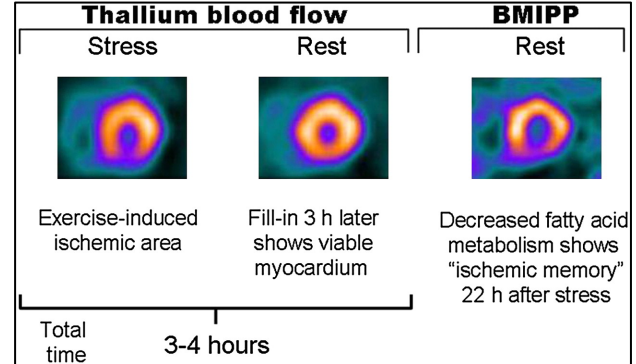


# Pre-Op Evaluation of Coronary Artery Disease

## Anesthetic Pearls: Anesthetic Implications and Management of Pre-Op CAD Testing

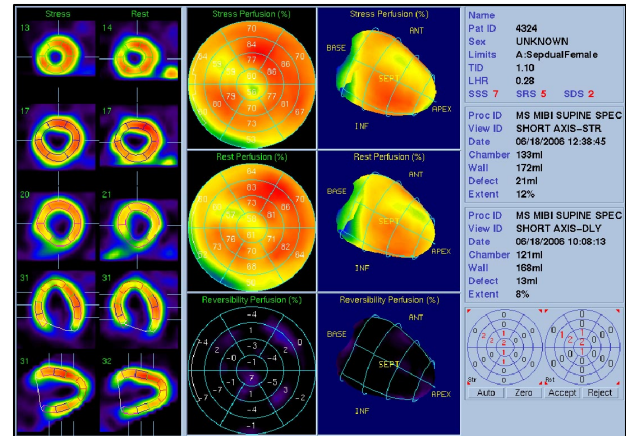
### Exercise Thallium

Thallium is a gamma-emitting isotope that is almost completely extracted from the coronary circulation into the myocardium. An area of decreased perfusion (cold spot) that is not present at rest but appears only with exercise indicates an area of ischemic myocardium. An area of myocardium that is **not** perfused before or after exercise indicates myocardial necrosis/dead myocardium (cold spot). After injection of thallium-201 during maximal exercise, imaging is performed within 5-10 minutes. Perfusion defects, or cold-spots if present will usually last approximately 30-60 minutes, with redistribution (thallium redistribution) occurring during the next 2-3 hours. Repeat imaging is performed approximately 3-4 hours after the initial injection. The initial perfusion defects will either persist or disappear. Those that persist are indicative of infarction or prolonged ischemia (unlikely). Those that disappear are indicative of a reversible perfusion defect or transient myocardial ischemia without infarction. Therefore, thallium redistribution is indicative of reversible myocardial ischemia



### Dipyridamole-Thallium (DPT) Myocardial Scan

DPT has attracted considerable attention as a perioperative screening test. In many centers it has completely replaced exercise treadmill testing (vascular surgery/patient unable to exercise). Following dipyridamole infusion, coronary blood flow significantly increases (dilates coronary arteries) without a significant increase in myocardial oxygen demand. Thallium is administered at the time of peak vasodilation (=4 minutes after dipyridamole) allowing assessment of coronary artery lesions as well as their functional consequences. Images are taken a few minutes after the administration of thallium and again 3-4 hours later. Regions with fixed defects are believed to identify previous infarcts, whereas those with redistribution indicate reversible ischemia. Thallium redistribution: a perfusion defect on the initial scan when dipyridamole induces maximal coronary vasodilation inducing coronary steal from areas of viable myocardium in which increased perfusion requirements can no longer be met by a commensurate increase in coronary flow owing to the presence of flow limiting coronary stenosis that after clearance of dipyridamole, the initial cold area fills in (redistributes) with thallium indicating coronary artery disease and reversible ischemia. **IF** reversible ischemia is present, further medical or surgical therapy (CABG) may be indicated prior to surgery.



### Dobutamine Stress Echocardiography

Dobutamine is administered intravenously at increasing doses to increase the heart rate and contractility, which increases oxygen demands of the myocardium and tests the ability of coronary flow to keep up with these demands. **IF** there is coronary stenosis, limiting flow reserve, the area of myocardium it supplies may become ischemic producing systolic dysfunction evidenced by segmental wall motion abnormalities (hypokinesis, akinesis, dyskinesis) detected by transesophageal echocardiography (TEE) or transthoracic echocardiography (TTE).

