Reviewer’s report

Title: Redesign of a Computerized Clinical Reminder for Colorectal Cancer Screening: A Human-Computer Interaction Evaluation

Version: 1 Date: 21 September 2011

Reviewer: Monique W Jaspers

Reviewer’s report:

Major Compulsory Revisions

This paper describes a human factors and usability evaluation of a redesigned computerized clinical reminder for use by primary care providers to support them in colorectal screening of their patients. As confirmed by the authors, uptake of human factors research and input into development and design of interactive healthcare technology is slow whereas it is needed to increase user acceptance of these technologies in daily work settings. The study however lacks lessons on usability issues and design of healthcare IT that system designers could profit from.

This is due to the fact that:

1. the reminder tool under study is not adequately described and the fact that it takes it data from the CPR. I would highly recommend the authors to refer to the STAR-HI standard for reporting on evaluation studies in healthcare to improve their system description. How would a typical user interact with the tool.

2. the insights following from the pre field study are not described. Apparently, these insights led to the decision to redesign the screening reminder tool but are not discussed in such a way that the reader can understand the rationale for choices made in the redesign of the tool. Why would the redesigned tool be easier to use, perceived as having a lower workload, better integrate in workflow compared to the current tool?

3. the results presented are for the most quantitative that do not provide a detailed insight into the usability problems users encountered in interaction with the two alternative designs. This is a laboratory simulation study with use of Morae software that allows the logging of all mouse, keyboard input and users verbalizations. I would therefore recommend to provide more details on the usability data produced and underlying causes for problems encountered by users. Only then, lessons learned, aside from that iterative design of these technologies is essential, could be given. The authors state in the discussion that: ‘the more general usability statements about simplicity, efficiency, learnability, error recovery, overall satisfaction and other dimensions of usability did not produce significant improved ratings for the redesigned prototype’. Important lessons could only be drawn from this statement when the reader knows in detail the underlying causes for this!

The introduction lacks reference to literature providing evidence that acceptance
and successful integration of CDS tools in work flow requires high usability, low
cognitive work load and mapping on work flow. Please refer to the work of Bates,
Ash, Patel, Kushniruk to mention a few here…

I would recommend going into the reasons why the validated CSUQ survey
provided results that differed from the questions added. CSUQ assesses usability
as a multi-construct and this was the main focus of the study in comparing the
two designs. Provide potential reasons for finding no significance differences
here between the two designs. Is power an issue here (the results of merely 9
participants were included in the analyses).

I would recommend to provide the questions of the Work flow integration
questionnaire and discuss differences found between the NASA TLX and this
survey in more detail in the discussion.

Minor Essential Revisions

I would recommend to change the structure of the paper and provide the system
description and pre field study insights as rationale for the redesign of the tool in
a distinct section.

Provide a rational for redesign choices such as the visual timeline.

Please be consistent in terminology: EHR vs CPR

The participants experience in the VHA shows a wide variation from 1-25 years.
Though the authors claim that average participant experience spanned the
existence of VA’s EHR (or CPR), I would be interested to learn whether
participants with longer EHR experience performed differently in using the two
designs than less experienced users..

The authors discuss that some providers questioned the validity of data provided
by the CDS tool and give alternative solutions for that. I yet up to now do not
know whether these data come from the HER-CPR or not. How do the authors
envision to improve the quality of the underlying data or transparently provide
information regarding the data source (and how would that solve the problem of
distrust?)

It would be worthwhile to readers if the authors could go into these matters in a
new version of their paper.

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

**Quality of written English:** Needs some language corrections before being
published

**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