Objective (/Problem Statement)

* Mental health diagnostics and **treatment** is not quantitative
* Prediction of treatment efficacy earlier in the regiment/which intervention strategy is optimal given the information

Background

* Psychiatric disorders are one of the leading causes of disability worldwide
* Estimated 30% of adults will experience mood, anxiety, and/or substance abuse disorder
* Precision psychiatry medications might be adapted personally to each individual patient with relevant or comparable genetic and imaging characteristics
* Diagnosis focused on patients’ own expression, behaviors reported by caregivers and psychiatrists’ evaluations rather than measurable biological pathology
* Lack of decisive neurobiological markers and reliance on phenomenological symptoms

Design Ideas

* Utilizing a combination of data (depending on what is available – as much as can be used; particularly interested in speech analysis)
* NLP for speech analysis combined with other EHR features (i.e. demographic information and previous intervention strategies tested) into neural network with softmax output layer.

Alternatives Considered

* Compare to basic classifier strategy
* Compare to simpler statistical method?
* Possible Markov chain or graph theory application
* Reinforcement learning model (not sure for length of study)

Related Work

* Strong amount of work in mental health diagnostics (i.e. disorder or control) and prediction (i.e. suicide risk), but less work on treatment efficacy
* Treatment efficacy work that does exist appears to use more rudimentary prediction techniques compared to diagnostics (mostly just classifiers).
* Spreadsheet of related work