

PI: Azra Bihorac

Title: Development of a FHIR-compliant data integration hub for real-time risk prediction on intra-operative period

Strengths of Proposal:

The main goals of the project are to utilize data continuously imported into electronic health records to predict the real time risk for a patient to develop a postoperative complication. For this purpose, the proposal has three specific aims: (1) Build a FHIR-enabled integration capabilities into a risk prediction and assessment system called IDEALIST. FHIR is an open source framework envisioned to be a modern approach to data integration and interoperability in healthcare, and it has a good standard in the communication of health data in terms of consistent format. (2) Develop a common data model that transform data contained with the EHR (electronic health record) system into a common format as well as a common representation, and also an intraoperative database that persists the deidentified health data associated with intraoperative care period of patients undergoing major surgical procedures. (3) Develop and validate a suite of robust, real-time statistical prediction models for intraoperative intervention strategies. The three aims are well oriented with the goal, the methods are clearly described especially for aims (1) and (2). The PI and co-PI has good expertise and experience as well as support from external experts.

Weaknesses of Proposal:

For specific aim 3: the plan for developing the statistical prediction model for intraoperative intervention strategies seems to be quite brief. Nor does the proposal mention that the PI and co-PIs have collaboration with the statistics community. But it is not a major issue, since UFII creates a good environment to foster such collaborations.

General Comments:

The core of this proposed research is focused on development of a system for data integration and analytics for real-time risk prediction among hospitalized patients. This research potentially has wide application and excellent potential external funding opportunities. The investigators are from Department of Medicine, Department of Electrical and Computer Engineering and Department of Biomedical Engineering seems to be a very good team to carry out the proposed research.

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Strengths of Proposal:

The objective of this pilot proposal is very ambitious, yet significantly needed, as it meets the epitome of precision medicine. The immediate interfacing with electronic chart record software is laudable as well as the well-detailed technological solutions.

Also the focus on intraoperative risk is appropriate as it is a crucial step in the hospital care continuum that requires streamlining and optimization of health outcomes to benefit both the individual and the infrastructure.

The investigators' team is diverse in expertise and composed of faculty with solid history of funding and publication record.

Weaknesses of Proposal:

The proposal is under developed in the modelling objective of developing a statistical prediction model. Not only there is a lack of a proper epidemiological study design and generalization to sub-objectives, but also lack of detailed description of how inference techniques will be set up, compared with existing state of the art, and then externally validated. Even if the TRIPOP is mentioned, there is no formal plan for implementing it.

A second flaw is the lack of a proper system deployment plan, i.e. interface implementation, usability, etc.

Finally, the project is not calibrated as a pilot. A proper, limited use case or specific application should have been proposed, to test feasibility. Also, working with commercial HER software vendors is not straightforward and there was no plan for managing that.

General Comments:

The proposal in its current form is not well calibrated for a pilot project and fails to rationalize an effective use case that could demonstrate potential for extramural funding or development upon available resources.