Methodological Challenges for Evaluating Visual Approaches for Clinical Data Access

Ketan K. Mane [1] Vincent N. Carrasco[2] and Javed Mostafa [2]

[1] Renaissance Computing Institute, Chapel Hill, NC, [2] School of Information and Library Science, University of North Carolina, Chapel Hill, NC

User-Interface Decision Support at 3 Levels

At-a-glance view of patient treatment history.

Aggregates evidence from comparative cohort and presents it with predictive insight.

Bridges gap in the use of treatment guideline and clinical practice.

Evaluation Study Focus

To understand implications to use visualization -
- To display aggregate clinical data
- To measure value add to communicate info
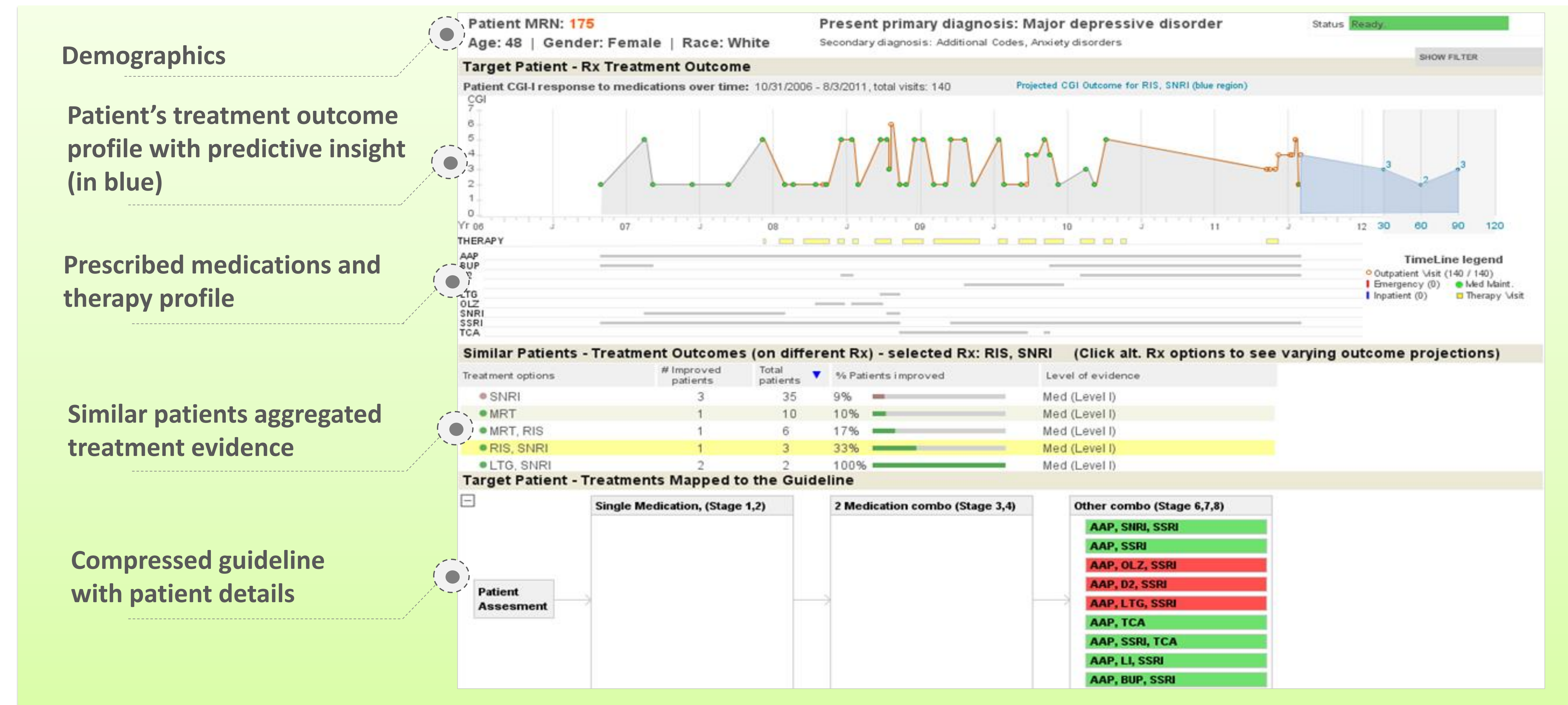- To build novel representation and interaction to view data and make sense from it.

User-interface (UI) Data Layers Evaluation

As a single view/ or in combination with others include -
- Patient outcome profile
- Patient outcome profile with Rx info
- Guideline component
- Guideline in conjunction with Patient outcome

Evaluation Hypothesis

- UI help the clinician gain a good overview of the patient condition?
- UI tailored to the match the clinician's workflow to support their decision making process?

- Demographics
- Patient's treatment outcome profile with predictive insight (in blue)
- Prescribed medications and therapy profile
- Similar patients aggregated treatment evidence
- Compressed guideline with patient details

Methodology: 4 Step Approach

Pre-test Questionnaire (captures user details)
Demo Video (showcases features of the UI)
User Interaction Session (captures quantitative info)
Post-test Questionnaire (captures qualitative info)

Challenge: Simulating real world workflow conditions

Designed UI Evaluation test likely to reveal data view - **Use pattern/variations, learning curves, popularity, user-friendliness, etc.**

To QUANTIFY user experience

For each user tasks, 4 levels of info captured
Time taken to complete the task
Steps taken to complete the task
Successful Completion of the task
Errors done during task completion

To measure user QUALITY experience

User feedback is captured on a scale from 1 to 5, here 1 = 'Strongly Disagree', and transition to 5 = 'Strongly Agree'.