

P: In patients with chest pain or suspected coronary artery disease  
 I: Does multimodality cardiac MRI  
 C: Instead of conventional provocative/imaging approaches  
 O: Offer sufficient prognostic and risk stratification information

Study	Group	Design	Endpoints	Results	Strengths/Weaknesses
Prognostic Value of Normal Adenosine Stress Cardiac MRI Pilz G et al, Am J Cardiol 2008: 101:1408-1412	218 patients with suspected CAD ( <i>intermediate or high pretest prob</i> ) got cardiac MRI (CMR)  included patients presenting of syncope, arrhythmia, equivocal stress test and sig underlying risk factors	Prospective enrollment 1) had nml adenosine stress CMR with delayed images 2) deferred cath  excluded: pacer/AICD, MRI metal contrainds, adenosine contrainds  perfusion images qualitative both early and late	12 month rate of major adverse coronary events (MACE): -cv mortality -MI -revasc -hosp due to cardiac event  1 year mortality  frequency and results of cath	CMR NPV for MACE 99.1% at 12 months  2 pts had pos cath then bypass or stent, 4 other patients had nml cath.  No cases of cardiac death or MI  Pretest predicted 1-year mortality sig lower in CMR population than expected by risk alone  Similar prognostic value as nuc stress	MACE did not include significant CAD unless intervention required (1 case at 6 months)—i.e. no evidence that CMR does not miss intermediate CAD  No data on the diagnostic accuracy of a nml CMR (no PPV)  Small study may not detect small adverse outcome rate  Including high pretest prob patients may falsely raise specificity
Prognosis of Negative Adenosine Stress MR in Patients Presenting to the ED with Chest Pain Ingkanisorn et al, JACC 2006: 47(7): 1427-32	135 patients who presented to the ED with chest pain	Prospective -CP>30 min -2 sets negative enzymes -non diagnostic EKG  excluded: CHF>NYHA IV, 2nd or 3 <sup>rd</sup> HB, unstable, asthma, COPD, MR contraind 3 componets of CMR: wall motion, stress perfusion, delayed enhancement  perfusion images qualitative both early and late	12 month rate of positive cath (>50% sten), new MI or death, abnml nuc stress  Could chronic MI explain false positive perfusion scans?	20/135 patients had adverse outcomes  NPV/sensit of nml CMR 100%  Sensit of nml adenosine perfusion component alone 100% PPV of any abnormality 67%  Specificity of any abnorm component of CMR exam >93%  CMR better predictor than cardiac risk	Very applicable to ED practice  High to int risk population (19 patients with wall motion abnorms, 28 patients with abn adenosine perfusion, 14 patients with abn delayed enhancement) Small study, may not see small adverse outcome rate  Did not exclude all CHF or known CAD (falsely raises specificity)

				factors Almost all positive tests without adverse outcomes had evidence of MI	
Assessment of Myocardial Perfusion in Coronary Artery Disease by MR: A Comparison with PET and Coronary Angiography Schwitter et al, Circ 2001; 103; 2230-2235	48 patients with suspected CAD who were due for cath 18 healthy volunteers (low risk CAD had CMR)  All underwent both PET and CMR before cath	Prospective enrollment  Excluded: UA, a fib, valvular heart disease, prev MI, prev CABG,	Sent and spec of CMR for detecting clinically significant CAD as compared to angio and PET	Sent/spec CMR comp to PET: 91/94% -good correlation with extent of hypoperfusion -subendocardium can be visualized  Sent/spec of CMR compared to angio: 87%/85%	Quantitative analysis likely increases sensitivity but is not practically applicable  Patients with previous MI excluded (scar tissue?) -no late enhancement  No resting perfusion images
Diagnostic Performance of Stress Perfusion and Delayed-Enhancement MR Imaging in Patients with Coronary Artery Disease Cury et al, Radiology 2006; 240; 39-45.	46 patients: 32 suspected of CAD 14 had prev MI with suspected new lesion (7 had previous CABG)	Prospective enrollment  All patients got CMR (with delayed images) prior to cath  Excluded: asthma, AS, ACS, severe HTN	Accuracy of CMR for detecting sig CAD (>70%) as compared to angiography	30/42 had positive cath (>70% stenosis)  CMR for predicting any CAD: sensit: 87%, spec 89% (better if consider only 1 vessel disease or CABG)  Maximize sensitivity: combine all three modes (89%) or use perfusion plus wall motion (89%)  Maximize specificity: Delayed enhancement alone (94%)  7 patients without known MI had evidence old infarct	Small study: no way to really tell what incremental value each component of the CMR exam offers  No comparison with nuclear imaging  High pretest probability

Clinical Bottom Line: Multimodality cardiac MRI is a viable alternative to standard provocative testing in patients with chest pain. A normal exam with normal delayed images has an excellent prognostic value for intermediate and even higher risk patients. Given the additional capabilities and benefits in speed and resolution of the technique, it may ultimately replace both exercise testing as well as nuclear stress.