

Stress Testing Workshop

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Disclosures

None

Provider Responsibilities/Issues

- **Training of Staff/credentials**
 - **Supervision of the test**
 - **Knowledge of stress testing guidelines/recommendations**
 - **Supervision and billing**
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Stress Testing Guidelines

Gibbons RJ, Balady GJ, Bricker JT, Chaitman BR, Fletcher GF, Froelicher VF, Mark DB, McCallister BD, Mooss AN, O'Reilly MG, Winters WL Jr. ACC/AHA 2002 guideline update for exercise testing: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Committee on Exercise Testing). 2002. American College of Cardiology Web site. Available at: www.acc.org/clinical/guidelines/exercise/dirIndex.htm.

Types of Stress Tests

- **Exercise stress test**

- **Variety of Protocols**

- Bruce
- Mod. Bruce
- Naughton
- Ellestad

- **Variety of modalities**

- Treadmill
- Bicycle
- Handgrip

Chemical Stress Tests

- Adenosine
- Dobutamine
- Regadenason

Imaging Modalities

- Nuclear
 - Echocardiogram
 - Cardiac MR
 - PET
-

Contraindications to Exercise Testing

Absolute

- Acute myocardial infarction (within 2 d)
- High-risk unstable angina*
- Uncontrolled cardiac arrhythmias causing symptoms or
- Hemodynamic compromise
- Symptomatic severe aortic stenosis
- Uncontrolled symptomatic heart failure
- Acute pulmonary embolus or pulmonary infarction
- Acute myocarditis or pericarditis
- Acute aortic dissection

Relative†

- Left main coronary stenosis
- Moderate stenotic valvular heart disease
- Electrolyte abnormalities
- Severe arterial hypertension‡
- Tachyarrhythmias or bradyarrhythmias
- Hypertrophic cardiomyopathy and other forms of outflow tract obstruction
- Mental or physical impairment leading to inability to exercise adequately
- High-degree atrioventricular block

Indications for Terminating Exercise Testing

Absolute

- Drop in systolic blood pressure of >10 mm Hg from baseline blood pressure despite an increase in workload, when accompanied by other evidence of ischemia
- Moderate to severe angina
- Increasing nervous system symptoms (eg, ataxia, dizziness, or near-syncope)
- Signs of poor perfusion (cyanosis or pallor)
- Technical difficulties in monitoring ECG or systolic blood pressure
- Subject's desire to stop
- Sustained ventricular tachycardia
- ST elevation (≥ 1.0 mm) in leads without diagnostic Q-waves (other than V1 or aVR)

*In the absence of definitive evidence, the committee suggests systolic blood pressure of >250 mm Hg and/or a diastolic blood pressure of >115 mm Hg. ECG indicates electrocardiogram; PVCs, premature ventricular contractions; ICD, implantable cardioverter-defibrillator discharge; and IVCD, intraventricular conduction delay.

Relative

Relative indications

- Drop in systolic blood pressure of (≥ 10 mm Hg from baseline blood pressure despite an increase in workload, in the absence of other evidence of ischemia
- ST or QRS changes such as excessive ST depression (>2 mm of horizontal or downsloping ST-segment depression) or marked axis shift
- Arrhythmias other than sustained ventricular tachycardia, including multifocal PVCs, triplets of PVCs, supraventricular tachycardia, heart block, or bradyarrhythmias
- Fatigue, shortness of breath, wheezing, leg cramps, or claudication
- Development of bundle-branch block or IVCD that cannot be distinguished from ventricular tachycardia
- Increasing chest pain
- Hypertensive response*

Positive Exercise Test Criteria

Greater than or equal to 1 mm of horizontal or downsloping ST-segment depression or elevation for at least 60 to 80 milliseconds (ms) after the end of the QRS complex.

Demonstration and Walk Through

