Chest Pain Clinical Guideline

Guideline History

Date Approved	05/03, 10/03, 10/05, 10/07
Date Revised	10/07
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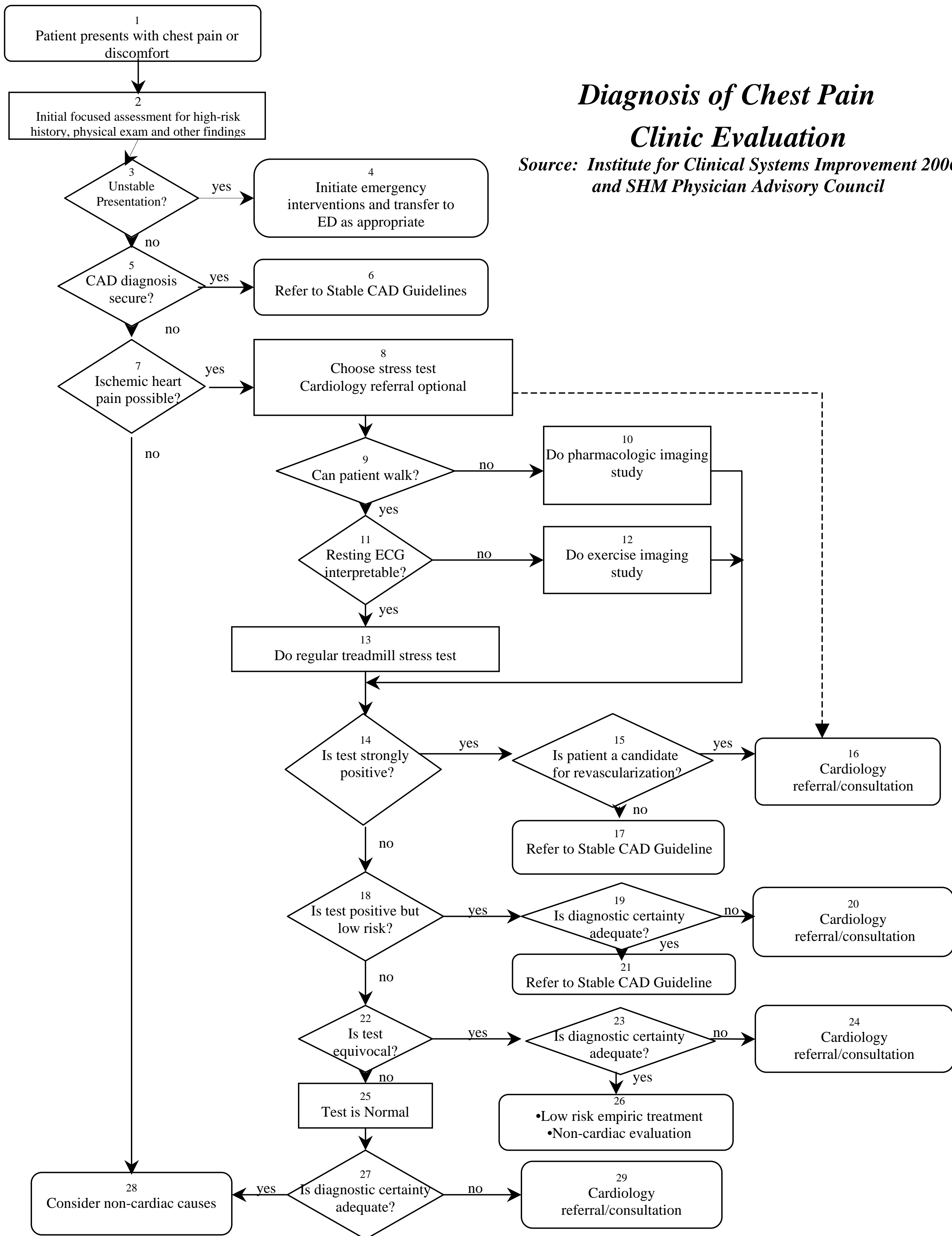
Next Review Date	10/09

These Guidelines are promulgated by Sentara Healthcare (SHC) as recommendations for the clinical management of specific conditions. Clinical data in a particular case may necessitate or permit deviation from these Guidelines. The SHC Guidelines are institutionally endorsed recommendations and are not intended as a substitute for clinical judgment.

Diagnosis of Chest Pain
Clinic Evaluation

Source: Institute for Clinical Systems Improvement 2006 and SHM Physician Advisory Council



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Diagnosis of Chest Pain
Clinic Evaluation Algorithm Annotations

1. **Patient Presents with Chest Pain or Discomfort**

2. **History, Exam, ECG, CXR, Office Labs**
   History should include characterization of pain, exacerbating or relieving factors, associated symptoms and risk factors for coronary disease. Physical exam should include careful cardiovascular and pulmonary exam, peripheral vascular exam, and evaluation for hypertension and hypercholesterolemia. Lab studies may include resting ECG, chest x-ray, hemoglobin, and others if clinically indicated.

   The patient's description of pain and the history of previous coronary disease are by far the most important parts of the history.

   Carotid bruits, peripheral vascular disease, and xanthomas on physical exam suggest a higher likelihood of coronary disease. The resting ECG may show evidence of previous infarction.

   Direct provider education toward completing the history evaluation.

   High-risk symptoms on initial presentation include:
   <u>History</u>
   - Severe or ongoing pain;
   - Pain lasting 20 minutes or more;
   - New pain at rest or with minimal activity;
   - Severe dyspnea;
   - Loss of consciousness

   <u>Physical Findings</u>
   - Hypotension or other signs of under-perfusion;
   - Tachycardia or bradycardia;
   - Pulmonary edema, cyanosis
   - Presence of peripheral vascular disease

   <u>ECG Findings</u>
   - ST elevation greater than 1mm on two contiguous leads suggesting acute MI;
   - New ST or T wave changes;
   - Widespread ST depression greater than 1mm at rest
   - New LBBB.

3. **Unstable Presentation (yes) move to #4; (no) move to #5.**

4. **Initiate Emergency Interventions and Transfer to ED as Appropriate**

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5. **CAD Diagnosis Secure?**
   When the clinical setting and history suggest typical angina pectoris (substernal pain provoked by exertion and relieved by nitroglycerine and rest), the physician is very likely correct in assuming an ischemic coronary syndrome. Treatment and prognostic evaluation may proceed as outlined under Stable Coronary Artery Disease Guideline.

6. **Refer to Stable CAD Guideline**
   Typical angina pectoris, stable for 60 days and without evidence of recent myocardial infarction, may be treated under Stable Coronary Artery Disease guideline. Previously diagnosed CAD (e.g., old MI, Coronary Artery Bypass Graft (CABG) with a stable symptom complex likewise may be treated under Stable Coronary Artery Disease guideline.

7. **Ischemic Heart Pain Possible?**
   When coronary disease is a reasonable possibility and the clinician remains uncertain after evaluating the history, physical exam, and resting cardiogram, a stress test may contribute supplemental information. When coronary disease is unlikely based on highly atypical symptoms and low prevalence of coronary disease among the population to which the patient belongs, stress testing is best avoided. An abnormal test will be misleading.

8. **Choose Stress Test/Cardiology Referral Optional**

9. **Can Patient Walk?**
   In patients who cannot exercise because of orthopedic or vascular limitations or because of debility, consider pharmacologic stress and imaging test (with adenosine, dipyridamole, or dobutamine). Selection of a pharmacologic test is best done after discussion with the cardiologist or imaging specialist.

10. **Do Pharmacologic Imaging Study**
    Patient education directed toward preparing for and understanding the selected pharmacologic imaging study should occur at this point.

11. **Resting ECG Interpretable?**
    Marked resting ECG abnormalities such as LBBB, LVH with repolarization abnormality, ventricular pre-excitation or ventricular paced rhythm render the exercise ECG uninterpretable for ischemic changes. Patients on digoxin and those with less than 1mm resting ST depression may undergo standard ECG stress testing, provided the clinician realizes that further ST depression with exercise has minimal diagnostic significance. A stable abnormality with exercise is reassuring.

12. **Do Exercise Imaging Study**
    When the resting ECG is markedly abnormal, use an exercise imaging test (stress echo, stress radionuclear perfusion, stress radionuclear ventriculogram) based on local expertise and discussion with the cardiologist or imaging expert.

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13. Do Regular Treadmill Stress Test

Use the Bruce protocol, modified if need be for debilitated patients. Elderly or debilitated patients receive a better exercise challenge on a more gradual protocol, which avoids the large jumps between stages of the stress test. The ideal protocol allows a patient to walk 6-12 minutes.

Exercise should be symptom-limited or terminated because of clinical judgement rather than stipped at an arbitrary age-predicted maximum heart rate. Adequacy of exercise and myocardial challenge is generally accepted as achieving greater than or equal to 85% of age predicted maximum heart rate.

14. Is Test Strongly Positive?

Stress testing may be strongly positive and suggest a moderate to high risk of cardiovascular events as indicated by the Duke treadmill score, which is based upon the Bruce protocol.

15. Is Patient a Candidate for Revascularization? (yes) go to #16; (no) go to #17

Unless advanced age, co-morbidity, or patient preference suggests medical treatment, high-risk patients should be considered for revascularization.

16. Cardiology Referral/Consultation

17. Refer to Stable CAD Guideline

18. Is Test Positive but Low Risk?

A stress cardiogram may be positive but without features, which signify a poor prognosis, as noted above. For example, a 65-year-old man with atypical angina and 1.0 mm ST depression at 10 minutes has a good prognosis even though he has coronary disease.

19. Is Diagnostic Certainty Adequate?

A positive test may confirm the clinical diagnosis of coronary disease and allow treatment as outlined under Stable Coronary Artery Disease Guideline. Refer to cardiology if diagnostic certainty is made. All patients with CAD should be seen by a cardiologist at least once to establish a diagnosis and a prognosis.

20. Cardiology Referral/Consultation

21. Stable CAD Guideline

22. Is Test Equivocal?

Because of resting abnormality, limited exercise performance, limited heart rate, or minor exercise abnormalities, the test may not be clearly normal or abnormal, yet high-risk treadmill findings are absent.

23. Is Diagnostic Certainty Adequate? (no) go to #24; (yes) go to #25

Refer to cardiology if diagnostic certainty is standard. Knowing that the patient is not at high-risk may suggest empiric treatment or non-cardiac evaluation.

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24. Cardiology Referral/Consultation

25. Low Risk Empiric Treatment/Non Cardiac Evaluation.

26. Test is Normal

A normal test may confirm the clinical impression of non-cardiac symptoms. Refer to cardiology if symptoms are worrisome despite a normal stress test.

27. Non-Cardiac Causes

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