Improving Operating Room Efficiency Using the Six Sigma Methodology

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Introduction

Six Sigma is a technique driven by data, methodology, and a philosophy of continuous improvement to help create a system in which 99.99966% of products are free from defects. This process helps reduce variability and waste in production, while increasing quality and decreasing cost of the final product. Keeping this goal in mind Six Sigma was used in a rural, tertiary care facility in Texas with the goal of improving operating room efficiency.

- The define, measure, analyze, improve, and control (DMAIC) methodology was utilized
- Variables measured included first start, patient-out to patient-in (turnover time), and close-to-cut time.
- Baseline results were recorded for each surgical specialty as well as each operating room. Changes in workflow were recommended for each level of OR personnel.

Define

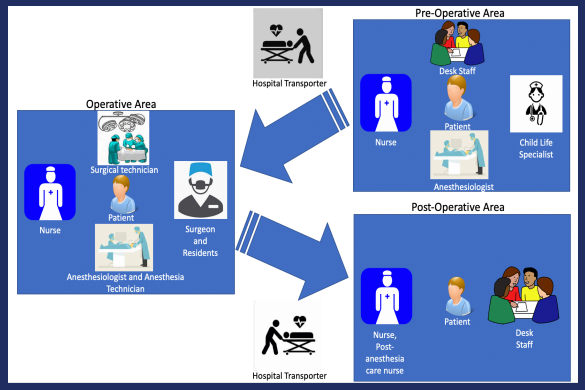
A team consisting of various operating room personnel, including anesthesiologists, surgeons, CRNAs, nurses, scrub technicians, porters, and administrators was created to develop and carry out the project.

Based on recommendations made by the Advisory Board-Surgery Compass, the following represent our goals for the measured variables:

- On-time first starts of 80%
- Close-to-Cut time of 45 minutes (75th percentile)
- Patient-Out to Patient-In (Turnover Time) of 20 minutes (90th Percentile)
- Overall goal was to increase patient satisfaction, improve the quality of care, and increase efficiency of patient flow throughout the hospital

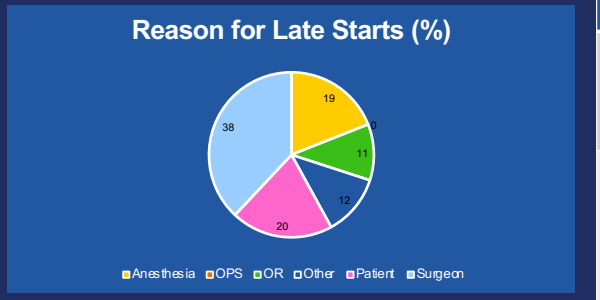
Measure

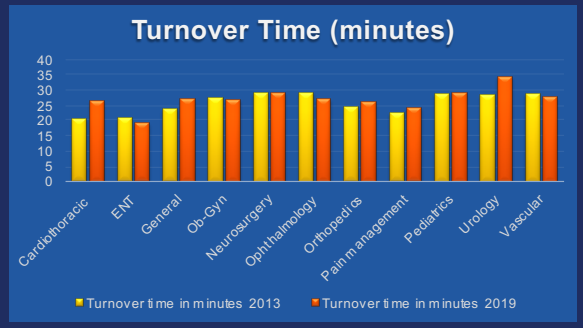
Circulating nurses in the various operating rooms recorded the variables previously discussed. The variables were recorded in a database and a flowsheet was created.

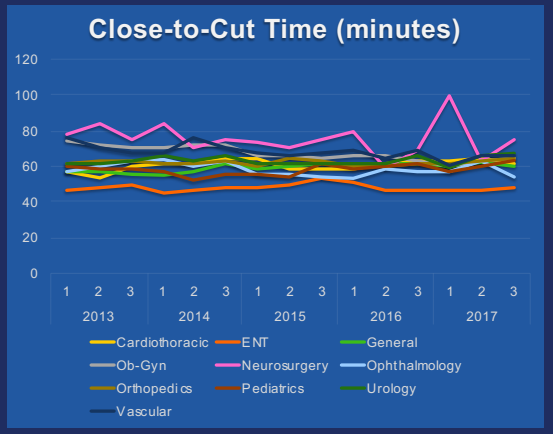


Analyze

Data collected was analyzed by the team and various recommendations were made for each level of OR personnel.







Improve

Operating room personnel	Changes to Role
Porters	• Arrive on time • Approximately 5 people in room to increase efficiency • Established roles
Nurses	• Page surgeons when patients enter holding • Update preference cards on surgeons • Bring patient into room while opening instruments so anesthesia can begin their work • Have one RN interview next patient while current case is ongoing
Anesthesia	• Stagger starts by 15-20 minutes to ensure availability of anesthesiologist for on-time start • Have attending see next patient while current case is ongoing • Proper ongoing communication between CRNA, anesthesiologist, and anesthesia tech to ensure functioning equipment and provide adequate supply of resources
Surgeons	• Ensure consent and H&P are in order • If resident is closing case, site mark next patient • If surgeon doesn't arrive on time, no first start

Control

Unfortunately, due to resistance from various OR personnel and physicians the changes described above were not implemented. As shown by the data, no progress was made in any of the variables.

Discussion

- While the use of the Six Sigma process could have significantly improved operating room efficiency, several hurdles were encountered due to leadership issues and guidance.
  - Lack of horizontal and vertical buy-in and leadership
  - Executive leadership did not exhibit commitment to the project
  - Lack of promotion of shared goals
  - Improper understanding of the process
    - Many thought they would be laid-off
    - Did not understand that improvement of process as a whole would improve their individual working environment
  - Lack of communication and active reinforcement
  - No feedback was obtained from personnel impacted by the process
  - Lack of proper data collection

Conclusion

Unfortunately, optimal results were not achieved at this Texas facility due to lack of leadership participation. Six Sigma has been shown to be a valuable method for improving OR efficiency and reducing financial burden as shown by the success of the process at Mayo Clinic. Proper leadership involving each stakeholder, obtaining active feedback, and clearly explaining the goals of the project is key to any successful endeavor.

References

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