

On time surgery start: Is standardization the answer?

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As health-care costs continue to increase, improving health-care efficiency without compromising patient welfare has never been more important. With the operating room being the potential greatest source of hospital revenue as well as costs, there is a growing interest in operating room value-based care. To add some perspective, Childers and others in 2014 calculated mean operating room costs per minute at 36–37 dollars in California's acute care hospitals with more than half of that being direct cost, 13–14 dollars being wages and benefits and the lowest contributor being surgical supplies (less than 4 dollars).¹ Operative start times and the impact on cost and outcomes are being increasingly explored particularly in complex multidisciplinary surgeries, of which cardiac surgeries are surely at the forefront. Causes of operative (incision) time delays probably differ with peculiarities in various institutions but some of these are common to all, for instance, preincision preparation particularly with the need for complex lines and monitors for invasive monitoring for cardiac surgeries as well as ensuring that all members of the multidisciplinary team are in sync to ensure a seamless and smooth operation.

The quality improvement study by Burton and colleagues highlighted adverse consequences of late start times including increased cost, delay in treatment, increase in medical errors, and patient complications.² Following the implementation of their multipronged intervention strategy, they were able to reduce late start times by 20% and found that adherence to on-time surgical start improved operating room (OR) efficiency, decreased cost, and improved employee satisfaction. Specifically, OR staff overtime and total time in the OR costs were reduced. They suggested that over time, this could result in significant health-care savings. While the authors listed a limitation of their study being the fact that it was performed in a single institution, their findings were in a similar direction as some previous studies evaluating late start times and impact on costs and patient outcomes. To mention a few, Overdyk et al. reported that after investigating etiologies of delayed start

times and educating staff on these issues, there was a significant reduction in delays due to the unavailability of surgeons, anesthesiologists, and residents resulting in earlier start times.³ They however noted that time savings would be more cost-effective with more flexible staffing of the OR and improved scheduling. Similarly, Yount and Colleagues found that afternoon start nonemergent cardiac surgeries were associated with a nearly 10% increase in costs as well as higher morbidity and mortality.⁴ They attributed the latter to possible surgeon and operating room staff fatigue, but like Dell'Aquila et al. suggested, we should additionally consider the impact of prolonged surgical fasting and its consequences with most patients being 'nil per os' from midnight regardless of surgical start times.⁵

A few studies do not share the enthusiasm of earlier start times defraying costs significantly or improving outcomes. Ou et al. found that late operating room start times were not associated with increased mortality or other complications in their tertiary-care academic medical center and while total hospital costs increased by 9%, this was not statistically significant.⁶ Likewise, Axtell and colleagues found no differences in perioperative outcomes, operative mortality, length of stay, or total hospital cost for elective cases after 3:00 p.m. although they suggested that this may be attributable to resources available at their large quaternary center regardless of time of day.⁷ Also, Luthra et al. in a 2015 edition of this journal noted that procedure times are more important than start time tardiness when considering efficiency indicators in cardiac surgery.⁸ Two other studies found no impact of late start times on morbidity and mortality, or length of hospital stay in cardiac surgeries, although one of the studies cited the presence of a 24-h in-house intensivist with no delay in extubation times.^{9,10}

Perhaps we should pause and ask ourselves a few questions. Is there a universally accepted definition for "late operative start time" and should there be? Should we focus on in-room time or knife-to-

skin time? Do staffing limitations and operator fatigue play a role in outcomes, duration of surgery, and cost? It is important to consider issues relevant to one's own practice and to be able to accommodate some degree of flexibility on a case-by-case basis. In other words, while health economics in the operating room is important, it is more crucial to strive to find a balance between being fiscally responsible, prioritizing patient safety, and avoiding errors related to time-pressure.

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