

Chapter 18

Fast Track to Reduce Patient Lead Time: A Discrete Event Simulation Analysis

Thais Gabriel Pincigher Silva

Rio de Janeiro State University, Brazil

Carolina Mendes e Senna de Castro

Rio de Janeiro State University, Brazil

Daniel Bouzon Nagem Assad

 <https://orcid.org/0000-0003-3911-4323>

Rio de Janeiro State University, Brazil

Ana Carolina Vasconcelos

Rio de Janeiro State University, Brazil

Thais Spiegel

 <https://orcid.org/0000-0002-7801-8492>

Rio de Janeiro State University, Brazil

ABSTRACT

Patient lead time in emergency units is a critical factor for quality of care and patient safety. The objective of the chapter is a public emergency care hospital of a Brazilian city, important for its localization in the second more populated area of the city. Green risk patients constitute more than half of attendances and represent the largest volume of out-of-goal attendances in the hospital. Considering this analysis, it was conducted the process modelling in order to understand patient pathway and the main related problems. A list of undesirable effects was subsequently composed, allowing the construction of the current reality tree (CRT). With the root causes identified, the literature suggested fast track as an alternative to reduce the average waiting time in queue until the medical care. The method used for testing scenarios of fast track was discrete events simulation.

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INTRODUCTION

In the last few decades, hospitals across the world have faced economic pressure (Capkun et al., 2012). Modernization of hospital structures has a two-fold objective: improving quality of care and reducing healthcare costs. The demand for productivity and quality in service recognized in the past still an issue now a day (Sundbo, 1994; Vahatlo & Kallio, 2015; Spiegel & Assad, 2018).

In Brazil, as a constitutional principle, people have the right to health, which is a State duty (Brasil, 1988). However, pragmatic differences and difficulties arise when the resources needed to support this right are restricted (Tieghi, 2013). As defined by Hollnagel et al. (2013, p. 59), healthcare is “an open, extensive and widely effective system characterized by large numbers of people, emerging and adaptive behaviors over time.”

In this context, designing healthcare operations refers to a complex object, which includes making decisions about the size of the health unit and its location, which healthcare flows will be available, what is the policy of hospital materials management, which IT system should be implemented according to the regulatory apparatus, among others (Spiegel & Cameira, 2016). The healthcare operations management refers to decisions and actions that occur within the limits defined by the operating system design. It includes activities such as the implementation of policies, procedures and strategies, contingent decision-making, process coordination, problem identification and resolution, response to uncertainty and unforeseen problems, and rewarding people (Spiegel et al, 2016). Improving the system refers to experimentation and learning activities aimed to improve operational performance over time (Gino & Pisano, 2008, p. 6).

In healthcare delivery systems, the problem of long waiting times is complex and highly variable (La & Jewkes, 2013). In some particular cases, such as emergency hospital units, the system is subject to demand peaks triggered by external and therefore uncontrollable events, where each patient presents a unique set of needs (Smith et al., 2007). Thus, this system needs to be designed to deal with variability in a scenario where there is an incompatibility between the investments and their potential demand (Hall, 2013).

The inefficiencies from wastes in the health service management also constitute a problem. To obtain efficiency gains in health services means reconciling different dimensions, such as quality, reliability, speed, availability and cost compatibility (Spiegel & Assad, 2016). Within the service operations strategy literature, there is a small but growing body of work that explores the links between operations strategy and healthcare performance (Silva et al., 2015). As discussed, this link is now even more important considering healthcare costs, the increasing importance of quality in healthcare, and current demographic patterns. Operations strategy has flourished as a field, yet there is still much to be learned regarding how this knowledge can be effectively applied within the healthcare setting. Specifically, how transferable are these manufacturing-derived principles to a setting where quality and costs take on a very different meaning (Spiegel & Cameira, 2016)?

La & Jewkes (2013) suggested that operations research (OR) techniques provide healthcare administrators a method of applying advanced analytical methods to facilitate better decision making. From this perspective, simulation and process modeling are essential tools for understanding resource allocation and utilization, as well the assessment of current and proposed system workflows.

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