Eliminating Room Exits with a Lean Approach

By Hunter Spencer
Doctor of Osteopathic Medicine 2017, Pacific Northwest University of Health Sciences
GE-NMF Primary Care Leadership Program Scholar

Abstract
Lean principles can be used in community health centers (CHCs) to increase value to patients and decrease waste. When providers must interrupt a patient encounter and exit the exam room to retrieve a necessary item not on-hand, there is a waste of time for the provider and patient and a waste of motion for the provider. These events, called room exits, are decreased using a 5 S methodology to reorganize exam rooms.

Keywords: Lean, waste, 5 S, community health centers, kanban cards

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Introduction

Patients typically face many episodes of waiting during the course of a single appointment with their primary care provider. They must wait in line to check in at the front desk and then wait in the lobby for the medical assistant (MA) to call them back to the exam room. After working with the MA they must wait for the provider, followed by waiting to get blood draws, make their next appointment and pick up prescriptions in the pharmacy. Combined, these episodes of waiting are taxing for patients and the patient experience is improved when waiting time is minimized. One particularly vexing episode of waiting occurs when providers must exit a room during a patient encounter to retrieve a necessary item not on-hand. The primary outcome of this study was a reduction in these events, called "room exits," achieved by applying a Lean approach to room organization and restocking. Furthermore, quantified adherence to 5 S methodology is expected to increase. These outcomes will improve the patient experience and eliminate waste.

Background

Lean management is a management philosophy built on the premise of eliminating waste to increase value (1). In this philosophy, value is defined as anything that the customer is willing to pay for and waste is anything that does not add value (1). Thus in healthcare, value is defined by the patient and includes health, customer service and efficiency. Waste is further categorized into seven types including wastes of time, motion, overproduction, defect, inventory, transportation and over-processing (1). 5 S is a system within Lean designed to organize supplies and materials so as to increase value (1). The 5 Ss are (2):

- Sort- separate necessary items from necessary items

- Sweep- ensure that all necessary materials are in place

- Standardize- ensure that similar work spaces are uniform

- Simplify- ensure that the system is easy to learn and maintain

- Self-discipline- employ a maintenance system to foster continued improvement.

5S is a visual system to facilitate simplicity and efficient recognition of missing or misplaced items (1). An example of this visual philosophy is the kanban card system (Fig. 1). Kanban cards are placed in the workspace along side a necessary item. When an item's stock is depleted to a critical threshold, the kanban card is used as a visual signal that restocking is necessary. Because the kanban card specifies the threshold at which restocking should occur, the item should never completely run out of stock, eliminating many potential wastes. The card also includes the maximum stock level, or par level, which ensures that waste of over-stocking is avoided. Finally the card includes a picture of the item and the items name to simplify the restocking process.

Fig. 1. A kanban card is placed alongside an item in the workspace (1.a). When the corresponding item is depleted to a certain level (1.b), the card is removed and displayed (1.c). This triggers restocking by the MA and ideal stock level is restored (1.d).

a   b   c   d

Lean philosophy and techniques began in auto manufacturing and have spread widely to other industries (1). In healthcare, Lean has been used to decrease wait times and improve patient satisfaction (3). Yet, many of the success stories of Lean implementation in healthcare predominantly occur in the process-rich environment of in-patient care (1, 3, 4). The benefits of lean in an out-patient primary care, community health center (CHC) setting are less well known.

Room exits represent a waste of time for the patient and provider and a waste of motion for the provider. Given the success of 5S techniques in manufacturing and hospitals, a similar approach in a CHC should result in decreased room exits, elimination of waste and increased value for the patient.

Methods

A longitudinal, self-controlled trial was completed. The author or a peer GE-NMF Primary Care Leadership Program scholar directly observed room exits demonstrated by one provider working in three specific rooms on five separate Mondays at the HealthPoint Medical Clinic in Kent, WA (KEMC). Room exits were defined as the provider interrupting a patient encounter and exiting the room for the express purpose of retrieving an item necessary for the patient interaction. The author and two MAs who typically work in the three specific rooms performed the intervention. The intervention was a 5 S reorganization of the rooms. This focused on sorting, sweeping, simplifying and standardizing all supplies in the exam rooms located on the countertop, in the cabinets under the counter, in the drawers under the counter, mounted on the wall and in the drawers built in to the exam table. Kanban cards were created for each item on the standardized

list either by the author or by the lead MA at KEMC or taken from a pre-existing database created by HealthPoint staff. The items included in each room, their location, their par level and refill level were specified by a pre-existing standardization list created by the lead MA at KEMC in conjunction with other MAs at that location. The author rated 5S adherence based on a standard rubric used by the Virginia Mason Institute (2).

Results

26 hours of clinic work were observed for the pre-intervention state and 20 hours of observation were recorded for the post-intervention state. During the pre-intervention state, 10 room exits were noted (Fig. 2). Two items, the ultrasound Doppler used for obstetric visits and the cards given to patients to record blood pressure and blood glucose, accounted for 60% of these exits. In the post intervention state, room exits were decreased by 80%. Items not included on the standardization list accounted for all the post-intervention room exits (Fig. 2). Room exits were decreased from 3.1 to 0.8 per the typical eight-hour shift worked by HealthPoint providers.

Fig. 2. Room exits stratified by causative item. Black stars indicate items not included on the standardization list.
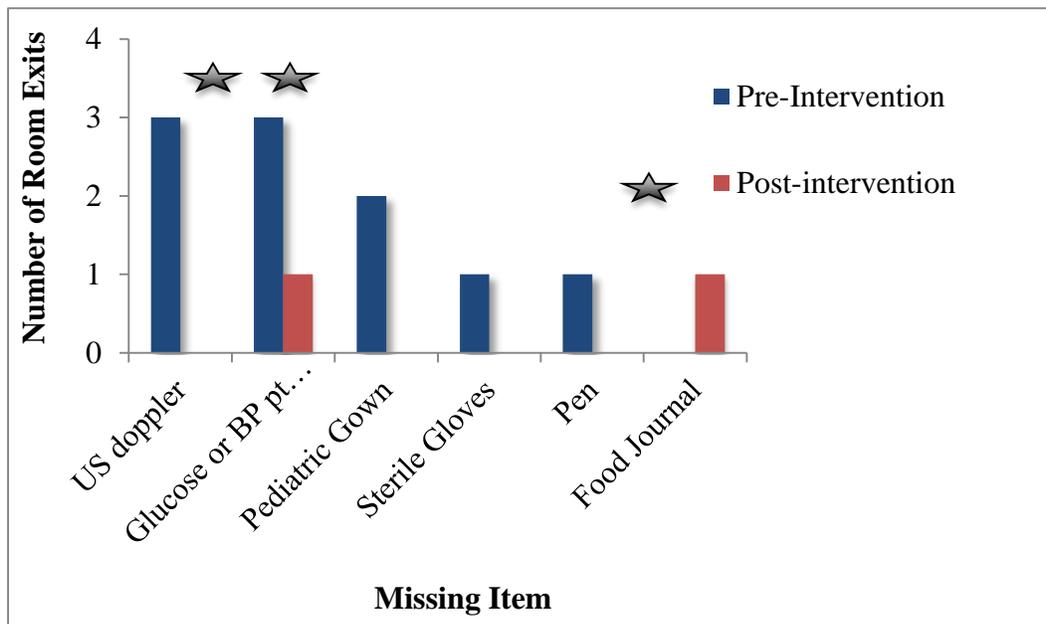
In the pre-intervention state, 5 S adherence was generally poor with almost all categories judged as "Just Beginning" (fig 3). Fig. 3a indicates the pre-intervention assessment and fig. 3b represents the post-intervention state in which four of the five categories had improved to level three of five. The sole unimproved category was "self-discipline" which remained at level 1. The post-intervention state 5 S adherence was judged two weeks after the initial 5 S intervention.
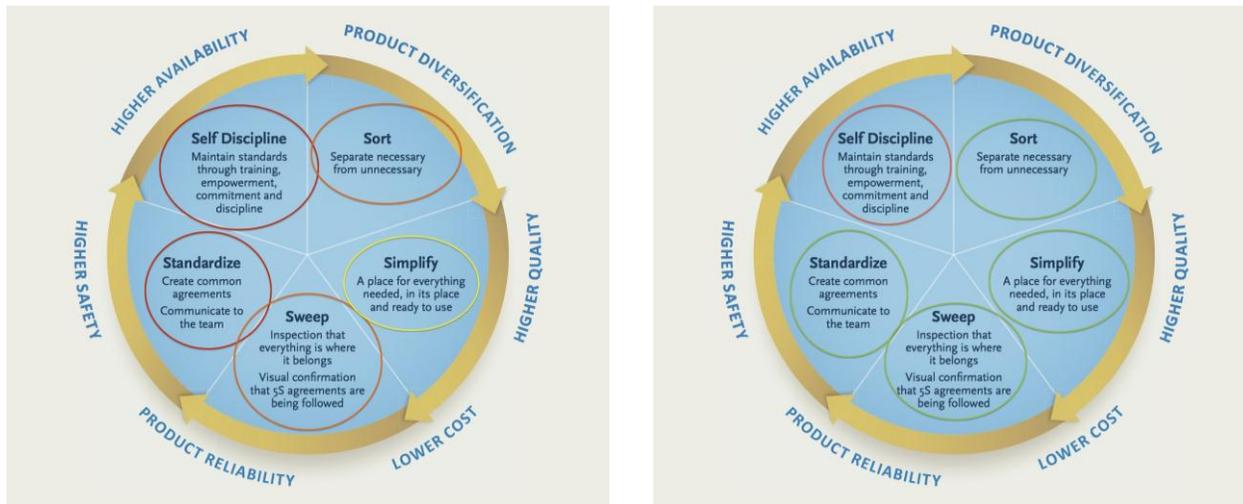
Fig. 3. 5 S adherence was rated on a scale of 1 ("Just beginning") to 5 (maximum achievement). Red correlates to level 1, yellow to level 2 and orange represents an intermediate level between 1 and 2. Green represents level 3. Fig. 3.a. (left) represents the pre-intervention assessment and Fig. 3.b. represents the post intervention assessment.

Discussion

Fig. 2 points to opportunities for further improvement. Items not included in the standardization list accounted for all of the post-intervention room exits and two thirds of all observed room exits, indicating that room exits could be decreased more effectively with a more comprehensive standardization list. Fig. 3 represents tremendous progress in the organization of the rooms. Prior to the intervention, necessary and unnecessary items existed side by side, necessary items were missing, the rooms were not standardized and there was no visual system to prevent necessary items from being completely depleted. Despite the poor pre-intervention 5 S adherence rating, it should be noted that each of the rooms appeared neat, the provider had not complained about the

rooms being difficult to use and the MAs responsible for organizing the rooms were well respected by providers. This indicates that maintaining cleanliness is distinct from following Lean methodologies and suggests that formal measures of 5 S adherence can reveal otherwise hidden opportunities for improvement. After the intervention, rooms were successfully organized and standardized with a visual system in place as a rudimentary maintenance system (Fig. 3b). However, the persistently low score in the "self-discipline" category indicates that a formal system to maintain the progress achieved is not currently in existence (Fig. 3b).

The findings of this study are consistent with the results of other Lean interventions in healthcare. Virginia Mason, a large integrated healthcare system in Seattle, WA, instituted a Lean approach to create a process for reducing cases of ventilator-associated pneumonia for in-patients. Over 2 years, this process resulted in an astounding 88% decrease in cases of ventilator-associated pneumonia and a savings of over $400,000 (4). These results are impressive but focused on the in-patient setting. Compared to CHCs, hospitals have many more processes that affect a patient; in-patients frequently depend on hospital staff for basic activities of daily living such as eating and toileting. The expanded provider-patient contact in the in-patient settings also facilitates easier and more robust data collection. Thus the relatively grandiose results of Lean interventions in hospitals do not suggest that the more modest gains from Lean interventions in CHCs are not worthwhile. Rather, they lay a framework that CHCs can emulate when embarking on a new Lean journey. CHCs will face difficulty in acquiring comparable data to that generated by large in-patient systems but creatively defining CHC specific outcomes will bolster research in Lean methodology in CHCs.

Lean methodology lends itself to many future research possibilities. Most applicable to the present study is research into the correlation between time saved and cost. Defining a validated algorithm to explain the elimination of waste of provider's time in dollars would be a powerful tool to encourage adoption of Lean methods. Also, a correlation between waiting time and patient satisfaction at HealthPoint should be delineated. In this study, it was assumed that patients would report higher satisfaction in an inversely linear relationship with waiting time. It is possible that this relationship is non-linear and that there exists a threshold at which decreases in wait time no longer improve patient satisfaction. Determining this relationship at HealthPoint will ensure that future elimination of wastes of time actually add value to the patient. Finally, research that determines the relationship between waiting time, patient satisfaction and patient health should be undertaken. Patient health is a hugely variable outcome affected by multiple factors and this has prevented research that correlates Lean methodology with tangible improvements in health in a CHC. However, HealthPoint's mission rests on improving people's health and a direct correlation between Lean interventions and health would ensure that such interventions are mission-focused. Research on the relationship of Lean and health could be simple, such as a study analyzing blood pressure control in patients who receive a card for recording blood pressure and the likelihood of a patient receiving such a card in a room that follows 5 S principles versus one that does not. These research priorities will allow HealthPoint to better understand the role of Lean methods in achieving its mission.

This study suffers from two main limitations. Due to provider scheduling conflicts, limited time was available for observation and few events were recorded. This limits the external validity of the study when considering other rooms used at KEMC or rooms at other clinic locations.

Second, the tool used to measure 5 S adherence has not been validated and judgments were made by only one, un-blinded, novice rater. Despite these limitations, the results are valid for the three rooms analyzed. The results are likely applicable to other rooms at KEMC because of similarities in room design, uniform training of MAs, cooperation between providers and a culture at KEMC that is open to Lean improvement. At other HealthPoint clinic locations, these factors account for variability that is beyond the scope of the present study.

Recommendation

With this in mind, recommendations particular to KEMC can be made with confidence. Of most importance, the standardization list should be expanded to include patient blood pressure and glucose recorder cards and items, such as the food journal, that are stored in an in-room file folder. The 5 S intervention should also be expanded to all rooms at KEMC to reduce room exits by other providers. At KEMC, site-specific training should include 5 S methodology, including proper use of kanban cards, for new MAs to improve the "self-discipline" performance. 5 S adherence of each room should also be periodically assessed, documented and displayed in the employee break-room to improve "self-discipline." Due to the limitations of the study, these recommendations can be made with less confidence for the other HealthPoint clinics. At an organizational level, 5 S training should be included for all new HealthPoint hires in every position.

Conclusions

Room exits can clearly be decreased with a Lean approach emphasizing 5 S methodology. Even if sorting, sweeping, simplifying and standardizing are the only aspects of 5 S to improve, room exits can be dramatically decreased. This is important because it means less waste of provider time and motion. Even more important is the decreased waste of time for patients. One of HealthPoint's organizational strategic imperatives is to consider the "Voice of the Patient" in decision-making. This means listening to patient feedback and considering patient satisfaction surveys when designing processes. 5 S methodology can be used to improve patient experience and satisfaction while increasing value, thereby satisfying this strategic imperative. Eliminating waste for providers and patients is clearly desirable for HealthPoint and a Lean approach is a simple, effective method of achieving this goal.

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