

Chapter 3

A Case Study Perspective for Balanced Perioperative Workflow Achievement through Data–Driven Process Improvement

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ABSTRACT

Based on a 143-month longitudinal study of an academic medical center, this paper examines operations management practices of continuous improvement, workflow balancing, benchmarking, and process reengineering within a hospital's perioperative operations. Specifically, this paper highlights data-driven efforts within perioperative sub-processes to balance overall patient workflow by eliminating bottlenecks, delays, and inefficiencies. This paper illustrates how dynamic technological activities of analysis, evaluation, and synthesis applied to internal and external organizational data can highlight complex relationships within integrated processes to identify process limitations and potential process capabilities, ultimately yielding balanced patient workflow through data-driven perioperative process improvement. Study implications and/or limitations are also included.

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INTRODUCTION

The perioperative process yields patient end-state goals: (1) a patient undergoes a surgical procedure; (2) minimal exacerbation of existing disorders; (3) avoidance of new morbidities; and (4) subsequent prompt procedure recovery (Silverman & Rosenbaum, 2009). To these end-state goals, a hospital's perioperative process provides surgical care for inpatients and outpatients during pre-operative, intra-operative, and immediate post-operative periods. Accordingly, the perioperative sub-processes (e.g. pre-operative, intra-operative, and post-operative) are sequential where each activity sequence paces the efficiency and effectiveness of subsequent activities. Furthermore, perioperative sub-processes require continuous parallel replenishment of sterile supplies and removal of soiled materials. Given the multiple sub-processes and associated dynamics, Fowler et al. (2008) views a hospital's perioperative process as complex and workflow complexity as a barrier to change and improvement. Nonetheless, integrated hospital information systems (IS) and information technology (IT) provide measurement and subsequent accountability for healthcare quality and cost, creating a dichotomy (e.g. quality versus cost) that represents the foundation for healthcare improvement (Dougherty & Conway, 2008).

The challenge of delivering quality, efficient, and cost-effective services affects all hospital stakeholders. Perioperative workflow tightly couples patient flow, patient safety, patient quality of care, and hospital stakeholders' satisfaction (i.e. patient, physician/surgeon, nurse, perioperative staff, and hospital administration). Consequently, implementing improvements that will result in timely patient flow through the perioperative process is both a challenge and an opportunity for hospital stakeholders, who often have a variety of opinions and perceptions as to where improvement efforts should focus. Furthermore, perioperative improvements ultimately affect not only patient quality of care, but also the operational and financial performance of the hospital. From an operational perspective, a hospital's perioperative process requires multidisciplinary, cross-functional teams to maneuver within complex, fast-paced, and critical situations—the hospital environment (McClusker et al., 2005). Similarly, from a hospital's financial perspective, the perioperative process is typically the primary source of hospital admissions, averaging between 55 to 65 percent of overall hospital margins (Peters & Blasco, 2004). Macario et al. (1995) identified 49 percent of total hospital costs as variable with the largest cost category being the perioperative process (e.g. 33 percent). Managing and optimizing a quality, efficient, flexible, and cost-effective perioperative process are critical success factors (CSFs), both operationally and financially, for any hospital. Moreover, increased government and industry regulations require performance and clinical outcome reporting as evidence of organizational quality, efficiency, and effectiveness (PwC, 2012).

This 143-month longitudinal case study covers a clinical scheduling IS (CSIS) implementation, integration, and use within an academic medical center's perioperative process. Empowered individuals driven by integrated internal and external organizational data facilitate the case results. The resulting systematic analysis and subsequent contextual understanding of the perioperative process identified opportunity for improvement. Specifically, the extension of data mining into the analysis and evaluation process of CSIS' data feedback from particular perioperative sub-processes provides the framework for the discovery and synthesis of redesign and reengineering within perioperative workflow to yield continuous process improvement. This paper investigates the research question of how data-driven continuous improvements can balance perioperative sub-process workflow to improve overall patient flow. Furthermore, investigation of the research question in this paper explains how analysis of perioperative performance metrics (e.g., key performance indicators), evaluation of perioperative sub-process constraints and capabilities, and synthesis of perioperative sub-process redesign implemented to balance perioperative workflow can

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