Reviewer's report

Title: Study on the Clinical Application of Pulsed DC Magnetic Technology for Tracking of Intraoperative Head Motion During Frameless Stereotaxy

Version: 1 Date: 1 March 2006

Reviewer: Kathryn L Holloway

Reviewer's report:

General
This is a nicely done study evaluating the accuracy of a non invasive DC pulsed magnetic reference frame for frameless stereotaxy. The device serves as a head tracker which provides information to the frameless system about ongoing head position. They evaluated the use of this device in 3 different applications: 1)as an add on to the standard frameless technique with 3 point head fixation 2) as a stand-alone technique to track the position of a mobile head using a semi-rigid attachment of the device to the patients teeth and 3) as a stand-alone technique to track the position of a mobile head with the device taped to the head behind the ear. They compared the root square mean error (RMSE) or fiducial marking error (FRE) and the position error (PE) of these different techniques with the standard technique of rigid fixation of the patients head with a fixed reference supplied by the electromagnetic transmitter. Unfortunately, they neglected to include their statistical analysis!

Although, there are arguments against using FRE or PE of a skull site to judge the accuracy of a system, these are less relevant given the appropriate comparison to a control population using the same system without the dynamic reference sensor. The alternative methods of noninvasive tracking, the potential problems, and potential uses are discussed appropriately.

In summary, this is a well written article about a novel device however it can not be published without statistical analysis.

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Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)
The authors should resubmit with statistical analysis and any additional discussion that would be relevant given the statistical findings.

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Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)
There is no reference in the text to figure 7 but I believe it should be on page 10, 2nd full paragraph.

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Discretionary Revisions (which the author can choose to ignore)

What next?: Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: Yes, and I have assessed the statistics in my report.