

Schedule Optimization Project

Diagnosis

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

Data

We have around 30K appointment record from 2018/09 to 2020/03.

- Demographic Information
- Medical Records
- Appointment Detail
- Appointment Status (Response Variable)

Treatment

Stage 1 Clean data and Engineer features

Use Optimal Classification Tree to predict patient's no-show probability

Stage 3 Feed the probability into optimization algorithms

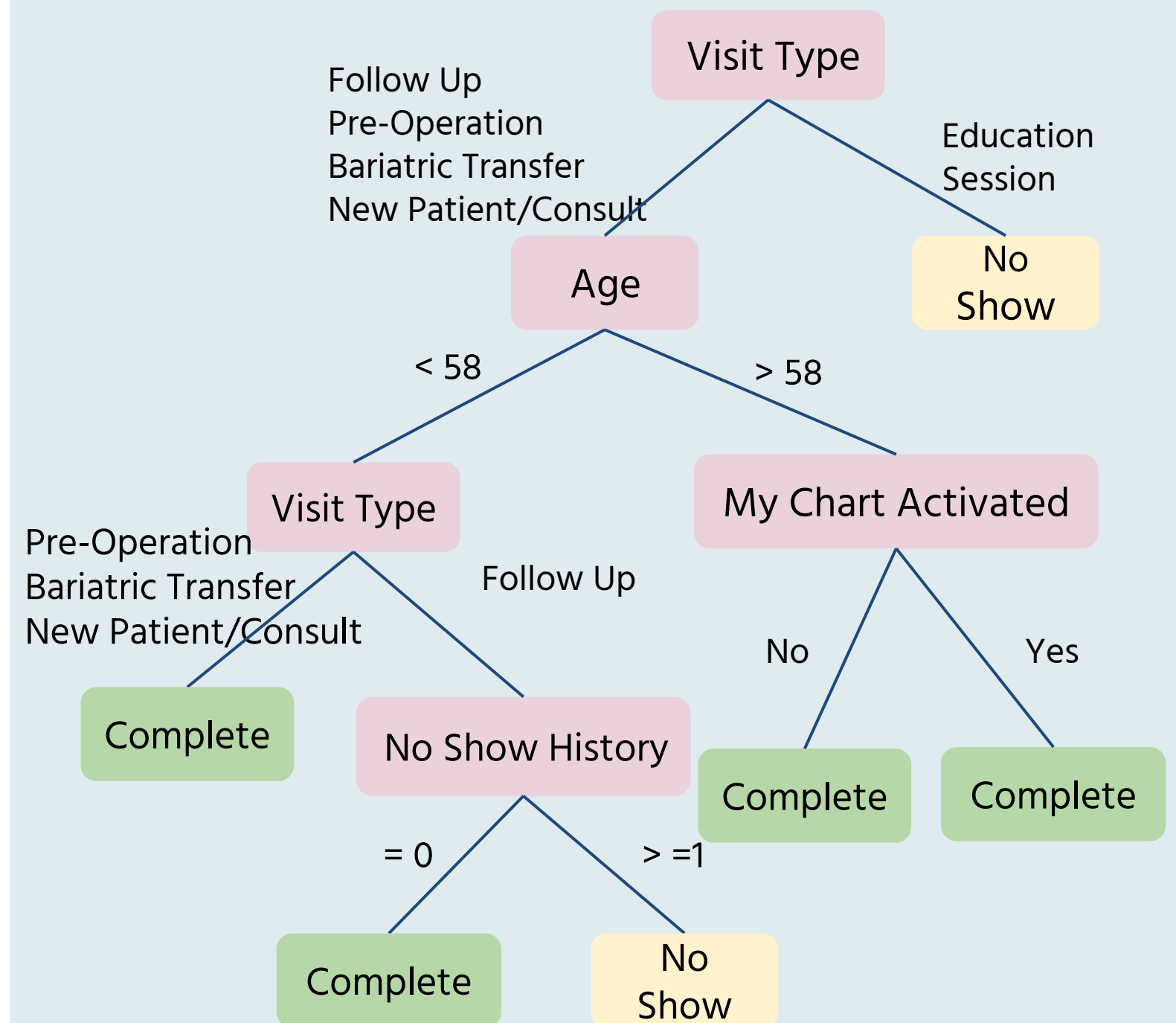
We create a score using the probability based on three objectives:

- minimize empty gaps in clinical schedule
- minimize patient waiting time
- create flexibility

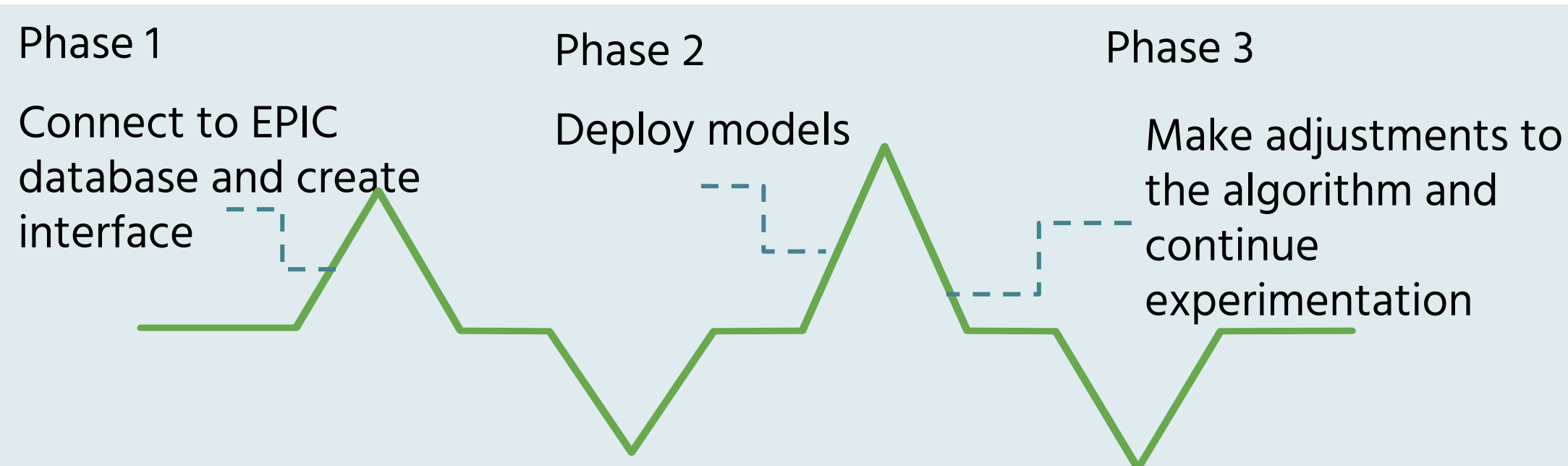
Stage 4 Assign appointment time based on the score

Result

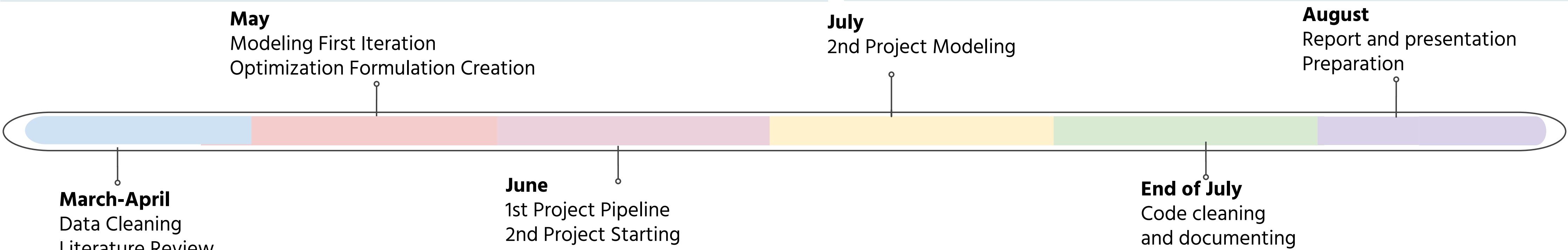
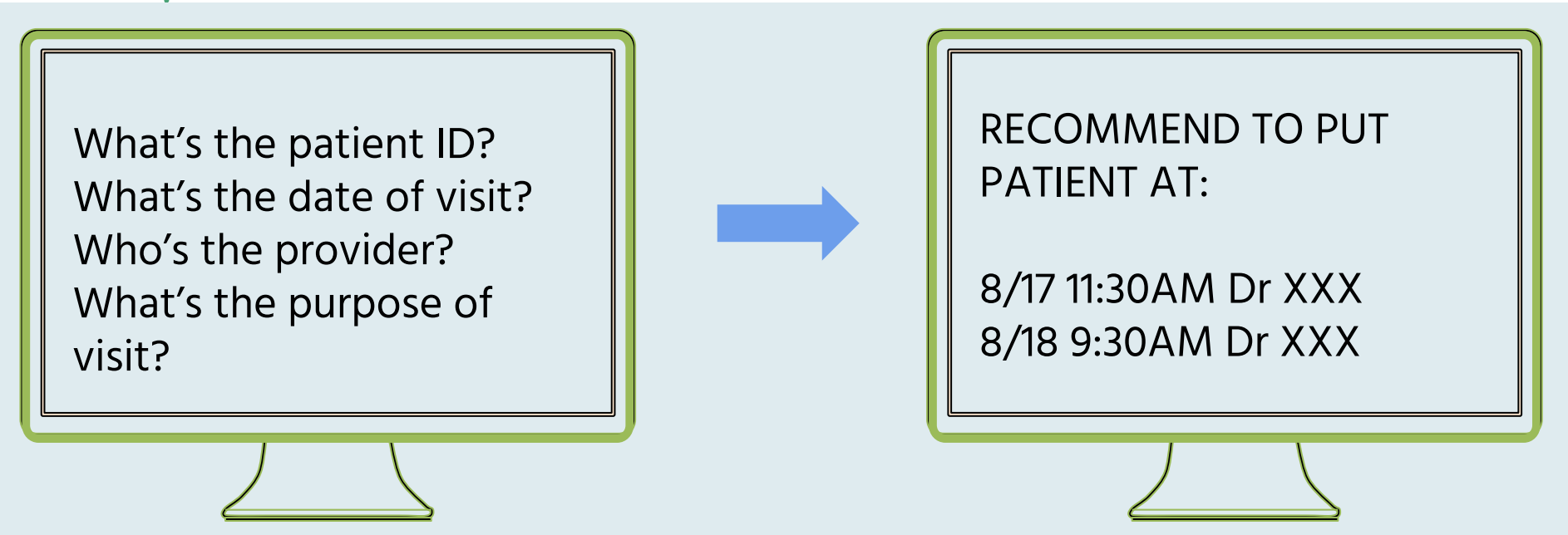
Optimal Classification Tree



Path Forward



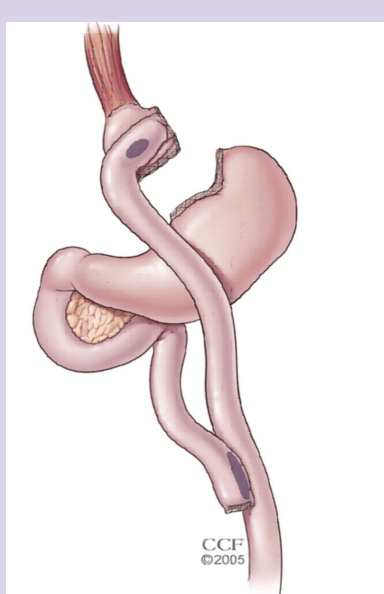
Prescription



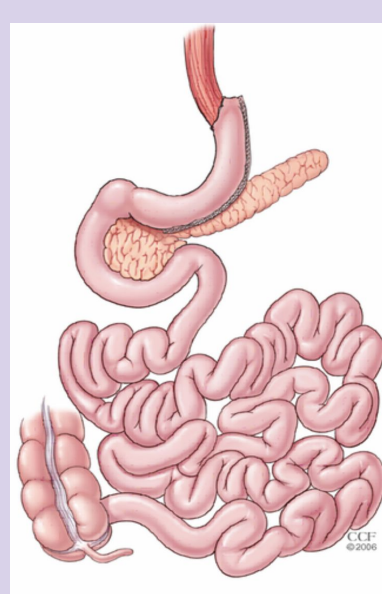
Surgery Outcome Prediction Project

Diagnosis

Gastric Bypass



Sleeve Gastrectomy



VS

Provide insights to help providers make decisions about which of the two surgeries to perform for each patient based on the predicted future weight loss.

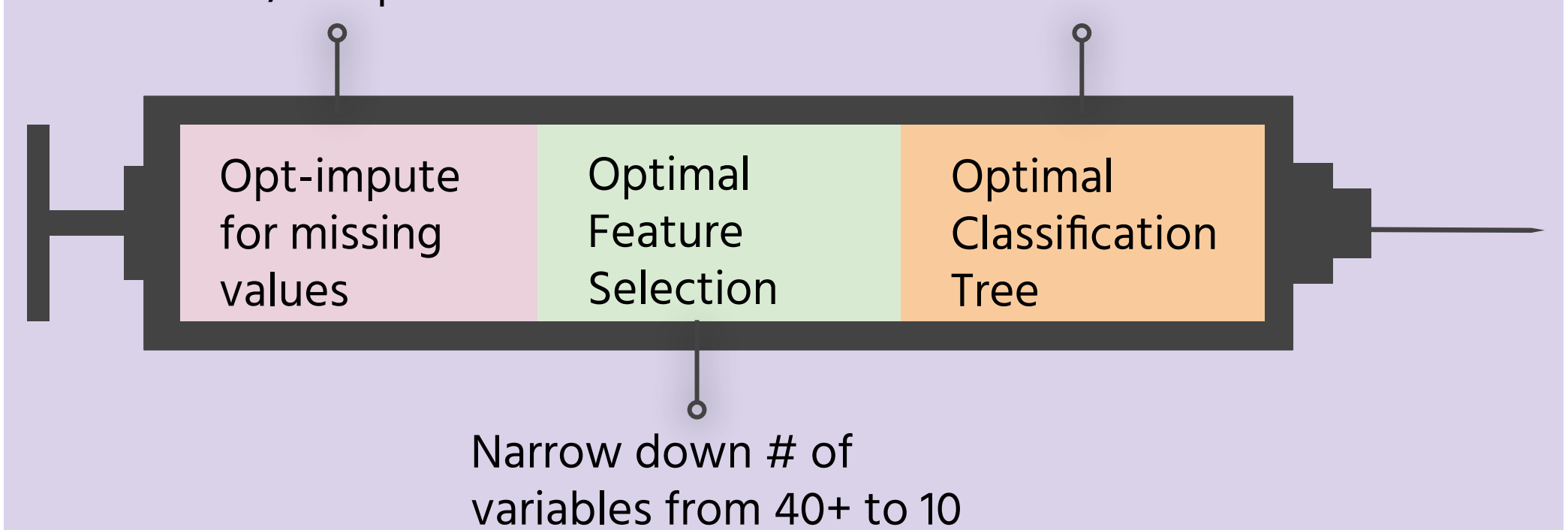
Data

There are 3033 patients in the dataset that underwent the two surgeries:

- Demographic Information
- Laboratory Results
- Comorbid Conditions

Treatment

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



Prescription

We create a prediction tool.

Choose type of surgery needed to be predicted

Ask some inputs from providers

Output prob. of success of the surgery

Outcome	Count	Probability
1 yr % of TWL <= 23%	80	33.90%
1 yr % of TWL > 23%	156	66.10%

Path Forward

Improve 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

Our Contribution



Create a pipeline to recommend appointment time slots



Build a prediction tool for bariatric surgery outcomes



Improve hospital efficiency



Provide better care to patients