

Chapter 87

Using Key Performance Indicators to Reduce Perceived Perioperative Complexity and Improve Patient Workflow

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ABSTRACT

This study examines the development and use of balanced scorecard metrics as key performance indicators within each stage of the perioperative process to enable business process management across the entire process to gauge performance and target improvement opportunities. The identification of existing limitations, potential capabilities, and the subsequent contextual understanding are contributing factors toward perioperative improvement. This paper identifies how dynamic technological activities of analysis, evaluation, and synthesis applied to internal and external organizational data can highlight complex relationships within integrated hospital processes to address root causes rather than symptoms and ultimately yield improved capabilities. This case study investigates how integrated information systems can identify, qualify, and quantify perioperative performance indicators to measure improvement based on a 157-month longitudinal study of a large, 1,157 registered-bed teaching hospital. The theoretical and practical implications and/or limitations of this study's results are also discussed with respect to practitioners and researchers alike.

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INTRODUCTION

The current focus of healthcare administration in the United States has shifted toward performance monitoring and improving clinical outcomes to meet regulatory and reimbursement requirements due to the American Recovery and Reinvestment Act of 2009, the Health Information Technology for Economic and Clinical Health Act, the Affordable Care Act, and the Joint Commission on Accreditation of Healthcare Organizations (TJC) / Centers for Medicare & Medicaid Services (CMS) core measures (Blumenthal, 2012). Meeting these performance and reporting challenges require leveraging information systems (IS) and technologies (IT) (PwC, 2012). Consequently, the current widespread IS/IT adoption across United States healthcare also necessitates the need for value realization (Jones et al., 2014). To this end, this study investigates how key performance indicators (KPIs) across a hospital's entire perioperative process can identify and ultimately achieve improved patient workflow via business process management (BPM).

A hospital's perioperative process is complex (Fowler et al., 2008), involving multiple interconnected sub-processes that provide surgical care for inpatients and outpatients during pre-assessment, pre-operative, intra-operative, post-operative, and central sterile supply (CSS) activities. Furthermore, the perioperative process yields patient end-state goals (Silverman & Rosenbaum, 2009) where: (1) a correct diagnosis for surgical intervention is identified with noted co-morbidities and patient consent; (2) a patient undergoes the surgical procedure; (3) a patient exhibits minimal exacerbation of existing disorders; (4) a patient avoids new morbidities; and (5) a patient experiences prompt procedure recovery. Meeting perioperative patient end-state goals also avoids hospital-acquired-conditions and hospital-acquired-infections (HACs/HAIs) connected with negative financial incentives (CMS, 2015; Waters et al., 2015; NQF, 2008). However, perioperative sub-processes are sequential, where sub-process activity sequence paces the efficiency and effectiveness of subsequent sub-process activities and risks achievement of patient end-state goals. Consequently, the perioperative process is tightly coupled to patient safety, patient quality of care, patient flow, and stakeholders' satisfaction (i.e., patient, physician/surgeon, nurse, perioperative staff, and hospital administration).

This case study identifies complex perioperative dynamics within and across the entire process that is nested in the hospital environment and reflected via sub-process scorecard metrics. This research investigates how traditional BPM practices are applicable to reduce perioperative complexity, measure process performance, target areas for improvement, and subsequently yield improved patient workflow. This study associates particular perioperative sub-processes with individual patient end-state goals, specifically highlights multiple balanced scorecard metrics from each perioperative sub-process, and explains how the metrics are applicable as KPIs. The investigation method covers a longitudinal study of an integrated clinical scheduling information system (CSIS) within an academic medical center. The implementation of agile, integrated IS and subsequent contextual understanding of perioperative sub-process data prescribed opportunities for measured improvements. Specifically, developing and implementing perioperative sub-process metrics as KPIs, grounded in internal and external best-practices, provides the framework for targeting opportunities and evoking improvement. The combined assessment of sub-process KPIs also provide change dynamics for evaluation and improvement to the overall perioperative process.

The following sections review previous literature on KPIs, BPM, as well as perioperative scorecards and dashboards. Following the literature review, we present our methodology, case study background, observed effects, and summary discussion. By identifying a holistic framework for analysis, evaluation, and synthesis of sub-process KPIs with established benchmarks, this paper prescribes an a priori envi-

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