

Improvement Cymru Academy Toolkit Guide



Introduction to Lean

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Introduction

Lean quality improvement provides a systemic and structured problem-solving approach to continuous improvement. Lean focusses on reducing wastes and improving value for the customer, which in healthcare is the patient. Lean can be used in any process or organisation to reduce waste and improve efficiency, creating high quality services for our customers. An example of where Lean can be used is when a patient is referred for an outpatient appointment with a healthcare professional. Lean could help reduce the waiting time from the time of referral to the time of the appointment by identifying and reducing wastes in the process which will help improve efficiency. By reducing the waiting time this will add value for the patient because they will see the healthcare professional within a shorter timeframe.

What is Value?

Value to the patient is defined as anything that changes the form or function of a product or service, the customer must be satisfied with it and the step within the process must be performed correctly the first time (<https://www.isixsigma.com/dictionary/value-added/>). Examples of activities that add value to the patient are time with a clinician within an outpatient clinic or on a ward round, having treatments, having a test performed etc... Anything that does not add value to a patient is called non-value adding and is considered waste. See our [TIMWOODS toolkit guide here](#) for more information. There is also essential non-value adding activities within systems e.g., filling in paperwork to ensure regulations are met. This type of activity is a requirement but does not necessarily add value to a patient but adds value to the process.

Background

Lean improvement methodology originated from the Toyota Production System (TPS). This methodology was developed by Toyota after World War II in Japan. Resources were scarce so waste needed to be eliminated to create efficient processes. Kiichiro Toyoda, Taiichi Ohno, and others at Toyota examined some of

the work of Henry Ford. They realised that by making a few simple innovations that they would be able to offer continuity to the processes a greater variety of products. They re-visited the work of Henry Ford which included mass production and standardisation. Toyota adapted these concepts to suit their needs, which led to the creation of the TPS and then Lean improvement methodology.

The Toyota Production System House

The Toyota Production System (TPS) house is a visual tool that shows the main principles and goals of the TPS. The foundation of the house is stability and standardisation. Stability focusses on improving consistency and reducing variation in processes. Standardisation focusses on defining and agreeing best practise and everyone following the same process. Stability and standardisation are core to continuous improvement, which is called Kaizen in Japanese. Heijunka refers to levelled production and is a way of scheduling the arrival of work to reduce overburden. There are two pillars that support the roof of the TPS house and represent the core concepts within TPS. These are Jidoka and Just-In-Time. Jidoka refers to building quality into the process by eliminating defects. Just-In-Time refers to only doing what is needed, when it is needed and doing only the amount that is needed. The roof represents the ultimate aims which are to achieve three goals: best quality, lowest cost, and shortest lead time. These goals are achieved by eliminating overburden which refers to overloading people or equipment, eliminating waste which refers to any work that does not add value to the customer and eliminating inconsistency which refers to any variation in output or inconsistency in the way things are done. In Japanese, these are referred to as Mura (inconsistency), Muri (overburden), Muda (waste). Although with lean there is an emphasis on reducing waste, overburden and inconsistency are given equal emphasis in TPS. Lastly, there is the human aspect of value and culture which drives the TPS house. These are respect for people, continuous improvement, and the transfer of knowledge.

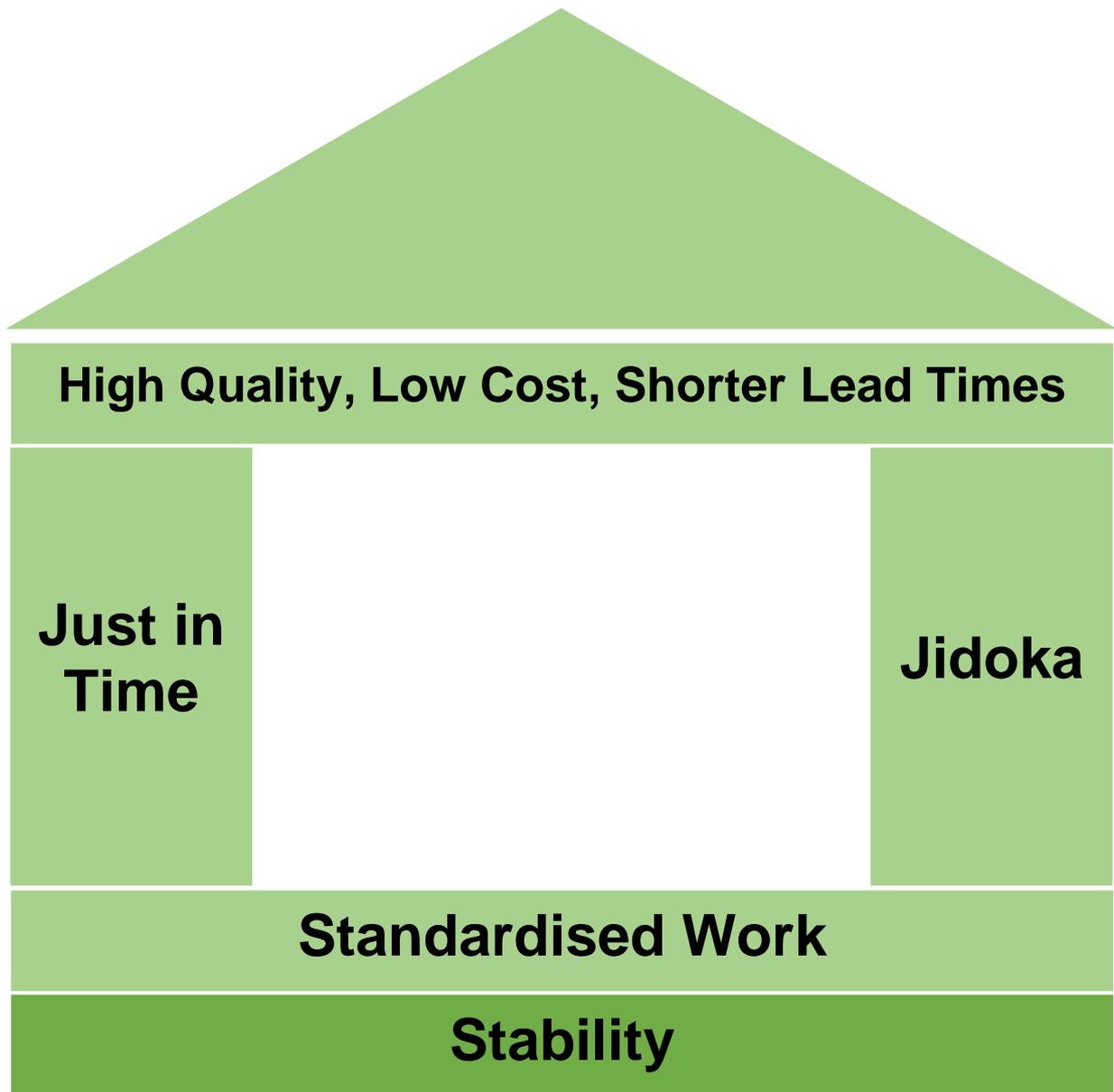


Diagram one: Toyota Production System House (Adapted from LearnLean6Sigma: [Guide: Toyota Production System \(TPS\) - Learn Lean Sigma](#))

How to use Lean

Five Principles of Lean

There are five principles in Lean that guide quality improvement. These principles are based on the TPS which has transformed manufacturing. By applying these principles, you can achieve increased patient satisfaction, shorter waiting times and reduced costs.

Principle 1: Specify Value

Specifying value requires you to define value from the customer's perspective for a specific service or product e.g., a hospital appointment, prescribed medication etc... You need to clearly understand what the patient sees as valuable.

Principle 2: Map the Value Stream

You will need to understand the process that creates the product or service so that you can understand what steps add value or do not add value to the patient.

Mapping the value stream by creating a Value Stream Map. See our [Value Stream Mapping toolkit guide](#) for more information.

Principle 3: Establish flow

To eliminate waiting, lean aims to establish continuous flow of products and services throughout the process. This is so there is nowhere for waste to build up.

Principle 4: Implement pull

In a pull system, work is only done when it is absolutely required and is not done based on the schedule of people, machines, or materials.

Principle 5: Continuous Improvement

No process is ever perfect, so there is always room for improvement and continually improve your products and services.

Plan, Do, Check, Act (PDCA Cycles)

Along with these five principles you will need to use the Plan, Do, Check and Act (PDCA) cycles. These are also known as Deming Cycles, named after William Edward Deming, and in some literature are referred to as Plan, Do, Check and Adjust cycles. The Model for Improvement uses a similar framework for small scale testing of solutions which you may have heard of PDSA – Plan, Do, Study Act. (See our [Model for Improvement Toolkit Guide here](#) for more information). Both the PDCA and PDSA use a four-step approach for problem-solving and continuous

improvement. The main difference between the PDCA and PDSA is the third step which in Lean methodology is referred to as check and in the Model for Improvement is known as study. PDCA is focussed on testing and verification whereas PDSA is focussed on learning and experimentation. PDSA is preferred in healthcare because of the complex and variable nature of the systems which requires a more analytical approach whereas PDCA is used in more corporate environments where work is predictable and standardised. PDCA and PDSA cycles are the essence of continuous improvement.

Plan:

The plan phase recognises that there is an opportunity for change and is where you need to define the problem, set the goals, and create an action plan on how you will achieve your goals.

Do:

The do phase is where you will test the change ideas, collect data, and observe the results.

Check:

The check phase is where you will review the test and analyse the data. You will need to compare the results with your goals and evaluate the effectiveness of the change idea.

Act:

The act phase is where you will need to take action based upon what you have learned. If it was successful, you may want to test your idea under different conditions to ensure sustainability before embedding it into practise. If it was not successful, then you may want to revise the work from this cycle or start again.

Benefits of using Lean in healthcare

Using Lean in healthcare will provide better, safer, and more efficient care for patients by eliminating waste from processes and improving value. Lean in

healthcare uses the same principles that have been used successfully in manufacturing and industries whilst using no more resources.

Some of the benefits of Lean in healthcare are that it will:

- Improve the quality of patient care
- Improve the safety of patient care
- Eliminate wasteful delays

Lean Glossary

Andon – This means ‘lantern’ which refers to the visualisation of the current process

Gemba – Going to the shop floor where value is added

Genchi Genbutsu – Go to see the process and what is really happening

Heijunka – Scheduling the arrival of work to reduce wastes

Jidoka – Making problems visible so they are not passed onto the next step

Kaizen – Change for the good. This means continually improving for positive impact

Kanban – Signal to make, move or order something

Keshikomi – A checklist of items that you will need to fulfil a project

Muda – Waste which is any work that does not add value to the patient

Mura – Inconsistency which refers to the variation of the output

Muri – Overburden which refers to the overloading of resources

Pokayoke – This means ‘mistake proofing’ which could mean having high quality systems to detect errors

Shokubaryoku – The power of the team

Yokoten – Sharing of best practise

Additional resources

If you are interested in learning more about how improvement practices can benefit your workplace, we offer a range of training courses. Visit our website for more information. <https://phw.nhs.wales/services-and-teams/improvement-cymru/improvement-cymru-academy/> or email us

improvementcymruacademy@wales.nhs.uk to find about the improvement courses we offer.

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