



11th International Conference Interdisciplinarity in Engineering, INTER-ENG 2017, 5-6 October 2017, Tirgu-Mures, Romania

## New Approaches and Trends in Health Care

Flaviu Moldovan\*<sup>a</sup>

<sup>a</sup>University of Medicine and Pharmacy, 38 Gheorghe Marinescu street, Tirgu Mures 540139, Romania

---

### Abstract

*Background:* Over the years a variety of process improvement methodologies have been proposed for health care delivery and Lean healthcare is one such method. The aim of this paper is to provide a review of the existing literature on Lean health care. It seeks to describe how this concept has been applied and to assess how trends and methods of approach in Lean health care have evolved over the years. The objective is to demonstrate the scientific knowledge developed on Lean thinking in health care. *Design/methodology/approach:* Health care systems have begun to employ Lean methods, with reports of improvements appeared in the literature. The paper surveys the applications of Lean health care in the current literature by presenting the success stories and limitations of Lean production in various health care organizations. We start from the key concepts of Lean thinking and how these concepts can be applied in the health care environment.

*Findings:* Lean health care is a novel approach to deliver improved care services to patients, and we believe that some branches like emergency medicine, drug dispensing process in the health care sector can achieve high level of success by using this approach. It appears that there is an agreement about the potential of lean health care, but before large-scale implementation it is necessary to evaluate the true ability of Lean interventions to improve healthcare delivery. It still remains a challenge for specialists in the field to evaluate lean health care under a critical perspective.

© 2018 The Authors. Published by Elsevier B.V.

Peer-review under responsibility of the scientific committee of the 11th International Conference Interdisciplinarity in Engineering.

*Keywords:* lean manufacturing; lean thinking; lean health care; emergency department.

---

### 1. Introduction

With health care costs continuing to rise, a variety of process improvement methodologies have been proposed to

---

\* Corresponding author. Tel.: +40-751-133-107.

E-mail address: [moldovan.flaviu95@yahoo.com](mailto:moldovan.flaviu95@yahoo.com)

address the reported inefficiencies in health care delivery and Lean production is one such method. The management philosophy and tools of Lean production come from the manufacturing industry, where they were pioneered by Toyota Motor Corporation [1].

Hospitals today face major challenges, because patients demand quality of care to be improved continuously and health insurance companies demand the lowest possible prices. There are quality improvement programmes originating from industry, like Lean Manufacturing which is an excellent tool to tackle present-day health care challenges [2]. Some Hospitals use to adopt the Lean quality approach with little knowledge on how well they produce sustainable improvements.

Since Lean started being applied in health care, some effort to provide a complete resource surveying the existing literature have been done in order to assess trends and methods of approach in Lean health care, but it was not evaluated under a critical perspective [3]. In a study Glasgow [4] identified 539 potential articles about quality improvement methodologies including Lean and revealed that the true impact of this approach is difficult to judge, given that the lack of rigorous evaluation or clearly sustained improvements provides little evidence supporting broad adoption. There is still a need for future work that will improve the evidence base for understanding more about quality improvement approaches and how to achieve sustainable improvement [4].

The aim of this paper is to provide a review of the existing literature on Lean health care. It seeks to describe how this concept has been applied and to assess how trends and methods of approach in Lean health care have evolved over the years. The objective is to demonstrate the scientific knowledge developed on Lean thinking in health care.

## 2. Lean thinking

Lean thinking represents one of the newer schools of thought in manufacturing [5] which first were developed in the industrial setting of car manufacturing. More recent it has been applied in the service industries and health care, which is able to benefit substantially from the implementation of Lean, often broadly described as a “systems engineering” approach to health care [6].

In literature have been identified five key concepts of Lean thinking: value, value stream, flow, pull and perfection. After some reflections these principles are suitable to be applied to the health care environment, for example:

- a) Value requires performing tests for diagnostic identification by avoiding excessive costs;
- b) Value stream requires to avoid patient’s time squander and to focus on minimizing the time required between each step in a complex medical treatment with numerous steps;
- c) Flow of a patient medical investigation has to flow efficiently;
- d) Pull requires adapting the medical service to the variability of the patient numbers;
- e) Perfection in medicine can be described as the correct diagnosis and therapy in a timely manner.

The principles of Lean thinking is widespread in various contexts of health, such as emergency, oncology, pharmacy, intensive care unit, radiology, orthopedics, mental health clinics and cardiology services [7].

Based on experience of applying Lean thinking in the UK's National Health Service, Brandão de Souza [8] discusses the differences and similarities between Lean thinking in manufacturing and health care and why Lean implementation has been slower in health care than in manufacturing. It is evidenced that the problems to be faced and overcome when implementing Lean approaches are compared with those in other improvement programmes and the authors conclude that Lean approaches do offer ways to improve health care.

Systems engineering with the focus on Lean thinking must be viewed as a long-term strategic initiative of a health systems that embrace these methodologies. It provides improvement of patient care metrics, greater efficiency, and ultimately happier and healthier patients [9]. It appears that Lean thinking employed in systems engineering of a medical unit offers substantial rewards.

## 3. Lean in emergency departments

Emergency departments face problems with overcrowding, access block, cost containment, and increasing demand from patients. A study of Chan et al. [15] aimed to resolve these problems employing “Lean” management”.

متن کامل مقاله

دریافت فوری ←

**ISI**Articles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات