



# Cardiac MRI – Bread and Butter

SHORT ABSTRACT

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A combination of the four most indispensable and established ingredients are presented that any radiologist could be using in a few basic cardiac magnetic resonance (CMR) recipes:

- 1. Balanced Fast Field Echo Cine imaging** is the backbone of any CMR study, used for morphologic imaging and volumetric quantification. Using one slice per long axis orientation requires more precision during the actual scanning, whereas 3 or 5 cine images of a long axis view allow for somewhat more forgiving positioning of the slices. In short axis volumetric view, saving each slice as a separate series ensures easier browsing with more basic DICOM viewers. Cine imaging depicts valve pathology very well, but it is not suitable for the quantification thereof.
- 2. Myocardial Late Gadolinium Enhancement (LGE)** imaging fills the radiology department with the unique flavor of myocardial fibrosis. No other imaging modality is capable of depicting, even quantifying myocardial fibrosis. The scar of myocardial infarction is a piece of cake to find; the more subtle fibrosis in cardiomyopathy requires more experience. LGE imaging also shows focal myocardial edema in myocarditis. The inversion time setting is as critical as meat temperature on the barbeque, and even in phase sensitive sequences, it is recommended to attempt optimization of myocardial nulling so as to achieve the myocardium well dark—and the meat well done.
- 3. T1-Maps and Extra-Cellular Volume (ECV%).** Myocardial T1 values were to be taken with a grain of salt. Calculation of ECV% as a ratio of T1 values, however, at least partially overcomes the variation in myocardial T1 values between vendors or sequences and the undefined boundary between normal and pathology. ECV% values can be calculated per myocardial segment. In the CMR report, not just the myocardial ECV% values should be reported, but also, and more importantly, the interpretation of these myocardial ECV%.
- 4. Magnetic Resonance Angiography (MRA)** can be spiced up with keyhole imaging technique, which drastically increases temporal resolution with little loss of spatial resolution. A MRA scan block needs to be positioned meticulously to encompass the entire arterial structure under study, and to avoid cutting off tortuous segments.

With these four well established MRI techniques, any radiology department could be serving CMR studies to their referrers in cardiology. Although we do not presume radiologists to put all their eggs in one basket, radiologists are encouraged to at least bring home some of the bacon by means of CMR.

## COMPETING INTERESTS

The author has no competing interests to declare.

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