

Scheduling/Referral Coordination Contact Information Cardiac Scoring

Performed at: TRA Medical Imaging-Tacoma, Tacoma General Hospital, St. Joseph Medical Center and St. Francis Hospital
TRA Scheduling: (253) 761-4200
Clinical Questions: Radiologists Daniel Heller, M.D., or Erik Elam, M.D.; (253) 761-4200-ask to page

CT Coronary Angiography

This is a collaboration between TRA Medical Imaging, Cardiac Health Specialists and St. Joseph Heart & Vascular Center
Performed at: St. Joseph Medical Center
Clinical Questions: Radiologist Daniel Heller, M.D., (253) 761-4200-ask to page; Cardiologist Raed Fahmy, M.D.; (253) 627-1244
Scheduling: (253) 426-6768

Adult Cardiac MRI

Performed at: Tacoma Magnetic Imaging, Tacoma General Hospital
TMI Scheduling: Ask for Vern Terry, RT, (MR); (253) 759-5900
Clinical Questions: Radiologists Daniel Heller, M.D., or Randy Otto, M.D.; (253) 761-4200-ask to page

Pediatric Cardiac MRI

Performed at: Mary Bridge Children's Hospital
Clinical Questions: Pediatric Radiologists Randy Otto, M.D., Shireen Khan, M.D., Jana Fahmy, M.D., or Deborah Conway, M.D.; (253) 403-2299

PET Cardiac/Nuclear Perfusion Imaging

PET Cardiac Imaging Performed at: TRA Medical Imaging-Tacoma
Nuclear Perfusion Imaging Performed at: St. Joseph Medical Center, St. Francis Hospital, Tacoma General Hospital; contact hospitals to schedule
TRA PET Scheduling: (253) 761-4200
Clinical Questions: PET/Nuclear Medicine Subspecialist Radiologists Anthony Larhs, M.D., Phillip Lesh, M.D., or William Jackson, M.D.; (253) 761-4200-ask to page

TRA Imaging News

TRA Imaging News is produced bimonthly for referring providers of TRA Medical Imaging. It is designed to aid in the understanding of TRA and its services. If you have any questions, please contact the following:

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TRA Imaging News

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August • September 2005

Evaluating Your Patients with Cardiac Disease



Daniel N.D. Heller, M.D.
Medical Director, TRA-Lakewood

Non-invasive imaging is now the important partner in the evaluation of cardiac disease. Faster hardware and sophisticated software allows the radiologists to provide you with three-dimensional anatomical and functional images to better evaluate the presence and assessment of coronary, valvular and intrinsic cardiac disease. Following is an overview of the options TRA

Medical Imaging offers.

CT Calcium Scoring Screens for Coronary Artery Disease (CAD)

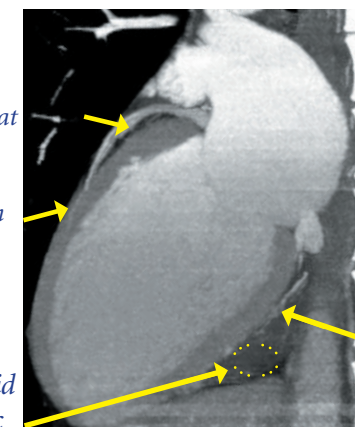
For more than 20 years, low-dose cardiac, gated, non-contrast CT has been used to identify coronary artery calcifications. Recent prospective studies demonstrate that a patient's coronary calcification burden predicts 10-year risk for heart attack (or other coronary event) and moreover, that coronary artery calcification is an independent risk factor when compared to other clinical measures (including cholesterol, family history, blood pressure, smoking history and diabetes).

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Case Study

38 year old woman with multiple emergency department visits and hospitalizations for atypical chest pain. Her calcium score is zero, and her coronary CT angiogram shows normal coronary vessels but also a pericardial effusion not seen on prior echocardiogram. Treated for inflammatory pericarditis with improvement and undergoing rheumatologic evaluation. This image shows a thin slab maximum intensity projection of oblique plane reformation of CT angiogram through mitral valve and left ventricle.

Portions of left main and left descending artery (note that a perforating vessel is visible in myocardium with diameter 0.5mm)



pericardial fluid in posterior sac

Portions of posterior descending artery which is normal but goes in and out of plane of image (1mm size)

Upcoming Events

Cardiac MR Fall Event

Be on the lookout for a fall dinner lecture, "Bringing Cardiac MRI to Your Medical Practice." Information will be available in the next newsletter, but if you'd like us to call you as soon as we know the particulars, call (253) 761-4200 and give your name and number to a customer care representative.

Holiday Closures

In observance of Labor Day, TRA Medical Imaging will be closed Monday, September 5.

Need a Report?

We now have a direct number to our Medical Records department- 253-284-0619. For films, please allow 24-48 hours for processing.

Toll-Free Numbers

TRA Medical Imaging
(866) 761-4200
Tacoma Magnetic Imaging
(800) 201-9800
Union Avenue Open MRI
(888) 276-3245



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TRA Medical Imaging is a local partnership of radiologists formed in 1943. The radiologists of TRA Medical Imaging serve Mary Bridge Children's Hospital, St. Francis Hospital, St. Joseph Medical Center and Tacoma General Hospital and its outpatient imaging centers.

OUTPATIENT CENTERS

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(253) 284-0614 or 284-0615 physicians only

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A recent and significant article in JAMA (2004;291:210-215) indicates high calcium score “can modify predicted risk obtained from Framingham Risk Score alone, especially among patients in the intermediate-risk category in whom clinical decision making is most uncertain.” This means, those patients with a 10 to 20 percent 10-year risk for future coronary events benefit from calcium scoring to sort them into either a higher risk group that requires further testing or a lower risk group. A normal calcium score can also help in evaluating atypical chest pain or shortness of breath—especially when combined, as needed, with CT coronary angiography.

CT Coronary Angiography Non-Invasively Evaluates All Major Coronary Vessels

Multi-head CT imaging now provides submillimeter resolution throughout the body—with until recently, the exception of the heart. This exception is now partially overcome with cardiac gating that limits data acquisition to diastole. When successful, the coronary

vessels are seen in exquisite detail that rivals conventional angiography and indeed, in some respects surpasses it. CT coronary angiography shines in characterizing the extent of extra-luminal plaque and plaque density. However, CT coronary angiography is technically challenging to do well. It requires beta-blockers to slow and steady the heart, nitroglycerin spray to dilate the vessels and careful timing of breath hold and contrast bolus. As with any emerging technology, the significance of CT angiographic findings are not fully understood. Certainly, when the test is “positive,” confirmatory follow-up testing is recommended.

Currently in the U.S., approximately one-third of cardiac catheterizations find normal vessels, and these patients are most likely to benefit from an alternative, noninvasive test.

We have found it most helpful in the evaluation of atypical chest pain or shortness of breath in patients with lower risk for CAD.

Cardiac MRI Delivers “One Stop” Functional and Anatomic Cardiac Assessment

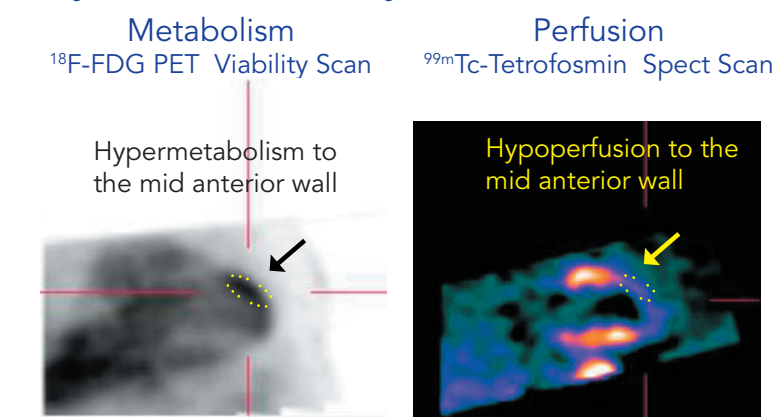
“Problem Solving” Capabilities

Cardiac gated MRI sequences are now the gold standard for: 1) picturing cardiac tissue, including congenital anatomic variants or acquired lesions, such as tumor or aneurysm 2) differentiating scar tissue from “hibernating” or “stunned” but still viable myocardium and 3) assessing cardiac function including wall motion, regurgitation and stenosis, and valvular dysfunction. Cardiac MRI differentiates ischemia from other causes of congestive heart failure, identifies right ventricular dysplasia, septal defects (or other intracardiac shunts), as well as pericardial disease. While MRI has a long way to go to fulfill its promise to visualize coronary vessels, MRI is technically able to consolidate and replace many conventional stress tests (whether with echo or nuclear agents).

PET Cardiac Imaging Determines Myocardial Viability while Nuclear Perfusion Imaging Identifies Ischemia

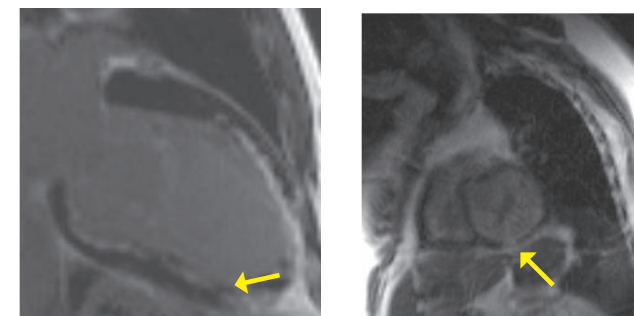
PET is the most sensitive method for identifying hibernating myocardium. This means PET is especially useful for detecting any arrhythmogenic foci, while MRI is more specific. Nuclear perfusion imaging (with stress) identifies the presence of stenotic coronary artery disease and quantifies its severity. While physicians have long relied on stress perfusion studies to differentiate cardiac disease from the many conditions that clinically mimic cardiac disease, it is also useful for assessing treatment response—its role in clinical management will evolve as CT and MR imaging become better understood and utilized.

Myocardial Viability



Perfusion-metabolism mismatch. This indicates chronically hypoperfused myocardium (hibernating) at this location. The findings imply improved prognosis with revascularization (improved regional wall motion and/or elimination of a possible arrhythmogenic focus).

Cardiac MRI



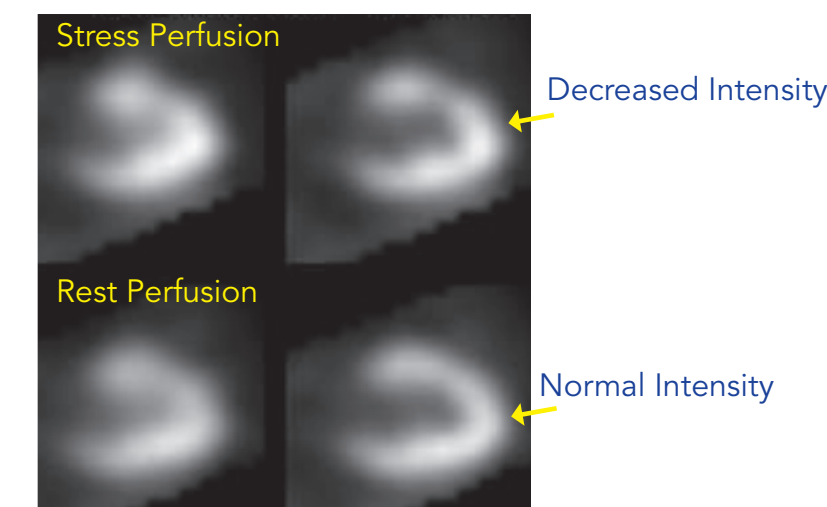
Case Study

Two different patients with severe congestive heart failure undergoing evaluation for possible coronary artery bypass.

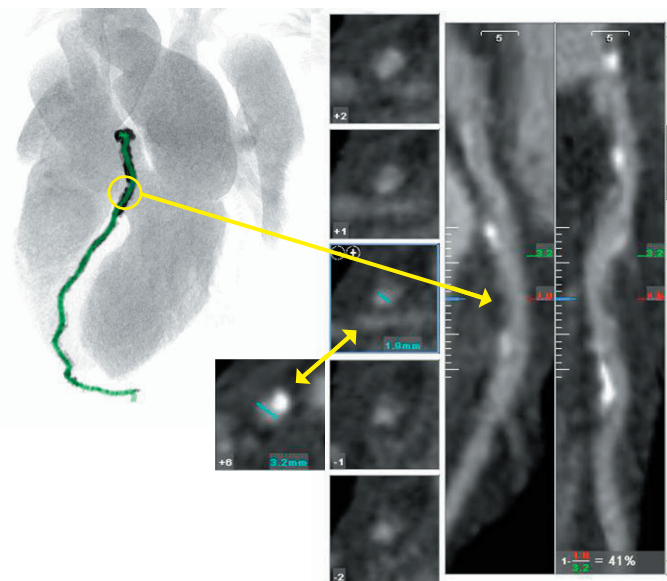
Left image: Cardiac MRI demonstrated akinesis and dyskinesia with very poor ejection fraction (13%). The 10 minute post contrast two chamber view of left ventricle and atrium (through mitral valve) shows persistent contrast in extensive scar of the anterior apical and posterior left ventricle. The patient will likely not benefit from revascularization.

Right Image: Cardiac MRI demonstrated global wall motion hypokinesia with very poor ejection fraction (15%). The 10 minute post contrast short chamber view shows persistent contrast in a small region of transmurular scar at inferior wall with surrounding larger region of subendocardial scar. The patient may benefit from revascularization.

Evaluation for Ischemia



Reversible anterior wall defect. This indicates occlusive (over 70% of luminal diameter) disease within the proximal left anterior descending coronary artery.



Case Study

72 year old man with intermediate Framingham risk profile for cardiac disease (10-20% 10 year risk ratio for cardiac event based on hypertension and elevated cholesterol). Screening calcium score showed agatston score of 550 indicating moderate to high risk for a CHD event over the next two to five years. CT angiogram showed mild narrowing at proximal left anterior descending artery (41% calculated) as well as at origin of second diagonal artery. Cardiac MRI showed normal ejection fraction, cardiac output and wall motion without any prior infarcts. Findings were confirmed on angiogram and patient started on medical treatment.

Left images: CT angiogram post processed images with simulated angiographic view of left anterior descending artery identifying site of 41% narrowing on orthogonal and cross sectional curved planar reformations of the left anterior descending artery. Note: white areas are calcifications, and diameter of the vessel is measured at and above a stenosis.

Right image: Cardiac MRI 10 minutes post contrast, two chamber view of left ventricle and atrium, through mitral valve, shows normal washout of contrast from muscle indicating normal myocardial tissue without scar. MRI also shows normal wall motion and ejection fraction.