

# Enhancing Productivity in Urology Operating Rooms

## Project Overview

- Lahey Hospital and Medical Center Urology Department hypothesizes two problems related involving utilization:
  - Urology's specialty ORs have low overall utilization
  - Operational factors are holding back surgical productivity
- Data Availability
  - Time-stamped records for ~1900 surgical cases from Sep '18 to Aug '19
  - Block schedules for OR 2 and lithotripsy rooms
  - Service primarily conducts elective cases during block hours
- Project Objectives
  - Investigate feasibility of closing one of two ORs
  - Increase scheduling efficiency
  - Evaluate block time allocation among surgeons
  - Identify utilization metrics to be tracked and communicated



## Project Methodology

Qualitative  
Analysis

- 14 stakeholder interviews to understand OR processes
- Root cause analysis and literature review

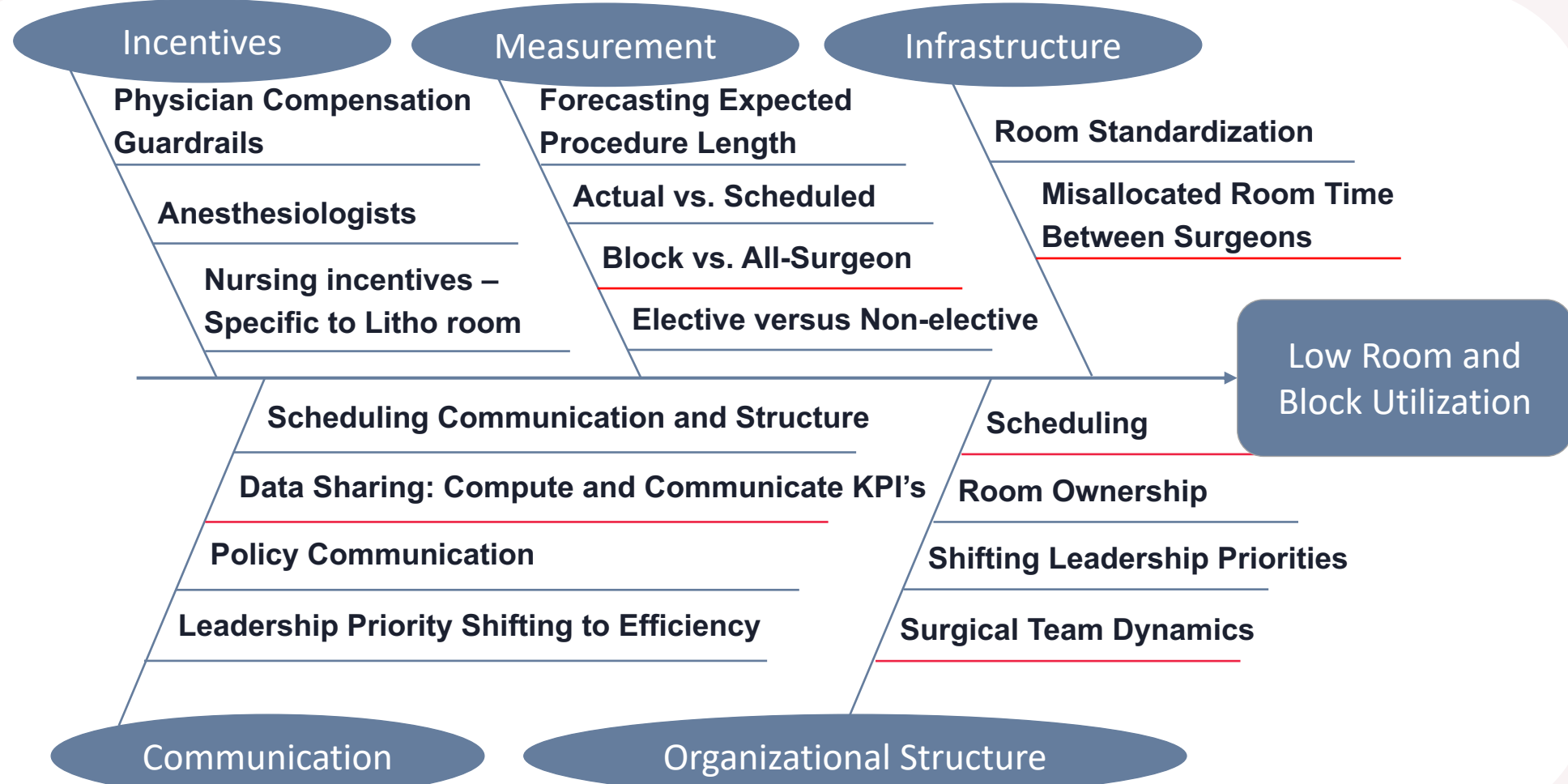
Quantitative  
Analysis

- Quantify room utilization to determine necessary open hours
- Quantify block utilization by individual surgeons

Recommend

- Develop actionable recommendations

## Root Cause Analysis



## Recommendation

- Lahey Hospital should continue to utilize both OR 2 and litho for Urology surgical cases.
- Schedule management for OR 2 and litho should be centralized.
- Urology should reallocate block time to align surgeon assignments with utilization patterns.
- After centralizing scheduling and reallocating surgeon assignments, OR 2 and litho available block time could be reduced to 9 hours/day, 5 days per week for OR 2 and 4 days per week for litho.
- These metrics should be tracked and communicated regularly between operations and Urology clinical leadership: Room utilization based on scheduled time; Owned and total block utilization by surgeon; Demand for OR time outside owned blocks by surgeon

## Team



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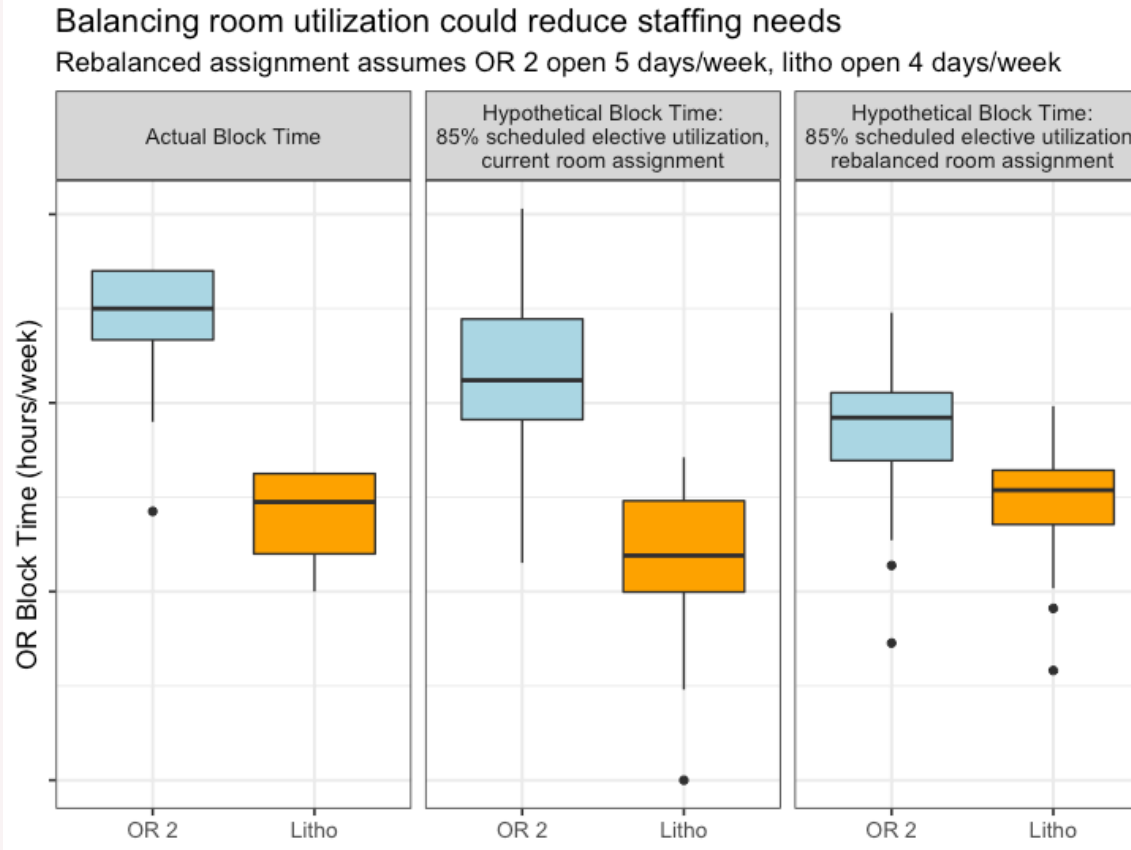
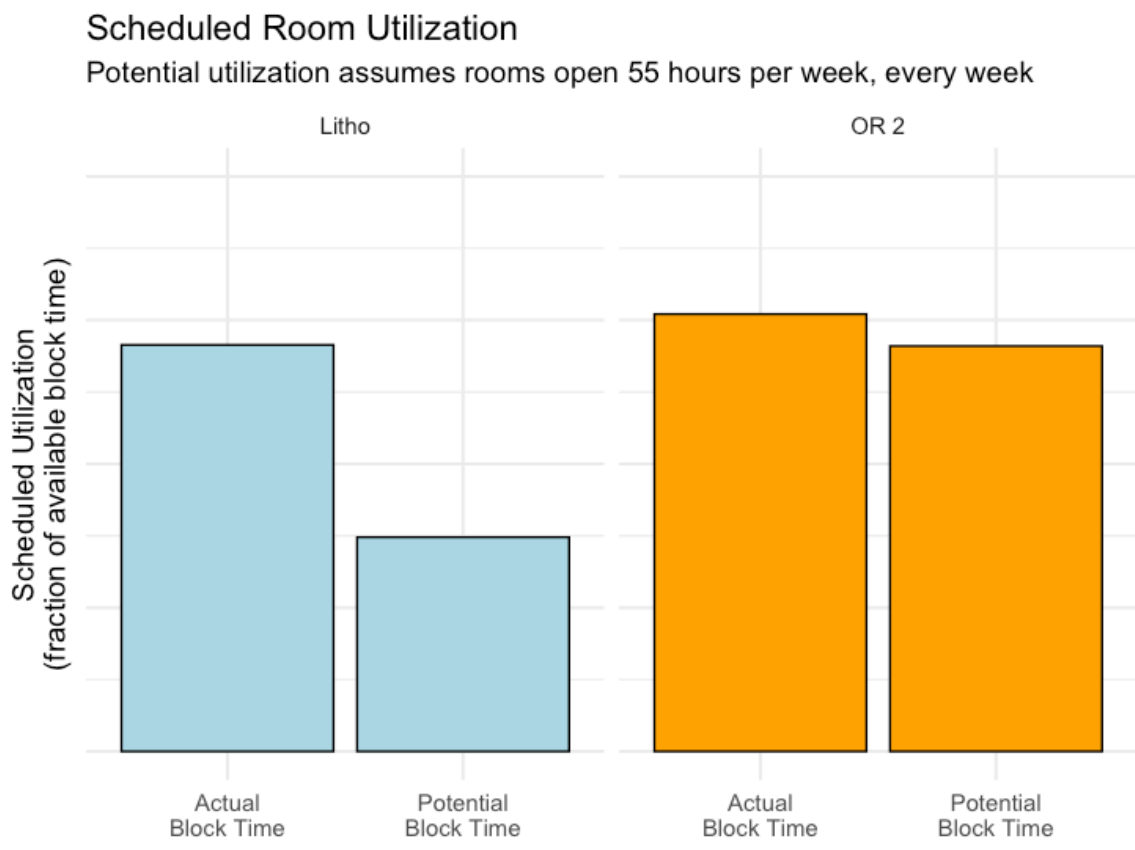


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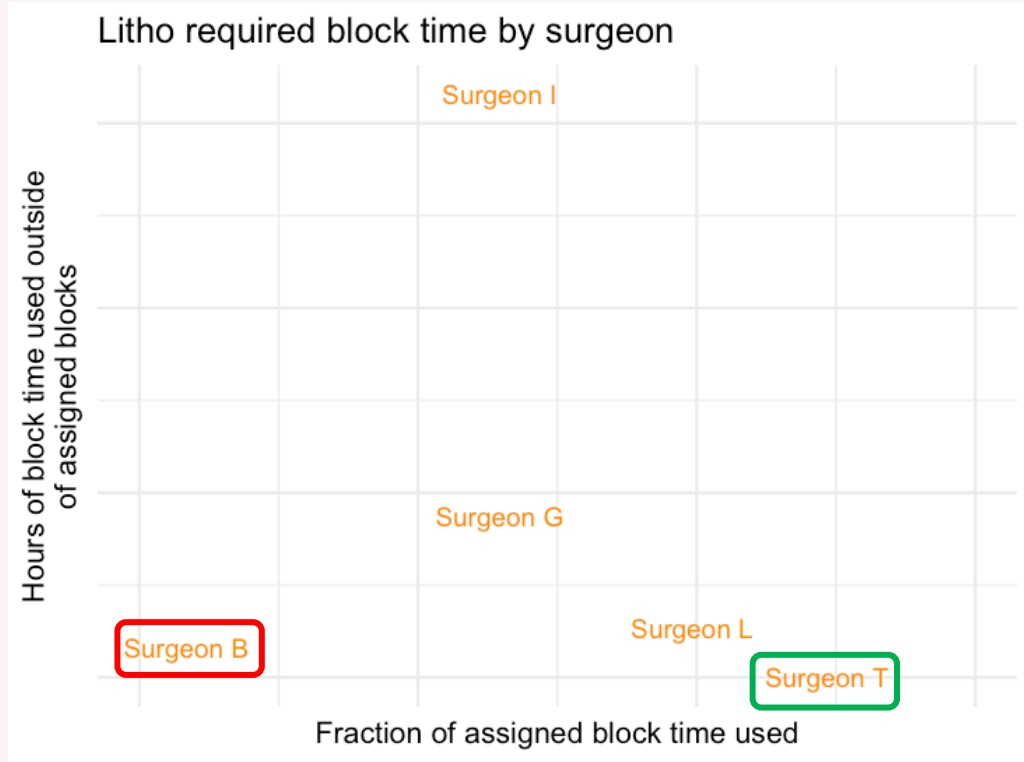
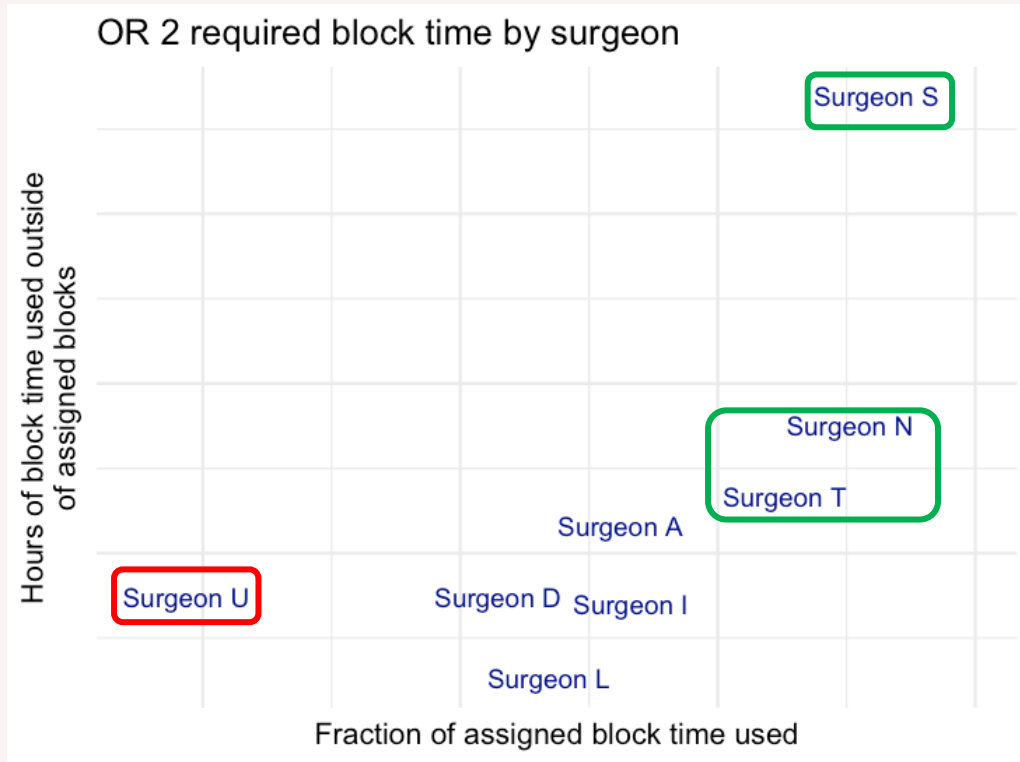
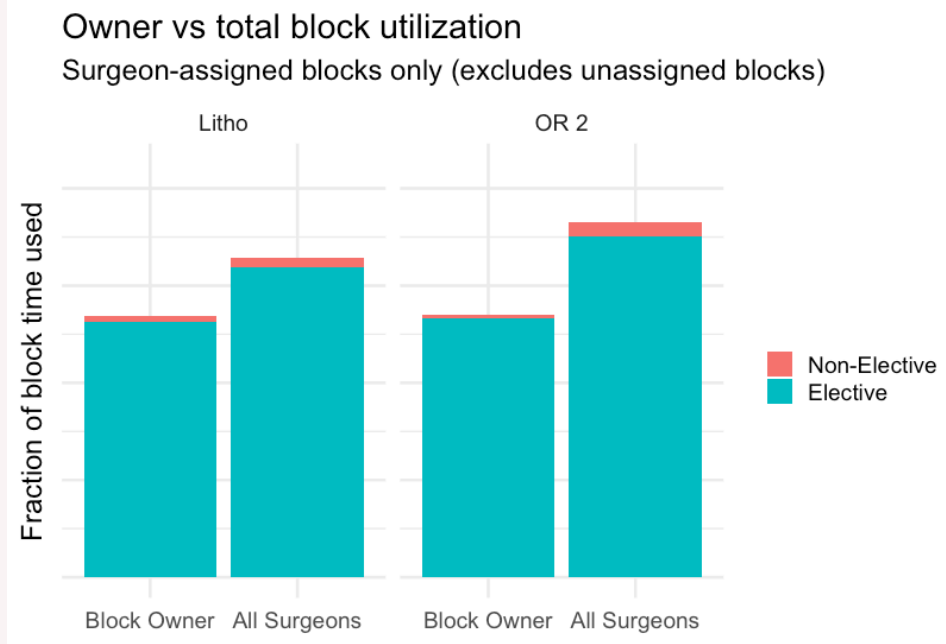
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## Room Utilization



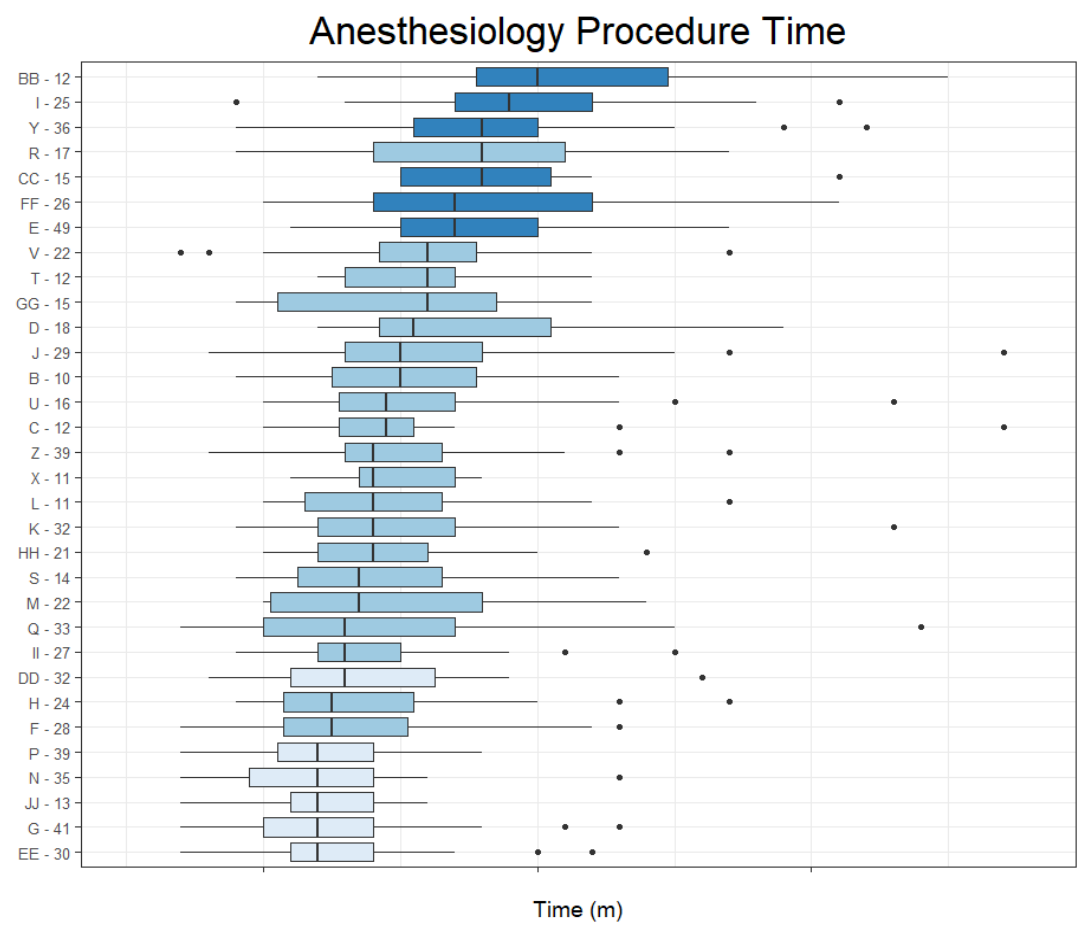
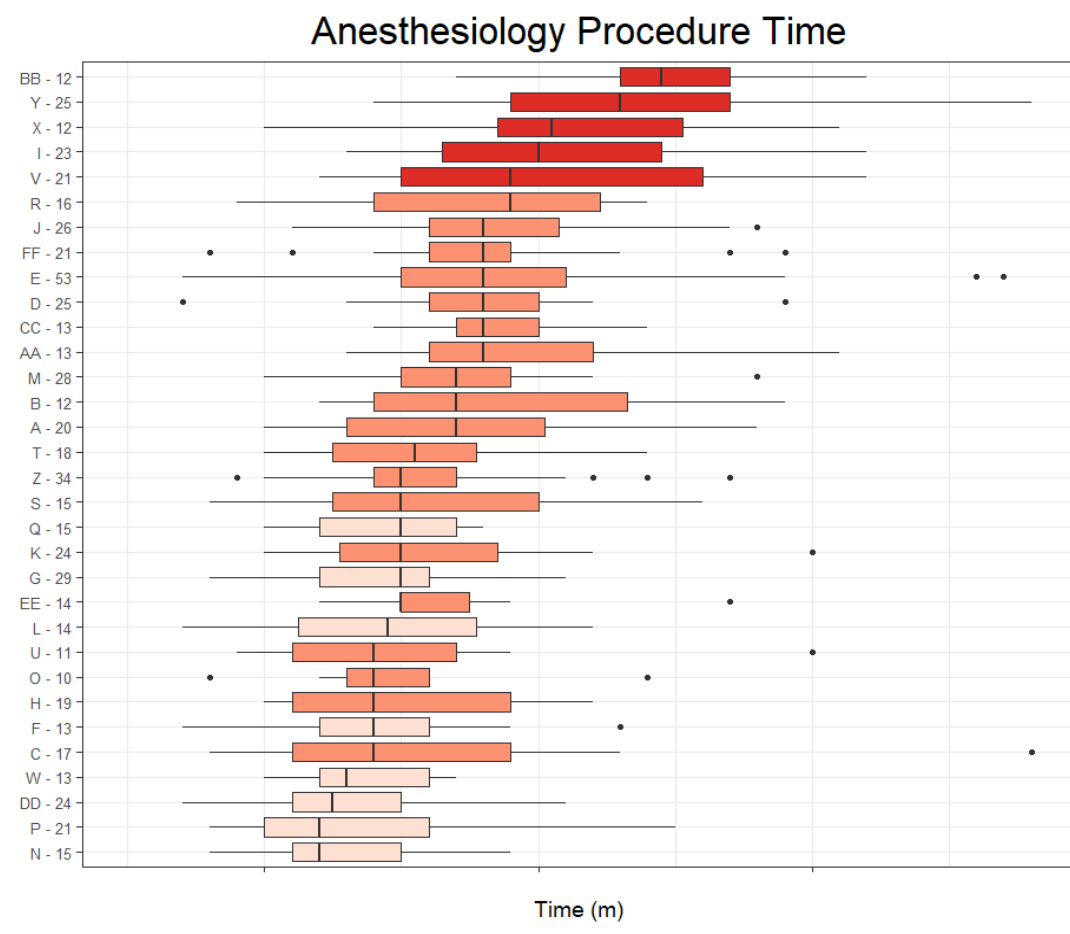
- Utilization is low for OR 2 and litho, but both rooms are necessary to meet demand for Urology surgical time, even with under extended hypothetical hours.
- Busy OR 2 weeks tended to coincide with light litho weeks
- Case load rebalancing decreases OR 2 variability without significantly increasing required litho block time
- After rebalancing, 9 hours per day of block time in both rooms satisfies demand for all weeks except 6 at 85% weekly utilization. This minimizes the demand for additional nursing shift after 3:30 pm and accompanying operational burden.

## Block Utilization



- Block owners use a small fraction of available time. Tracking block owners' productivity when not operating is an important metric that could lead to increased clinic time.
- Significant amount of out-of-block utilization implies the need for block reallocation between surgeons
- New report tracking owned block utilization versus out of block OR demand provides vehicle for ongoing evaluation of block time allocation

## Anesthesiology Procedure Time



- Separated procedures into two groups with statistically similar anesthesia times
- In both procedure categories, ~20% anesthesiologists show significantly higher procedure time than group mean, ~20% show significantly lower procedure time than group mean
- Combining this analysis with similar analysis for surgeon procedure times could aid future work on surgeon-anesthesiologist matching

### Project Summary

Our team worked with Lahey Hospital & Medical Center to conduct qualitative and quantitative analysis on enhancing productivity in two Urology operating rooms (ORs), the lithotripsy room (litho) and cystoscopy room (OR 2). Lahey hypothesized that opportunities existed to both increase utilization of these Urology ORs and reduce operational barriers to surgeon and staff productivity. We employed both qualitative (primary and secondary) research and quantitative analysis to structure actionable recommendations related to these hypotheses.

After extensive interviews with OR stakeholders, we conclude that detailed measurement of OR time and communication of key metrics between operations and leadership is the most important general solution to solving existing and future OR scheduling challenges. Our own analysis of OR time stamp records from September 2018 – August 2019 indicates that Lahey should continue to staff both specialty Urology ORs, but we see the potential to reduce OR 2's block time from 11 hours per day to 9 with the aid of centralized schedule management. We also identify an opportunity to reallocate OR blocks to better match individual surgeon demand for OR time and propose a set of metrics to monitor the ongoing quality of OR time allocation. We identify a set of current individual surgeons who are candidates for block time reassignment. Finally, though the bulk of our work takes procedure time as given, we analyze differences in anesthesiology time for Urology procedures and propose a framework for monitoring individual procedure time deviations for anesthesiologists and surgeons.