

MRI Heart

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Standard uses: Cardiomyopathy, viability (coronary artery disease), (peri-) myocarditis, cardiac mass, heart failure, arrhythmia, congenital heart disease, etc

IV Contrast: 0.2mmol/kg of MultiHance, max 20cc; 2cc/sec

Coil: Body Array Coil

Notes:

- Each exam needs to be protocolled by a cardiac radiologist.
- Perform with ECG gating
- <http://www.cmr-guide.com/> to be used to assist in planning cardiac planes

Steps 1 – 18 comprise the basic 'Cardiomyopathy' protocol; potential additional sequences include 19 - 22

1. Scout/3 plane localizer
2. Axial T2 dark blood (HASTE) images from above arch to the bottom of heart, 6 - 8 mm, no skip, with breath hold
3. Axial bSSFP bright blood (true FISP) coverage from above arch to the bottom of heart, flip angle > 70, 6 - 8 mm, no skip, with breath hold
4. 2 chamber true FISP, iPAT_loc, 8mm (single shot, for planning)
5. 4 chamber true FISP, iPAT_loc, 8mm (single shot, for planning)
6. Short axis true FISP, iPAT_loc, 8mm to cover the LV (~10-12 slices)
7. 2 chamber true FISP cine, 6mm
8. 4 chamber true FISP cine, 6mm
9. 3 chamber true FISP cine, 6mm
10. LVOT / Oblique Coronal true FISP cine, 6mm
11. Short axis true FISP cine, 8mm, cover entire LV (~10-12 slices), ensure slices / concatenations = 2; can be performed after administration of contrast to reduce exam time
12. Post Gadolinium VIBE, fat sat, 2mm no skip, axial plane above aortic arch to bottom of heart
13. TI Scout Sequence, short axis basal – mid ventricle
14. Delayed Overview, true FISP, short axis, 8mm, cover entire LV, MAG & PSIR
15. Single slice short axis delay, true FISP, 8mm, MAG & PSIR
16. 4 chamber delay, 8mm, MAG & PSIR

17. 2 chamber delay, 8mm, MAG & PSIR

18. 3 chamber delay, 8mm, MAG & PSIR

19. T2: Turbo spin echo; TE ~100, short axis, 5-10 slices of LV

20. Phase Contrast Imaging: Plan Aortic Valve off 3ch / LVOT; plan Pulmonic Valve off axial at MPA / RVOT; review images to ensure no aliasing; if aliasing present, increase Venc = Encoding velocity

21. Resting dynamic perfusion: true FISP, typically 3 short axis slices (advise to run dyn perf test sequence to ensure slice location before administration of gadolinium), 6mm, if LV function normal, inject contrast and start sequence at ~10 sec (may be longer when systolic function decreased), review look locker, when contrast reaches right ventricle, start breathing instructions to ensure patient holding breath when contrast reaches LV

22. Pre- and Post- Gadolinium Turbo Spin Echo T1, plane and slice thickness dependent on cardiac mass being evaluated