

# Lean Influenced by Leadership in Healthcare

Kari Sanford

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## ABSTRACT:

Lean healthcare can be adopted to improve efficiency and quality of patient care. While hospitals, clinics, and other health organizations have identified red flags in their system, and even drafted solutions, they struggle to implement these changes. Van Rossum *et al.* attributes this struggle to a gap between strategy and execution. Dr. McCarville teaches that enacting changes often begins with top leadership, following a transformational leadership model. Other methods, such as team leadership and workforce flexibility, contribute to adopting changes. To improve the effectiveness of the proposed system changes, they should be documented as new standards. This maintains the improvements observed in the experimental phase, and prevents the recurrence of poor system performance.

## INTRODUCTION:

The healthcare sector experiences breakthroughs in new medical information, technologies, relationships with other medical systems, legislature and federal standards. Organizations must constantly update their systems to accommodate all of the above, as well as “maintain and improve performance, quality of care and patient satisfaction” (van Rossum *et al.*, 2015). To balance consistent updates with quality performance, organizations can adopt lean principles.

Lean principles originate from the Japanese manufacturing industry. While initially applied to the engineering and business management sectors, many healthcare leaders have adopted lean into their management plans to improve patient care. Lean can be defined “as an integrated system of principles, practices, tools, and techniques focused on reducing waste, synchronizing work flows, and managing variability in production flows” (van Rossum *et al.*,

2015). The lean principles [value, stream, flow, pull, perfection] can be used to focus on treatment efficiency and patient satisfaction.

In the healthcare system, patients are the primary customers. These customers experience delays, repeated encounters, errors, and incorrect procedures during their hospital stay. A value stream map can illustrate precisely where these pain points occur in the hospital, or the system. Tools for waste reduction include *Andon* indicators for process, *Kanban* cards for inventory, and *Jidoka* for human supervised automation. It has been found that healthcare organizations use a “process of ‘trial and error’ and find it difficult to achieve sustainable change results and long-term improvements in quality and safety while simultaneously lowering costs” (van Rossum *et al.*, 2015). Kaplan *et al.* encourages an organizational transformation based on lean principles to ensure success of lean tool implementation.

#### PROBLEM DEFINITION:

This definition of lean healthcare is used to clarify how using lean methods can improve patient care:

Lean healthcare is a management philosophy to develop a hospital culture characterised by increased patient and other stakeholder satisfaction through continuous improvements in which all employees (managers, physicians, nurses, laboratory people, technicians, office people etc.) actively participate in identifying and reducing non-value-adding activities (waste) (Dahlgaard *et al.*, 2011).

#### LEADERSHIP STYLES:

*Transactional Leadership*

A transactional leader instructs their followers. “It is characterized by the leader clarifying performance criteria, stating expectations and determining what followers receive in return” (van Rossum *et al.*, 2015). This leadership style appears to be most commonly used in the healthcare industry now, and might be a major contributor to the failure to implement change. Using a hierarchical structure inhibits the bottom-up engagement with employees; it is an obstacle of implementing lean healthcare (Brandao de Souza and Pidd, 2011).

### *Transformational Leadership*

A transformational leader facilitates change in the organization from the top down. They define the need for change, share their vision for improvement, and inspire their followers to execute the idea. This leadership style is effective because the leader does not dictate to the followers, but rather encourages them to take their own initiative to help solve the problem (Hater and Bass, 1988).

Studies performed by Jimmerson *et al.* at Intermountain Health Care and Dickson *et al.* studied transformation techniques to lean healthcare in the emergency departments of four hospitals. The researchers identified that the drive and positive attitudes held by senior management to the system changes reassured workers that this was not a passing fad. When employees saw that management was committed to improvement, they chose to apply lean principles to establish a sustainable, new system.

### *Team Leadership*

Team leadership, also known as shared leadership, is defined as “a dynamic interactive influence process among individuals in groups for which the objective is to lead one another to

the achievement of group or organizational goals or both. This influence process often involves peer, or lateral, and at other times involves upward or downward hierarchical influence” (Pearce and Conger, 2003). Team leadership uses a bottom-up approach to solving solutions. The power is dispersed amongst all the members, instead of given to a single leader. This allows for active participation in brainstorming sessions, and strengthened communication in day-to-day tasks. Team leadership is useful for lean healthcare because it engages the employees who have the most interactions with the patients, or customers. These employees are aware of the daily generation of waste because they see it. They can pinpoint where quality and efficiency of care improvements can be made in the system. These employees must also implement the solutions, so it is important for them to be committed to plan.

#### WORKPLACE FLEXIBILITY:

The healthcare culture has previously described as one with “frequently dominating hierarchical blame and shame” (van Rossum *et al.*, 2015). Researchers would like to replace this culture with values of safety, continuous improvement, learning, and multidisciplinary work. These values can be woven into the culture through execution of workplace flexibility. Workplace flexibility is defined as, “the dynamic capability of the firm in the sense that it is focused on adapting employee attributes - such as knowledge, skills, and behaviors - to changing environmental conditions” (Bhattacharya *et al.*, 2005).

Walley’s work, pertaining to emergency care, concludes “it is essential that the entire staff is flexible and multi-skilled enough in order to respond to daily demand changes and adjust to the many different types of patients entering the system” (van Rossum *et al.*, 2015). All healthcare organizations interact with functional and professional silos, which are fragmented

care and professional practice. Improving an independent silo is not enough to impact the cumulative healthcare system. Furthermore, the use of simultaneous yet separate, silos coupled with a hierarchical structure could reduce staff flexibility in utilizing lean procedures and skills (Drucker, 1994). It is imperative that employees and leaders evaluate the process flow together to determine target areas (and metrics) for improvement (Kim *et al.*, 2006).

## CASE STUDY, OPERATING THEATRE OF DUTCH UNIVERSITY MEDICAL CENTRE

### *Hypotheses*

Considering the definitions of lean healthcare, the leadership styles, and workplace flexibility, van Rossum *et al.* drafted the following hypotheses for the Operating Theatre of Dutch University Medical Centre:

- H1: Transformational leadership at senior management level is positively related to the implementation of lean healthcare.
- H2. Team leadership is positively related to the implementation of lean healthcare.
- H3. Workforce flexibility is positively related to the implementation of lean healthcare.

### *Method*

The researchers used a cross-sectional survey-based methodology to leverage the large number of respondents for statistical evidence. The Operating Theatre, OT, of the Dutch University Medical Center had begun to implement lean healthcare 18 months before the study started. A process involvement team had defined and targeted performance metrics for improvement. This team, OT staff and one external consultant, used a cross-functional process to implement lean.

The researchers distributed a 69-question survey to all 380 OT staff via email. 103 employees responded, providing a response rate of 27%. The respondents' functions in the OT were varied, along with age and tenure. The respondents were sorted into hierarchical levels 1 and 2 to test differences in transformational leadership. The head of the OT and unit leaders were sorted into level 1. The medical employees that reported directly to a unit leader were sorted into level 2. All responses were collected on a Likert scale that ranged from fully disagree to fully agree. Questions were adjusted to the particular context of the hospital system. Each lean term was defined before being used in a question, to ensure clarity. "All questions referred to the respondent's perception of the extent to which lean healthcare process and results were present and implemented in the OT" (van Rossum *et al.*, 2015).

### *Results*

The researchers calculated the reliability of the implementation, or Cronbach's alpha, to be 0.93. The reliabilities for each of the three hypotheses were 0.89 or above. All correlations between scores were indicated to be significant. The researchers also performed a linear regression analysis [see Table 2]. "Each individual predictor also has a significant, specific, and positive relationship with the dependent variable, confirming all three hypotheses" (van Rossum *et al.*, 2015). Workplace flexibility has the strongest tie to the implementation of lean healthcare.

	Mean	SD	1	2	3	4	
1 Implementation of lean healthcare	4.27	0.87	(0.93)				<b>Table I.</b> Correlations and descriptive statistics for the main variables
2 Transformational leadership	4.82	1.16	0.54**	(0.95)			
3 Team leadership	4.53	0.87	0.55**	0.44**	(0.89)		
4 Workforce flexibility	4.44	0.82	0.60**	0.28**	0.53**	(0.90)	
<b>Notes:</b> On the diagonal are Cronbach's $\alpha$ . ** $p < 0.01$ level							
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Multiple $R = 0.73$							<b>Table II.</b> Results of the linear regression analysis
Durbin-Watson = 2.21	$\beta$		$t$			$p$ (one-tailed)	
Transformational leadership	0.34		4.42			0.000	
Team leadership	0.20		2.25			0.013	
Workforce flexibility	0.40		4.90			0.000	

Table I and Table II, (van Rossum *et al.*, 2015)**CASE STUDY LESSONS LEARNED:**

- Transformational leadership helps reduce the implementation gap, but it is more effective when applied with workforce flexibility.
- The finding that lean can only be achieved by optimization of an entire workflow is not just applicable to a silo, such as an OT, but is applicable to all other silos that need to be optimized when practicing lean healthcare. Use lean in the emergency room, patient registration, patient discharge, and transportation.
- Use a longitudinal study to detect causality between the variables. This would have helped the researchers determine if the leadership styles had any relationship to each other and/or to workforce flexibility. This information would provide healthcare leaders with the insight of which variable truly has a stronger relationship to implementing lean healthcare, so they can focus on that feature.
- Gather more data from the population study. Less than a third of the potential respondents replied to the survey the researchers sent out to the OT staff. The researchers



observed that the respondent data collected did reflect the OT functions, but it is undermined if it also reflects psychological characteristics (van Rossum *et al.*, 2015).

- “The strong interdependent nature of surgery demands a high level of shared understanding among members about their respective roles, tasks and objectives throughout the process and their responses to unexpected clinical events” (van Rossum *et al.*, 2015). If employees are cross-trained, or at least engage in a bottom-up form, they are more likely to synergize better to provide the best patient care.
- Use a baseline measurement from before lean healthcare improvement. The Dutch University Medical Centre did not have the performance metrics from before lean was implemented. Lack of this information limited the researchers’ ability to quantify the impact that lean had on the system.

### CONCLUSIONS:

The researcher’s cross-sectional study in an OT proved that transformational leadership best supports the implementation of lean healthcare from a senior management perspective. Team leadership is also useful, because it engages them in creating the success in their own work environment. Workforce flexibility enables all employees to adapt to the ever-changing requirements in the healthcare industry. It fosters a new culture that encourages multidisciplinary work, regardless of physical barriers. The use of transformational leadership and workforce flexibility optimize workflow (van Rossum *et al.*, 2015).

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