Reviewer's report

Title: Gated myocardial perfusion SPECT underestimates left ventricular volumes and shows high variability compared to cardiac magnetic resonance imaging - a comparison of four different commercial automated software packages

Version: 2 Date: 20 November 2009

Reviewer: Stephan Nekolla

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Comments on Hedeer et.al, revision 1

The authors addressed the raised concerns mostly sufficiently. However, as the paper carries a pretty hard conclusion against a methodology which is annually used in 1,000,000’s of patients (in contrast to MRI with maybe 10,000’s), some methodological critics remain.

p. 3 l 7. The usual abbreviation is actually MRI or MR imaging. Make consistent of either the one or the other version throughout the manuscript.

p. 6 l 17. Does figure 2 show MRI+SPECT data from the same patient ? If so, it should be stated. If not, it would be actually quite interesting to see the individual differences in a consistent example.

p. 8 l. 12. If the authors insist on the +/- 2SD approach, a box plot with 5,25,75,95% percentile should be used.

p. 8 l. 9. The results of inter observer variability should also be presented +/- 2SD and added to table 3. Just to be fair ;)

Furthermore, as the MRI inter observer analysis shows quite some variability: in the clinical settings, a reproducible analysis has a distinct advantage over absolute precision. Thus, the repeated SPECT analyses would provide interesting information. Based on previous publications, such an inter-study reproducibility in SPECT gives usually pretty good values as compared to the MRU intra/interobserver variability (but this is then data from the groups who actually develop the algorithms).

Again, as the conclusions are pretty harsh, either this should be discussed in detail or – even better – performed in this paper. Another option would be to soften the conclusions.

p. 12 l.8 The authors use iteratively reconstructed data. Just a plain visual comparison reveals substantial differences between filter back projection and this approach. Just mentioning this as limitation is not sufficient. The minimal requirement would be an interstudy comparison to demonstrate that the SPECT programs are not affected – which I doubt.