Reviewer's report

**Title:** Cardiac magnetic resonance imaging parameters as surrogate endpoints in clinical trials of acute myocardial infarction

**Version:** 2  **Date:** 27 June 2011

**Reviewer:** Peter Bernhardt

**Reviewer's report:**

The manuscript by Desch and colleagues describe different possible cardiac magnetic resonance end-points for clinical trials in myocardial infarction. The manuscript is overall well written and structured.

**Major compulsory reviews:**

1. The authors state that reliability of infarct size is very high and thus, it could be used as an endpoint of clinical trials. However, since different sequences are used and different contrast- and signal-to-noise ratios as well as image qualities between different vendors exist, it is doubtful to what extent late gadolinium enhancement is reproducible between different scanners. Up to now, no prospective multi-center trial is available to clarify this point. Hence, it is a long way for late gadolinium enhancement to be used as a stand-alone endpoint in large multi-center trial, since previous work-up has to be done and validated. The authors should include this possible limitation in their manuscript.

2. The manuscript fails to suggest a standardized analysis method, however above point needs to be taken into account.

3. Presented myocardial salvage analysis approach is promising. However, since the contours are all drawn manually, a more quantitative approach is needed. Again, there is no validation in a multi-center trial available, not to speak of different imaging techniques and sequences.

4. Microvascular obstruction could be measured at different time-points using different imaging techniques and resulting in different extend of microvascular obstruction. A standard has to be found and validated before any statement of possible surrogate marker could be made.

5. It is well known that area of late gadolinium enhancement, area of T2 hyperintensity, and microvascular obstruction change during the first week on a daily basis. Hence, a standard has to be found when to perform the scan. Moreover, time since occurrence of first chest pain, revascularization time has to be taken into account to find a common basis.

**Minor revisions:**

1. The authors should comment on newer late gadolinium enhancement techniques, such as phase-sensitive IR sequences and their possible advantages to act as a surrogate end-point in clinical trials.

2. Quantitative analysis of late gadolinium enhancement is an important tool to
allow for serving as a surrogate end-point in infarction studies. However, transmurality of infarction is also important, since rest of myocardial viability is important for possible functional improvement. The authors should comment on that.

3. The authors should be more humble in their conclusions, since a lot of work has to be done before any statement of surrogate end-points could be made so far.

**Level of interest:** An article of importance in its field

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.