warning symptoms or short (<10 s) prodrome^{36, 38, 49, 56}
- Family history of SCD at young age⁵⁷
- Syncope in the sitting position⁵⁴

High-risk

Major

- Severe structural or coronary artery disease (heart failure, low LVEF or previous myocardial infarction)^{26, 27, 35, 55, 59}

Examination and Risk

PHYSICAL EXAMINATION

Low-risk

- Normal examination

High-risk

Major

- Unexplained systolic BP in the ED <90 mmHg^{26, 55}
- Suggestion of gastrointestinal bleed on rectal examination⁴⁴
- Persistent bradycardia (<40 b.p.m.) in awake state and in absence of physical training
- Undiagnosed systolic murmur⁶⁰

ECG and Risk

ECG^a

Low-risk

- Normal ECG^{26, 35, 36, 55}

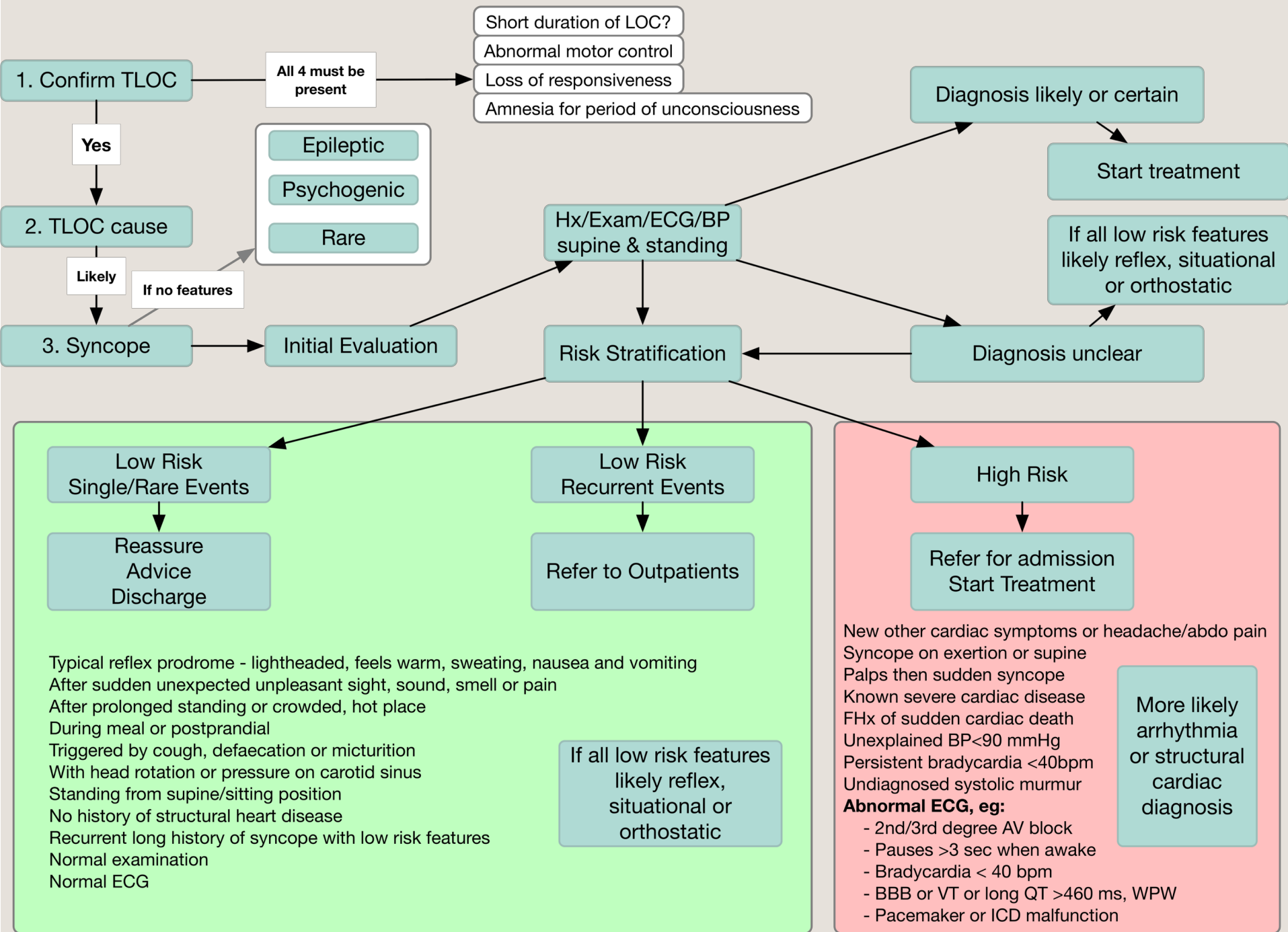
High-risk

Major

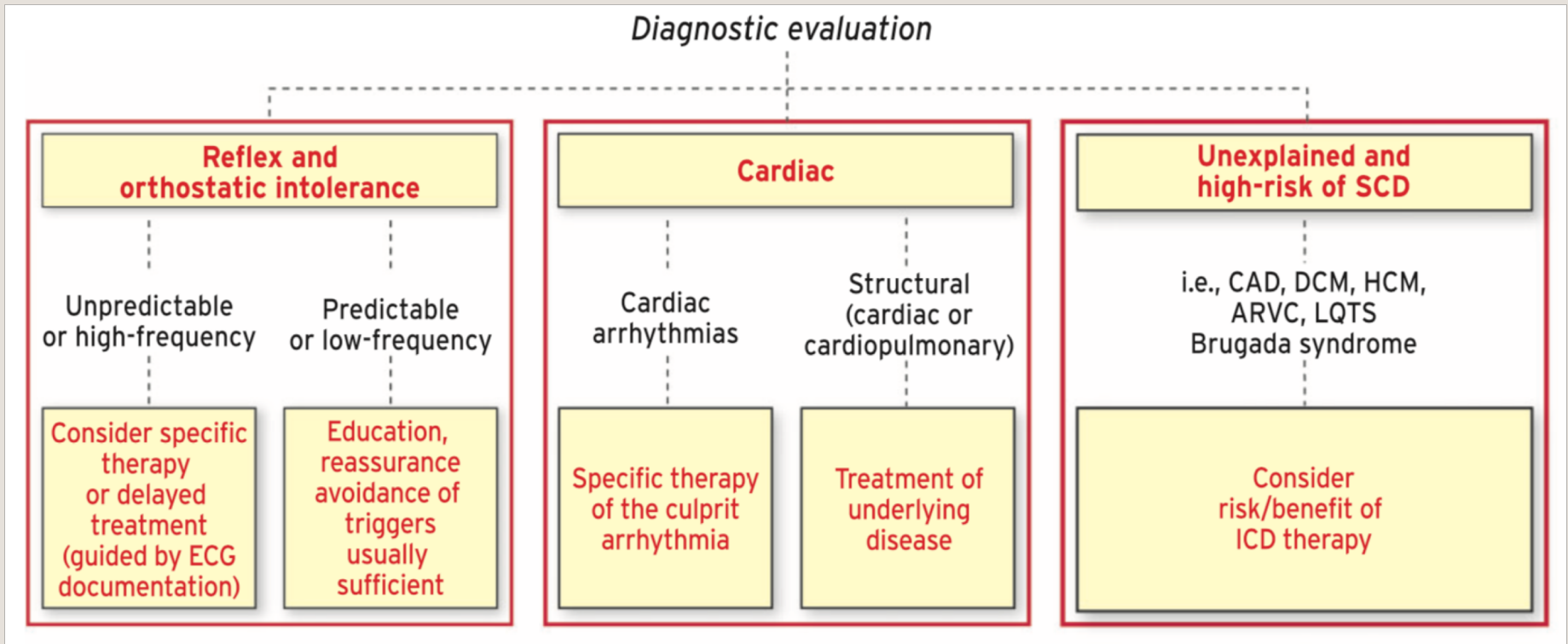
- ECG changes consistent with acute ischaemia
- Mobitz II second- and third-degree AV block
- Slow AF (<40 b.p.m.)
- Persistent sinus bradycardia (<40 b.p.m.), or repetitive sinoatrial block or sinus pauses >3 seconds in awake state and in absence of physical training
- Bundle branch block, intraventricular conduction disturbance, ventricular hypertrophy, or Q waves consistent with ischaemic heart disease or cardiomyopathy^{44, 56}
- Sustained and non-sustained VT
- Dysfunction of an implantable cardiac device (pacemaker or ICD)
- Type 1 Brugada pattern
- ST-segment elevation with type 1 morphology in leads V1-V3 (Brugada pattern)
- QTc >460 ms in repeated 12-lead ECGs indicating LQTS⁴⁶

Minor (high-risk only if history consistent with arrhythmic syncope)

- Mobitz I second-degree AV block and 1°degree AV block with markedly prolonged PR interval
- Asymptomatic inappropriate mild sinus bradycardia (40-50 b.p.m.), or slow AF (40-50 b.p.m.)⁵⁶
- Paroxysmal SVT or atrial fibrillation⁵⁰
- Pre-excited QRS complex
- Short QTc interval (≤ 340 ms)⁴⁶
- Atypical Brugada patterns⁴⁶
- Negative T waves in right precordial leads, epsilon waves suggestive of ARVC⁴⁶



Syncope Treatment - Overview



Extra slides if time...

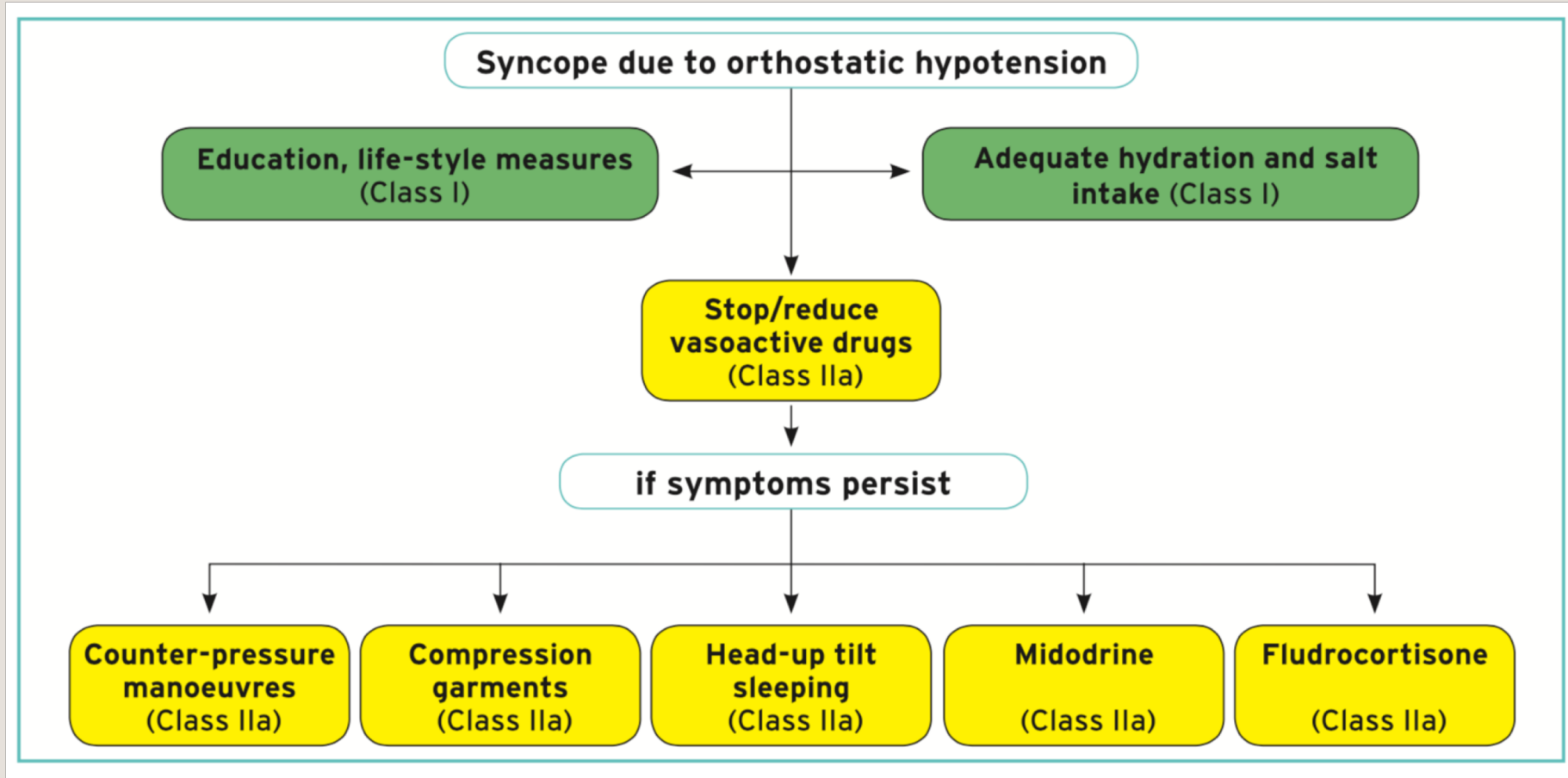
Treatment – Reflex Syncope

- Education, Lifestyle modification, Reassurance
- Avoidance of triggers and situations
 - e.g. dehydration and/or hot crowded environments
- Early recognition of prodromal symptoms
 - Sit or lie down
 - Activate counter-pressure manoeuvres
- Increase oral fluids
- Salt supplementation 120 mmol/day
- Avoid hypotensive drugs

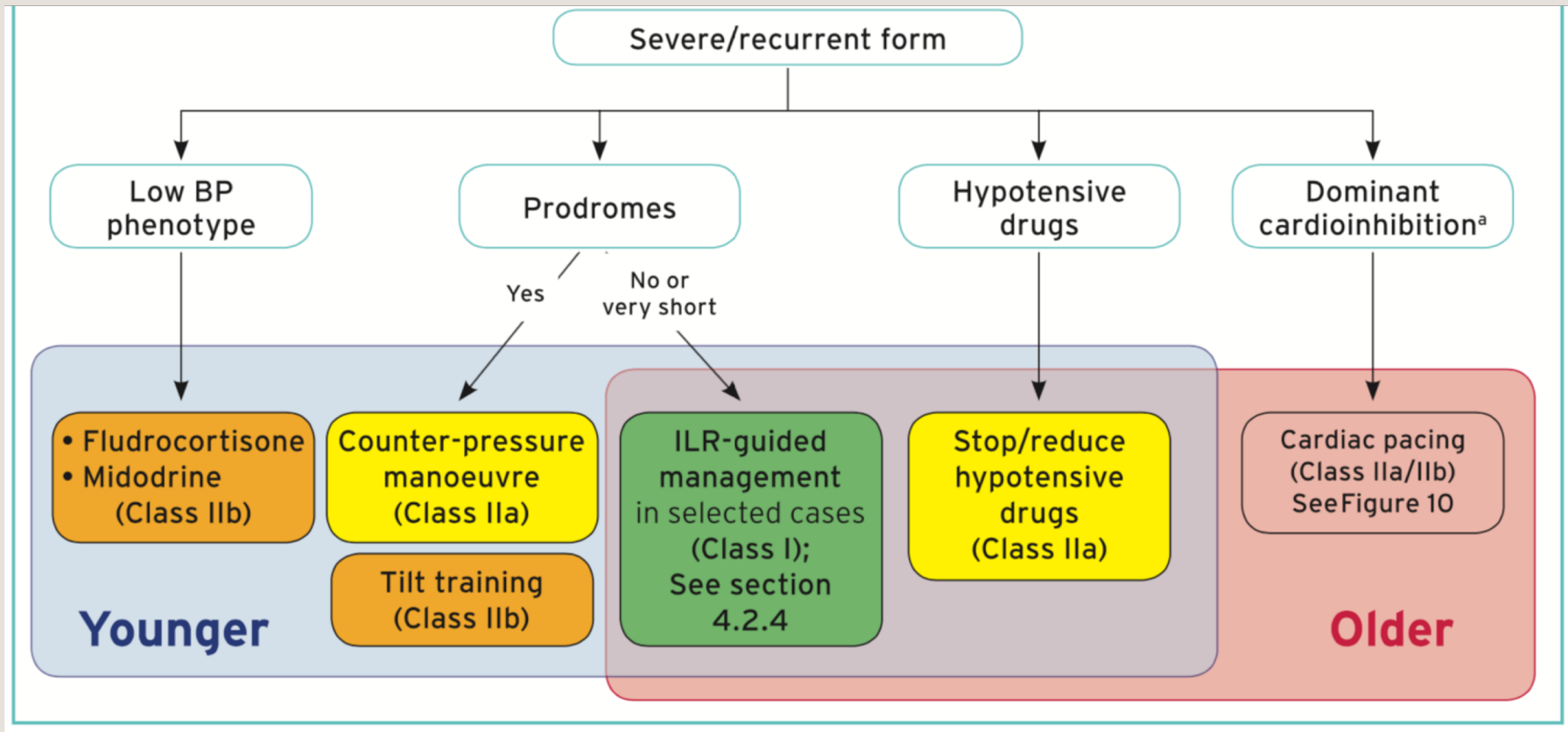
Treating OH

- Education and lifestyle
- If no HTN – 2-3 L fluids day/ 10 g salt day
- Review vasoactive drugs (accept 140/90 mmHg)
- Stop beta-blockers/diuretics first
- Drugs: Midodrine first line, Fludrocortisone
- Head up tilt sleeping

Treating OH



Severe Recurrent Reflex Syncope



In young subjects with unexplained syncope

- No history of cardiac disease
- No family history of sudden death
- No supine/sleep/exercise syncope
- No unusual triggers
- Normal ECG
- chance of cardiac syncope is very low
- SCD rates in subjects <35 years ~ 1–3/100 000

Table 10 Differentiating syncope from epileptic seizures^{9,50,410,411}

Clinical feature	Syncope	Epileptic seizures
Useful features		
Presence of trigger	Very often	Rare
Nature of trigger	Differs between types: pain, standing, emotions for VVS; specific trigger for situational syncope; standing for OH	Flashing lights is best known; also range of rare triggers
Prodromes	Often presyncope (autonomic activation in reflex syncope, light-headedness in OH, palpitations in cardiac syncope)	Epileptic aura: repetitive, specific for each patient. Includes <i>déjà vu</i> . Rising sensation in the abdomen (epigastric aura) and/or an unusual unpleasant smell
Detailed characteristics of myoclonus	• <10, irregular in amplitude, asynchronous, asymmetrical • Starts after the onset of LOC	• 20–100, synchronous, symmetrical, hemilateral • The onset mostly coincides with LOC • Clear long-lasting automatisms as chewing or lip smacking at the mouth
Tongue bite	Rare, tip of tongue	Side of tongue (rarely bilateral)
Duration of restoration of consciousness	10–30 seconds	May be many minutes
Confusion after attack	No understanding of situation for <10 seconds in most syncope, full alertness and awareness afterwards	Memory deficit, i.e. repeated questions without imprinting for many minutes
Features of limited utility		
Incontinence	Not uncommon	Common
Presence of myoclonus (see below for nature of myoclonus)	Very often	~60%, dependent on accuracy of observation
Eyes open during LOC	Frequent	Nearly always
Fatigue and sleep afterwards	Common, particularly in children	Very common
Blue face	Rare	Fairly often
LOC = loss of consciousness; OH = orthostatic hypotension; VVS = vasovagal syncope.		

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