Assessing Operating Room Efficiency and Parallel Processing

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Surgeons spend countless hours practicing many technical aspects of our discipline in the operating room (OR) suite. This is where many lives are saved and a multitude of destinies are altered. Despite their importance to us and our patients, ORs exhibit much inefficiency, which is particularly manifest in academic medical centers. Resident participation and teaching activities often prolong case times. Anesthetic induction and wakeup times may be lengthy for similar reasons. Turnover times can be extended by the lack of clear direction to the many trainees in the perioperative area. Surgeons often try to fit in other tasks between cases. Personnel shortages are common as institutions compete for a limited number of qualified OR nurses and technicians. Attempts to control expenses and create a greater profit margin may restrict necessary resources. Work is often done sequentially with little support to change "the system." Poor process design can create multiple bottlenecks that impede the flow of patients both into and out of the OR suite. Supervisors often respond to demands to increase the number of cases by asking the personnel to work harder or tasks are redesigned to be done more quickly.

The introduction of outpatient surgery centers was accompanied by improved OR efficiency with turnover times of 15 to 20 minutes achieved routinely. These enviable results were due to process improvements, patient and procedure selection, plus "the size factor." Free-standing surgical centers usually are unburdened by the bureaucracy of academic medical center complexes. Translating these practices to institutional-based ORs has been challenging and not easily done.

In this issue, Friedman et al[1] report improved OR efficiency in a large academic medical center by the use of parallel processing. This term originated in the computer industry where it is used to describe the concurrent or simultaneous execution of 2 or more parts of a single computer program. They demonstrate impressive reductions in anesthetic induction/patient prep and room turnover times of 61% and 45%, respectively, compared with a historical control group. This translates into a time savings of approximately 25 minutes between each case. Their study involved a single surgeon consistently doing uncomplicated inguinal, umbilical, and small ventral hernia repairs. Operating time averaged less than 30 minutes per case, and only operations done under local anesthesia were studied. The OR team was consistent, the exchange of personnel during operations was prohibited, and the role of each team member was well defined. As a result of efficiency improvements, the surgeon was able to reduce his time in the OR without a decrease in case load, thus freeing up time for additional cases or other activities. The patients seemed satisfied, although the construction of the survey appeared somewhat biased toward satisfaction.

This is a wonderful experiment! But can it be adapted to other surgeons and settings where a variety of cases are done among a heterogeneous group of patients with the multiple personnel changes that typically occur during the day? The answer: maybe. But only if certain parameters are met.

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First and foremost, there must be champions for improving efficiency through this process among surgeons, nurses, anesthesiologists, and hospital administrators. The champions need to identify and obtain the necessary personnel and other resources and commit to redesign the work flow. Second, there must be "buy in" among the various nurses, OR technicians, anesthesia personnel, surgeons, environmental services, instrument processing, and others involved in the operational tasks of the OR. Third, success is more likely if there is a continuous quality improvement process in place to review and modify the plan.

The surgeon was happy, but what about the other personnel? A recent report by Stahl et al[2] from the same institution as this study suggests that there is increased stress associated with process changes designed to improve OR efficiency and the risk of "burn out" is real. Given this observation, are these results sustainable?

Our hospital is involved in a similar project to improve OR efficiency. As in the current study, it has been easiest to demonstrate success among a select patient population with participation restricted to a small, highly committed group. The bottom line is whether this success can be transferred to other surgeons and more rooms. Can you improve turnover among the variety of cases done in the typical operating room with complex equipment and instrumentation requirements as well as sicker patients who may need longer times for anesthesia induction and emergence? Are these results applicable only to highly select situations or specialized practices? How do you provide incentives for OR personnel other than the surgeon to adopt this work pattern as their routine? Finding answers to these questions is the key to success.

Friedman and his colleagues are to be congratulated for their efforts to transform an area of the hospital that is unusually resistant to change. The authors emphasize that they designed their process to transfer work from the OR to the preoperative area. They did not work any less; they worked smarter! Is there impetus to keep the effort going? This is questionable since the advantages seen in the study group did not carry over to a concurrent group of patients having the same procedures done by the same surgeon.

It is gratifying that the patients were satisfied, but the authors do not provide information about complications or sentinel events. We would like to think that the efficiencies of parallel processing will maintain or improve their care and safety. This is the ultimate litmus test.

REFERENCES

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