Currently, there is a relatively high no-show rate to the scheduled appointments, which leads to inefficiency in the system.

We have around 30K appointment record from 2018/09 to 2020/03.
- Demographic Information
- Medical Records
- Appointment Detail
- Appointment Status (Response Variable)

Path Forward
- Phase 1: Connect to EPIC database and create interface
- Phase 2: Deploy models
- Phase 3: Make adjustments to the algorithm and continue experimentation

Data Cleaning
Literature Review

Surgery Outcome Prediction Project

Diagnosis
- Gastric Bypass
- Sleeve Gastrectomy

There are 3033 patients in the dataset that underwent the two surgeries:
- Demographic Information
- Laboratory Results
- Comorbid Conditions

Choose type of surgery needed to be predicted

Ask some inputs from providers

Optimal Classification Tree

Create a prediction tool.

Optimal Classification Tree

- Opt-mpute for missing values
- Optimal Feature Selection
- Optimal Classification Tree

Narrow down # of variables from 40+ to 10

- Only 1850 patients have 1-year post-surgical weight loss data
- Lab results are missing for about 2/3 of patients

Create two separate trees for each type of surgeries

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Data

Optimal Model Accuracy
- Obtain provider written notes
- Use Natural Language Processing to generate additional features

Deploy & Testing
- Deploy models
- Compare predicted outcomes and actual results to evaluate model

Improve hospital efficiency
Provide better care to patients

Our Contribution
- Create a pipeline to recommend appointment time slots
- Build a prediction tool for bariatric surgery outcomes

A Data-driven Approach to Healthcare
Gege Zhang, Muro Kaku | Faculty Advisor: Dimitris Bertsimas