Simulation and analysis of outpatient endoscopy scheduling policies

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Motivation & Background

- Colorectal cancer is the 2\textsuperscript{nd}-leading cause of cancer death in the U.S. [1]
- Colonoscopy may reduce colorectal cancer incidence by up to 40% and reduce mortality by up to 50% [2]
- Simulating patient scheduling and daily operations for colonoscopy procedures in the Medical Procedures Units at Michigan Medicine
- Scheduling variability sources: patient demand for appts., preferences, arrivals, procedure durations
- Scheduling requires trade-offs in patient access, quality of care, resource utilization, and patient and provider satisfaction

Methods

- Inputs $\rightarrow$ Simulation $\rightarrow$ Metrics

- Scheduling: Template $\rightarrow$ RNG $\rightarrow$ Randomly Filled Template

- Operational: Randomly Filled Template $\rightarrow$ RNG $\rightarrow$ Randomly Operated Clinic Schedule

Results and Discussion

- Key Takeaway 1: Benefits of custom appointments

- Key Takeaway 2: High impact of small buffers

Conclusions

- Simulating clinic scheduling and operations allows new policies to be tested robustly at low cost
- Simulation is useful in communicating the role random variability plays in clinical operations to clinical collaborators
- Trade-offs must be made between patient access, provider utilization, and patient wait time

Acknowledgements

References