Syncope & Chest Pain

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Disclosures

• None



CLASS (STRENGTH) OF RECOMMENDATION

CLASS I (STRONG)

Benefit >>> Risk

Suggested phrases for writing recommendations:

- Is recommended
- Is indicated/useful/effective/beneficial
- Should be performed/administered/other
- Comparative-Effectiveness Phrases†:
 - Treatment/strategy A is recommended/indicated in preference to treatment B
 - Treatment A should be chosen over treatment B

CLASS IIa (MODERATE)

Benefit >> Risk

Suggested phrases for writing recommendations:

- Is reasonable
- Can be useful/effective/beneficial
- Comparative-Effectiveness Phrases†:
 - Treatment/strategy A is probably recommended/indicated in preference to treatment B
 - It is reasonable to choose treatment A over treatment B

CLASS IIb (WEAK)

Benefit ≥ Risk

Suggested phrases for writing recommendations:

- May/might be reasonable
- May/might be considered
- Usefulness/effectiveness is unknown/unclear/uncertain or not well established

CLASS III: No Benefit (MODERATE) (Generally, LOE A or B use only)

Benefit = Risk

Suggested phrases for writing recommendations:

- Is not recommended
- Is not indicated/useful/effective/beneficial
- Should not be performed/administered/other

CLASS III: Harm (STRONG)

Risk > Benefit

Suggested phrases for writing recommendations:

- Potentially harmful
- Causes harm
- Associated with excess morbidity/mortality
- Should not be performed/administered/other

Definition

 Syncope, or transient loss of consciousness(LOC) is a symptom that presents with abrupt transient, complete LOC associated with the inability to maintain postural tone, with rapid and spontaneous recovery. The presumed mechanism of syncope is cerebral hypoperfusion. The metabolism of the brain, in contrast to that of many organs, is exquisitely dependent on perfusion. Consequently, cessation of cerebral blood flow leads to LOC within approximately 10 seconds.

Definition

 Abrupt, transient, complete loss of consciousness, associated with inability to maintain postural tone, caused by brief period of global cerebral hypoperfusion which is by definition spontaneously self-limited.

Question #1

Which of the following is not a Class I recommendations for the initial evaluation of syncope based on 2017 ACC/AHA/HRS Guideline for the Evaluation and Management of Patients With Syncope

- A) History
- B) Physical Exam
- C) Routine laboratory testing
- D) ECG
- E) All of the above

Audience Response #1

| COR | Recommendations |
|--------------------|---|
| lla | Targeted blood tests are reasonable in the evaluation of selected patients with syncope identified on the basis of clinical assessment from history, physical examination, and ECG. |
| llb | Usefulness of brain natriuretic peptide and high-sensitivity troponin measurement is uncertain in patients for whom a cardiac cause of syncope is suspected. |
| III: No Benefit | Routine and comprehensive laboratory testing is not useful in the evaluation of patients with syncope. |

This slide adapted from the 2017 ACC/AHA/HRS Guideline for the Evaluation and Management of Patients With Syncope. Published on March 8, 2017, available at: *Journal of the American College of Cardiology*

Answer #1

Which of the following is not a Class I recommendations for the initial evaluation of syncope based on 2017 ACC/AHA/HRS Guideline for the Evaluation and Management of Patients With Syncope

- A) History
- B) Physical Exam
- C) Routine laboratory testing is not indicatedD) ECG
- E) All of the above

Transient-LOC **#** Syncope

- Seizures disorders
- Traumatic brain injury (i.e. concussion)
- Intoxications
- Metabolic disturbances (i.e. hypoglycemia)
- Conversion disorders (i.e. psychogenic, pseudo syncope)

Question #2

Which of the following are not high risk features in diagnosis of syncope?

- A) Low number of syncope episodes (1 or 2)
- B) Male sex
- C) Syncope during exertion
- D) Syncope in the supine position
- E) None of the above

Audience Response

Answer #2

- A) Low number of syncope episodes (1 or 2)
- B) Male sex
- C) Syncope during exertion
- D) Syncope in the supine position
- E) None of the above

High Risk Features in Diagnosis of Syncope

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

2017 ACC/AHA/HRS Guideline for the Evaluation and Management of Patients With Syncope.

Low Risk Features

- 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

Orthostatic Hypotension

- Dehydration
- Volume depletion/Blood loss
- Prolonged standing
- Autonomic insufficiency: Parkinsons, DM, adrenal insufficency
- Medication-induced: Diuretics
- Drug/Alcohol-induced

Cardiovascular Causes

• Structural

- HOCM
- Prolapsing atrial myxoma
- Severe aortic stenosis

• Arrhythmias

- VT or SVT, NSVT + short or long QT interval
- Bradycardias/Block/Pauses
- Bifasicular block
- Pacemaker/ICD malfunction
- Pulmonary HTN
- Pulmonary Embolus
- Acute aortic dissection

Mr. Donald T. Tripp

71y/o M presents after he passed out while walking up the stairs. He felt slightly lightheaded just prior to the event. Wife saw him fall but was able to quickly arouse him. He had no incontinence or tongue biting. Similar event occurred 2 weeks prior while he was doing yard-work for which he did not seek medical care. He has a long history of DM, and hypertension for which he takes Glipizide, Amlodipine, Lisinopril, and HCTZ. He does not drink alcohol or take recreational drugs.

Vitals/orthostatic, and blood sugar are unremarkable. ECG shows sinus rhythm with Left Ventricular Hypertrophy. PE shows 1+ bilateral edema and 3/6 systolic murmur at RUSB with radiating to the carotids.

Question: Mr Don T. Tripp

Most likely cause of his syncope will be confirmed by which of the following tests:

- A) Inpatient Telemetry
- B) Transthoracic Echocardiography
- C) Mobile Cardiac Outpatient Telemetry(MCOT)
- D) Implantable Loop Recorder
- E) Coronary Angiography

Audience Response

Question: Mr Don T. Tripp

Most likely cause of his syncope will be confirmed by which of the following tests:

- A) Inpatient Telemetry
- B) Transthoracic Echocardiography
- C) Mobile Cardiac Outpatient Telemetry(MCOT)
- D) Implantable Loop Recorder
- E) Coronary Angiography

| COR | Recommendations |
|-----|---|
| lla | Transthoracic echocardiography can be useful in selected patients presenting with syncope if structural heart disease is suspected. |

Aortic Stenosis

3 Primary causes of Valvular AS

 Congenital (Bicuspid/Unicuspid)
 Degenerative (Age related)
 Rheumatic

AS Epidemiology



Worldwide

- Rheumatic most common
- North America/Europe
 - Degenerative/Congenital



AS Epidemiology

Original Articles

- WC Roberts, JM Ko in *Circulation* 2005
- An anatomically abnormal valve was present in 54 percent: 49 percent had a bicuspid valve and 4 percent had a unicuspid valve, but the frequency varied importantly with age



Clinical Cardiology Curriculum sine and Cardioviscolar Outcomes: Is The sporary Reviews in Cardlevascular Medicin Repair of the Recorditant Bicasoid or Tricanold Rightstring Invarive Cavilia: Services in the United State tic Valve: Rackensoral, Principles, and Outcom Let's Clear the Air for Cooline Patrots and Employees New Drugs and Technologies Overview of the 2003 Food and Drug Administratio Circulatory System Disvices Pastel Monting on osigitazone and Outcomes for Patients With Melitus and Coronary Artery Disease in so Anomphete Revenuestation Investor the MitraClip Delivery System 2 Dubetes (GARI 20) Trul ю. ECG Challence Response Fruit and Vinetable Concentration With Risk of Alabamina ECG Response: August 20, 2003 >> Images in Cardiovascular Medicine Espansion of Invasive Candiac Services in the United State Changes in Ambolatory Calls After Implementation of a pertrophic Cardiomyxpathy With Mitral Inflow Stocke-Free Law and its Extension to Casines Obstruction and Severe Putmonary Hypertension ntensive Cantlac Magnetic Resonance Imaging technicopy Reveal a High Burden of Muncandia Servived Sudden Cardiac Death in a Young Marathon Runner: Cardiac Ischemic Event Attributed to an Interarterial Course of the Right Disease in HIV Related **Coronary Artery** Storty Patients With Acute Coronary Syndromes Ganaged Without Revenuelarization, Insights Into the Salirty If Long Rom Dual Antipitation Theoapy With Reduced-Devi **AHA Scientific Statement** us Standard-Date Clopidogral CME Exercise Standards for Testing and Thaining A Scientific Statement From the American name involves the Oversetdation of sain. Type II and Is Recovered by the Heart Association usin Actually Menetic That Induces Circulation Topic Review ted Effect of Proton Pump Inhibitors: Elevation of the **Circulation Editors' Picke: Next Read Articles on** dar Risk Factor Assemmetric De the Topic of Pediatric Cardiology

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AS Epidemiology

- <u><50 years of age</u> approximately two-thirds had a bicuspid valve and one-third had a unicuspid valve
- <u>Between ages 50-70</u> approximately two-thirds had a bicuspid valve and one-third a tricuspid valve; only rare patients had a unicuspid valve
- <u>Patients over 70</u> approximately 60 percent had a tricuspid valve and 40 percent had a bicuspid valve.

The natural history of aortic stenosis.



Prediman K. Shah Circulation. 2012;126:118-125

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AVR/TAVR/TAVI



Coffee Break

- EKG:
- ECG:
- EEG:
- EGD:
- EGG:

Coffee Break

- EKG: Electrocardiogram
- ECG: Electrocardiogram
- EEG: Electroencephalogram
- EGD:Esophagogastroduodenoscopy
- EGG: To make omelets with...

Cardiovascular Causes Syncope

Structural

- HOCM
- Prolapsing atrial myxoma
- Severe aortic stenosis

Arrhythmias

- VT or SVT, NSVT + short or long QT interval
- Bradycardias/Block/Pauses
- Bifasicular block
- Pacemaker/ICD malfunction
- Pulmonary HTN
- Pulmonary Embolus
- Acute aortic dissection

Question# Rhythm 1



A) Normal Sinus Rhythm
B) 1st degree AV block
C) 2nd Degree AV Block Type I
D) 2nd Degree AV Block Type II
E) 3rd Degree AV Block

Audience Response

Answer# Rhythm 1



A) Normal Sinus Rhythm
B) 1st degree AV block
C) 2nd Degree AV Block Type I (Wenkebach)
D) 2nd Degree AV Block Type II
E) 3rd Degree AV Block

Question# Rhythm 2(The Pool Guy)



A) Normal Sinus Rhythm
B) 1st Degree AV Block
C) 2nd Degree AV Block Type I
D) 2nd Degree AV Block Type II
E) 3rd Degree AV Block

Audience Response

Answer # Rhythm 2(The Pool Guy)



A) Normal Sinus Rhythm
B) 1st Degree AV Block
C) 2nd Degree AV Block Type I
D) 2nd Degree AV Block Type II
E) 3rd Degree AV Block

Question# Rhythm 3(Back to the ER)



A) Normal Sinus Rhythm
B) 2nd Degree AV Block Type I
C) 2nd Degree AV Block Type II
D) 3rd Degree AV Block
E) Ventricular Tachycardia

Audience Response

Question# Rhythm 3(Back to the ER)



A) Normal Sinus Rhythm
B) 2nd Degree AV Block Type I
C) 2nd Degree AV Block Type II
D) 3rd Degree AV Block
E) Ventricular Tachycardia

Question# Rhythm 4



- A) Normal Sinus Rhythm
- B) 2nd Degree AV Block Type I
- C) 2nd Degree AV Block Type II
- D) 3rd Degree AV Block
- E) Ventricular Tachycardia

Audience Response

Question# Rhythm 4



- A) Normal Sinus Rhythm
- B) 2nd Degree AV Block Type I
- C) 2nd Degree AV Block Type II
- D) 3rd Degree AV Block
- E) Ventricular Tachycardia

Chest Pain/Angina

Chest Pain

• Approximately 1 percent of all ambulatory visits in the primary care

Hsiao CJ, Cherry DK, Beatty PC, Rechtsteiner EA. National ambulatory medical care survey: 2007 summary. *Natl Health Stat Report*. 2010;(27):1–32.

History and Physical

• RF for CAD:

 diabetes mellitus, tobacco use, hyperlipidemia, or hypertension, Family history,

• Age

- Known CAD or cerebrovascular disease
- Pain not reproducible by palpation
- Pain worse during exercise

Noncardiac CP: The Top 3

• CHEST WALL PAIN

- Localized muscle tension, stinging pain
- Pain reproducible by palpation
- Absence of a cough.

COSTOCHONDRITIS

- Subset of chest wall pain
- Self-limited condition characterized by pain reproducible by palpation in the parasternal/costochondral joints.
- Tietze syndrome: Specifically has swelling over the affected joints.

• GERD

- Burning retrosternal pain
- Acid regurgitation
- Sour or bitter taste in the mouth
- One-week trial of a high-dose proton pump inhibitor

PANIC DISORDER AND ANXIETY STATE

- Panic disorder and anxiety state are common.
- ¼ of people with a panic attack will have chest pain and shortness of breath.
- Often not recognized, leading to more testing, follow-up, and higher costs of care.
- One question (In the past four weeks, have you had an anxiety attack [suddenly feeling fear or panic]?) is sensitive (93 percent) and modestly specific (78 percent) in detecting panic disorder ²

Löwe B, Gräfe K, Zipfel S, et al. Detecting panic disorder in medical and psychosomatic outpatients: comparative validation of the Hospital Anxiety and Depression Scale, the Patient Health Questionnaire, a screening question, and physicians' diagnosis. *J Psychosom Res*. 2003;55(6):515–519.

35 y/o male with sharp, pleuritic chest pain that is worse when supine and relieved by leaning forward.



Best Treatment Option

- A) Medical Management
- B) Stress Test
- C) Cardiac CT
- D) Aspirin 81 mg(x4) chew and swallow, and call EMS to take to hospital and active STEMI protocol
- E) None of the above



Audience Response

Best Treatment Option

- A) Medical Management
- B) Stress Test
- C) Cardiac CT
- D) Aspirin 81 mg(x4) chew and swallow, and call EMS to take to hospital and active STEMI protocol
- E) None of the above



PERICARDITIS

- Pleuritic chest pain, pericardial friction rub, and diffuse electrocardiographic ST-T wave changes
- ECG usually demonstrates diffuse ST segment elevation and PR interval depression without T wave inversion.
- Acute pericarditis should be considered in patients presenting with new-onset chest pain that increases with inspiration or when reclining, and is lessened by leaning forward.

2015 ESC Guidelines for the diagnosis and management of pericardial diseases: The Task Force for the Diagnosis and Management of Pericardial Diseases of the European Society of Cardiology

Diagnosis per ESC 2015 Guidelines

- Diagnosis: 2/4 Criteria
 - Pericarditic chest pain
 - Pericardial rub
 - New widespread ST-segment elevation or PR depression
 - New or worsening pericardial effusion

Supporting findings can include elevation of inflammatory markers (C-reactive protein, erythrocyte sedimentation rate, white blood cell count), and evidence of pericardial inflammation on imaging (computed tomography [CT], cardiac magnetic resonance [CMR]).

Prognosis in Pericarditis

- Major predictors of poor prognosis:
 - Fever >38°C
 - Subacute onset
 - Large pericardial effusion
 - Cardiac tamponade
 - Lack of response to aspirin or nonsteroidal anti-inflammatory drugs (NSAIDs) after ≥1 week of therapy
 - Minor predictors are myopericarditis, immunosuppression, trauma, and oral anticoagulation therapy.
- Outpatient management is recommended for low-risk patients (no risk factors), and inpatient management is recommended for patients with ≥1 risk factor.

Pericarditis Treatment

- First Line
- Aspirin (750-1000 mg every 8 hours for 1-2 weeks)
- NSAIDs (ibuprofen 600 mg every 8 hours for 1-2 weeks) with gastric protection are recommended as first-line therapy for acute pericarditis.
- Colchicine (0.5 mg daily [<70 kg] or BID [≥70 kg] for 3 months) is recommended as first-line therapy as an adjunct to aspirin/NSAID therapy.

• **PNEUMONIA**

- Community-acquired pneumonia is a cause of chest pain and respiratory symptoms in the outpatient setting. Common symptoms include fever, chills, productive cough, and pleuritic chest pain.³⁰ Fever, egophony heard during auscultation of the lungs, and dullness to percussion of the posterior thorax are suggestive of pneumonia.¹⁰ Clinical impression is modestly useful for ruling in or out pneumonia (LR+ = 2.0; LR- = 0.24).¹⁰ The test of choice for diagnosing pneumonia is chest radiography,¹¹ although it has been more recently recommended that it be performed only if other diagnoses are being considered in the uncomplicated outpatient setting.³¹
- HEART FAILURE
- Most patients with heart failure present with dyspnea on exertion, although some will have chest pain.¹² A history of heart failure or acute MI best predicts the presence of heart failure (LR+ = 5.8 and 3.1, respectively).¹² Clinical impression/judgment is predictive of heart failure (LR+ = 9.9; LR- = 0.65), as is pulmonary edema on chest radiography (LR+ = 11.0).¹²
- PULMONARY EMBOLISM
- Diagnosing pulmonary embolism in the office based on signs and symptoms is difficult because of its highly variable presentation. Although dyspnea, tachycardia, and/or chest pain are present in 97 percent of those diagnosed with pulmonary embolism,³² there is no single clinical feature that effectively rules it in or out.³³ The physician can estimate the patient's likelihood of pulmonary embolism by using a validated clinical decision rule, such as the Wells criteria (<u>Table 3¹³,³⁴</u>), to determine if further testing should be performed (e.g., D-dimer assay, ventilation-perfusion scan, helical computed tomography of the pulmonary arteries).^{13,14,35}

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Incessant, recurrent, and chronic pericarditis

- Incessant pericarditis lasts for >4-6 weeks, but <3 months without remission.
- Recurrent pericarditis is pericarditis that recurs after a symptom-free interval of at least 4-6 weeks.
- Chronic pericarditis is pericarditis lasting >3 months. Aspirin or NSAIDs until symptom relief plus colchicine (for 6 months) is recommended for recurrent pericarditis.