ABSTRACT

The lean philosophy became one of the most popular Japanese quality management approaches in the West, which aims to increase efficiency. The lean concept has been already proven in emergency rooms in developed countries. The aim of the paper is to evaluate whether this concept is transferrable to emerging countries.

KEYWORDS: Central Eastern Europe, Emergency Rooms, Lean, Six Sigma

INTRODUCTION

Emergency medical care (EMC), in particular emergency rooms (ER), also known as emergency department (ED) and accident & emergency (A&E) is one of the most widely publicized area of the health care system (Van der Vaart at al., 2011). Criticism and public debate can be especially strong when process failures (for instance excess time spent in waiting rooms or misdiagnoses) happen as hospital-based emergency and trauma care is critically important to the health and well-being of Americans (IOM, 2006).

LITERATURE REVIEW

Dykstra (1997) differentiates between the “Anglo-American Model”, which may be in the hospital (emergency medicine) and pre-hospital (emergency medical services) settings but in both cases the goal is to bring the patient to the hospital, and the “Franco-German Model” which focusing on emergency medicine in a pre-hospital setting (physicians and technology are sent to the scene). However, in both cases all major changes in the health care system affects ER as it provides a safety net of the whole health care system among many reasons such as people with limited access to a level of appropriate primary care can also use it. Christensen (2013) points out that the root of the problem relies within the rising demand for emergency care as the capacity for hospitals, ambulance services and other emergency workers to provide it is actually dropping.

Currently, one of the most concerning is the level of inefficiency of spending that describes the ER and the health care system as a whole. A review of US healthcare expenses by the Institutes of Medicine (IOM, 2012) revealed that 30 cents of every dollar spent on medical care is wasted,
adding up to $750 billion annually, which is larger than the defense budget proposed by the Pentagon for 2014 - $526.6 billion (DOD, 2013).

HYPOTHESES/MODEL

The primary purpose of the paper is to investigate whether best practices in developed countries can be applied to create a better understanding of the lean process in the ER in emerging countries. Based on the current literature review there are three hypotheses that will be the aim for the pilot project described by the paper and the later research.

H1 • Lean implementation will face resistance by ER staff.
H2 • Based on the OECD numbers lean practices are not adapted.
H3 • International benchmark is implementable in emerging settings as well.

The US health care system and its implications to ER

To better understand the US health care challenges, it is useful to take a closer look what the statistics say of other countries. According to the OECD’s health expenditure data (OECD, 2013), the United States spends much more on health care (including ER services) than any other country in the world; yet, the return on investment (e.g. life expectancy) is not that good as those indicators are below the OECD average. The per capita expenditure in the United States was $8,508 compared to $4,448 in Denmark; therefore these numbers should indicate a large difference between these countries in the case of the population related health data (e.g. life expectancy etc.). Surprisingly however, in the case of Denmark (and most other OECD countries), the population’s health indicators are much better than in the US, in which health care costs are double or more. Moreover, according to international surveys (Pedersen, 2012), more than 90 percent of Danes are totally satisfied with their health care (including ER services), which uses the most advanced methods available anywhere (including the US) while the per capita there are more hospital beds and doctors than in the US.

While it should be recognized that there is a wide variety of reasons what explain the difference, but the literature (Hopp and Lovejoy, 2013) agrees that the main cause of its lower cost level is due that it can be a lot simpler to manage.

In the case of the most efficient OECD health care schemes with some proof of identification (national/EU citizenship or residence status) people are free to pick their own doctors and hospitals. Furthermore they have less administrative burdens as there are no uninsured (e.g. no medical insurance companies/lawyers/etc. operating for profit exist within the system, no need for financial background checks, etc.). The universal (that in most cases non-profit) health care means indeed higher overall tax bill and that healthy people are paying for the treatment of sick people through their taxes. Yet, if the system kept simple enough, it finally ends up being cheaper for everybody. A report from the Institute of Medicine (IOM, 2012) also described that America's health care system has become far too complex and costly to continue business as usual. However, the level of efficiency could be changed dramatically in the United States as well (regardless from other factors, like for-profit and non-profit approach), if the health care processes
– including ER – became more efficient. Properly implemented lean principles could help to achieve that.

**Health care industry and the lean philosophy**

As the health care industry undergoes major changes, several new movements appeared. However, with time many trends tend to fade and only some will have a long-term, positive impact on the future health care design. While many developments popped up in the industry in the recent years, in particular in the emergency rooms; yet only two of them became popular: strategic simulation design and lean processing (Cavallaro, 2013). The latter especially shaped health services as lean principles were applied in almost all health care setting (Poksinska, 2010; Mazzocato et al., 2010).

Most lean definitions are focusing on the concept of eliminating waste or “muda” (Womack and Jones, 2003; Bicheno and Holweg, 2004). While Toyota made the concern about waste and methods for avoiding it widely recognized (Liker, 2004), the concept is present from the beginnings of human civilization. Yet, lean philosophy has only recently been widely incorporated within the health care design industry (Kollberg et al., 2004).

The health care efficiency movement is also promoting process speed: increasing efficiency by reducing the inputs needed to produce a unit of output or equivalently increase the amount of output from a given quantity of inputs. Practically lean aims for (a) removal of the different wastes – Ohno (1988) identified seven of them, (b) properly configure work cells, (c) adding value with every step of any process and (d) move to single piece flow (Pascal, 2007).

The IOM study (IOM, 2012) identified six major areas of medical waste:

1. unnecessary services
2. inefficient delivery of care
3. excess administrative costs
4. inflated prices
5. prevention failures
6. fraud

In the case of the ER services the first three are crucial as one of the reason U.S. health care, including ER, spending increased excessively as hospitals and doctors continuously charge more and more for their services with little transparency about the origins of those rising cost. Fortunately, these can be addressed if lean service operations are adopt to the translated lean production principles (Ahlstrom, 2004). Moreover, ER can be perceived as a production system since according to Hopp (2011) any system that delivers goods or services can be determined like that. Also, it comprised of processed, in which physical and human resources are used to
convert a set of inputs (information, material, labor) into outputs (different ER services) that satisfy patients' needs.

These risks need to be addressed as delivering a great patient experience will be increasingly critical for hospitals to gain market share, increase profitability and improve outcomes. Lean is a great answer known to consistently provide these benefits. On the other hand, while many hospitals embraced the philosophy, it should not be forgotten that saying lean alone does not mean that the organization is actually doing lean.

**Positive lean and its benefits in the ER settings**

One reason that lean methods are increasingly implemented across the US is to establish streams for patient flows in an emergency medical care to comply with the strict cost burdens. The Emergency Medical Treatment and Active Labor Act (EMTALA), which is part of the Consolidated Omnibus Budget Reconciliation Act (COBRA) requires Medicare-participating hospitals to provide emergency health care treatment to anyone needing it regardless of citizenship, legal status, or ability to pay (CMS.gov, 2013). Lean also addressed urgent quality and safety concerns (Young and McLean, 2008, 2009).

The success of the principles explained by that instead changing the specifics of clinical practice, those rather concerned with improving the processes through ER, clinical and other systems (Ben-Tovim et al., 2007). Patient wait times, and deteriorating patient and staff satisfaction could be greatly improved by applying business management techniques (Trisolini, 2002) and by establishing lean assessment frameworks (Bhasin, 2011; Stamatis, 2011) without adding any new funding or beds. The most popular methods lean techniques are the following: value stream mapping, just in time delivery techniques, workplace organization, reduction of systemic wastes, use of the worker as the source of quality improvement and ongoing refinement of the process steps (Ng et al., 2010). All these ensured that lean adapters can achieve operational improvements but the effects mostly tangible on the local level, instead of an organization-wide strategic impact.

Hopp (2013) explained why lean is not living up to its potential. History shows that using lean tools to improve efficiency and aim for a better quality also reveal challenges:

1) complexity (more complex production and service environments create extensive policies),
2) dissemination (the innovation and improvement transfer between systems become more difficult due to their increasing dissimilarities) and
3) motivation (negative impacts of efficiency affects work gratification, which decreases employee motivation) issues.

Therefore an integrated approach is needed. Hopp’s relies on four aspects to describe the possible outcomes (Ignorant Lean, Neutral Lean, Negative Lean, Positive Lean), which describe the interaction between efficiency and motivation in lean systems. For instance Negative Lean characterizes the classic failures of Taylorism, while Positive Lean represents a self-improving situation in which efficiency improvements actually increase worker motivation, which in turn drives further efficiency improvements (Hopp, 2013).
METHODS

As a pilot phase of the project interviews were conducted with staff in different positions in the emergency room in two Central Eastern European countries. Topics mainly touched on providing a brief explanation of a possible lean implementation for the ER, getting feedback of how services are contacted on a daily basis and asking suggestions for improvement. Interviews were conducted with staff in different age groups to see the attitude towards change. Data has been kept confidential and anonymous and assured personal that it will only be used on an aggregate level for the pilot phase of this research.

The pilot interview phase focused on the below topics to see whether it would be possible to conduct a similar research based on best practices from other countries:

- Would the ER allow researchers to conduct pilot interviews?
- What is the general perception towards change?
- Are employees reluctant to share concerns regarding the current system?
- Is it possible to conduct interviews with stuff at all levels?
- Is the ER focusing on employee motivation?
- Does the ER staff have a deeper understanding of the impact of any problems?
- Is eliminating waste considered as a priority?

RESULTS

The initial findings revealed that ER staff is not well educated to understand the benefits of lean. Overall we could conclude that interviewing staff in the region’s public and private clinics would reveal different results. Private clinics in the area are more focused on improving efficiency, implementing new IT systems, motivating staff and providing proper training. As a matter of fact, these private clinics have been built recently to support the medical tourism industry. Eastern European countries attract Europeans and Americans for medical procedures that are out of their basic insurance policy in their respective country. These facilities have been built to function in an efficient way with computer systems in place. Public hospitals on the other hand are rarely using computerized systems; patient charts are still in paper form, which increases the time spent in the ER. Hospitals in more developed countries on the other hand are already one step ahead with better computer systems, less waiting time and more efficient care giving process.

The extended research in the given region should be built as kick-off process, based on the pilot interviews. From the initial interviews we were able to research some areas of the lean
implementation. We have focused on identifying whether hospitals in the area would be willing to share information regarding the processes used in their facility. Many hospitals rejected the request up front denying to share any information about their current working process. These countries have another aspect that needs to be taken into consideration. Medical stuff is motivated to work in Western European countries due to better facilities, higher standards and benefit package. Statistics show that since Romania joined the European Union in 2007, approximately twenty-five thousand doctors and fifteen thousand nurses left the country (The Bulletin, 2014). According to the World Health Organization latest data published in 2012, Romania has one of the lowest physician density of 2.4 doctors per thousand people while for Hungary the same indicator is 3.1.

The Eastern European region selected in the pilot phase had the lowest healthcare spending budget as % of GDP 5.8% for 2015, while developed regions had significantly higher budget such as 16.5% of GDP in North America; 10.5% GDP in Western Europe (EIU, 2015). Since most hospitals in the analyzed region are public the healthcare budget plays an important role in the feasibility of the lean implementation. Furthermore, analysts still see a potential change in Eastern European healthcare spending, they project an average growth of 7.7% a year between 2014 and 2018 (Deloitte, 2015).

The twenty-first-century healthcare system should focus on the following quality aims (IOM, 2001): safe – avoid injuries to patients; effective – provide services based on scientific knowledge to all who could benefit; patient-centered – ensuring that patient values guide clinical decisions; timely – minimizing delays; efficient – avoiding waste; equitable – providing standardized care that does not differentiate patients. All these aims are just a starting point, when developing the pilot interview phase, measuring the areas of improvement and quantifying these is an important factor as well. In a recently published study Abdelhadi A. (2015) is applying lean metrics to measure customer service perceptions using the Takt time measure (operational time per period/required production volume per period) to highlight improvement areas.

Similar studies conducted by Waring and Bishop (2010) found that lean was largely resisted by clinical staff considering it as an initiative by the management team to cut costs. On the contrary surveys conducted in a Nottingham University Hospital in UK reveled that professionals were enthusiastic about lean mainly due to a national policy and the professional engagement of doctors in the emergency medicine (Timmons et. al. 2014). A study from Denmark showed that efficiency in patient treatment increased using various lean tools such as stream mapping and Kaizen tables. The study emphasized that employees should be included in the lean implementation process to visualize the changes and realize how important their implementation is. (Dammand et. al., 2014).
DISCUSSION AND CONCLUSIONS

By adjusting Positive Lean to the ER specifics tasks, it is possible to identify what are the necessary factors to an efficient lean implementation in the ER setting:

1) The most crucial for the ER staff is to develop a deeper understanding of the impact of variability on flow. Without understanding the possible root causes of the problem, only the “tip of the iceberg” is visible and the true problems are not identified and addressed.

2) Job characteristics (task significance, task identity, skill variety, autonomy and feedback) have tremendous impact on worker satisfaction and motivation. The hospital leadership has the responsibility to effectively use these concepts in the workplace incorporated into its management systems.

3) Eliminating waste should be a priority but the main focus should be building capabilities on the basis of a muda-mura-muri based vision.

4) Motivation cannot be raised permanently with short-term incentives. Leadership needs a long-term planning horizon to workforce development and motivation and let sufficient time to pay off. The importance of feedback should be emphasized.

5) Finally, positive lean should always leave space for exploration and experimentation. While ER has a very structured process, it still provides plenty of opportunities for employees to discover new ways to make work both more efficient and more rewarding.

Positive lean offers great improvement possibilities for the ER processes and most of all many benefits for the stakeholders, including ER staff, investors and the patients nonetheless.
REFERENCES


