Syncope

Margarita E. Pena, M.D., F.A.C.E.P.
St. John Hospital and Medical Center
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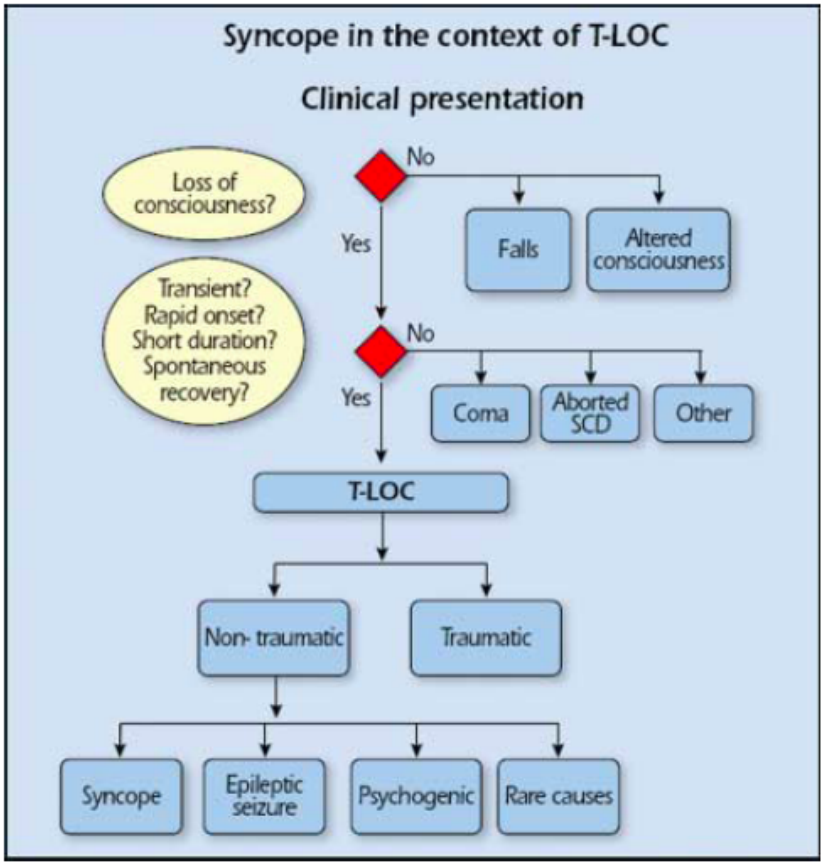
Defining Syncope

Transient LOC

- Global cerebral hypoperfusion
- Loss of postural tone
- Rapid onset
- Short duration
- Complete and spontaneous recovery
- Bimodal prevalence: 10-30 yo ; > 65yo

Syncope is NOT…

- There should not be clinical features of other nonsyncope causes of LOC such as seizure, antecedent head trauma, or apparent LOC (i.e., pseudosyncope)



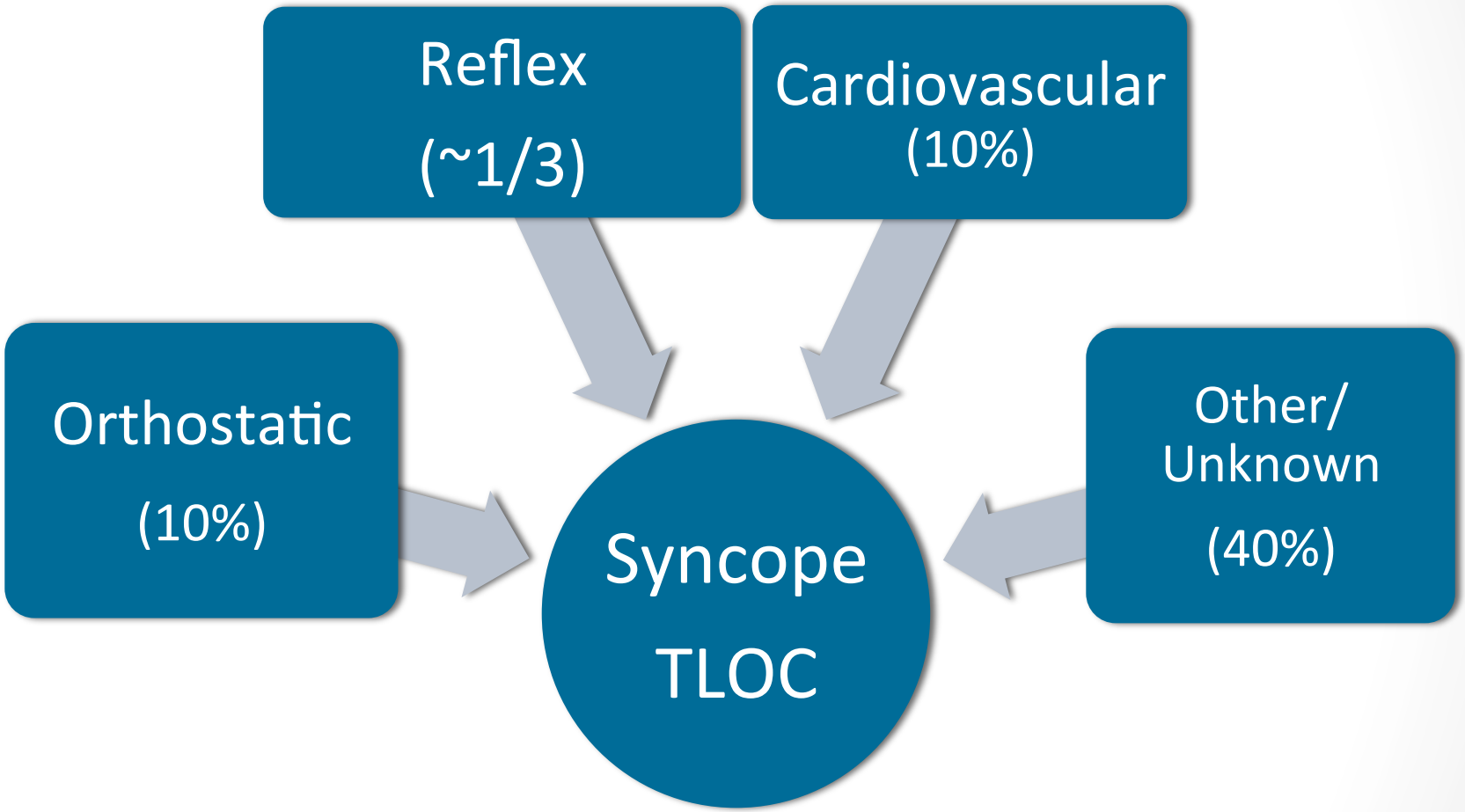
[ESC. *Eur Heart J* 2009]

Pre-Syncope

- Symptoms before syncope, could progress to syncope, or it could abort without syncope.

Symptoms may include:

- Extreme lightheadedness
- Visual sensations, such as “tunnel vision” or “graying out”
- Variable degrees of altered consciousness without complete loss of consciousness



Brignole M. *J Am Coll Cardiol* 2012;59(18):1583–91

Non-Cardiac causes of Syncope

Table 1 | Classification and synonyms of non-cardiac syncope

Classification of syncope	Synonyms and suggested diagnoses
Neurally mediated syncope:*	Reflex syncope, neurocardiogenic syncope, neurocardiovascular syncope, neurogenic syncope
Vasovagal syncope	Simple faint, swoon, vasovagal attack, vasodepressor syncope, reflex anoxic seizures
Situational syncope	
Needle or blood phobia	
Respiratory (cough, sneeze) syncope	Cough syncope
Urinary (micturition) syncope	Micturition syncope, postmicturition syncope
Gastrointestinal (defecation, swallowing, visceral pain) syncope	Defecation syncope, deglutition syncope, swallow syncope, syncopal dysphagia
Postexertional syncope	Exercise syncope
Postprandial syncope	Postprandial hypotension
Laughter syncope	Laugh or laughter induced syncope, gelastic syncope
Valsalva induced (for example, weightlifting, brass instrument playing) syncope	Weightlifter's syncope; trumpet blower's syncope
Carotid sinus syndrome	Carotid sinus syncope
Carotid sinus hypersensitivity with syncope	
Orthostatic hypotension:	Postural hypotension
Primary autonomic failure	Pure autonomic failure, Bradbury-Eggleston syndrome, idiopathic orthostatic hypotension, multiple systems atrophy, Shy-Drager syndrome, Parkinson's plus syndromes
Secondary autonomic failure	Autonomic neuropathy (for example, diabetic, alcohol related, and amyloid)
Volume depletion	Diuretics, dehydration, haemorrhage, addisonism

*All may have vasodepressor, cardioinhibitory, and mixed components.

ED Evaluation

- Starts with H & P and EKG
- Rule in/out dangerous causes
- Certain cause ID in ED
- Uncertain cause after ED evaluation
- Assess prognostic risk for disposition decision

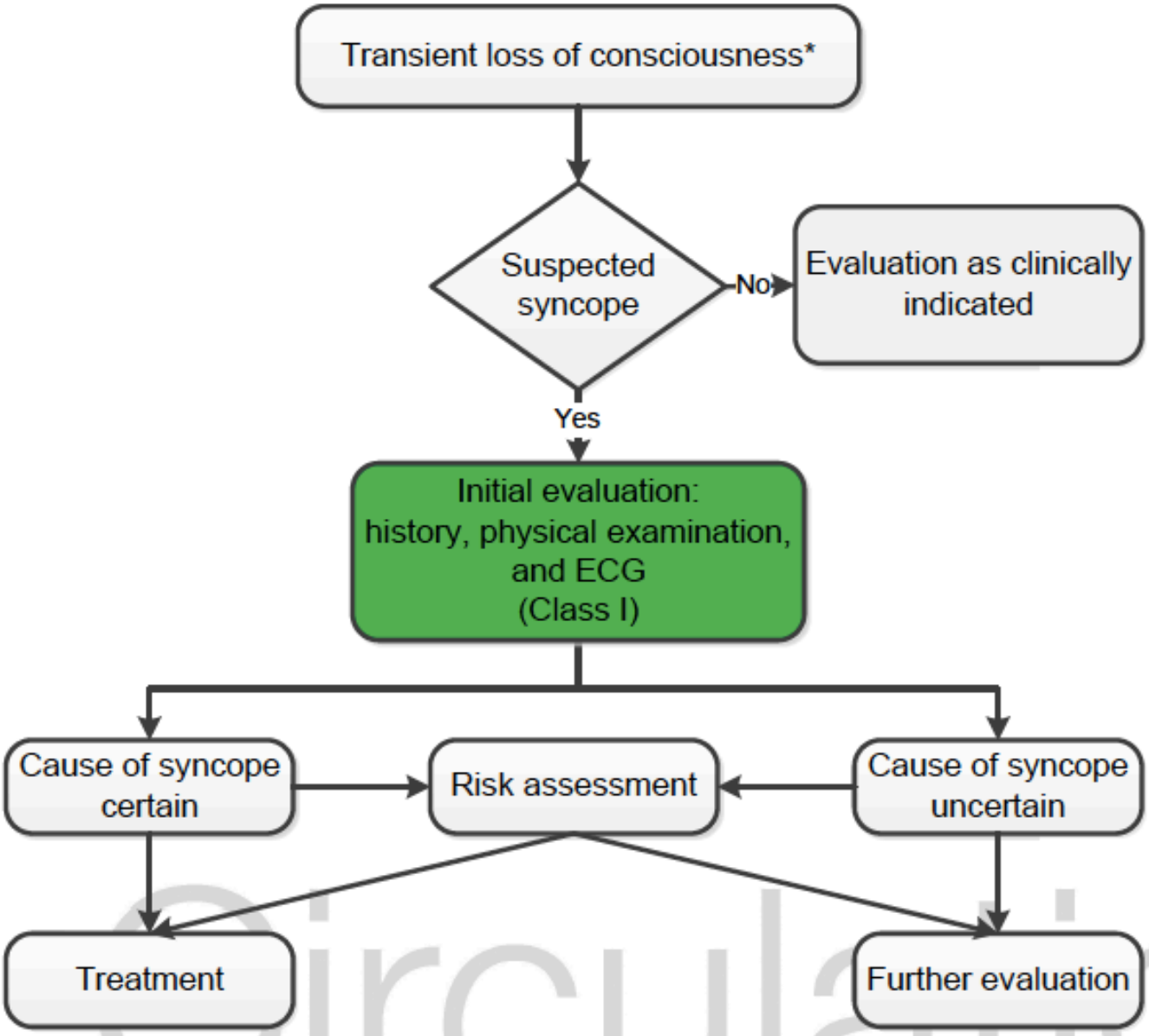
Dangerous Causes of Syncope

Cardiac: Brady/tachydysrhythmias, AMI, structural heart disease, valvular disease

Circulatory: Aortic dissection, PE, GIB, ruptured AAA, ruptured ectopic

Neurologic: SAH, TIA/CVA

Figure 1. Syncope Initial Evaluation



Who should go to the OU?

- Evidence for Intermediate risk pts
- Physician judgment part of RCTs
- Require further monitoring or testing to rule in/rule out a serious diagnosis
- Require further treatment for suspected syncope cause – ex. Orthostatic pts, medication effects/changes
- **<u>Should not go to CDU</u>: High risk and Low Risk with no f/u concerns**

Evidence for Protocol-driven OU

Prospective and randomized (OU vs standard care)

- Shen WK et al. Syncope eval in ED study (SEEDS). A multidisciplinary approach to syncope mgmt. Circulation 2004;110:3636
- Sun B et al. Randomized clinical trial of an ED observation syncope protocol vs inpatient admission (EDSOP) Ann Emerg Med 2014;64(2):167
- [Prospective cohort study]: Numeroso F. Short-term prognosis and current mgmt of syncopal pts at intermediate risk: results of IRiS study. AcadEmergMed 2016;23:941

Intermediate RF

- ≥50 years of age
- PMH of cardiac disease
- Cardiac device without dysfunction
- Concerning but not high risk EKG findings
- Family history of early SCD
- Symptoms not consistent with reflex-mediated syncope
- Physician judgment

Physician Judgement - Considerations

- Suspicion for cardiac syncope – exertional, supine, palpitations
- Risk of injury +/- have poor follow-up
  - Absence of prodrome esp in older pts
  - Recurrent syncope
  - With clinical injury

Initial Evaluation: H & P, EKG

History

- Aim to identify prognosis, diagnosis, reversible or ameliorable factors, comorbidities, med use, PMH

Physical Exam

- *Orthostatics*: lying/sitting/immed standing/after 3 min upright
- *Cardiac auscultation*
- *Neuro exam*: focal defects/abnormalities needing further eval

EKG

- No conclusions re: prognostic value of abnl EKG

le 4. Historical Characteristics Associated With Increased Probability of Cardiac and Noncardia ses of Syncope (60,67-75)

More Often Associated With Cardiac Causes of Syncope
Older age (>60 y)
Male sex
Presence of known ischemic heart disease, structural heart disease, previous arrhythmias, or reduced ventricular function
Brief prodrome, such as palpitations, or sudden loss of consciousness without prodrome
Syncope during exertion
Syncope in the supine position
Low number of syncope episodes (1 or 2)
Abnormal cardiac examination
Family history of inheritable conditions or premature SCD (<50 y of age)
Presence of known congenital heart disease

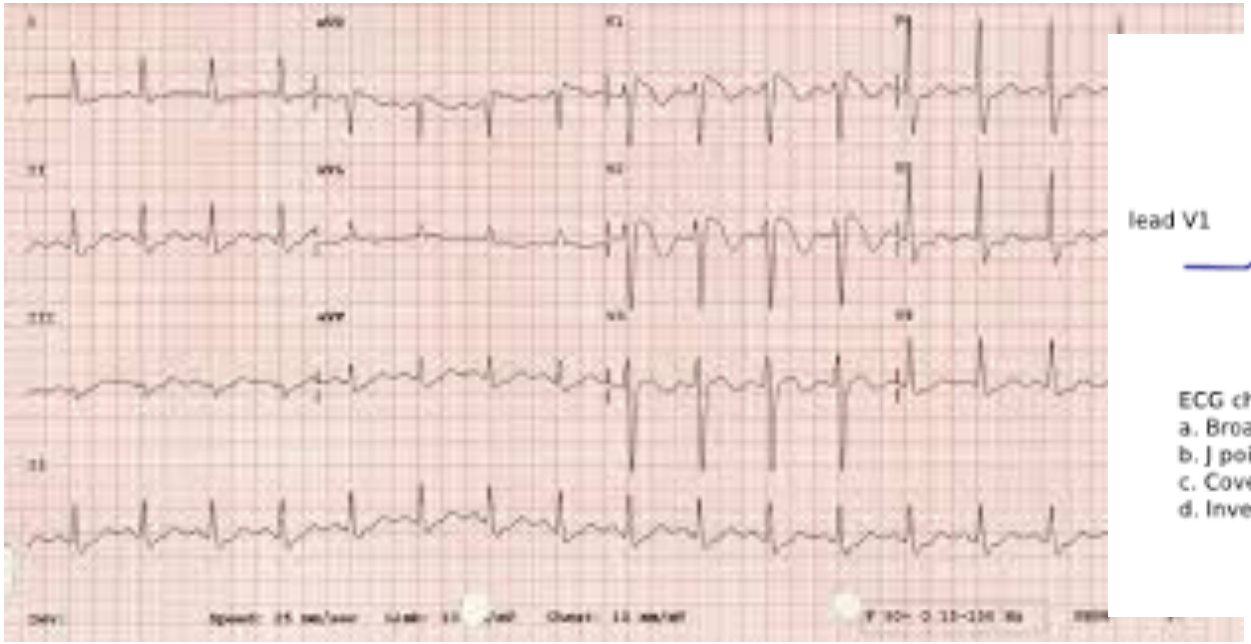
More Often Associated With Noncardiac Causes of Syncope
Younger age
No known cardiac disease
Syncope only in the standing position
Positional change from supine or sitting to standing
Presence of prodrome: nausea, vomiting, feeling warmth
Presence of specific triggers: dehydration, pain, distressful stimulus, medical environment
Situational triggers: cough, laugh, micturition, defecation, deglutition
Frequent recurrence and prolonged history of syncope with similar characteristics

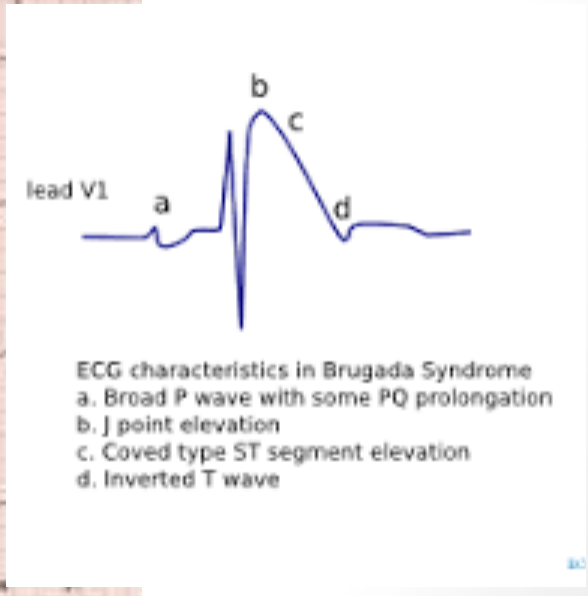
Orthostatics

- Drop in SBP ≥20mmHg or DBP ≥10mmHg or SBP <90mmhg within 3 min of standing
- Clinically important if original symptoms are reproduced during active or passive standing
- HR should rise with standing:
  - Rise >30 bpm or rate >120 bpm diagnostic of postural orthostatic tachycardia syndrome
  - Lack of HR response suggests autonomic failure, rate-limiting drugs or chronotropic incompetence

EKG – Look out for these…

- Bradyarrhythmia -sinus pauses, high-grade AV Blocks, ventricular tachyarrhythmia
- Brugada, Long QT Syndrome, Wolff Parkinson White, Hypertrophic Cardiomyopathy

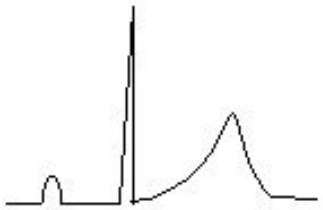




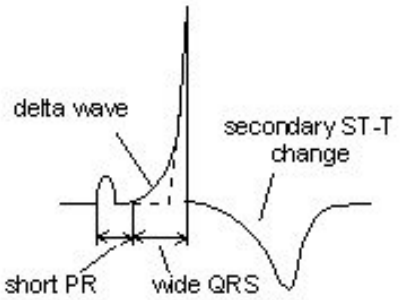
ECG characteristics in Brugada Syndrome
a. Broad P wave with some PQ prolongation
b. J point elevation
c. Coved type ST segment elevation
d. Inverted T wave

Name that Block…

WPW

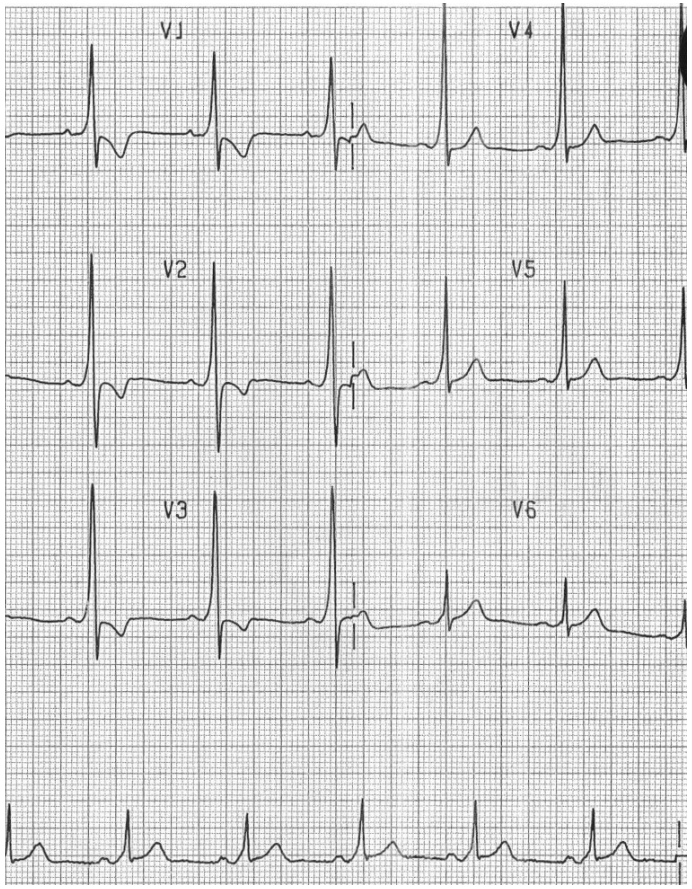


Normal conduction

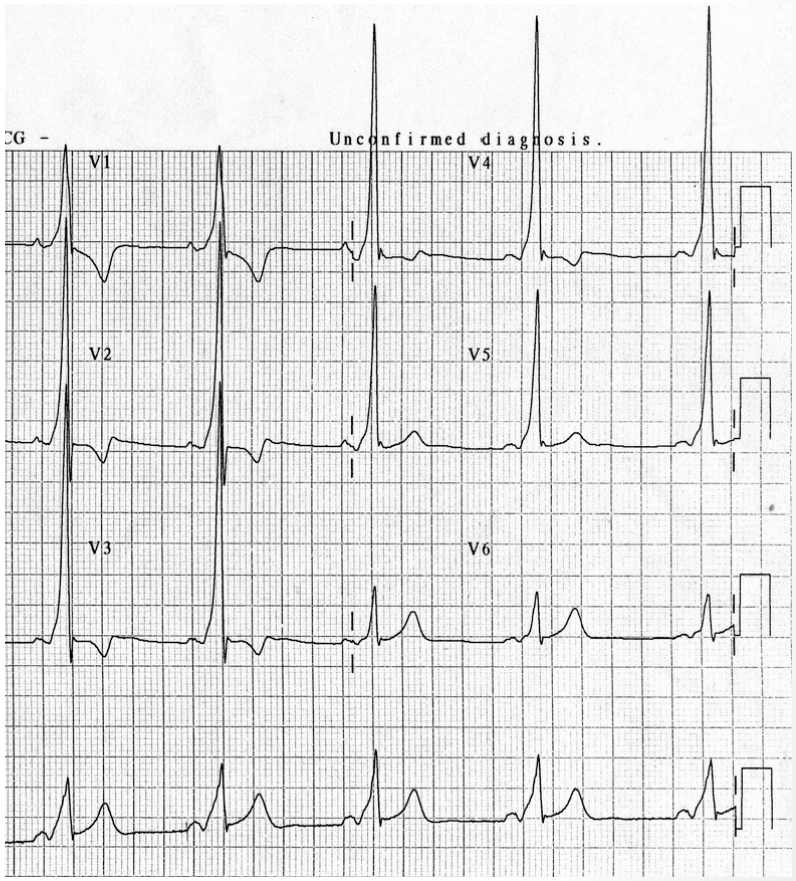


Preexcitation

Type A: Dominant R wave in VI

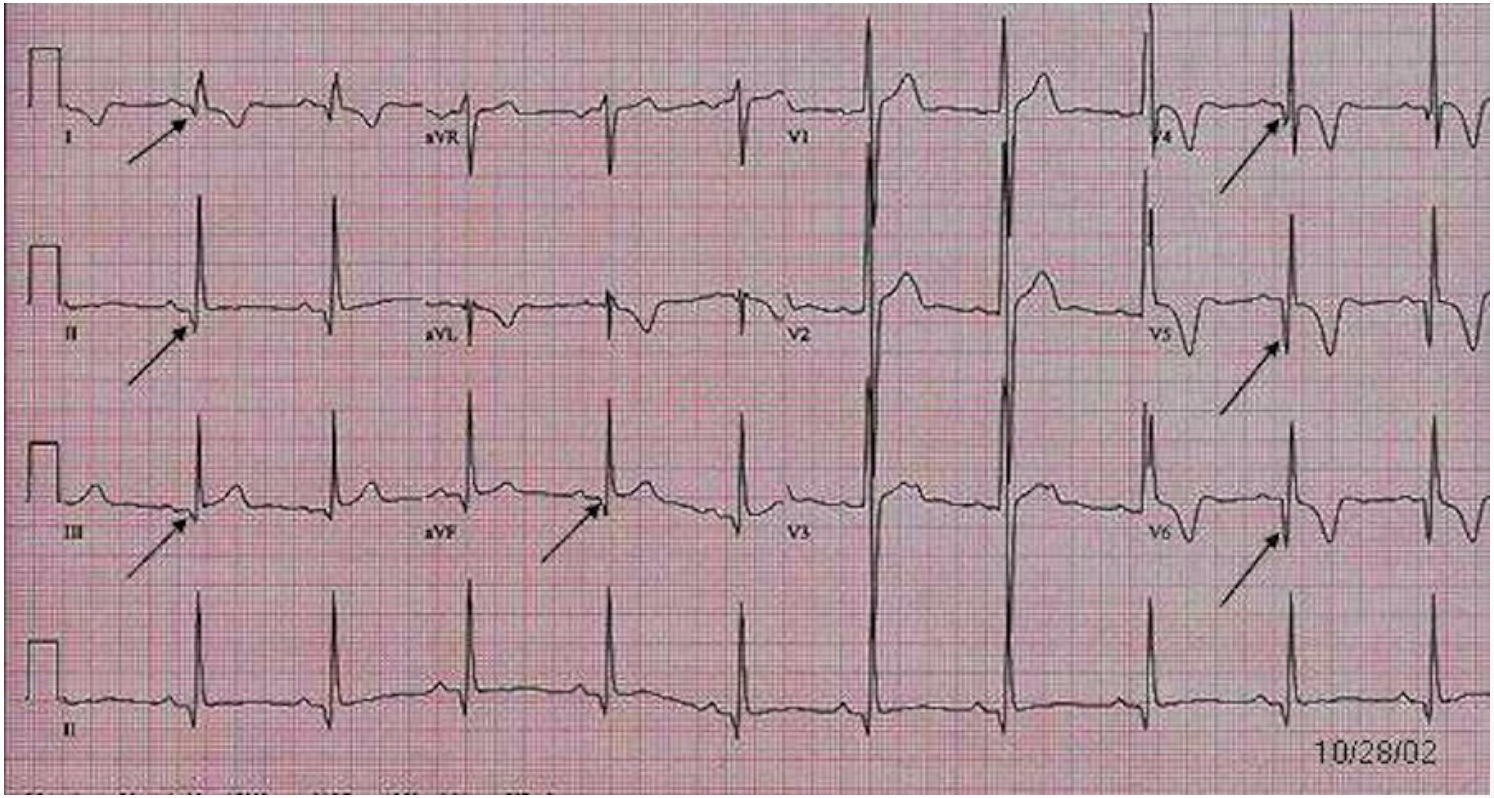


Type B: Dominant S wave in VI



Bad Ones Not to Miss…

Hypertrophic Cardiomyopathy: deep, narrow (“dagger-like”) Q waves in the lateral (V5-6, I, aVL) and inferior (II, III, aVF) leads.



Signs that Cause of Syncope may be Serious

Cause

Cardiac: Brady/ tachydysrhythmias, AMI, structural heart disease, valvular disease

Circulatory: Aortic dissection, PE, GIB, ruptured AAA, ruptured ectopic

Neurologic: SAH, TIA/CVA

Signs

- An abnormal EKG
- Positive Troponin
- Persistent abnormal Vital Signs
- Evidence of Bleeding
- Altered Mental Status

Risk Assessment

Short-Term Risk Factors (≤30 d)
History: Outpatient Clinic or ED Evaluation
Male sex (74,85,101,102)
Older age (>60 y) (88)
No prodrome (68)
Palpitations preceding loss of consciousness (83)
Exertional syncope (83)
Structural heart disease (70,83,88,101,103)
HF (74,83,85,88)
Cerebrovascular disease (70)
Family history of SCD (70)
Trauma (68,101)

Syncope OU Management PRN

- Telemetry - ALL
- Serial VS, Orthostatics - ALL
- IVF hydration
- Laboratory studies, imaging (CT, MRI)
- Cardiac studies: echo +/- bubble study, stress echo stress test
- Consults: Cardiology, Electrophysiology, Neurology

Echocardiogram

- Useful when concerned about presence of valvular disease (e.g. AS), HCM, or LV dysfunction
- Indications: **Positive cardiac hx, concerning Physical exam (e.g.murmur) and/or abnormal ECG**
- Echo with bubble study if < 55yo and unexplained syncope (ex. No PMH of cardiac disease)

Stress testing

- Indications: **Syncope with exertion**
- Exertion can result in syncope in a variety of conditions: structural lesions – Hypertrophic CM, Aortic Stenosis, pulmonary HTN, V-tach
- Want to reproduce symptoms or evaluate the hemodynamic response to exertion

Echocardiogram Indications

Transthoracic Echocardiogram if:

- Abnormal cardiac exam (murmur)
- Abnormal ECG
- History of cardiac disease

Stress echo if:

- Syncope with exertion or suspicion for cardiac ischemia

Tilt Table Testing Indications Class IIa

- Unexplained syncope in high risk setting (risk of injury, occupation)
- Tilt-table testing can be useful for patients with syncope and suspected delayed OH when initial evaluation is not diagnostic
- If the diagnosis is unclear after initial evaluation, TTT can be useful for patients with suspected VVS
- Recurrent episodes when cardiac causes have been ruled out

Consults or Follow-up: Cardiology, EP, Neurology

- Patients with recurrent syncope, unexplained falls and negative CDU evaluation
- Clinical or ECG features suggestive of arrhythmic syncope
- Holter monitor (24-48 h), event recorders (30 - 60 days, implantable loop recorders (2-6 wks, mos), AICD (esp with low EF)
- Suspicion for vertebrobasilar TIA, severe bilateral carotid artery disease, neuro s/s

Take-Home Points

- **Everyone get a good H & P, EKG and Orthostatics**
- **R/o life-threatening causes in ED**
- **Intermediate Risk Patients good for CDU**
- **Echo only if abnormal EKG or cardiac exam or PMH CV disease (bubble if <55yo and no cause ID)**
- **Stress echo if exertional syncope**
- **Many need only 6-8 hours of tele-monitoring in CDU to r/o arrhythmia**