Lean Management in Healthcare Sector

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The starting point for improvement is to recognize the need.

Masaaki Imai (1930-today)

17.1 Lean Thinking in Healthcare Sector

Lean starts from the refusal to accept waste as defined by several authors like Helmold and Samara, Ohno, or Liker. Credited to Taiichi Ohno the lean system was developed through the 1950s and 1960s to provide the best quality, lowest cost, and shortest lead time through the elimination of waste. The Japanese term for what American companies usually categorize as waste is muda and was defined by Fujio Cho of Toyota as "Anything other than the minimum amount of equipment, space and worker's time, which are absolutely essential to add value to the product". The presence of these types of waste in a system has a negative impact on lead-time, cost, and quality. In the early 1980s, companies in other sectors like the healthcare sector have understood that the introduction of lean principles will lead to several advantages. Waste in healthcare can be described, among other elements, in excessive transport of medicine or patients, waiting time for treatments or underutilization of equipment and machines in hospitals. Moreover, duplications and inefficiencies by nurses may also impact the creation of waste.

17.2 Waste in Healthcare Sector

17.2.1 Lean Management and Waste in Healthcare

Although the lean business improvement methodology was initially developed to improve the quality and productivity of automotive factories, it has been used with

M. Helmold, *Lean Management and Kaizen*, Management for Professionals,
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great success in industries and settings of all types, including software development, government, retail, and other service settings.

Healthcare organizations, in particular, have found that the approach can be used to reduce costs and improve quality and patient satisfaction at the same time (Millard 2017). One of the core principles of lean is the elimination of waste, which is defined as anything that doesn't add value to the customer. Practitioners target eight specific types of waste (there were originally seven – more on that later). They are as common in healthcare as they are in manufacturing. Lean management targets therefore the elimination like waiting times or overmedication as outlined in Fig. 17.1 (Gupta 2013).

17.2.2 Transport

The waste of transportation occurs when materials are moved around inefficiently. In healthcare it occurs when:

- Patients are moved from department to department or room to room
- Medication is moved from the pharmacy to where it is needed
- Supplies are moved from storage to the floor

Some of this transportation is considered "necessary" waste to be minimized, even if it can't be completely eliminated.

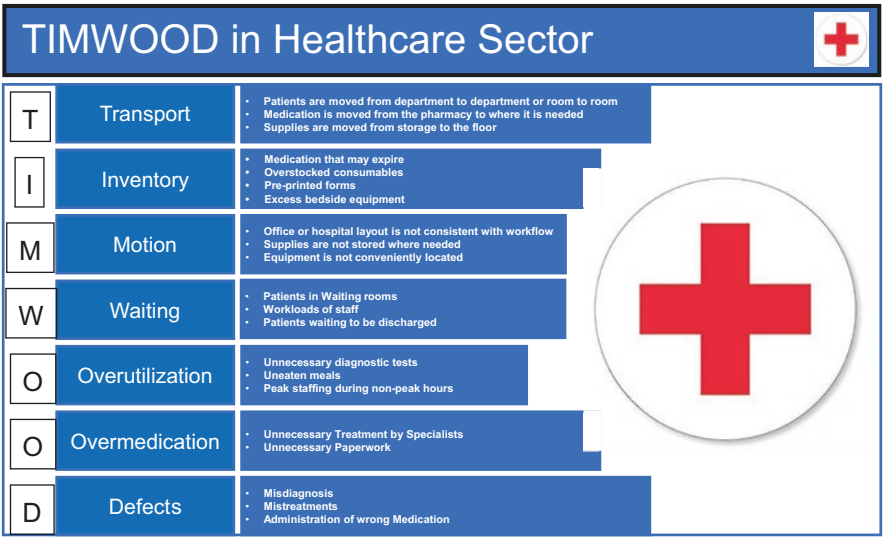

Fig. 17.1 TIMWOOD Concept in Healthcare-Sector. (Source: Author's Source)

17.2.3 Inventory

Manufacturers have largely moved to a just-in-time approach to inventory in order to reduce costs related to storage, movement, spoilage, and wastage. Healthcare organizations look to do the same as it relates to:

- Medication that may expire
- Overstocked consumables
- Pre-printed forms
- Excess bedside equipment

17.2.4 Motion

Motion refers to unnecessary movement of people within a facility or campus. This happens when:

- Office or hospital layout is not consistent with workflow
- Supplies are not stored where needed
- Equipment is not conveniently located

The first step in combating the wastes of lean is recognizing them within your organization. For most, examining each of these specific frequent contributors to waste leads to the discovery of multiple opportunities for improvement. We can also strive to eliminate wasted motion (including clicks) in software systems.

17.2.5 Waiting

In manufacturing, waiting occurs when parts can't flow or when team members can't perform their tasks due to problems, such as a lack of inventory or equipment failure. Waiting in healthcare is a problem for both patients and providers.

- Patients in waiting rooms (or exam rooms)
- Staff members with uneven workloads waiting for their next task
- Emergency department patients and physicians waiting for test results
- ED patients waiting to be admitted to the hospital
- Patients waiting to be discharged once medically ready

17.2.6 Overutilization

Overproduction in manufacturing results in excess "work in process" or unsold inventory of "finished goods". It is more difficult to spot in healthcare, but it occurs when providers do more than is needed by the customer at this moment. It includes:

- Unnecessary diagnostic tests
- Uneaten meals
- Ordering medications that the patient doesn't need
- Peak staffing during non-peak hours

17.2.7 Overmedication

Over-processing means doing more work, making it more complex or more expensive than is necessary. It takes the form of:

- Ordering complex diagnostic imagery (MRI) when a simpler method would suffice (X-ray)
- Unnecessary paperwork
- Surgical intervention in lieu of an equally effective medical alternative
- Follow-up appointments that don't improve patient outcomes
- Treatment by specialists that could be done by primary providers

17.2.8 Defects

While defects in manufacturing are expensive and troublesome, in healthcare they can be deadly. They may include:

- Misdiagnosis
- Administration of incorrect medications
- Hospital acquired conditions
- Incorrect IDC codes

The waste includes the time spent creating a defect, reworking these defects, and inspecting these defects. Even though we consider inspection to be waste, we can't eliminate inspection altogether until we have a perfect defect-free process. Even Toyota still has final inspection in the year 2016, but they consider it to be waste that they'd hope to eliminate some day.

17.3 Case Study: Vivantes' Transformation and Saving Plan

Vivantes, the largest municipal hospital group in Germany, is now initiating a restructuring phase in Berlin after the refurbishment in order to maintain its profitability. The Vivantes – Network for Health GmbH – is a hospital operator in Berlin. The sole shareholder is the state of Berlin. The company was founded on January 1, 2001. According to Vivantes, Vivantes is Germany's largest municipal hospital group. In 11 operating theatres from 6 different specialist disciplines, we work inter-professionally and interdisciplinary close and trusting together to ensure the

safety and satisfaction of our patients at the highest level (Vivantes 2008). The team of the surgical coordination steers the surgical program and the daily routine in constant co-operation with all occupational groups involved in the surgical procedure. In doing so, we continuously monitor the processes for process optimization and keep statistics on planned stability and emergency emergencies. Vivantes CEO Joachim Bovelet showed in a shareholder meeting the Group's development concept, we will write in the coming years, no positive annual result, if we do not change. "He outlined the difficult conditions for hospitals in general and the particular historical structure of Vivantes with nine formerly urban clinics of the capital. The Supervisory Board and the Management Board of Vivantes use this concept as a strategy for the entire Group. They expect an efficiency improvement of 50 million euros if all measures are implemented. By 2015, the total operating area is to be reduced by around 20 percent to 550,000 square meters. Currently, at 130 square meters per patient, they are twice as high as in an optimized new building.

At the same time, it is planned that individual clinics will be merged into larger units, because the average size of Vivantes' clinics is well below the optimal size of 60 beds. Another goal is to reduce the comparatively high proportion of personnel costs by around 70 percent through process optimization. It also checks which medical activities can be transferred to nursing staff and which nursing work can be transferred to medical assistants. The expansion of outpatient services is also planned. A medical care centre (MVZ) or specialist centre is to be created at each location. Bovelet puts less emphasis on the opening of clinics in accordance with Article 116b SGB V: "The now wide opening of the clinics will be relativized, and it cannot compete with the residents but only with them", said the Vivantes boss. That also applies to the MVZ. The Group also wants to expand its range of comfort and optional services and the promising field of geriatric medicine. However, a detailed medical concept for the restructuring still has to be worked out. For the individual locations, the concept has different consequences. For example, the large Vivantes clinics are to be expanded, while smaller ones rather than simple "neighbourhood care providers" continue to be developed, and the Klinikum Prenzlauer Berg is completely converted into an outpatient centre. Uncertain is the future of the two Vivantes clinics in southwestern Berlin. For them and the campus Benjamin Franklin of the Charité, a common development concept of Charité and Vivantes is to be presented soon.

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