Scheduling Efficiency in Robotic Surgery: A Single Institution's Experience

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Background

- From 2012 to 2018, the percentage of general surgery procedures that were completed robotically increased from 1.8 to 15.1 percent.[1]
- Despite the benefits of robotic surgery, one of the drawbacks to the widespread adoption among hospitals is the cost associated with purchasing, maintaining, and supplying robotic platforms.
- Our medical center underwent swift growth after the implementation of a robotics program with the primary aim of increasing access to robotic surgery.

Methods

Program Overview

- This study takes place at quaternary academic medical center in the Midwest with two hospital campuses and 64 operating rooms with 7 robotic platforms.

Scheduling Paradigm

- Blocks refers to the assigned time to a surgeon or a service line to schedule cases into an operating room.
- If robotic block times are not utilized by the initial assignee, they are released two weeks prior.
- For days 14 through 8, it is released first come, first served for robotic case scheduling only. For days 7 through 0, the block becomes first come, first served for any type of case.
- Block utilization measures how much a surgeon or service line uses the time allocated to them by the perioperative leadership team.
- Blocks are typically scheduled as case hours/9.5 hours Monday through Friday

Turnaround Time

- Three quality improvement initiatives were implemented that targeted reducing turnaround time to a goal of <30 minutes.

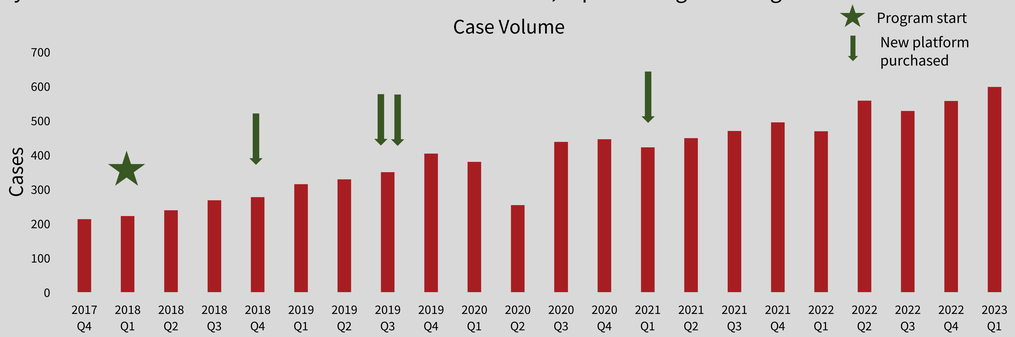
Analysis

- A retrospective analysis of the electronic medical record was performed to analyze robotic case volume, case length, turnover times, and block utilization from January 2017 to May 2023.

Results

Case Volume

- 9590 robotic-assisted soft tissue surgical cases were performed at our institution from January 2017 to May 2023, with a **48%** growth in case volume over the first year of program implementation.
- Yearly case totals increased from 680 in 2017 to 2112 in 2022, representing a **211%** growth over this time.

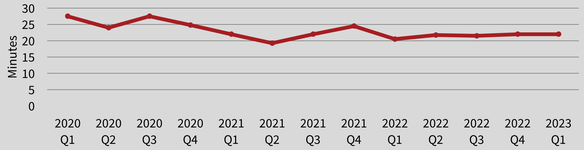


Scheduling Improvements

- Block utilization was **27%** in 2017 and increased to **60%** in the first quarter of 2023.
- After the initiation of the scheduling paradigm in 2018, block utilization averaged **54%**.
- Case scheduling accuracy (scheduled:performed within +/- 20%) increased from **44%** in 2019 to **51%** in 2022.

Turnaround Time

- Turnaround time averaged 26 minutes in 2020 and decreased to 21.4 minutes in 2022.



Cost Savings

- The average number of robotic cases performed per day increased from 3.5 to 9.2 over the period analyzed, with an increase in annual case hours from 1019 in 2017 to 9025 in 2022.
- The average length of robotic cases decreased from 4.8 hours in 2017 to 4.3 hours in 2022, resulting in an average savings of **$1234.20 per case**.

Discussion

- The implementation of a formalized robotics surgery program at our institution resulted in a considerable improvement in scheduling efficiency.
- Various initiatives contributed to the ability to schedule cases accurately and predictably, leading to the noted increase in block utilization.
- Our institution found that the continuous inflow of data and the regular assessment of trends aided in consistently meeting our targets.
- The reclaiming and redistribution of underutilized blocks after a certain length of time allows for the institution to increase console time and optimize the already dedicated staffing and equipment requirements.
- With the increase of block utilization from 27% pre-implementation to 60% post-implementation, this method of OR scheduling proved effective at our institution.
- Over a three-year period, we saw an average annual growth of 4.3%, which is greater than prior reported growth of 2.8% annually.[1]
- Our novel robotic scheduling paradigm resulted in increased case volumes and increased number of cases per day with improved block utilization, translating to added value in robotic surgery.

References

1. Sheetz KH, Claflin J, Dimick JB. Trends in the Adoption of Robotic Surgery for Common Surgical Procedures. JAMA Network Open. 2020;3(1):e1918911-e1918911. doi:10.1001/jamanetworkopen.2019.18911