"Cardiac Solution" Program Tip Sheet

MYOCARDIAL PERFUSION IMAGING (MPI) vs. STRESS ECHOCARDIOGRAPHY (SE)

Main Points about the Two Tests:

- **Both tests have equal diagnostic accuracy** for coronary artery disease, with MPI showing greater sensitivity and SE showing greater specificity.

- **MPI is based upon the expectation of relatively reduced blood flow** in a myocardial segment during exercise or pharmacologic coronary micro vessel dilation, while **SE is based upon development of wall motion abnormality** provoked by myocardial ischemia during treadmill exercise or similar stress.

- **In order to perform a SE, one would prefer to have a patient who could perform treadmill exercise well, along with a good acoustic imaging window, while MPI can be performed with either exercise or the pharmacologic option.** Exercise can also provide the additional information from the EKG, when the baseline EKG does not already have substantial abnormality (e.g. a 1 mm ST segment depression at baseline, left bundle branch block, ventricular pacing, PVCs, or pre-excitation).

- Even with MPI, an exercise modality is preferred over pharmacologic vasodilation due to the additional functional and EKG information inherent in exercise testing. However, **in some patients, such as those with a pre-existing wall motion abnormality, left bundle branch block, ventricular paced rhythms, frequent PVCs, or pre-excitation (WPW), the related cardiac contraction pattern during exercise could obscure the effects of ischemia, making a pharmacologic approach more helpful.**

- **The radiation exposure of SE is zero**, while MPI incurs a radiation dose of 7-24 mSv (the equivalent of about 117-400 PA & lateral chest X-rays), with an increase in lifetime radiation exposure and its associated cancer risk.

Radiation Exposure

MPI: 7 - 24 mSv

SE: 0 mSv

Annual Background: 3 mSv

Radiation exposure should be limited when possible.

Clinical Applications that Prefer MPI:

I. Technique Related
   A. Obesity with BMI over 40 or poor acoustic imaging window, even with use of contrast

II. Functional Capacity Related
   A. Physical infirmities precluding a reasonable ability to exercise for at least 4 METS or at least 3 full minutes of Bruce protocol
   B. Patients who cannot walk up a single flight of stairs at even a slow pace or even perform ADLs based upon documented limitations

III. Comorbidity Related
   A. Prior cardiac surgery (CABG or valvular), CHF with left ventricular ejection fraction < 40%
   B. Severe COPD with PFT documentation, severe shortness of breath on minimal exertion, or requirement of home oxygen during the day
   C. Poorly controlled hypertension, with systolic BP > 180 or Diastolic BP > 120
   D. Medical instability or serious acute illness, where maximal exercise is not recommended or appropriate (e.g. acute myocarditis or pericarditis, active infective endocarditis, acute aortic dissection, etc.)

IV. EKG Related
   A. Pacemaker or ICD
   B. Left bundle branch block
   C. Poorly controlled atrial fibrillation
   D. Frequent PVCs
   E. Ventricular Pre-excitation (WPW)