Reviewer's report

Title: Interactive Decision Support in Hepatic Surgery

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Reviewer: Dr Vivek Goel

Level of interest: A paper whose findings are important to those with closely related research interests

Advice on publication: Accept after discretionary revisions

This is an interesting report on an interactive database to support hepatic surgery. By using a distributed web-based system, the authors allow for easy access to the database by surgeons. The surgeon can then extract data on patients that are similar to one being considered for surgery, and to thereby predict outcomes and assess risk. While there are many such databases in institutions throughout the world for a variety of conditions and procedures, there use is often limited, particularly by the clinicians that generate the data, for specific patient assessments, since the databases are difficult to use. A system such as one proposed in this report could greatly enhance the use, and quality, of such databases.

COMPULSORY REVISIONS

1) The two research questions on page 3, which are the basis of the research, are highly relevant. Unfortunately, the paper, and the discussion do not directly address the second of these questions. While the feasibility of the system is demonstrated, the methodology does not provide a means to assess whether the decision support system is providing clinically relevant information. The authors should provide some of this data, or at minimum, outline how they propose to address this question in future work.

2) There is very little discussion of how security and confidentiality of information is addressed by the system. This should be described in more detail.

3) While the system allows the surgeon to eliminate cases that are identified that are not actually similar (system sensitivity), there is no way for the surgeon to know if there are any cases that are not identified that are similar (system specificity). On page 7 the authors state that the algorithm is to be designed to avoid this from occurring. Data on how this is done and what the actual sensitivity and specificity are should be presented.

DISCRETIONARY REVISIONS

4) The authors note at several points that there is high rate of missing data in the system. They justify
this by stating that it is impossible to anticipate future research questions, and therefore better to collect everything. Unfortunately, even if a variable required in the future is in the system, it is not of much value if it is missing frequently. An alternative is to have a smaller data set of high quality, the authors should consider the pros and cons of this.

5) In addition to the high missing data rate, it is also evident that they are missing a large proportion of the patients in their hospital. There is no discussion of why this is so or what sort of selection bias may be introduced.

6) On page 8 the authors note that the clinical decision for each patient is stored and that this provides the opportunity to analyze decision patterns. They do not discuss how this is to be done. Are the surgeons actually using the system in decision support?

7) On page 13 they present common characteristics for effective systems from the literature. Unfortunately, they do not address whether all of these characteristics are met by their own system, such as workflow integration.

8) Figure 3, Kaplan-Meier plots are not presented as histograms.

**Competing interests:**

None declared.