

## Who really benefits from surgical tray reduction?

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*Comment on:* Cichos KH, Linsky PL, Wei B, *et al.* Cost Savings of Standardization of Thoracic Surgical Instruments: The Process of Lean. *Ann Thorac Surg* 2017;104:1889-95.

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Cichos and colleagues (1) describe applying the process of lean to surgical trays at the University of Alabama at Birmingham Hospital. Through a consensus process, three surgeons in the Division of Cardiothoracic Surgery identified the least number of instruments required for mediastinoscopy, video-assisted thoracoscopic surgery, robotic thoracic surgery and thoracotomy, achieving reductions of 75%, 62%, 61% and 44%, respectively. This important study adds to a growing list of publications documenting the accumulation of excess instruments on surgical trays and demonstrating effective deliberative processes to reduce surgical trays and enhance efficiencies. (2-6).

The authors estimate cost savings of \$69,412 in 2016, derived from savings in instrument replacement costs and sterile processing costs across the four procedures. Replacement cost estimates were based on 5-year historical data. It would have been helpful for the authors to provide more details about this historical data. How frequently were instruments replaced? Also, authors made no adjustment for inflation and this may have resulted in an underestimate of the cost savings. The approach to estimating instrument repair costs was also unclear. Sterile processing cost estimates were derived from the literature. Authors prorated published estimates downward to \$0.35 per instrument on the rationale that costs are lower in Alabama. It would have been helpful for the authors to cite data supporting this rationale.

Tray reduction has the potential to streamline tray

assembly and sterile processing, reduce operative time and increase operating room throughput. Unfortunately, the researchers did not directly measure these reductions. Researchers did document a reduction in wet trays, which are improperly sterilized, from 2% in 2015 to 0% in 2016. While it's not clear that this reduction should be attributed to the lean process, the authors make a compelling argument that less crowding on surgical trays would lead to fewer wet trays and a reduced need to rerun the autoclave.

Lean process case studies provide a compelling rationale for hospitals to implement surgical tray reduction. However, several factors limit more widespread adoption of lean processes.

The cost savings are modest. Even if lean processing were implemented in all surgical divisions, the savings of \$69,412 pale in comparison to the \$1.5 billion budget of the University of Alabama at Birmingham Hospital in 2017 (7).

Another factor limiting widespread reduction of surgical trays is a lack of incentives. Hospitals allocate budgets to departments based on past expenditures and as a result, departments have no incentive to reduce operating costs, as this would translate into budget reductions the following year. Ultimately, the beneficiaries of tray reduction will determine uptake. Do savings benefit the hospital bottom-line, surgical departments, insurers, or patients?

Department size plays a role in surgical tray reduction. As Cichos and colleagues acknowledge, achieving consensus on surgical instruments is easier in smaller departments. None amongst the three surgeons requested instruments

that had been removed from trays. In larger departments, a greater diversity of surgeon preferences may pose challenges and hinder tray reduction efforts.

Perhaps the most important barrier to more widespread implementation of tray reduction is a lack of agency amongst support staff. Cichos and colleagues allude to the challenges faced by surgical support staff, and the power imbalance that prohibits them from addressing the accumulation of instruments.

*“Surgeons are particular about their surgical tools... Most surgical scrub nurses error on having too many instruments on their back table instead of too few to avoid an angry surgeon asking for an urgently needed instrument during a critical part of an operation. This culture has led to an increasing number of instruments on most surgical trays that are rarely used”.*

Cichos and colleagues observed a 70% reduction in the total weight of the trays. The potential benefits to nurses, sterile processing personnel and other staff who handle surgical trays are obvious. Less musculoskeletal strain, easier instrument retrieval and increased job satisfaction could result. Beyond the direct cost savings, this additional value should be of interest to hospital administrators. Indeed, those who stand to benefit most are least empowered to lead tray reduction efforts. Thus surgeons, chairs, chiefs and chief operating officers owe it to staff to initiate lean processes, to their benefit and the ultimate benefit of the patients.

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### Footnote

*Conflicts of Interest:* The author has no conflicts of interest to declare.

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