## MRI protocol

**CMR ARVC/PLN protocol on 1.5 Tesla (Philips or comparable scanners)**

UMC Utrecht, Radiology department Last version: 2-7-‘18 Version 46.0

**Scanned Sequences**

1. Survey for determination of the cardiac position – Balanced Fast Field Echo (BFFE) – expiration

2. t T1 weighted Black Blood

Plan on coronal plane

3. Balanced Turbo Field Echo (BTFE/RETR) 2 chamber left

Cine images of the 2 chamber view

Plan parallel to the septum, in the middle of the mitral valve

4. BTFE/RETR short axis

Plan perpendicular to the 2 chamber left view, about 1/3 to the apex

5. BTFE/RETR 4 chamber 50 phases

Cine images of the 4 chamber view: plan on the short axis

6. Native T1 mapping in short axis (3 slices) (MOLLI sequence)

Three slices of the short axis: between mitral valve and apex. Three times in one breath hold.

Optional: A hematocrit value may be used for the calculation of the extracellular volume from the T1 mapping sequence. It is important that the blood draw for determination of the hematocrit value should be performed on the same day of the CMR.

*Administer a double dose of contrast (0.2 cc gadovist/kg) for the late enhancement images*

7. 3D whole heart breath hold

Transversal non-angulated image of the whole heart

8. BTFE/RETR short axis view

Functional images of the short axis, parallel to mitral valve

Between mitral valve and apex ±12-15 slices

Always check on the end diastolic phase

9. BTFE/RETR left ventricular outflow tract (LVOT) view

Cine images of the LVOT, angulate through the mitral- and aortic valve

10. BTFE/RETR 2 chamber right view

Plan on the 4 chamber view, through the tricuspid valve and parallel to the septum.

It is important that the tricuspid valve is clearly visible.

11. BFFE/RETR Right Ventricular Outflow Tract (RVOT)

Cines of the RVOT. These are sagittal views through the RVOT

12. Look Locker 2 beats

Determine the optimal inversion time (=highest blood/muscle contrast)

Use the inversion delay table and use these values for the 3D short axis views

Add +85 and use this value for the 2D Phase-Sensitive Inversion Recovery (PSIR) images.

13. Viability 2D 4 chamber

14. Multiple 2D slices (M2D)/ 4 chamber PSIR

Viability of 4 chamber

15. M2D/short axis PSIR

Viability of the short axis view, number is the same as the number of slices used for the cine short axis images

16. M2D/RVOT PSIR

Viability of RVOT

17. M2D/ 2 chamber right PSIR

Viability of the 2 chamber right view

*Make sure that at least 15 minutes have past between contrast injection and T1 mapping sequence*

18. T1 mapping enhanced short axis, 3 slices

Three slices of the short axis view conform native T1 mapping.