Reviewer's report

Title: Stroke patients' utilisation of extrinsic feedback from computer-based technology in the home: a realistic evaluation

Version: 2  Date: 30 January 2014

Reviewer: Silvana Quaglini

Reviewer's report:

Major Compulsory Revisions

The paper reports on an interesting evaluation study of a system for post-stroke upper-limb rehabilitation. The methodology looks sound, but the results suffer from a very small sample size (5 patients). The authors should try to increase this number. This is important to support their claims. For example, in the paragraph "Accuracy and Reliability", the fact that one patient does not agree with the system feedback is not sufficient to deduce that the system does not perform well. Is there a mechanism to verify if that patient's complaint is justified?

Moreover, some of the patients' comments reported in the paper are likely to be correlated. For example, Mrs Green declared that the results chart was easier to understand than the avatar replays. But Mrs Green was also the patient that did not like avatar because he was a male instead of a female.

Inclusion/exclusion criteria should be written more clearly. For example, among the exclusion criteria there is "Have not been referred for further rehabilitation and/or receiving further rehabilitation". In my opinion, it would be better to extend the first inclusion criterion as "A definite diagnosis of stroke, with referral for and/or receiving further rehabilitation".

The last exclusion criterion "Do not have a co-resident carer" is redundant, since it is equivalent to the third inclusion criterion.

The authors should provide more quantitative figures. For example, pag. 6, "... using the SMART system for a prolonged period": how long that period was?

Pag. 16: I do not understand this sentence: "For example, not having somewhere to store the SMART system when not in use and the sensitivity of the inertial sensors to large metal objects (i.e. radiators) resulted in the SMART system being stowed away upstairs."

I know that metal objects interfere with that kind of sensors, but how this can affect the location to store the SMART? Is it very huge?

Pag. 17 About the absence of improvement of the functional independence, the authors should elaborate more on possible motivations: the five patients were at >= 5 months from stroke, probably too much time to have further improvement; is 5 weeks a reasonable time to observe a change? And did all patients use
SMART for 5 weeks?

Discussion: the discussion reports (only qualitatively) positive results, while the paragraph about quantitative outcomes reports no improvement. The authors should clarify this apparent incongruence.

The result that "accuracy and reliability are essential" seems to me too obvious ...

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Minor Essential Revisions

- MRC is not in the list of abbreviations
- some acronyms are only in the list of abbreviations, they should be explained also in the text, at their first appearance
- in Figure 2d, there is the graph, but no interpretation is given to the patient (while for example, in figure 2c, there is a rewarding message)
- why is the comprehension of written English essential? cannot the system provide a vocal interface? this and multilingual functionality should be discussed
- pag. 19 : 16000+ --> 16000

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Discretionary Revisions

- Figure 1 could be eliminated
- Some references about the MyHeart project results could be added (we worked exactly on the upper-limb post-stroke rehabilitation), e.g.


Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable
**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests’ below.