

Midwest Surgical Association

Improving operating room efficiency via an interprofessional approach



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Six Sigma;
Utilization;
Performance;
Interprofessional

Abstract

BACKGROUND: Third-party payer reimbursements will likely continue to decrease. Therefore, it is imperative for operating rooms (ORs), often a hospital's largest revenue source, to improve efficiency. We report the outcome after 3 years of a lean, Six Sigma program to improve OR utilization.

METHODS: In January 2011, our hospital system instituted a facility-wide approach to address the problem of OR efficiency. Interprofessional teams were formed to examine all aspects of OR use. An OR Governance Committee consisting of Department Chairs, nursing and senior administration oversaw the project.

RESULTS: Outpatients' readiness on time for surgery increased from 59% to 95%, while first case on-time starts improved from 32% to 73%. Block utilization went from 68% to 74% and actual room utilization improved from 56% to 68%. The number of cases increased by 9%. Overtime went from 7% of total to 4%, so personnel costs decreased 14% despite 26% more employees. There was a reduction in annual voluntary OR staff turnover from 28% to 11%. Revenues increased more than 10% annually.

CONCLUSION: A concerted effort to optimize OR performance resulted in marked improvements in access, overall case efficiency, staff satisfaction, and financial performance.

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Operating room (OR) inefficiencies are a major surgeon dissatisfier. Indeed, they are frustrating for all concerned. In addition, these inefficiencies affect hospital and physician revenue. As third-party reimbursements are unlikely to

increase (and, more probably, will lessen), it is important to improve OR efficiency.¹

OU Medical Center, a 317-bed facility, is Oklahoma's only American College of Surgeons verified Level I Trauma Center, only National Cancer Institute-designated Cancer Center, and a tertiary referral hospital for the state. Thus, demand for OR access is constant and often time sensitive.

This access issue was especially felt by services, primarily Orthopedics and Trauma that did a high percentage of urgent and emergency cases. As access to block time was limited, such cases were often being done at the end of the day or on weekends.

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Senior leaders recognized that our ORs were not being effectively utilized and instituted a process to improve this. A combination of lean and Six Sigma methodology, both of which have been extensively discussed elsewhere, was used.²⁻⁵

The initial goals of this reorganization were simple: get all the cases done in a timely manner; improve access for unscheduled cases; increase case volume, especially for referral cases; and improve physician and staff satisfaction.

Methods

A full day retreat involving all surgical-related chairs, senior administration, nursing, and other interested stakeholders was held in January, 2011. The immediate result of this retreat was the formation of an OR Governance Committee (Table 1) to oversee the improvement process. One of this committee's first acts was to appoint an OR Medical Director (a general surgeon), an Anesthesiology Medical Director, and an Assistant Surgical Director (an orthopedic surgeon).

In addition, 4 Six Sigma teams were formed to look at all aspects of possible inefficiencies. These teams (scheduling, daily flow, preoperative services, and instruments and supplies) were headed by a physician and a nurse. Residents, anesthesiologists, attendings, and other staff (scrub techs and head of sterile processing) were included as appropriate. An anesthesiology OR performance committee was also created.

An executive committee consisting of the nursing and physician directors was also created to integrate and coordinate the team activities and to work on long-term goals and planning. Initially, the Governance Committee met weekly to hear reports from the teams and to analyze data. As progress was made, this decreased to semi-monthly. Currently, the teams meet once or twice a month and report to the executive committee plus the Chief Operating Officer (the administrator in charge of the ORs). OR Governance Committee meets monthly to give final approval to projects and provide strategic planning.

A 6-month nurse OR residency program was started. Eight groups have finished the program with 27 new nurses

hired. The ninth group starts in July 2014. Twelve new scrub techs were also hired to improve staffing.

An ambulatory surgery center (ASC) containing 5 ORs was opened on campus in October 2010. Two additional ORs were added to the inpatient (IP) facility in January 2013, increasing the total number to 22. An additional robot was added in mid-2013, bringing the total number to 2.

This report covers the first 3 years of our improvement project (ie, through December 2013).

Results

Results are summarized in Table 2. Of note, even though an ASC was opened, total numbers of cases in the main ORs increased in 2013 by 9% over the 2010 baseline. This was primarily in the number of IP cases, which increased 14%. Also of note, even though the total number of IP cases increased and the percentage of IP cases went from 55% in 2010% to 60% in 2013, the number of OR minutes only went up by 5%. (Outpatient cases include patients who were admitted the same day after an elective operation. Due to a quirk in our data management system, such patients were initially impossible to separate electronically from true outpatients.) Patients done at the ASC who required admission are not included in these numbers. The increase in IPs likely resulted from having more OR capacity to add additional surgeons as there was no change in referral patterns or payor mix.

Turnover times have not been affected by this process, remaining constant at 43 to 44 minutes. However, time from patient in room to procedure starting has decreased from 40 to 34 minutes. Time from procedure ending to out of room has decreased from 10 to 8 minutes, an average savings of 8 minutes per case.

Block utilization increased from 68% to 74% and actual room utilization improved from 56% to 68%. This was due to a variety of factors. First, block utilization was examined by service and underutilized blocks were redistributed to busier services. Second, block expiration times were enforced (usually 48 hours prior) with the service getting credit for full utilization if the block was released before that time. Exceptions were made for Orthopedics, General Surgery, and Neurosurgery when data analysis showed that approximately 40%, 20%, and 15% of their cases were unscheduled. Thus, a corresponding percentage of their blocks were staffed but left open until the day of surgery. This allowed access to rooms during the day and led to a decrease in the number of rooms running after 1700. This went from an average of 9 rooms per day to 5 rooms per day. The average running after 1900 went from 4 to 2.

Finally, a weekend scheduler was hired. Prior to this, any case seen by a surgeon after 1,200 on Friday or who was admitted over the weekend could not be scheduled until Monday morning. This has led a decrease in the number of unscheduled cases on Mondays and Tuesdays from approximately 25 per week to 10.

Table 1 OR governance committee

Chief Executive Officer, OU Medical Center
Chief Operating Officer, OU Medical Center
Chief Medical Officer, OU Medical Center
Chair, Department of Surgery
Chair, Department of Anesthesiology
Chair, Department of Neurosurgery
President, OU Physicians
OR Medical Director
OR Nursing Director, ex officio
OR Anesthesiology Medical Director, ex officio
OR Assistant Surgical Director, ex officio

OR = operating room; OU = Oklahoma University Medical Center.

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