

A Study of Lean in Oncology: Reducing Waste and Increasing Value

Sunil Aggarwal^{1*}, Sanju A¹ and Somya Aggarwal²

¹Avalon University School of Medicine, Netherlands A

²Rochester Institute of Technology, USA

Submission: April 17, 2015; Published: April 25, 2016

*Corresponding author: Sunil Aggarwal MD,MBA, Master Black Belt in Lean Six Sigma, Avalon University, Netherlands A., Tel: 1-717-622-1264; Email: drsunilaggarwal@gmail.com

Abstract

The literary meaning of lean is thin and is a process with focused, productive approach towards achieving better results. This necessitates elimination of waste in the process and effective use of available resources to its best.

With the growing need for quicker and effective oncology care, it is imperative that cancer centers with big turnover of patients do not make their patients "sit on cold benches" waiting for their turn to come: first to make an appointment and then to get a treatment initiated that may includescans like a PET-CT or MRI, and eventually cancer therapy. It is also equally important to understand the psychology and mental agony of these waiting patients for the eventual diagnostic outcome from their scans and that this mental agony is enhanced by the longer wait time.

Keywords: Lean; Oncology; Lean cancer care

Abbreviations: CT: Computed Tomography; PET-CT Positron Emission Tomography; MRI: Magnetic Resonance Imaging; TAT: Turnaround Time; VOC: Voice of Customer; DMAIC: Define, Measure, Analyze, Improve and Control; SIPOC: Suppliers, inputs, process, outputs, customers

Introduction

Lean began with Taiichi Ohno's articulation of Toyota Production System [1]. Lean has its focus on finding ways to channelize processes and reduce waste [2]. Various quality approaches are in lace but Lean has proved to be effective in minimizing waste and increasing value.

"Lean Cancer Care" is the term used for process improvisation, approach to cancer drug delivery with improved standard care and removal of waste in a patient-centric management.

Methodology

KMM Hospital (KMMH) has been implementing Lean over the years in various departments like cardiovascular surgery, pathology, and orthopedics. With the growing need to be more effective with concerns and competitors, the management of the hospital noticed that oncology department needs to be revamped as Process excellence in its protocols and identified three areas of concern and formed simultaneous study teams for these. These three study teams were assigned to study the effectiveness of Lean methodologies in cancer drug delivery, diagnostics, and waste in the system. The three teams worked independently in their study protocol, but the ultimate approach

was a common route to achieve results.

Process of Lean and Cancer Management in KMM Hospital

The analysis lead to specific targets that meant to be achieved to recondition the working of the oncology department and this should lead to an early appointment, proper delivery of technically sound procedures, and effective and early cancer management. This would mean an overall satisfaction of the VOC and a good confidence building measure. VOC are the cancer patients awaiting treatment and oncologists wanting to give prompt treatment.

Once the problems were identified, the teams also had to identify the risks of failures that were involved if these problems were not corrected effectively. It was identified clearly that waste, that could be, unnecessary procedures like PET-CT, long wait, decreased quality with excessive travel time, inappropriate prescription of some of the costly anti- cancer drugs, and due to defensive medicine practice mindset.

The final objective of increased revenue generation and improvement in the overall process would then be targeted in critical cash strived economy [3] (Figure 1).

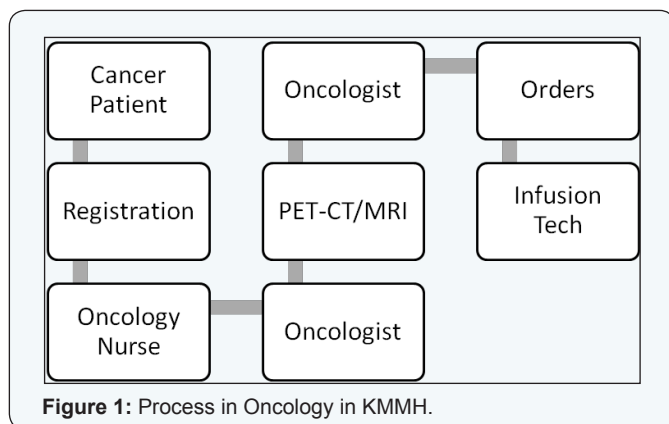


Figure 1: Process in Oncology in KMMH.

Process Importance

The teams used DMAIC approach as a common platform to study the effectiveness in terms of improvements, revenue generation, and customer satisfaction.

A preliminary SWOT analysis was done about the undertaken project. It was noticed that the Strength and weaknesses are internal factors within the oncology department and weaknesses need to be turned into strength by use of external opportunities and minimizing threats. This meant identifying the threats in the form of past experiences and also future possibilities within the system.

The Voice of customers (VOC) was critical to the outcomes as the customers were just not patients but also all the other physicians.

DMAIC –Oncology Experience

Define Phase

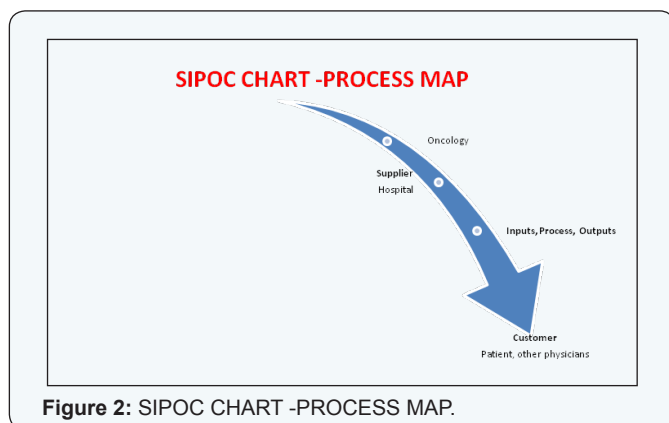


Figure 2: SIPOC CHART -PROCESS MAP.

This was a crucial study as everyone in the hospital understood that improvements in oncology meant improving the overall revenue and in turn infrastructure of the KMMH. So the teams started looking into the rationale of the need for such a study as to what would happen if changes were not incorporated immediately in the oncology and how would the Voice of Customers (patients and physicians) effect the ultimate

Critical to Quality factors that needed to be an important aspect in the final outcome. Also, the Voice of Customers was equally important in determining how soon this project needs to be completed so as to trigger its earliest implementation. A SIPOC model was generated to outline suppliers, Inputs, process, Outputs and customers. This model was in the form of a flow diagram and was used by all the three teams (Figure 2).

Problem Definition

During this phase of study, it was clearly defined that the customers, both patients, and physicians, were not satisfied as there was undue delay in the turnaround time of patient management and use of appropriate cancer drugs. The oncology team had an approach of “can’t help it” rather than “must help it”. This further leads to “frustrated” customers. This was causing a drift of patient to other competitor oncology groups and also a decrease in the registration of new patients since the negativity affected the reputation of KMMH in the community as the hospital with delays and ultimately loss of revenues.

Measure Phase

The teams were now ready to understand the basic matrices that would measure the inputs and outputs of this process by measurement of the appointment waiting time, faulty procedures leading to delays, and TAT of the delivery to the effective management.

Hence, it was imperative to understand key input and output variables (KIPV/KOPV) and selective determination of factors that are not so important to this process that could be removed. The fundamental principle was to understand the speed and integrity of the whole process by all the personnel within oncology department.

Needless to mention here is the importance to measure the positivity in the work culture within the department.

This was a big task as Oncology Department is a major department in KMMH and this meant preparing questionnaires and a considerable time was spent on measure phase before the teams could move on to the analyze phase.

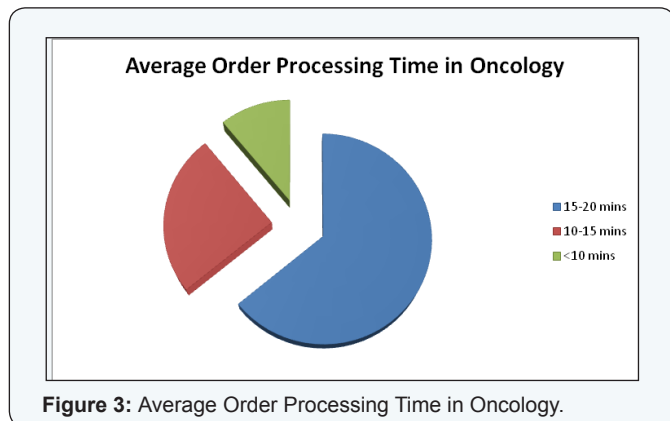
Analyze Phase

This phase leads to determination of the most critical factors that were causing a delay in the TAT of the oncology care and this was due to:

- Incomplete orders and lack of fulfillment of orders.
- An “Order backlog meeting” held every morning for 15 minutes and assigning of special tasks that morning. This necessitated the employment of Lean to improve the whole process.
- Delay of chemotherapy Infusion preparation of patients lead to delayed TAT of effective management

- Ineffective communication between the oncology team led them to “look for” patient notes. This was mainly due to ineffective data management and the oncologists had no option but to wait for the patients and an unnecessary waste of time.

It was measured at KMMH that:



1. There are defects in all the processes mentioned above leading to a vicious cycle correlated with each other.
2. Murphy’s analysis and SIPOC factors, and hence the defects, were clearly measurable and important factors that needed to be analyzed (Figure 3).

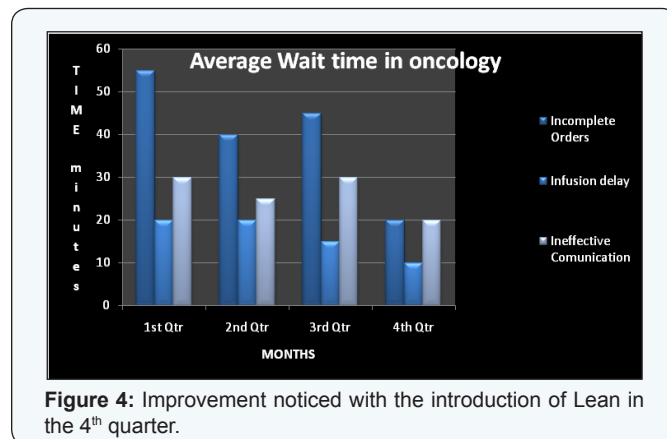
Improve Phase

- Several meetings were called by the team leads with the Head of this study about improving the process. Throughout this study, changes were made about the novel ideas received from VOC and if found suitable were implemented. The oncology now has instant messenger software to link the team together and avoid wasting time for searching patient note.
- It has been realized that the “work backlog meeting” is, in fact, helping to increase the backlog more than to help to eliminate it. The pharmacy and infusion coordinator were made familiar with workflow data and this led to a substantial jump in overall process improvement as these personnel realized their inputs in the process.
- In this phase of improvement, the best remedial steps were benchmarked as standards for improvement and policies were framed underlining them as the best solutions for improvement. The training of personnel in Lean methodologies has led to a better, organized oncology department (Figure 4).

Control Phase

Control and continuous implementation of the remedial measures taken so far are very important. All the employees in

oncology department have been informed by way of a handout about the various changes that have been implemented in the department by way of this project. They have been informed that these changes are policies effectively immediately and managers within the department have been assigned the task to incorporate them as part of employee appraisal and performance report on a bi-annual basis.



An ethics committee, consisting of oncologists, Lean management, and oncology managers have been set up to periodically verify on the implementation of these policies and report these to CEO of the hospital in the form of a report every month.

An educational program to study Lean has been started in the hospital where by the already certified Lean and six sigma professionals can train interested employees towards a certifying exam from a competent Lean professional.

Results and Conclusion

Lean is an advanced tool for enhancing revenue generation in KMMH and also increases patient and physician satisfaction by decreasing the reporting turnaround time (TAT). Lean has created an improvised work approach and a better understanding of generating revenues. It has clearly pointed to us that Voice of customer is something that underlines the final success in achieving the desired results. Lean tells us about the approach to stay focused and takes us from the step to observe right up to performance appraisals and verification of the implementation of renewed policies but requires dedicated leadership and supportive institutional environment [4]. With Lean in place, there is no scope of not improvising process and serves as a roadmap [5].

Originality/Value

This paper will serve as a guide for various organizations striving to excel and improve revenue. This will be an approach to set a benchmark in patient management and lean cancer care by the use of lean methods.

References

1. Ohno T (1988) Toyota Production System: Beyond Large-Scale Production. Productivity Press. Original Japanese edition published in 1978 by Diamond Press, New York, USA.
2. Bendell T (2006) A review and comparison of Six Sigma and the Lean organizations. TQM Magazine. 18(3): 255-262.
3. Critical issues include using Lean Six Sigma to generate cash in difficult economic times, development of data-based process management systems and the use of working on improvement as a leadership development tool.
4. Kaplan GS, Patterson SH, ChingJM, Blackmore CC (2014) Why Lean doesn't work for everyone. BMJ quality & safety.
5. Jens J, Dahlgaard, Su MiDahlgaard-Park (2006) Lean production, six sigma quality, TQM and company culture", The TQM Magazine, 18(3): 263-281.