

Ambulatory Small Talk
Angina
October 15, 2007
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1. A 56yo male is referred to you from a neighbor. He states that he has had chest pain over the last several months, but only when he works out in his garden. Upon further questioning, he also has this pain when his ten grandkids visit. The pain is described as left anterior chest discomfort and is relieved with rest. He is a former smoker of 1ppd for 20+ years and he consumes no alcohol. Both his mother and father had bypass surgery, but he doesn't remember at what age. His blood pressure is 138/84 and his HR is 89. His TChol is 242 and his LDL is 172. You perform an ECG and it shows NSR and no STT changes or Q waves. What test, if any, do you offer him next?

- A. CXR
- B. Electron-beam CT (CT of the coronaries)
- C. Coronary angiography
- D. Exercise Treadmill stress testing
- E. BNP

2. Classify the following symptoms as classic (typical) or atypical

- A. Sensations of heaviness, squeezing, pressure, burning or aching
- B. Random onset
- C. Radiation to shoulder, neck, jaw, arm or epigastrium
- D. Pleuritic, sharp, knife-like
- E. Chest wall pain, positional, tender to palpation
- F. Relatively predictable in onset
- G. Last 3-15 minutes
- H. Lasts seconds, minutes, hours, or all day
- I. Relieved with rest or NTG

3. You have just come from an ACC meeting and you know the characteristics of chronic stable angina (CSA) include:

- A. Complete reversibility of the symptoms
- B. Worsening symptoms
- C. Recurrence of symptoms over time
- D. Recent onset of symptoms
- E. Symptoms at rest

4. On your PE, you pay close attention to his cardiac and pulmonary exam. You are careful to note any murmurs, wheezes or rhonchi. His neurologic exam is completely normal. You know that the following may produce angina-like chest pain in the absence of overt coronary disease:

- A. Pneumonia
- B. Aortic-valve disease
- C. Esophageal spasm
- D. Hypertrophic cardiomyopathy
- E. Musculoskeletal disorders
- F. All of the above

5. You offer him an exercise treadmill stress test because you know that he doesn't have which one of the following cofounders that would contraindicate ETT:

- A. WPW syndrome
- B. Complete LBBB
- C. Pt unable to exercise
- D. Electronically paced ventricular rhythm
- E. More than 1mm of ST depression at rest
- F. All of the above

6. Indications for LV systolic function (EF) measurement by resting Echo or radionuclide angiography in pts with CSA or are asymptomatic include:

- A. Patients with prior hx of MI
- B. Patients with pathologic Q waves on ECG
- C. Patients with symptoms or signs of CHF
- D. Patients with complex ventricular arrhythmias
- E. All of the above

7. Indications for exercise stress testing include:

- A. Patients with typical chest pain
- B. High risk patients with atypical chest pain
- C. For determination of exercise prescription after MI, PTCA or CABG
- D. Asymptomatic, annual exam
- E. Unstable angina
- F. Acute CHF exacerbation

8. Indications for stress imaging studies (radionuclide angiography or stress echo) in patients who have abnormal results on resting ECG or are using digoxin include:

- A. Patients with CSA who are able to exercise
- B. Patients with CSA who have LBBB
- C. Patients with CSA and an electronically paced ventricular rhythm
- D. Patients with unstable angina
- E. All of the above

9. Treatment of CSA includes:

- A. Lifestyle modification (regular exercise, smoking cessation, weight reduction and glycemic control if applicable)
- B. ACE inhibitors in pts with prior hx of MI, HTN, systolic dysfunction or diabetes
- C. Nitrates
- D. Beta-adrenergic blockers
- E. Calcium-channel blockers
- F. Statins
- G. Antiplatelets (aspirin or clopidogrel in pts with asa intolerance)
- H. Revascularization (if applicable)

Answers/Discussion

1. **D. ETT.** Pts with symptomatic chronic stable angina who are able to exercise should undergo risk stratification with exercise treadmill testing. This pt is >55, a former smoker, has HTN and a +FH of CAD. A chest radiograph may assist in the diagnosis of chest pain if a cardiac, pulmonary, or neoplastic etiology is being considered. The ACC/AHA does not recommend EBCT or BNP as a screening test for CAD. Note a normal ECG markedly reduces the probability that chest pain is due to acute myocardial infarction, but it does not exclude a serious cardiac etiology (particularly unstable angina). ECG findings must be considered in the context of the history and physical examination.

2. Typical – A, C, F, G, I
Atypical – B, D, E, H

3. **A & C.** Substernal chest discomfort with a characteristic quality and duration that is (A) provoked by exertion or emotional stress and (B) relieved by rest or NTG. Worsening of symptoms, recent onset and symptoms at rest are all cardinal features of unstable angina.

4. **F. All of the above.** A prospective study of 399 episodes of chest pain in patients seen in multiple outpatient centers over a one-year period noted the following prevalences of various causes of chest pain: Approximately 60 percent of chest pain diagnoses were not "organic" in origin (e.g., not due to cardiac, gastrointestinal, or pulmonary disease). Musculoskeletal chest pain accounted for 36 percent of all diagnoses (of which costochondritis accounted for 13 percent) followed by reflux esophagitis (13 percent). Stable angina pectoris was responsible for 11 percent of chest pain episodes; unstable angina or myocardial infarction occurred in only 1.5 percent. Nevertheless, most of the ancillary diagnostic testing used was directed toward finding or excluding a cause of coronary disease.

5. **F. All of the above.** The ACC/AHA recommends that all patients with intermediate to high probability of CAD undergo exercise stress testing to assess risk for future cardiac events, unless they have confounding features on the testing ECG, are taking digoxin, or are unable to exercise.

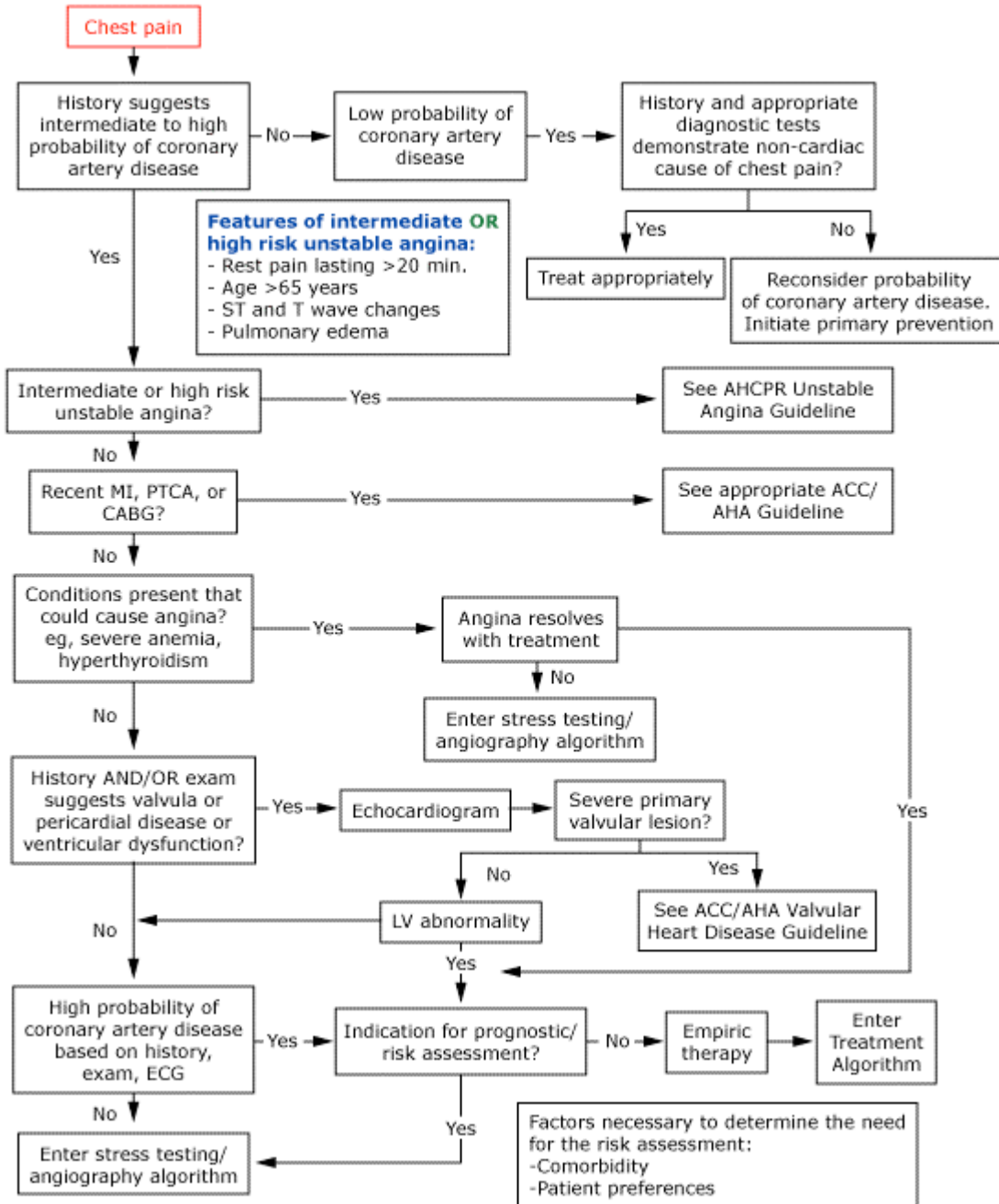
6. **Once again, All of the above.** Most patients undergoing a diagnostic evaluation for angina do not routinely need echocardiography. For risk stratification in a patient with chronic stable angina who has a history of documented MI or Q waves on ECG, measurement of global left ventricular systolic function (i.e., EF) can be important in choosing appropriate medical or surgical therapy and making recommendations about activity level, rehabilitation, and work status. In asymptomatic patients with a history of documented MI or Q waves on ECG, measurement of global left ventricular systolic function is also important because it is the strongest predictor of long-term survival.

7. **A, B, C are true.** Along with aiding in the diagnosis of CAD in typical chest pain and high risk pts with atypical chest pain, noninvasive testing may provide useful additional prognostic information, such as total exercise time, the inducibility of LV dysfunction, BP and HR responses, and most important, the degree of myocardial ischemia. Stress testing is not recommended in routine annual examinations and is contraindicated in an acute CHF exacerbation.

8. **A, B, C are true.** Whenever possible, exercise should be used as the most appropriate form of stress. Exercise imaging testing should be used in patients who are able to exercise but who have confounding factors on their resting ECG or are taking digoxin. For patients who are unable to exercise, however, various types of pharmacologic stress are useful for risk stratification. It is important to note that the inability to perform an exercise test is itself a negative prognostic factor. Once again, stress testing is contraindicated in unstable angina.

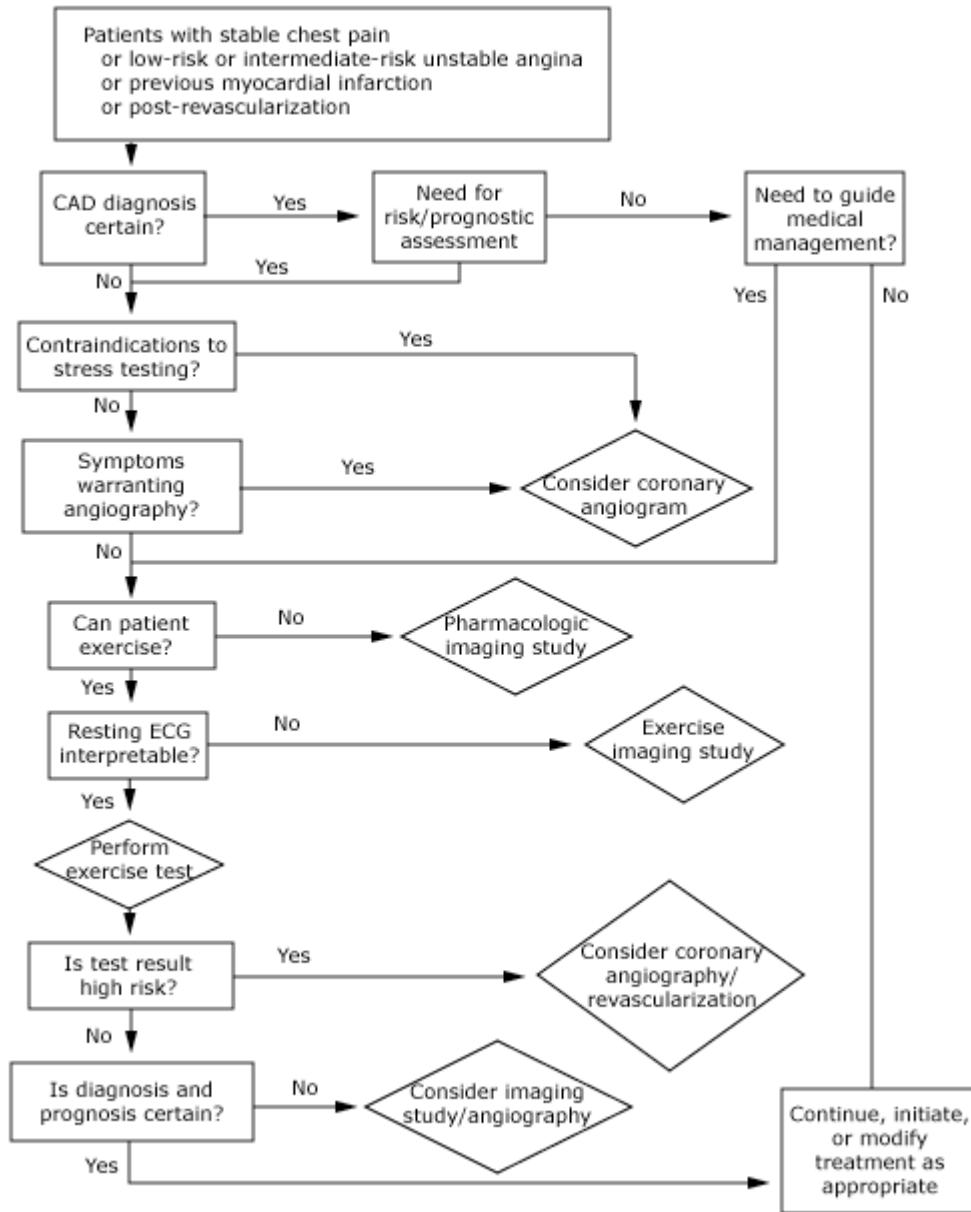
9. **ALL are true.** All antianginal drugs (nitrates, β -blockers and CCBs) have been shown to decrease the frequency of angina as well as prolong the duration of exercise before the onset of angina. Comparative trials have not shown that any single class of drugs has greater antianginal efficacy than the others. Regular exercise reduces the frequency of anginal symptoms, increases functional capacity, and improves endothelial function. Vigorous efforts at smoking cessation and weight control are important in patients with chronic stable angina. For patients with diabetes, a multifactorial approach that includes lifestyle changes and medications for glycemic control and coronary risk factors substantially reduces the risk of cardiovascular events. The use of aspirin at a dose of 81 to 150 mg per day reduces cardiovascular morbidity and mortality by 20 to 25% among patients with coronary artery disease. Statins reduce the levels of C-reactive protein, and two recent studies suggest that lowering these levels is as important as decreasing LDL cholesterol levels for the optimal reduction of coronary events. ACE inhibitors have been reported to reduce morbidity and mortality among patients with coronary disease. ACE inhibitors should be prescribed for patients with chronic stable angina who have a history of MI, HTN, left ventricular systolic dysfunction, or diabetes, as well as for patients with impaired renal function who do not have a contraindication to the use of these agents. Revascularization (performed by any technique) has not been shown to decrease the risk of MI or death from coronary artery disease in patients with chronic stable angina and preserved left ventricular function. However, revascularization should be considered for persons with lifestyle-limiting angina who have a good medical regimen or for those with high-risk factors, such as symptomatic multivessel disease, proximal left anterior descending or left main artery disease, left ventricular systolic dysfunction, diabetes, a large ischemic burden on nuclear or echocardiographic stress testing, early onset of ischemia on stress testing, or ST-segment depression of 2 mm or more.

Clinical assessment of patients with chest pain



AHCPR: Agency for Health Care Policy and Research; MI: myocardial infarction; PTCA: percutaneous transluminal coronary angioplasty; CABG: coronary artery bypass graft; ACC: American College of Cardiology; AHA: American Heart Association; LV: left ventricular; and ECG: electrocardiogram.

ACC/AHA guidelines: exercise testing in patients with suspected ischemic heart disease



National Cholesterol Education Program-Adult treatment panel III risk factors

Positive risk factors

Age: male ≥ 45 , female ≥ 55 or premature menopause without estrogen replacement therapy

Family history of premature coronary heart disease: definite myocardial infarction or sudden death before age 55 years in male first-degree relative and before age 65 in female first-degree relative

Current cigarette smoking

Hypertension: blood pressure $> 140/90$ mmHg, or an antihypertensive medication

HDL cholesterol < 40 mg/dL (1.03 mmol/L)*

Negative risk factors*

HDL cholesterol ≥ 60 mg/dL (1.55 mmol/L)

Status based on presence of risk factors other than low-density lipoprotein cholesterol

* Confirmed by measurements on several occasions.

*If the HDL cholesterol level is > 60 mg/dL, subtract one risk factor.

Data from Executive Summary of the Third Report of the National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III). JAMA 2001; 285:2486.

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