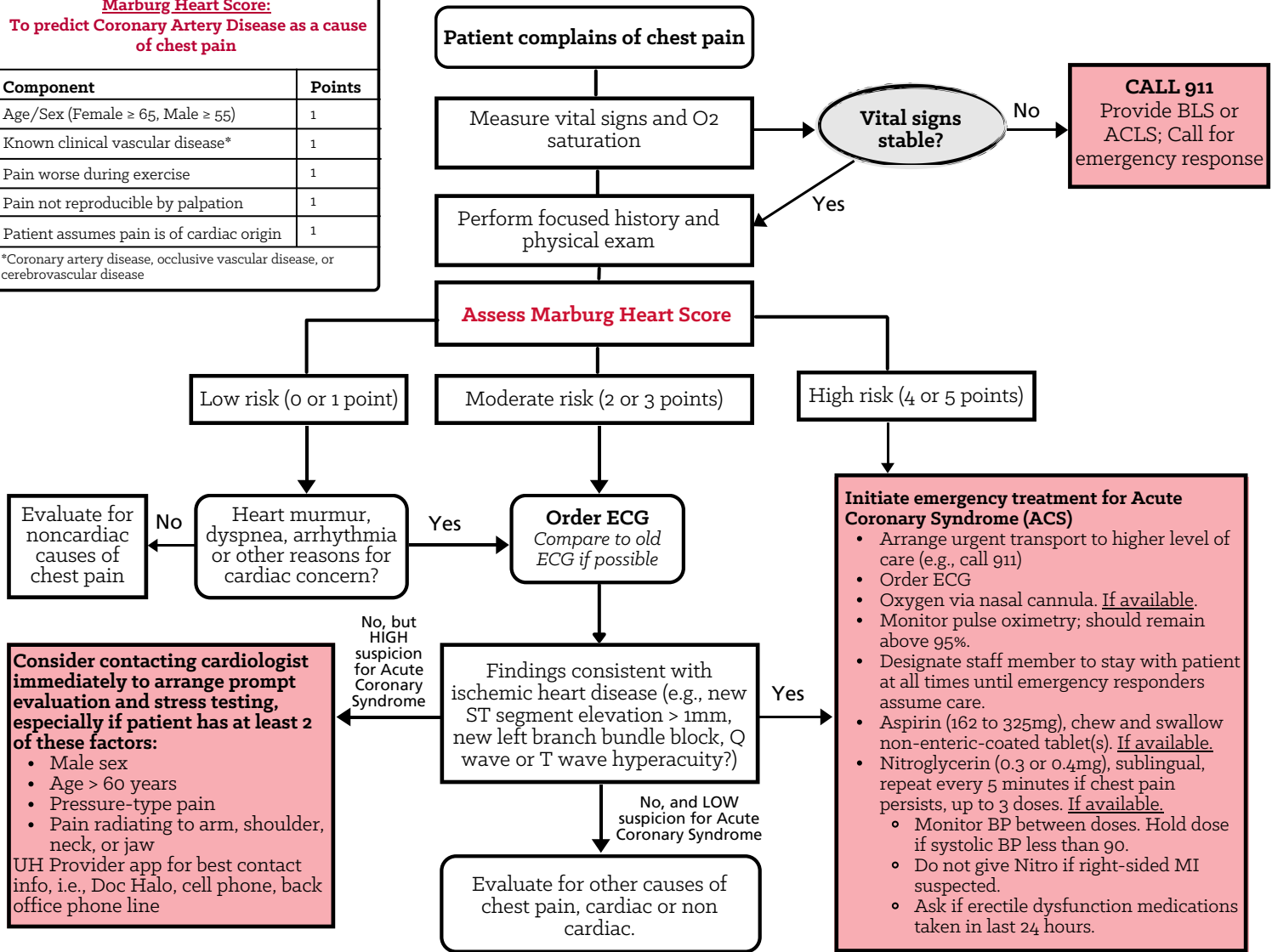


Chest Pain Evaluation for Adult Patients in a Primary Care Setting

Marburg Heart Score:
To predict Coronary Artery Disease as a cause of chest pain

Component	Points
Age/Sex (Female ≥ 65, Male ≥ 55)	1
Known clinical vascular disease*	1
Pain worse during exercise	1
Pain not reproducible by palpation	1
Patient assumes pain is of cardiac origin	1

*Coronary artery disease, occlusive vascular disease, or cerebrovascular disease



Troponin Testing

It is NOT recommended to order STAT Troponin in non-ED ambulatory locations when evaluating possible acute coronary syndromes. If you are concerned that patient may need this testing they should be transferred to ED for proper monitoring and serial testing of these enzymes.

These Clinical Practice Guidelines are guidelines only. In no way should these be used as a substitute for clinical or medical judgment. For specialty patient populations such as elderly or post-partum patients, refer to evidenced based practice guidelines to best serve these populations' unique needs.

Identifying Life-Threatening Conditions in Adults in the Primary Care Setting: Chest Pain

Epidemiology of Chest Pain

Cardiac disease is the leading cause of death in the United States. In primary care settings, chest pain is rare but potentially a sign of a life-threatening condition. Only 1% of primary care visits are for chest pain. Of these, 2% to 4% are unstable angina or myocardial infarction (MI) (McConaghy et al., 2020). Chest pain can indicate Acute Coronary Syndrome (ACS), several other potentially life-threatening conditions, or numerous non-life-threatening conditions. Although individual characteristics may not rule in or out a diagnosis, a combination of signs and symptoms may increase diagnostic accuracy. The initial

goal of patient care is to determine if the patient needs to be referred to a higher level of care for further testing (e.g., ED referral for troponin and observation, stress testing, coronary angiography) to rule in or out a potentially catastrophic acute coronary syndrome (ACS) or acute MI. Missed diagnosis of ACS can increase short-term mortality.

Life-threatening conditions that can cause chest pain:

- Acute Coronary Syndrome (ACS)
- Acute Aortic Dissection
- Pulmonary Embolism
- Tension Pneumothorax
- Pericardial tamponade
- Mediastinitis (e.g., esophageal rupture)
- Sarcoidosis-related arrhythmias

Classic symptoms of stable angina:

- Chest pain with pressure, heaviness, tightness or constriction in center or left side of chest
- Chest pain precipitated by exertion and relieved by rest
- Radiating pain to neck, throat, jaw, upper extremity, shoulder
- Dyspnea
- Nausea or vomiting
- Diaphoresis
- Presyncope
- Palpitations

Risk Factors for ACS:

- Older age
- Family history of cardiovascular disease
- Tobacco use
- Cocaine use
- Diabetes mellitus
- Hypertension
- Hyperlipidemia
- Coronary artery calcium score
- CVD risk score (e.g., MESA or Framingham)

Atypical symptoms (more common with women, older age, and diabetes):

- Absence of chest pain
- Dyspnea as major or only symptom
- Weakness
- Nausea or vomiting
- Epigastric pain or discomfort
- Palpitations
- Syncope
- Cardiac arrest

Missed Diagnosis of ACS:

Atypical patient presentation is the most common factor of missed diagnosis; misreading of ECG is less frequent.

Patient characteristics more likely to have missed diagnoses:

- Women less than 55 years of age
- Persons of color
- Shortness of breath as major presenting symptom
- Normal or non-diagnostic ECG

Wells Criteria for Prediction of Pulmonary Embolism

Note: Wells Criteria for DVT is a separate calculation.

Criteria	Points
Signs or symptoms of DVT (asymmetric leg swelling or pain with palpation of deep vein)	3
Diagnosis of PE is more likely than an alternative diagnosis	3
Heart greater than 100 beats per minute	1.5
Immobilization (\geq 3 days) or surgery in the previous four weeks	1.5
Previous diagnosis of Deep Vein Thrombosis (DVT) or PE	1.5
Hemoptysis	1
Malignancy within the past six months	1
Probability	Points
High Risk	> 6
Moderate Risk	2 to 6
Low Risk	0 to 1

Pulmonary Embolism Rule Out Criteria (PERC Rule)

The PERC rule can be applied to further rule out a PE if Wells Criteria shows low risk (0 to 1 point). If all criteria are met, then the diagnosis of PE is highly unlikely.

1. Age <50 years
2. Heart rate <100 bpm
3. Oxyhemoglobin saturation \geq 95%
4. No hemoptysis
5. No estrogen use
6. No prior DVT or PE
7. No unilateral leg swelling
8. No surgery/trauma requiring hospitalization within the prior four weeks

Also assess for recent history (<2 months) of long-distance airplane travel



Other Life-Threatening Conditions That Can Present as Chest Pain

All suspected cases must be transferred emergently to a higher level of care or diagnosis and treatment.

Common Presenting Symptoms and Signs of Life-Threatening Non-ACS Conditions with Chest Pain

<u>Condition</u>	<u>Common Findings</u>	<u>ECG</u>
Pulmonary Embolism	<ul style="list-style-type: none"> • Dyspnea • Chest pain (often pleuritic) • Tachycardia • Cough • DVT Symptoms 	ECG can be normal and does not exclude a PE/ An S1Q3T3 pattern may be present. Other ECG abnormalities in a PE may include tachycardia and nonspecific ST-segment and T-wave changes.
Acute Aortic Dissection	<ul style="list-style-type: none"> • Chest pain (sudden, sharp) • Pulse differential in upper extremities 	ECG may be normal or show ischemic changes. Chest x-ray is more likely to show abnormality.
Tension Pneumothorax	<ul style="list-style-type: none"> • Dyspnea • Chest pain (pleuritic) • Hypotension • Tachycardia 	
Pericardial Tamponade	<ul style="list-style-type: none"> • Chest pain (sudden) • Tachypnea • Dyspnea • Venous distension in forehead and scalp • Muted heart sounds 	ECG typically shows sinus tachycardia, low QRS voltage.
Esophageal Perforation and Mediastinitis	<ul style="list-style-type: none"> • Chest pain (mild to severe) • Nausea/vomiting and/or hematemesis • Tachypnea • Fever 	
Cardiac Sarcoidosis	<ul style="list-style-type: none"> • Palpitation • Syncope • Atypical chest pain • Dyspnea • Jugular venous distension • Cardiac murmur • S3 or S4 gallop 	ECG may show PR interval prolongation, 2nd or 3rd degree AV block, QRS prolongation, frequent VPBs, atrial arrhythmias, pathologic Q waves, and nonspecific ST segment and T wave abnormalities. However, none of these findings are specific to cardiac sarcoidosis.
Arrhythmias	<ul style="list-style-type: none"> • Atrial fibrillation • Atrial flutter • Supraventricular tachycardia (SVT) • Premature ventricular contractions (PVC) • Tachycardia 	Treat per ECG finding.

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