

## Booklet - Lean management

### How lean is born?

Lean concept was developed by Toyota in the 1940's to compete with American car companies like Ford. A way to adapt to the market they were in to meet demand was needed. They had to create a production line that could produce different models and specs quickly to meet customer demand. Taiichi Ohno is considered the founder of Lean manufacturing<sup>1</sup>.

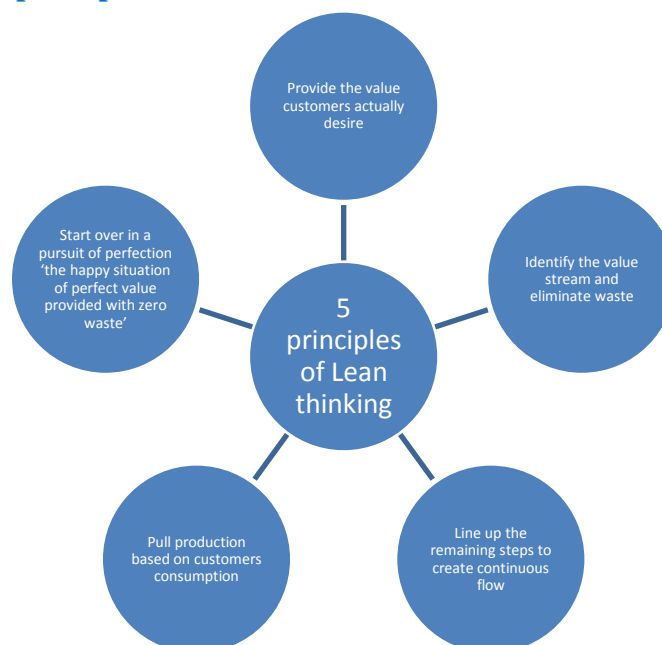
### How to define Lean?

Lean is the elimination of waste to improve the flow of information and material. Lean maximizes customer value while minimizing waste. The aim is to create more value for customers with fewer resources<sup>2</sup>.

Eight types of wastes are defined:

- Non-utilized talent (i.e. underutilizing people's talents, skills and knowledge)
- Defects (i.e. efforts caused by rework, scrap and incorrect information)
- Extra-processing (i.e. more work or higher quality than is required by the customer)
- Transportation (i.e. unnecessary movements of products and materials)
- Waiting (i.e. wasted time waiting for the next step in a process)
- Motion (i.e. unnecessary movements by people)
- Overproduction (i.e. production that is more than needed or before it is needed)
- Inventory (i.e. excess products and materials not being processed).




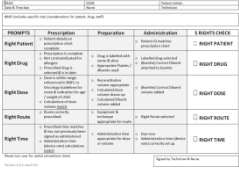
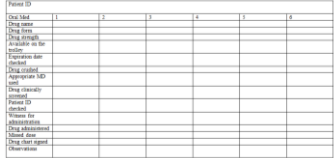
### What are the key principles of Lean?



**Figure 1.** Five principles of lean thinking

## Some Lean tools...

**Table 1.** Five examples of Lean tools with applications in hospital pharmacy practice

<i>Tool</i>	<i>Principle</i>	<i>Example</i>	<i>Illustrations</i>
Visual management - <b>Kanban</b>	Inventory-control system to control the supply chain. Indicate that something needs to happen.	Restock kanban alert the supply department that a specific supply is getting low.	
Visual management - <b>Spaghetti diagram</b>	Visual creation of actual flow. Identify redundancies in the work flow and opportunities for process improvement.	Evaluate the prescription workflow in the dispensary.	
Visual management – <b>Obeya board</b>	Provides a visual representation of the steps in a process.	Management tool to lead change in the paediatric parenteral nutrition activity <sup>3</sup>	
Standardised work - <b>Check list</b>	Ensure that clinical practice guidelines are followed.	Five dose checklist (i.e. right patient, medicine, dose, route and time) before IV administration <sup>4</sup> .	
<b>Audits</b>	Process that has been defined as "a quality improvement process that seeks to improve patient care and outcomes through systematic review of care against explicit criteria and the implementation of change.	To evaluate how closely oral medication preparation and administration procedures are adhered to by nurses <sup>5</sup> .	

And a lot of others tools: Six Sigma, Failure mode and effects analysis, mistake proofing, Kaizen, etc...

## A lot of literature and ... It works!

### Success of Lean application in healthcare ....

In 2007, Ben Tovim et al, introduced and developed a lean thinking-based program to redesign care processes across a teaching general hospital<sup>6</sup>. Redesigning Care has produced substantial benefits over the first two-and-a-half years of its implementation; making care both safer and more accessible .They also improved the flow of patients. In 2008, Culig et al,

developed a new heart surgery program using methodology based on Lean in a community hospital setting<sup>7</sup>. The authors observed low rates of complications and a cost savings of \$3,497 per each case of isolated coronary artery bypass graft was realized. In 2005, a group of hospitals participating in the Pittsburgh Regional Healthcare Initiative (PRHI) have implemented lean concepts to minimize the risk of developing central catheter-related bloodstream infections. Several hospitals have been able to cut the incidence of central line infections by 50%-90% through implementation of lean production methods<sup>8</sup>.

### *... And in hospital pharmacy*

Curatolo et al in 2013, analyzed the published Lean literature in the hospital setting using a methodological maturity-level framework and what the authors defined as the 11 characteristic activities of business process improvement<sup>9</sup>. The authors concluded that for Lean to be adopted and implemented by hospital practitioners a structured robust method should be provided. In 2010, Al-Araidah et al, selected principles of lean management (DMAIC (Define, Measure, Analyze, Improve, Control) and 5S (Sort, Set-in-order, Shine, Standardize, Sustain)) aiming at reducing the wasted time associated with drug dispensing at an inpatient pharmacy at a local hospital<sup>10</sup>. The results obtained from the study revealed potential savings of >45% in the drug dispensing cycle time. Benitez et al<sup>11</sup> followed a define, measure, analyze, improve and control (DMAIC) methodology in order to reduce the defect rate of the current process and to develop a standardized process that works for all hospital units. The control chart data show the medication error reduction team's goal of 50% reduction was surpassed. Audits revealed the percentage of order entry errors consistently improved by 90% to less than 0.04 errors per bed every month for four months after the process changes.

### **It's up to you!**

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<sup>1</sup> Lean Enterprise Institute. A brief history of Lean. On line <http://www.lean.org/WhatsLean/History.cfm>

<sup>2</sup> Lean Enterprise Institute. What is lean? On line <http://www.lean.org/WhatsLean/>

<sup>3</sup> Descout J, Decottignies A, Vaconsin P, Fortineau V, Barbault-Foucher S, Rieutord A. L'Obeya, bien plus que de la communication visuelle, une révolution culturelle du management. J Pharm Clin 2015 ; 34(3) : 113-23 doi:10.1684/jpc.2015.0315

<sup>4</sup> Sinclair A, Caron E, Heather P, Correa J, Shuard R, Guerin A. Introduction of pharmacy technicians onto a busy Oncology ward as part of the nursing team preparing and

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administering IV injections. <http://ejhp.bmj.com/content/early/2016/06/07/ejhpharm-2016-000951.abstract>

<sup>5</sup> Abstract will be submit

<sup>6</sup> Ben-Tovim, D, Bassham J, Bolch D, Martin M, Dougherty M, Szwarcbord M. 2007. « Lean Thinking across a Hospital: Redesigning Care at the Flinders Medical Centre ». Australian Health Review: A Publication of the Australian Hospital Association 31 (1): 10-15

<sup>7</sup> Culig, M, Kunklem R, Frndak D, Grunden N, Maher Jr T, Magovern Jr G. 2011. « Improving patient care in cardiac surgery using Toyota production system based methodology ». The Annals of thoracic surgery 91 (2): 394-99.

<sup>8</sup> Spear SJ. Fixing health care from the inside, today. Harv Bus Rev. 2005;83(9):78-91.

<sup>9</sup> Curatolo N, Lamouri S. A critical analysis of Lean approach structuring in hospitals. Business Process Management Journal Vol. 20 No. 3, 2014: pp. 433-454.

<sup>10</sup> Al-Araidah O, Momani A, Khasawneh M, Momani M. 2010. « Lead-time reduction utilizing lean tools applied to healthcare: the inpatient pharmacy at a local hospital ». Journal for Healthcare Quality: official publication of the National Association for Healthcare Quality 32 (1): 59-66.

<sup>11</sup> Benitez Y, Forrester L, Hurst C, Turpin D. 2007. « Hospital Reduces Medication Errors Using DMAIC and QFD. » Quality Progress 40 (1): 38-45.