Reviewer’s report

Title: Design of a Novel Multifunction Decision Support Display for Anesthesia Care: AlertWatch OR

Version: 0 Date: 28 Aug 2017

Reviewer: Kirk H Shelley

Reviewer’s report:

This interesting paper comes from a group at the University of Michigan with its first author being the chairman, Kevin Tremper PhD, MD. Dr Tremper and his department are well known leaders when it comes to advancing anesthesia related technology (home of MPOG & GE’s Centricity). The paper outlines the development and features of a new anesthesia display system designed to integrate the flow of information to the anesthesiologist. It is hoped that this display system will reduce the cognitive burden on the anesthetist in such a way as to allow better clinical decisions to be made.

Concerns:

I would recommend that existing online demos of the system be linked in the article. This will give the reader a much better feel for the "real time" appearance of the model and allow them to interact with the various features of the display. http://alertwatch.com/wp-content/demo/awdemo.html

There should be a discussion regarding the potential impact of colorblindness on the functionality of the display. Approximately 8% of the male population have this disorder. Ideally some thought should be given to mitigating approaches (use of patterns/shapes?) either for an individual or institutional display.

On page 5 it is mentioned that the FDA "cleared decision support software device". It was also written on page 29 that "These color limits have received FDA Clearance". The reference (17) given in the paper goes to a 510(k) approval based upon predicate technology (Philips MP90) which existed prior May 28, 1976. I want to confirm that the limits did receive FDA approval/review. As a side note I'm sure the authors would agree with me that the entire 510(k) requiring the innovator to make the case to the FDA that there "nothing new here" conflicts with simultaneously going to the marketplace espousing the message that the innovation is "breakthrough and state-of-the-art" is ridiculous.

The 4-2-1 rule should be explained. It is likely that non-physicians, mid-level providers and others unfamiliar with the reference might review the paper.

MAC* was well explained. Has there been any consideration for the fact that age can have a significant impact upon the limits of this number?
Page 12 line 309 Figure 7b does not show the cardiac risk factors as described in the text.

Page 15 line 370 It is unclear what window is being referred to in the text especially given the fact the reader is instructed to "see the equation in the window".

The discussion was understandably short but the authors might consider mentioning the challenge of modeling human physiology compared to that of flight physics.

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

Yes

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Yes

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

Yes

Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

Not relevant to this manuscript

Quality of written English
Please indicate the quality of language in the manuscript:

Acceptable

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