



## ANALYSIS

## QUALITY IMPROVEMENT

# Adapting Lean methods to facilitate stakeholder engagement and co-design in healthcare

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Quality improvement approaches drawn from industry can go beyond traditional concepts of value and deliver improvements in healthcare services, argue **Iain Smith and colleagues**

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Healthcare systems internationally face quality and productivity challenges and calls have been made for them to focus on delivering better value.<sup>1-3</sup> However, in healthcare, value is a debated concept. Value is often viewed in terms of health outcomes per spend for a given population<sup>4</sup> or in terms of clinical efficacy, focusing on interventions with a robust evidence base and reducing the use of interventions of low benefit.<sup>2</sup> But it can also be considered at the level of the microsystem, and systematic quality improvement (QI) approaches can help provide better value through action on quality, safety, and productivity.<sup>1</sup>

The Lean method is one approach that is being increasingly used to enhance value in healthcare.<sup>5-7</sup> In the UK, for example, NHS Improvement (which regulates NHS care providers) has embarked on a programme to embed Lean in English NHS trusts—some with support from the Virginia Mason Institute, a US based healthcare consultancy,<sup>8</sup> and others with support from an NHS Improvement consulting team.<sup>9</sup> Lean has drawn criticism for assuming that production efficiency techniques can apply directly to healthcare<sup>10,11</sup> and for lacking methods to integrate clinical knowledge and expertise with patients' preferences and needs in defining value.<sup>12</sup> We examine how it can be used to engage stakeholders in both defining value and designing systems and processes to deliver value.

## What is Lean?

Lean is derived from the practices of Japan's automotive industry, specifically the Toyota production system.<sup>13</sup> It is a systematic improvement approach that conceptualises work as processes that can be continuously improved by emphasising customer value and eliminating waste.<sup>6,13</sup> Although it was developed for industry, it has been used successfully to improve

quality and safety in acute, primary, and mental healthcare contexts (**box 1**).

### Box 1: Examples of Lean in healthcare

- Western Sussex Hospitals NHS Foundation Trust has developed its patient first improvement system based on Lean principles. The system has been credited as contributing to the trust being rated outstanding by the Care Quality Commission.<sup>14,15</sup> It is also credited with improving timeliness of patient observations, fall rates, response rates for friends and family tests, and theatre start times, as well as many more small improvements that make a difference to the everyday experience of patients or staff.<sup>16,17</sup>
- NHS England's General Practice Development Programme has saved thousands of hours of clinical time by applying Lean principles through its "time for care" and "productive general practice" programmes. This involved identifying and implementing high impact changes to reduce waiting times and increase available GP time. Examples include redirecting patients not requiring a GP appointment to see other healthcare professionals such as nurse prescribers.<sup>18</sup>
- A cross-organisational collaborative in North East England used Lean methods to improve dementia care and nurse-led liaison mental health services for older adults. This included rapid improvement events that resulted in changes that reduced wait times, readmission rates, and length of hospital stay and made qualitative improvements such as increased confidence of staff and calmer ward environments.<sup>19</sup>

The goal of Lean is to improve customer value.<sup>13,20</sup> Defining value in customer terms is the first step. The Lean ideal is then to design systems and processes that deliver customer value without waste, delay, or errors. This is achieved through iterative application of the Lean principles (**box 2**), which set out the steps for continuous improvement towards the ideal.<sup>13,22</sup>

**Box 2: Five core principles of Lean in healthcare<sup>21</sup>**

*Value*—Understanding value from the customer's perspective (usually the patient)

*Value streams*—Identifying all the steps (both helpful and unhelpful) in the pathways of care that patients experience as they move through the system

*Flow*—Working along care pathways to align healthcare processes to facilitate the smooth flow of patients and information

*Pull*—Creating processes that direct value towards the patient such that every step in the patient journey pulls people, skills, materials, and information towards it, as needed

*Perfection*—an ideal to be pursued through the ongoing continuous improvement of processes

Contextual and cultural differences must be taken into account when importing improvement approaches from other industries.<sup>23</sup> Differences must be well understood to adapt the approach to the specific requirements of the new context.<sup>23</sup> Therefore, delivering value for healthcare using a Lean approach requires understanding of how Lean views customer value, how this concept should be translated to the healthcare context, and practical methods for engaging stakeholders in defining and delivering value.

**Translating Lean value principle to healthcare**

Lean value definitions typically emphasise a commercial, production perspective. Customer value is related to manufacturing processes that convert raw materials into finished products, such as a car, ready for sale.<sup>24</sup> Customers will not pay for defective vehicles, so to deliver value these processes must be performed correctly first time.<sup>7</sup> Production activities that are not adding value are deemed to be waste and targeted for elimination.<sup>13</sup>

US advocates applying Lean to healthcare have tended towards definitions of value in terms of the customer's willingness to pay<sup>20</sup> and its corollary that "anything in the process that the customer would be unwilling to pay for is waste."<sup>25</sup> Although this logic may be appropriate for the US system of hybrid payment healthcare, it is less relevant in national health insurance systems like the NHS.<sup>26-28</sup>

Unlike manufacturing, healthcare services are generally intangible and are characterised by simultaneous production and consumption.<sup>29</sup> Value is not created through transformative production steps in a remote factory. Rather, the value of the service is co-created with the customer (or end user)<sup>29-31</sup>; patients are not customers at the end of a production process but right in the middle of it throughout their pathways of care. Some believe that the principles of Lean have therefore been misunderstood and a more service oriented view is required that assumes value in healthcare is co-produced with patients.<sup>26 30</sup>

Although it may seem obvious that the patient should be considered the customer and value defined from their perspective,<sup>32</sup> there are other customers and stakeholders in healthcare whose needs and value perspectives must also be considered.<sup>32 33</sup> Young and McClean<sup>33</sup> proposed a framework to help do this by defining three critical dimensions to healthcare value—clinical, operational, and experiential. The clinical dimension of value relates to delivering effective care that achieves the best clinical outcome.<sup>33 34</sup> The operational dimension relates to the effectiveness of care relative to the cost of care.<sup>2 4 33</sup> The experiential dimension relates to how patients experience the care they receive and can be related to their interactions with staff as well as the care environment.<sup>2 20 33</sup> The various healthcare stakeholders (such as patients and carers, clinical and

non-clinical staff, managers, and regulators) may place different emphasis on these dimensions of value.<sup>33</sup>

**Lean QI methods to engage healthcare stakeholders**

Arguably, most applications of Lean to healthcare have been limited by a largely operational view of value, where the focus has been on reducing costs rather than a more holistic, multistakeholder view.<sup>11 33</sup> However, through various workshop formats, Lean does have methods that enable definition of value and enhance customer participation.<sup>35</sup>

Lean rapid improvement events are already commonly used in healthcare to make incremental changes to processes.<sup>6 36</sup> Other Lean workshops include value stream analysis, which focuses on end-to-end pathways at high level to define strategic improvement plans,<sup>37</sup> and the production preparation process (3P), which focuses on developing new products and production facilities.<sup>25</sup> These Lean workshop formats differ in emphasis but all offer the opportunity to involve patients and service users in identifying value adding activities and eliminating waste.<sup>35</sup> The question is how can people leading health service improvement use these methods in practice?

Box 3 presents an example from the NHS in North East England, which adopted Lean using knowledge from Virginia Mason.<sup>45</sup> The Lean 3P method was used to involve stakeholders in simultaneously designing healthcare facilities and service systems.<sup>38 43 44 46</sup> The example illustrates challenges to participation that may be generally applicable (specifically the perception that patients are unable to contribute because of a lack of knowledge or ability).

**Box 3: Using Lean 3P in healthcare: the design of space project**

The design of space project used the Lean 3P method to help NHS stakeholders such as patients, clinicians, and architects design two endoscopy units, a maternity unit, and a paediatrics unit in North East England.<sup>38</sup>

Previous reports of applying Lean 3P to design healthcare facilities have limited patient involvement to consultative walkthroughs<sup>39</sup> or not included them.<sup>40</sup> Furthermore, earlier research into stakeholder participation in the design of healthcare facilities identified scepticism from professional designers about the ability of patients to contribute.<sup>41 42</sup> Negative beliefs about users' ability included feelings that they are "meddling" in areas they know nothing about<sup>41</sup>; practical barriers in interpreting drawings and perceiving them spatially in three dimensions<sup>41</sup>; and concerns regarding understanding of professional issues such as construction costs and material options.<sup>42</sup>

The project showed that Lean 3P design workshops can provide an effective process for engaging a wide range of stakeholders<sup>43</sup> and a structured approach for corporate and clinical staff to work together with patient representatives.<sup>44</sup> The Lean concept of end-user value contributed to the design process by drawing out the perspectives (clinical, operational, and experiential) of multiple stakeholders in terms of what mattered most to them. Stakeholders were engaged in activities that stimulated discussion and debate and encouraged sharing of their requirements and preferences. In particular, the process gave patient and service user voices greater influence in designing the pathways and how delivery would be facilitated by the layout of the physical environment—for example, the location, layout, and size of treatment rooms. They were also able to contribute to the design of facilities for partners, family members, and carers; creation of family friendly environments; and an emphasis on sound privacy.

Simple Lean tools, such as spaghetti charts, were used to engage stakeholders in mapping out the pathway (value stream) and flows that patients and staff would follow. Flows were also designed to minimise the burden on patients (in terms of movement and anxiety) and direct staff and equipment towards the patient to deliver care.

The 3P method engaged stakeholders to articulate and share their value perspectives. Most importantly, this included service users, who shared their experiences and views on how these could be improved. Their experience was combined with staff experience to design care pathways (value streams) to deliver the desired user value. Staff contributed clinical experience and professional knowledge to ensure this could be done safely and effectively. The treatment rooms and other facilities were located

to ensure steps in the pathway lined up with the physical layout to facilitate good flow. The service user, carer, and staff flows were mapped and simulated at each cycle of the design process. Information on how pathways would work was discussed by stakeholders, which helped facilitate improvement.

To improve the overall experiences of care, participants applied a service oriented approach in which “every step in the patient journey [pulls] people, skills, materials and information towards it, one at a time, when needed.”<sup>21</sup> This helped stakeholders design more innovative models of care that could respond flexibly to changing circumstances. Services could then be “pulled” towards patients as required (for example, by bringing a clinician to a patient in a treatment room rather than moving the patient to the clinician in a different location, reducing patient movement). Through multiple cycles of design, the Lean 3P method helped participants move towards an optimised service model and design.<sup>44 46</sup>

## Effective collaboration

The example shows that QI approaches such as Lean can be adapted to include important dimensions of service led value and quality, such as patient experience and satisfaction. In translating such methods to healthcare, it is important to identify both the primary customer and other service stakeholders to define value and target improvement. The 3P method facilitated conversations across multiple stakeholder groups (including patients, clinicians, and managers) that considered value in a more holistic way. For example, the clinical dimension of value involved stakeholders considering the effectiveness of treatments; the operational dimension involved stakeholders considering the efficiency and productivity of service delivery; and the experiential dimension involved stakeholders considering patients’ preferences and needs. Stakeholders, including patients, articulated and shared their value perspectives, tested their ideas, and co-designed healthcare facilities and systems to deliver users’ requirements. Stakeholder conversations about the different dimensions of value could also be facilitated in other workshop formats such as rapid improvement events and value stream analysis.

When patients are asked to participate in QI initiatives, their role needs to be relevant and have a practical impact. Proper collaboration early in the change process can help avoid the unintended consequences of overlooking experiential details that matter to patients. To achieve this, the qualitative nature of patient experience must be recognised and given equal priority to that of healthcare professionals.<sup>47</sup> It is therefore important to involve patients, clinicians, and managers early in the improvement initiative and select methods that allow them to work together on improvement. This includes facilitating conversations between stakeholders about what matters to them and creating opportunities for practical and tangible improvement activities such as small scale tests of change, working through the plan-do-study-act cycle, or creating prototypes together. In this way, QI approaches such as Lean will begin to fulfil their potential to deliver greater value in healthcare.

## Key messages

- Quality improvement approaches used in industry, such as Lean, consider value from a customer perspective, focusing on productivity
- Healthcare requires a more holistic, multistakeholder view of value to target improvement that benefits patients as well as clinicians and management
- Lean also has methods that enable healthcare stakeholders (including staff and patients) to engage in the definition of value and the design of processes
- Early involvement of all stakeholders through these methods can optimise the outcomes

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