SYNCOPE

Win Myint Aung, MBBS, MD, DM, MBA, FRCP, FACP

DISCLOSURE

- None
- Acknowledgement
- Mission

Hospital Medicine Practice

Empowering Hospitalists With Evidence-Based Reviews

Syncope: Identifying Patient Risk Is Key To Maximizing Effective Treatment

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Author

Win Myint Aung, MD, DM, MBA, FRCP
Assistant Professor, Division of Hospital Medicine, University of Miami Miller School of Medicine, Miami, FL

Peer Reviewers

Alpesh N. Amin, MD, MBA, MACP, SFHM
Thomas & Mary Casario Endowed Chair of Medicine, Professor of Medicine, Business, Public Health, Nursing Science & Biomedical Engineering; Executive Director, Hospitalist Program, University of California-Irvine, Irvine, CA

Daniel Dressler, MD
Professor of Medicine, Director of Internal Medicine Teaching Services, Emory University Hospital; Associate Director for Education, Emory Division of Hospital Medicine, Associate Program Director, J. Willis Hurst Internal Medicine Residency Program, Emory University School of Medicine, Atlanta, GA

CME Objectives

Upon completion of this article, you should be able to:
1. Explain the basic pathophysiology of syncope.
2. Describe the differential diagnosis of syncope and the entities that mimic syncope.
3. Accurately identify high-risk syncope patients.
4. Compare and contrast the effective use of risk stratification and diagnostic testing in syncope.

Prior to beginning this activity, see "Physician CME Information" on the back page.

Abstract

Syncope is a common presentation in emergency departments, observations units, and the hospital impatient setting. Several guidelines on syncope have been published and have been updated periodically, but there is still lack of prospective studies on syncope, and the overwhelming amount of information can make these inapplicable for frontline physicians. Understanding the pathophysiology and scope of differentials of the common as well as the unusual, but life-threatening, causes of syncope are highlighted. This review also summarizes the guidelines and risk stratifications tools, with emphasis in basic history and clinical examination and a formulated algorithm applicable for current practice.

OBJECTIVES

- Define syncope and differentiate from other syncope mimic
- Pathophysiology
- Common causes and approach
- Risk stratification
- Management

QUIZ: ETIOLOGY

Which of the following clinical conditions may cause a transient loss of consciousness due to syncope?

a. Hypoglycemia

b. Seizure

c. Postural hypotension

d. Narcolepsy cataplexy

DEFINITION

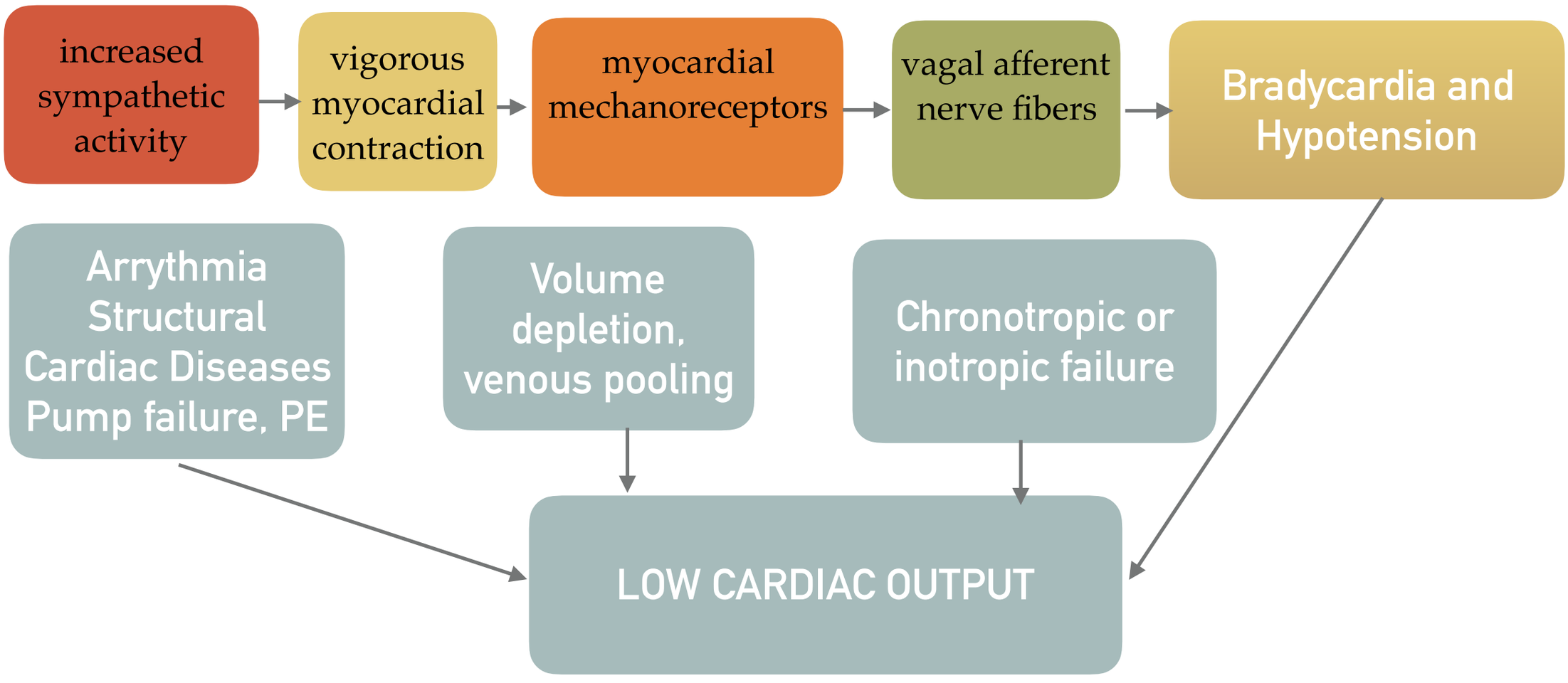
Syncope is a clinical syndrome characterized by sudden onset of transient loss of consciousness (TLOC) due to a temporary period of global hypoperfusion with loss of postural tone, followed by a complete recovery.

SYNCOPE IS NOT UNCOMMON

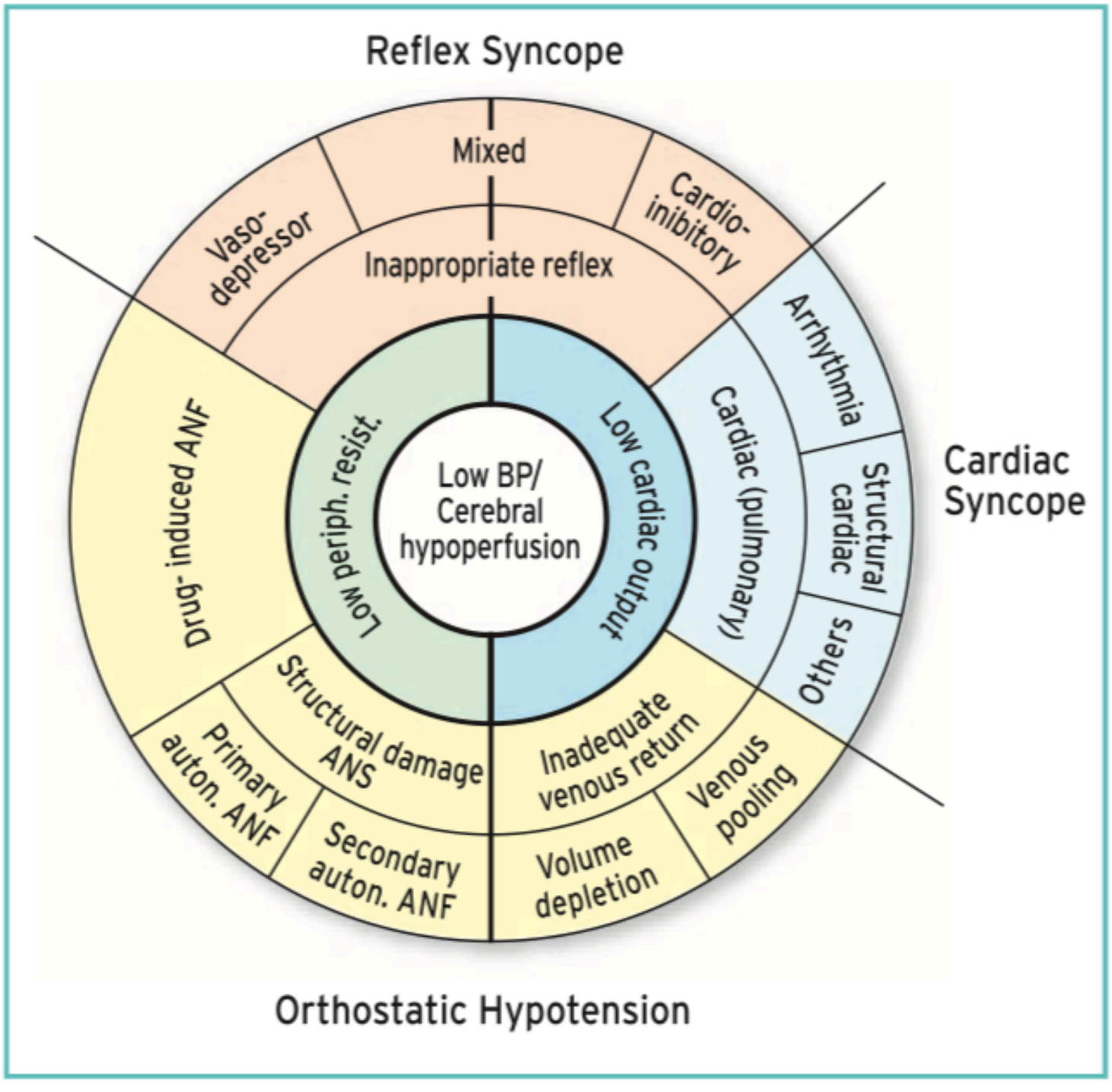
- 6.2 per 1000 person years
- The incidence rate increases with age, with a sharp rise at 70 years of age
- slight female preponderance (58% vs 42%)
- Lifetime prevalence of syncope is approaching 40%
- 1% of emergency department visits in United States

PATHOPHYSIOLOGY

transient global hypoperfusion of the brain due to low cardiac output, with or without associated reduced peripheral vascular resistance



PATHOPHYSIOLOGY



CAUSES OF SYNCOPE

- Neurally mediated reflex syncope (30%)
- Orthostatic Hypotension (17%)
- Cardiac Syncope (10%)
- Cereborvascular Syncope (4%)
- Unknown (39%)

DIFFERENTIAL DIAGNOSIS

- Seizure
- Metabolic disturbance (eg, hypoglycemia)
- Cerebral concussion
- Intoxications
- Drop attacks
- Cataplexy

QUIZ: SYNCOPE VS SEIZURE

Which of the following symptoms helps to suggest that the cause of transient loss of consciousness is likely to be due to seizure rather than syncope?

a. Loss of consciousness in supine position
b. Myoclonic jerks
c. Urinary incontinence
d. Post recovery confusion

SYNCOPE VS. SEIZURE

Event	Precipitating Factor	PreTLOC	Duration of TLOC	Facial Appearance	Head Turning	Tongue Bite	Post TLOC
Syncope	Anxiety, postural, situational, Cardiac	Light-headedness, sweating,	Few Seconds to a minute	Pallor	Absent	Anterior (rare)	Complete and rapid recovery
Seizure	Emotional Stress	Aura (abnormal sight, smell) Deja vu or Jemais vu	Minutes	Cyanosis, frothing	Present	Lateral (sometimes)	Post ictal confusion

TLOC= transient loss of consciousness;

biting involving the tip of the tongue in the diagnosis of syncope are: sensitivity 0.11 (95% CI 0.04–0.36), specificity 99.8 (95% CI 98–1), pLR 5.32 (0.257–110.185), nLR 0.991 (0.976–1.006).
lateral tongue biting in the diagnosis of epileptic seizures is: sensitivity 11.3 (95% CI 0.76–1.64), specificity 99.8% (95% CI 97.9–1), pLR 49.275 (95% CI 3.009–806.972), nLR 0.89 (0.846–0.935). Akor F.et al,Seizure. 2013; 22: 328

HISTORY

- Position
- Situation and circumstances
- Relation to exercise
- Associated symptoms
- EMS note

CLINICAL FEATURES SUGGESTIVE OF REFLEX SYNCOPE

- Long history of recurrent syncope, in particular occurring before the age of 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

CLINICAL FEATURES SUGGESTIVE OF OH

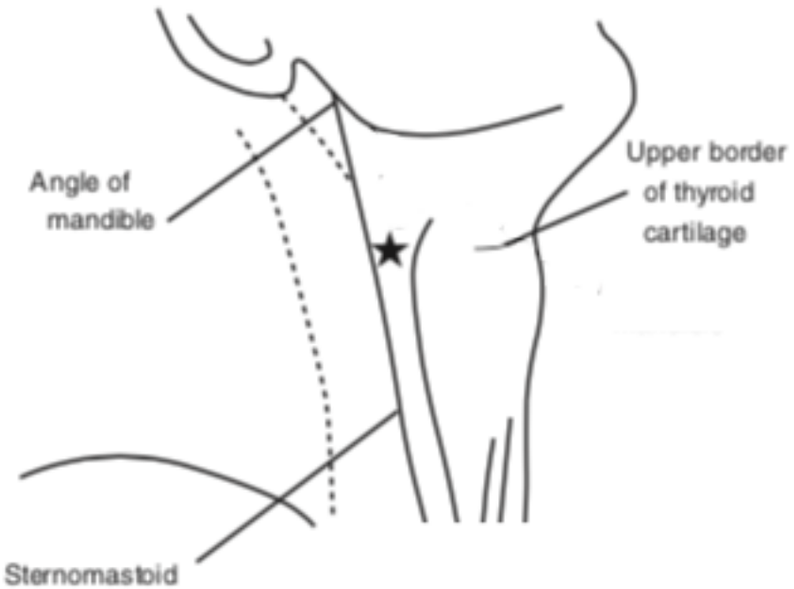
- While or after standing
- Prolonged standing
- Standing after exertion
- Post-prandial hypotension
- Temporal relationship with start or changes of dosage of vasodepressive drugs or diuretics leading to hypotension
- Presence of autonomic neuropathy or Parkinsonism

CLINICAL FEATURES SUGGESTIVE OF 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
- Abnormal ECG findings*

PHYSICAL EXAMINATION

- Vital signs, pulse oximeter
- Cardiac mur mur
- Through neurological exam
- Orthostatic challenge
- Carotid sinus massage



QUIZ: TEST

Which of the following tests is routinely indicated in patients presenting with syncope?

a. Chest x-ray
b. Troponin
c. Electrocardiogram
d. Brain CT

LABORATORY STUDIES

- CBC
- BNP (troponin, D-Dimer?)
- EKG
- Imaging (Echo, cardiac MRI)
- Special tests (Tilt table, EP studies, stress test, cardiac catheterization)

ABNORMAL EKG

Cardiac Ischemia

Presence of Q wave other than lead III

Left bundle branch block
Septal hypertrophy with repolarizing abnormalities
Atrial enlargements

Conduction Defects

Second-degree Mobitz type II block
Third-degree AV block
Bifascicular block (right bundle block with anterior/posterior fascicular block)

Arrhythmias

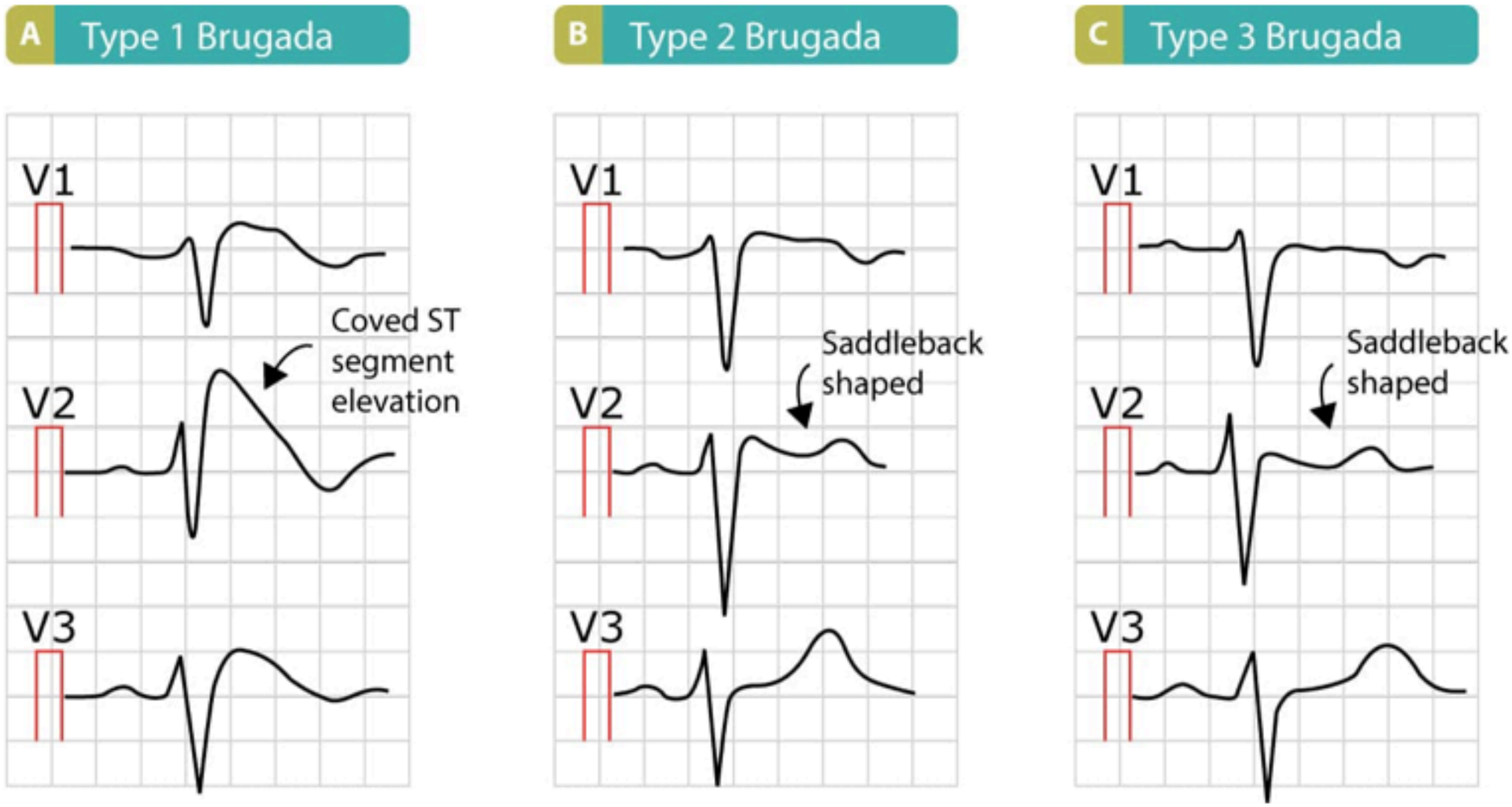
Bradycardia (< 40 beats/min)
Sinus pauses (> 3 sec)
Sick sinus syndrome
Supraventricular tachycardia

Nonsustained ventricular tachycardia

Proarrythmogenic Syndromes

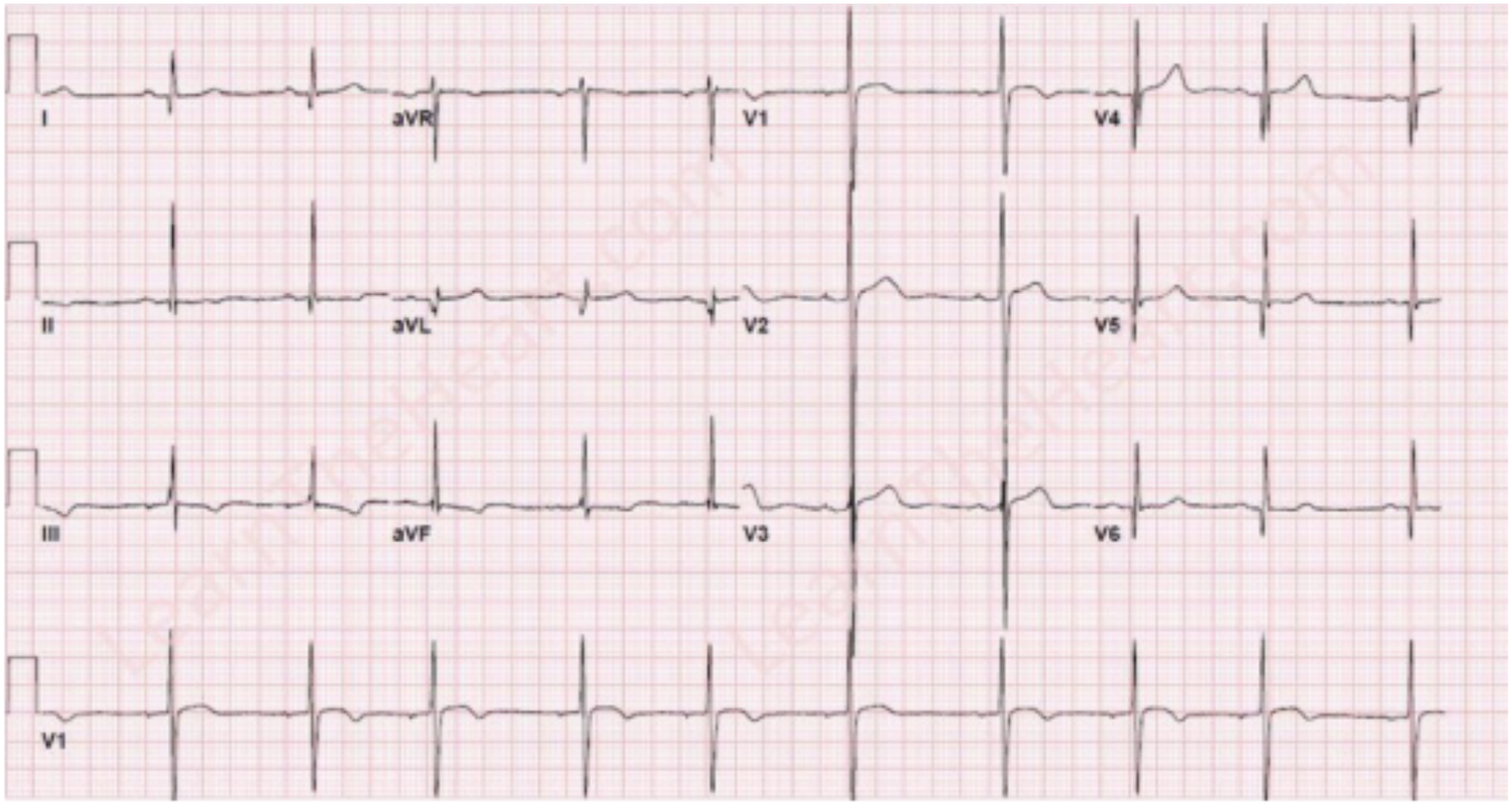
Long QT syndrome (QTc > 480 ms), short QT interval, QRS >130 ms
Brugada syndrome (ST elevation > 1 mV in V1 and V2)
Short PR without or with delta wave (pre-excitation syndrome)
Arrhythmogenic right ventricular cardiomyopathy changes

BRUGADA SYNDROME



www.ekgwaves.com

EKG IN HOCM



www.healio.com/cardiology/learn-the-heart/ecg-review/ecg-topic-reviews-and-criteria/hypertrophic-obstructive-cardiomyopathy-review

OTHER DIAGNOSTIC TESTING

- Tilt table testing
- Autonomic function test
- EKG monitor (Tele, event, smart phone, loop recorder)
- Video recording
- EP study
- Echo
- Exercise stress test

QUIZ: RISK STRATIFICATION

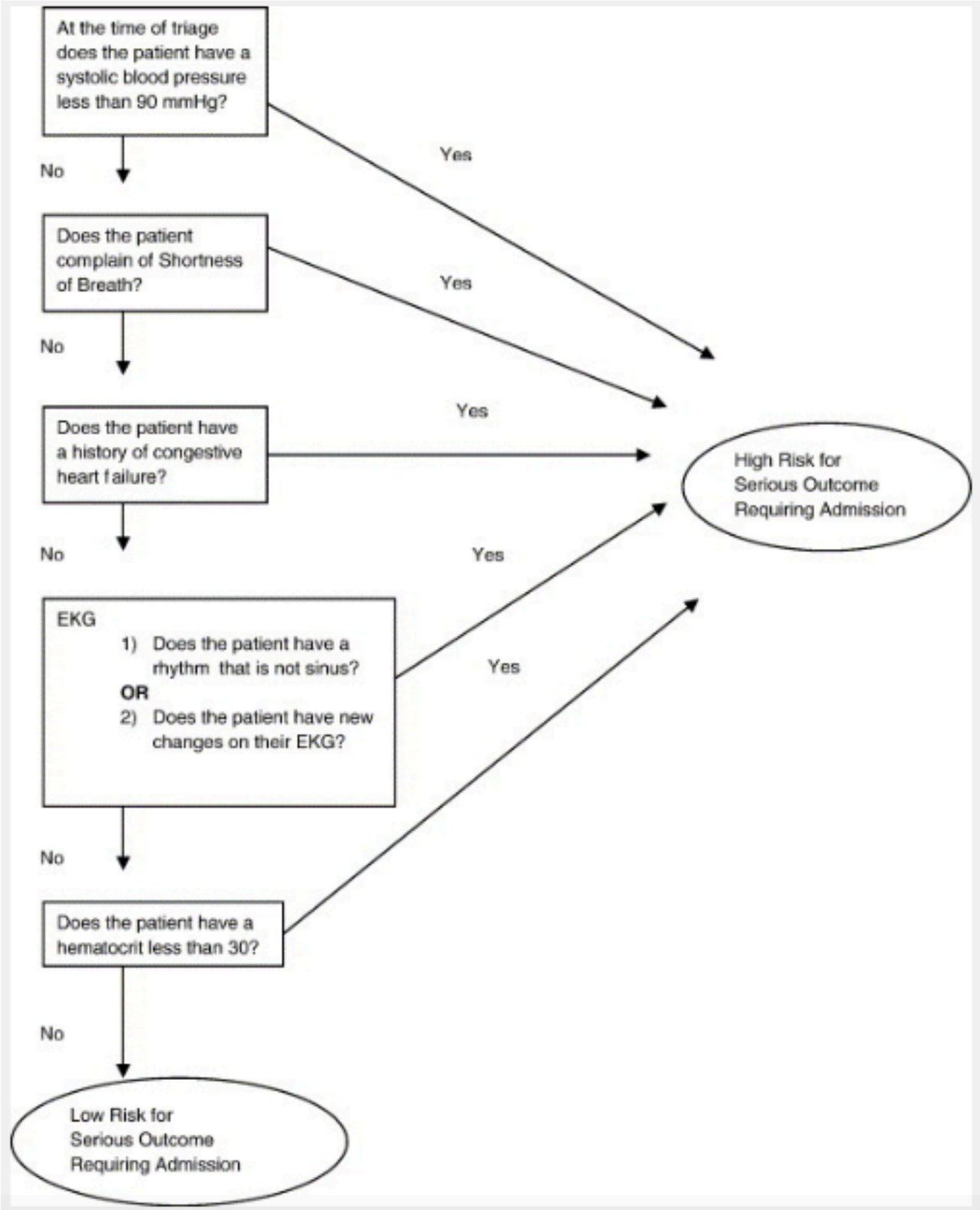
Which of the following factors is classified as high risk in patients with syncope?

a. 60-year-old male
b. Absence of precipitating factors
c. Syncope during exercise
d. Absence of prodrome

RISK STRATIFICATION

- SFSR(San Francisco Syncope Rule)
- ROSE(Risk Stratification of Syncope in the Emergency Department Study)
- OESIL(Osservatorio Epidemiologico sulla Sincope nel Lazio)
- SEEDS(Syncope Evaluation in the Emergency Department Study)

SFSR (SAN FRANCISCO SYNCOPE RULE)



www.medcal.com

RISK STRATIFICATION OF SYNCOPE IN ED (ROSE) SCORE

Admit if <u>any</u> of the following are present:

B	**B** NP level ≥ 300pg/ml
	B radycardia ≤50 in Emergency Department or pre-hospital
R	**R** ectal examination showing fecal occult blood (if suspicion of gastrointestinal bleed)
A	**A** nemia - Hemoglobin ≤90 g/l
C	**C** hest pain associated with syncope
E	**E** CG showing Q wave (not in lead III)
S	**S** aturation ≤94% on room air

M.J. Reed et al JACC Vol. 55, No. 8, 2010

OESIL(OSSERVATORIO EPIDEMIOLOGICO SULLA SINCOPE NEL LAZIO) SCORE

- age >65 years
- cardiovascular disease in clinical history
- syncope without prodromes
- abnormal electrocardiogram

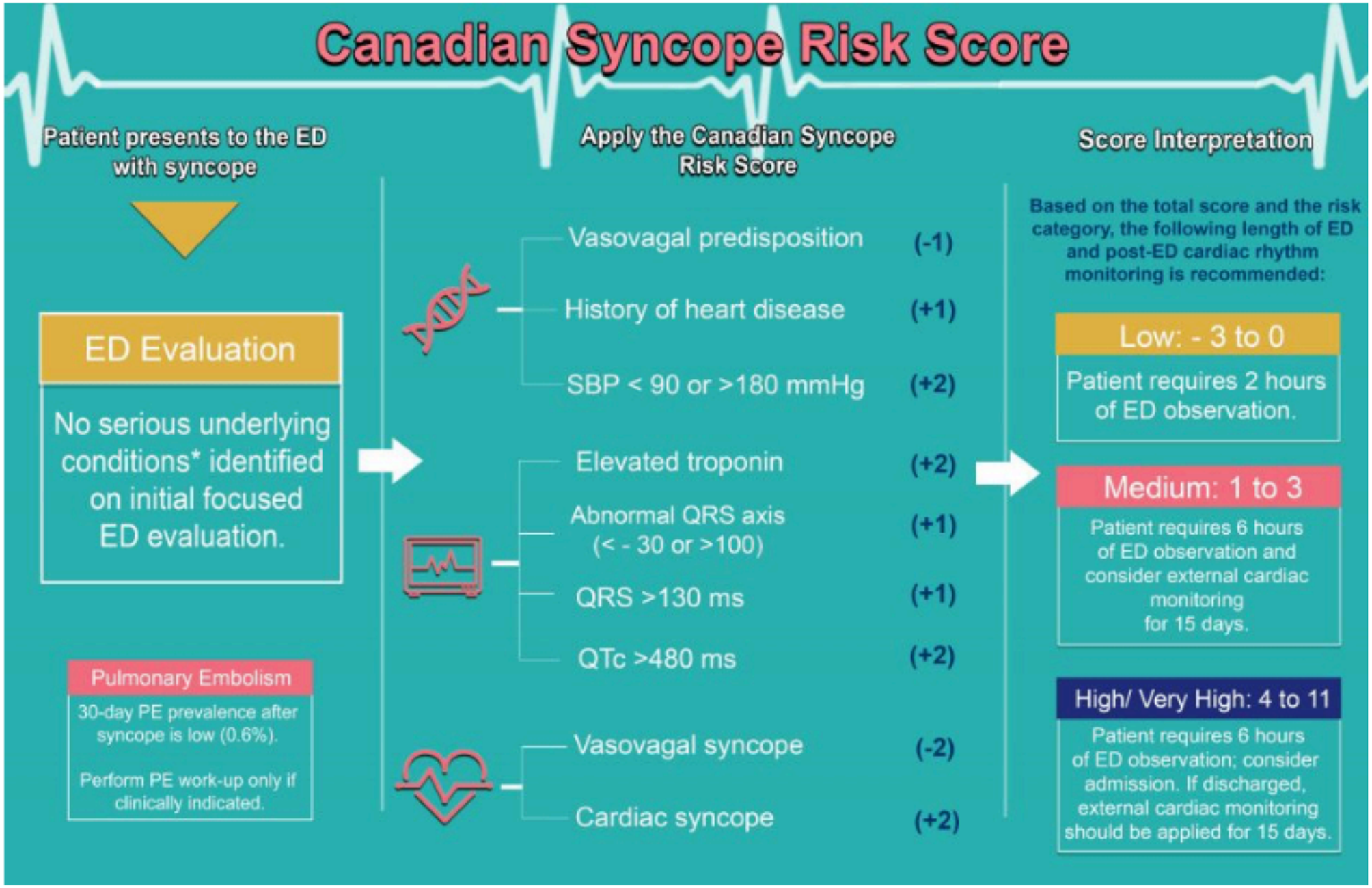
Mortality increased significantly as the score increased in the derivation cohort (0% for a score of 0, 0.8% for 1 point; 19.6% for 2 points; 34.7% for 3 points; 57.1% for 4 points; p<0,0001

Eur Heart J. 2003 May;24(9):811-9.

SEEDS (SYNCOPE EVALUATION IN THE EMERGENCY DEPARTMENT STUDY)

High-Risk Group	Intermediate-Risk Group	Low-Risk Group
Chest pain compatible with acute coronary syndrome	Age ≥50 y	Age <50 y
Signs of congestive heart failure	With previous history of:	With no previous history of:
Moderate/severe valvular disease	Coronary artery disease	Cardiovascular disease
History of ventricular arrhythmias	Myocardial infarction	Symptoms consistent with reflex-mediated or vasovagal syncope
ECG/cardiac monitor findings of ischemia	Congestive heart failure	Normal cardiovascular examination
Prolonged QTc (>500 ms)	Cardiomyopathy without active symptoms or signs on cardiac medications	Normal ECG findings
Trifascicular block or pauses between 2 and 3 seconds	Bundle-branch block or Q wave without acute changes on ECG	
Persistent sinus bradycardia between 40 and 60 bpm	Family history of premature (<50 y), unexplained sudden death	
Atrial fibrillation and nonsustained ventricular tachycardia without symptoms	Symptoms not consistent with a reflex-mediated or vasovagal cause	
Cardiac devices (pacemaker or defibrillator) with dysfunction	Cardiac devices without evidence of dysfunction	
	Physician's judgment that suspicion of cardiac syncope is reasonable	

CANADIAN SYNCOPE RISK SCORE



CURRENT SOCIETY GUIDELINES

Circulation
Volume 136, Issue 5, 1 August 2017, Pages e60-e122
https://doi.org/10.1161/CIR.0000000000000499

CLINICAL STATEMENTS AND GUIDELINES - ACC/AHA/HRS GUIDELINEACC/AHA/HRS GUIDELINE

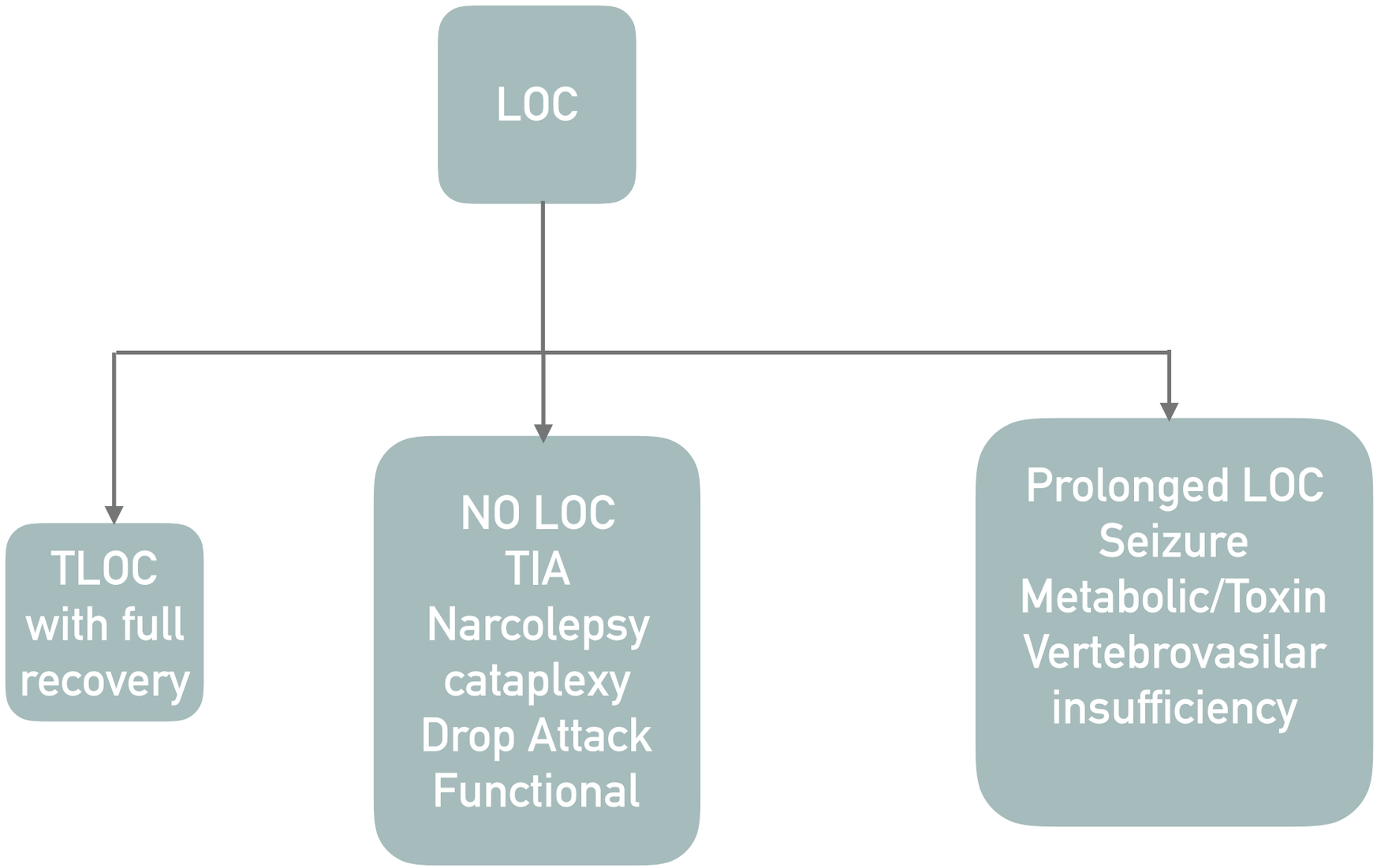
2017 ACC/AHA/HRS Guideline for the Evaluation and Management of Patients With Syncope: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines and the Heart Rhythm Society

ESC European Society of Cardiology
European Heart Journal (2018) **39**, 1883–1948
doi:10.1093/eurheartj/ehy037

ESC GUIDELINES

2018 ESC Guidelines for the diagnosis and management of syncope

CLINICAL PATHWAY: STEP I: IDENTIFICATION OF TRUE SYNCOPE



LOC= loss of consciousness; TLOC= transient loss of consciousness

CLINICAL PATHWAY: STEP II: ESTABLISH DIAGNOSIS

- History
- Physical examination
- Laboratory studies
- EKG

CLINICAL PATHWAY: STEP III, RISK STRATIFICATION

High Risk Group

- Known cardiac pathology
- Presence of cardiac symptoms
- Syncope during exercise or supine
- ECG suggestive for arrhythmic
- syncope or ischemia
- Severe anemia
- Electrolyte disturbance

Admit for further evaluation and management (telemetry, 2D echocardiogram, stress testing)

Structural heart disease (systolic failure, wall motions abnormality, AS, HOCM, others)

Interventional cardiology, CT surgery, medical therapy

Cause undiagnosed

Abnormal rhythm/telemetry

(Sinus bradycardia, AV blocks, Long QT, Brugada syndrome, Vetech, SVT)

- Electrophysiology
- Pacemaker
- AICD
- Ablations

Intermediate Risk Group

- Age > 64 years
- Family history of sudden cardiac death
- Absence of precipitating factors
- Absence of prodrome

Conduct further risk stratification

- Prolonged ECG monitor
- Head-up tilt table testing
- 2D echocardiogram
- Rhythm specialist consult

- Refractory syncope
- Pharmacotherapy
- Implantable loop recorder
- Cardiac pacing

Low Risk Group

- Age < 64 years
- Negative cardiac history
- Presence of known precipitating factor
- Presence of prodrome

Discharge patient with reassurance and follow- up planning, handoffs to primary care provider

W.M. Aung; Syncope, May 2015: www.hmpractice.com

MANAGEMENT

- Education, reassurance, avoidance of triggers
- Adequate hydration and salt intake
- Medication reconciliation and adjustment
- Treat underlying cardiac condition
- Cardiac pacing, AICD

QUIZ: MEDICATION

Which of the following medications is proven to be beneficial for long-term use in treatment of syncope?

a. Midodrine

b. Fludrocortisone

c. Metoprolol

d. None of the above

DRUG THERAPY

Drug	Mechanism	Usual Dose	Supportive Data
Midodrine	Direct alpha agonist	2.5-10 mg TID	Weak
Fludrocortisone	Mineralocorticoid	0.1 - 0.2 mg daily	Improved with bisprolol
Metoprolol	Selective B blocker	25-50 mg BID	No benefit
Paroxetine	SSRI	20 mg daily	No reproducible

W.M. Aung; Syncope, May 2015: www.hmpractice.com

SUMMARY

- Diagnosis of syncope must have TLOC followed by rapid and full recovery.
- It is important to rule out cardiac syncope since it is associated with high mortality.
- Understanding or risk stratification and clinical pathway may improve overall outcome.