Delays in Perioperative Patient Flow: An Initial Analysis

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Introduction

- When considering the operating room (OR) suite as a hospital business unit, one must not only acknowledge its revenue-earning contribution to financial solvency but also the potential for margin-eroding cost when utilized inefficiently.
- One particularly challenging contributor to perioperative inefficiency is when patients are prevented from moving out of the OR into downstream phases of care once surgery has been completed. These so-called “PACU delays” (also known as recovery room admission delays) are particularly concerning for OR leadership because they increase direct labor costs and result in opportunity cost when additional surgery is prevented from being performed.
- At Thomas Jefferson University Hospital in Philadelphia, PA, PACU delays increased in frequency and magnitude in a relatively short period of time, prompting data-driven evaluation and innovation to determine underlying cause.

Methods

- September 2018 OR-PACU delay (OPD) data was obtained for the two PACU locations at our institution, “Thompson” and “Gibbon,” and was defined as minutes per case that patients were held in the OR despite being ready to move to the PACU.
- Baseline delay rates on a total case basis were determined to be 13% for “Thompson” PACU bound patient and 22% for “Gibbon” PACU patient. Mean delay time was 22 minutes (standard deviation 32 min) and 32 minutes (SD 50 min) for each PACU location, respectively (see figure 1 and figure 2).
- Financial analysis was performed that focused on the variable costs of OR labor (conservatively estimated at $25.63/min), yielding an estimated annualized financial impact of $4.9M.
- Interviews were conducted with unit managers including PACU nursing leadership, perioperative leadership, and patient flow management (PFMC) to gather data for analysis of cultural, nursing leadership, perioperative leadership, and patient flow.
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- At the same time, 13 additional hospital beds were made available in attempt decompress ED and PACU overflow.

Results

- Post-intervention OR-PACU delay metrics were then obtained for November 2018 and are displayed in Figures 3 and 4.
- OR-PACU delay rate for the two PACU locations “Thompson” and “Gibbon” were found to be 14% and 20%, respectively, an increase of 1% for Thompson and 2% for Gibbon PACUs.
- The magnitude of delays decreased to mean of 17 minutes (SD 24 min.) and 26 minutes (SD 50 min.) for each PACU, respectively.

Discussion

- Clearly the impact of delays in perioperative patient flow have urgent and far-reaching consequences in several domains: patient experience, safety, operational efficiency, and financial solvency.
- The estimated financial impact of $4.9M is a conservative estimate that highlights incremental labor cost alone, and does not reflect several other negative implications such as LOS, time to recovery, and opportunity cost of not performing surgery. Moreover, the effect on staff morale and patient satisfaction is unquantifiable and unsustainable.
- While the mean and standard deviation of OR-PACU delay minutes decreased modestly, the raw rate of delayed cases was essentially unchanged in months where surgical volume was similar—suggesting that capacity and staffing are likely only partial contributors to defects in perioperative patient flow (figure 5).
- Despite increasing structural and operational capacity by augmenting PACU staffing and increasing downstream bed availability, the results suggest that process defects exist that warrant further investigation. Such process-related hypotheses include inefficient service-line bed allocation, bed availability by level of patient acuity, and changes in case mix that represent decanting opportunities to other systemwide OR facilities. Further investigation is underway, and includes in-depth process analysis and value-stream mapping.

References