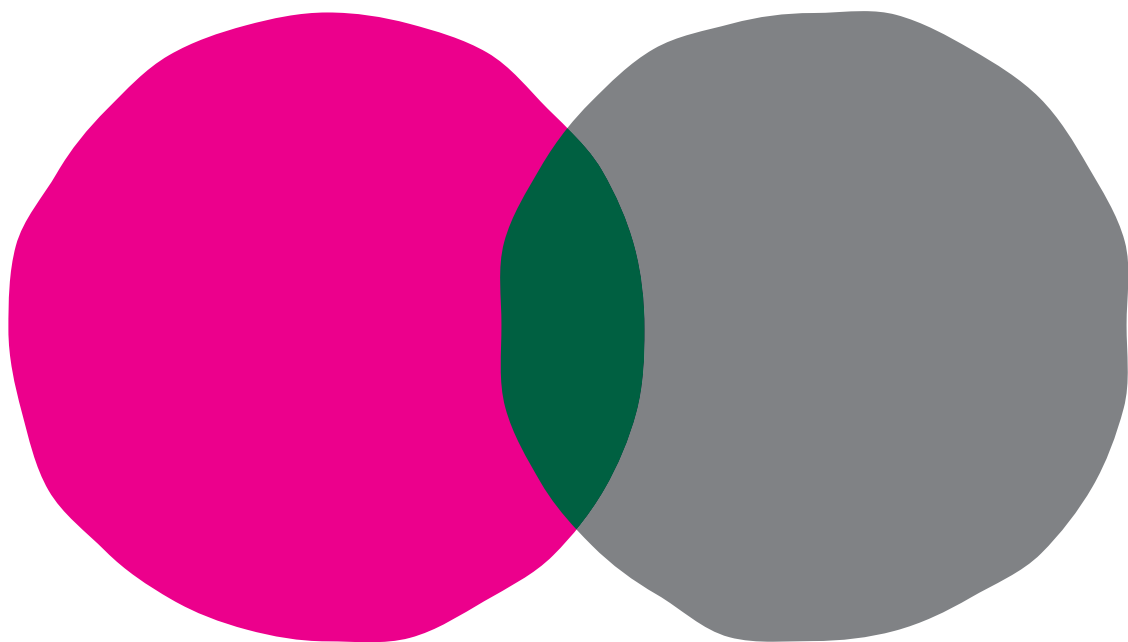


The Person-centred Lean Six Sigma Model

Seán Paul Teeling



A guide for health service staff seeking to adopt a person-centred approach to Lean Six Sigma quality and process improvement interventions.

With thanks

Sincere thanks to the following:

- The healthcare organisations that have participated in and continue to participate in this research, your shared time and expertise has been invaluable in understanding how Lean Six Sigma can contribute to Person-centred cultures.
- Colleagues in the Centre for Person-centred Practice Research, Queen Margaret University, Edinburgh, for their continued collaboration.
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- The students I have the pleasure to work with and learn from on a daily basis.
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Foreword

It is an honour to write a foreword to this guide to the Person-centred Lean Six Sigma Model developed by Seán Paul Teeling. The model is based on his research on, and practical experience of, implementing a person-centred approach to Lean Six Sigma quality improvement projects and programmes in partnership with many healthcare colleagues in a range of settings over several years. The guide neatly distils this hard-won knowledge to provide a user-friendly resource for health services staff who, despite the myriad challenges they face in their daily work, are committed to improving the quality of the care that they provide.

From my experience of developing, directing and teaching the MSc in Leadership, Innovation and Management at the UCD School of Nursing, Midwifery and Health Systems — of which Seán Paul’s courses on process improvement are an integral and very popular component — healthcare staff are rightly unimpressed and understandably uninspired by quality improvement approaches focused on a narrow range of metrics and comprised solely of checklists and toolkits. They are smart and experienced enough to hold in esteem practical guidance that is clearly grounded in values, informed by theory and based on evidence. The Person-centred Lean Six Sigma Model is manifestly all three and this guide articulates the values and summarises the theory and evidence underpinning the model in an accessible way. The principal contribution of the guide, however, lies in the eight sets of questions prompted by the model. These questions enable healthcare staff to reflect deeply on their quality improvement practices, contextualising and critiquing them to gauge the extent to which they align with the principles and values that underpin person-centredness and Lean Six Sigma. The questions are designed to develop and enhance awareness of self, purpose and context. In heightening self and system awareness in this way, the guide empowers health services staff to think and work differently so that they can improve not only service users’ experience of healthcare but also their own and their colleagues’ experience of providing that care. And that is why all healthcare staff interested in making a meaningful and enduring difference through their quality improvement work should read and, more importantly, use this guide.

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November 2023



Overview

This guide begins with a short introduction setting out the context in which the Person-centred Lean Six Model was developed. Lean and Six Sigma improvement methodologies are then separately and briefly outlined after which their combined form as Lean Six Sigma is discussed.

Next, a person-centred approach to improvement is then defined and the question of locating process improvement in person-centredness is addressed.

The Person-centred Lean Six Sigma Model is then introduced and explained, with links to further learning about the model. The guide then lays out each of the components of the model with questions to aid reflection for each component.

The questions are intended to enable health services staff to align their improvement work with person-centred approaches. The guide ends with a short conclusion summarising the Person-centred Lean Six Sigma Model and its application.

Introduction

This guide is designed for staff working within health systems who are using Lean Six Sigma methodologies for their process and quality improvement work and who wish to take a more person-centred approach to improvement initiatives.

The model is intended to be used as a lens through which individuals and teams can view their Lean Six Sigma work, guiding them to locate their work within a person-centred framework and enabling an understanding of the synergies and divergences between both approaches.

One of the biggest healthcare challenges globally continues to be ensuring equitable and fair access to quality services. Many countries struggle with disparities in access to healthcare based on factors such as income, location, ethnicity and gender, leading to inequalities in experiences of care and health outcomes (Orach, 2009). Meanwhile, healthcare costs continue to rise worldwide, making it difficult for some individuals and communities to afford necessary medical care, which can result in delayed or inadequate treatment, leading to poor health outcomes (Cygańska et al., 2023).

Many countries are experiencing demographic shifts with aging populations posing challenges to health services. The Organization for Economic Cooperation and Development (OECD) suggests that an aging population often requires increased healthcare services, including long-term care and management of chronic conditions, which can strain healthcare systems and resources (OECD, 2015).

More recently, the COVID-19 pandemic has underlined how infectious diseases such as COVID-19 and influenza can overwhelm healthcare systems leading to increased demand for care and considerable strain on resources (Daly et al., 2021).

All of these challenges are compounded by workforce shortages with healthcare services facing challenges in recruiting and retaining enough skilled workers. Shortages of healthcare professionals, including doctors, nurses, and allied health personnel, can limit the capacity of health services to deliver timely and quality care (Butler et al., 2022). These challenges can vary widely across different countries and regions and require context-specific solutions and strategies to address them effectively.

To help address these challenges, staff working within the health system are increasingly turning towards quality improvement methodologies such as Lean Six Sigma (Teeling et al., 2020).

The Person-centred Lean Six Sigma Model was developed over a seven year period, from initial inception as a PhD study, to deployment and testing across 12 clinical sites in both acute hospital and community sectors in public and private settings in Ireland.



Lean Six Sigma

Lean Six Sigma is a combination of two process improvement methodologies: Lean, developed by Toyota, and Six Sigma, developed by Motorola (Abu Bakar et al., 2015).

Lean

Lean is a management system, a methodology and a philosophy that can support employees and enable them to deliver better care to their patients (Grabau, 2012).

Whilst Lean was developed for car manufacturing and utilised in engineering and production operations, other industries quickly picked up on its inherent benefits and it is now used in pharmaceutical, electronic and healthcare settings with noted improvements in process flow, impacting, for example, patient wait times, releasing clinician time to care, error reduction and improved patient outcomes (Flynn et al., 2018).

In effect, the application of Lean in healthcare is about shortening the time between the patient entering and leaving a care facility by eliminating what is termed Non-Value Add (NVA) time and activity for patients and staff (Teeling et al., 2020, 2021; Ward et al., 2022). Antony and colleagues (2019) note that Lean has been widely adopted for healthcare process improvement even in fundamentally different healthcare contexts.

Six Sigma

Lean is often used in conjunction with Six Sigma, another widely used improvement methodology developed by Motorola to optimise its manufacturing processes by reducing their variability through the rigorous collection and statistical analysis of process metrics (Daly et al., 2021,2022).

Six Sigma's data-driven process approach is designed to improve process capability and enhance process throughput (Teeling et al., 2023a). The Lean Six Sigma 'Define, Measure, Analyse, Improve, Control' (DMAIC) framework provides a model for a structured approach to change (Rathi et al., 2022).

Six Sigma has a strong emphasis on eliciting and responding to the 'Voice of the Customer' and understanding the expectations of both service users and providers (Teeling et al., 2020, 2021). This emphasis on customer voice aligns well with users' expectations of healthcare services, where the primary goals are to improve patient safety, quality of care, process efficiency, patient and staff satisfaction, and process performance (Vaishnavi and Suresh, 2020).

Lean Six Sigma

Lean Six Sigma

A hybrid of Lean and Six Sigma as Lean Six Sigma appears in the healthcare literature from 2010 onwards (Abu Bakar et al., 2015) following the integration of Lean and Six Sigma for project delivery from early 2002 and its increased use by 2008.

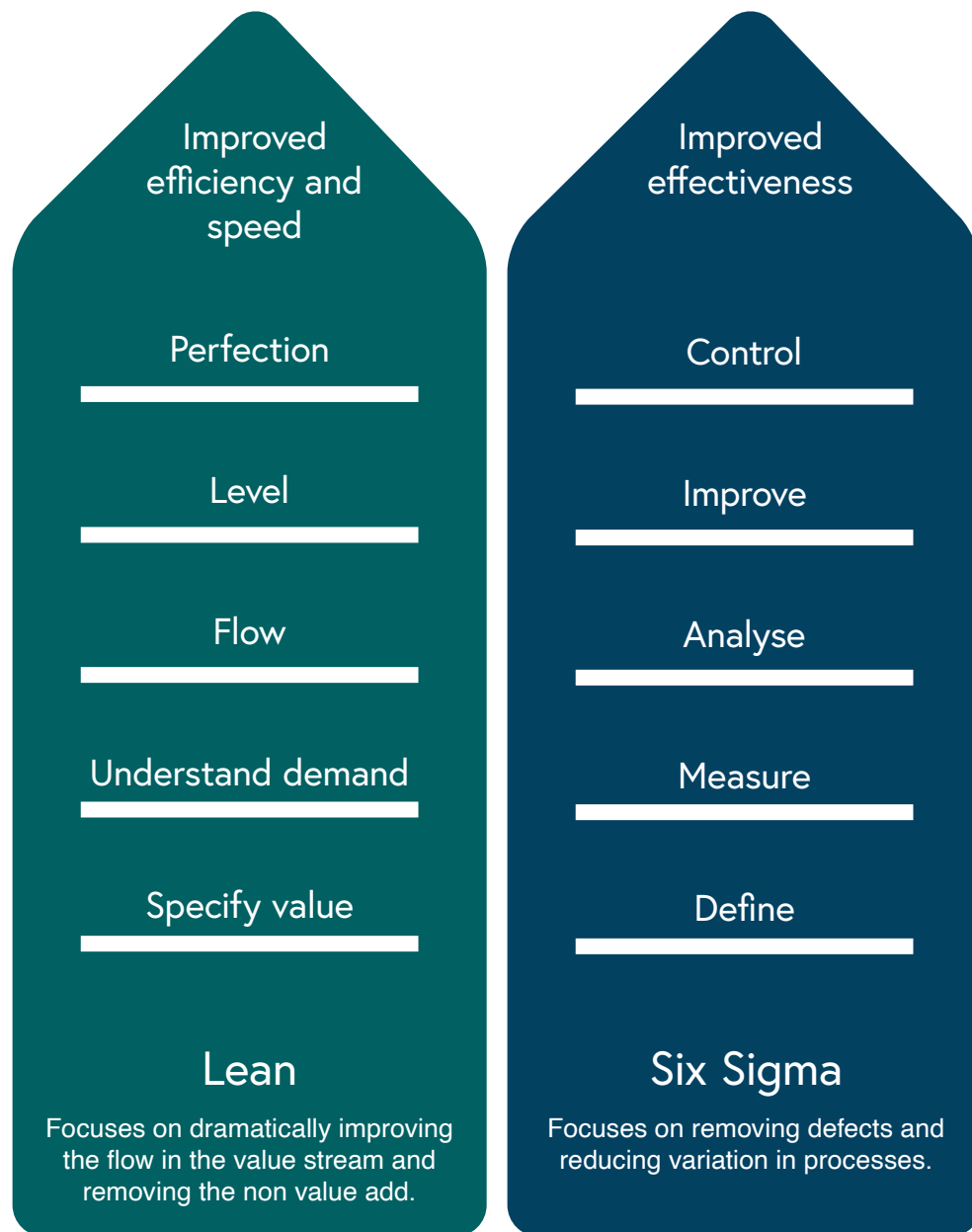


Figure 1 | The focus and outcomes of Lean and Six Sigma

Both methodologies have a strong focus on the customer, the employee, management support and teamwork (Teeling et al., 2020, 2021). Lean Six Sigma has demonstrated improvement in healthcare settings at patient, staff and organisational levels (Burgess et al, 2013; Mazzacato et al., 2016; Teeling et al., 2023a). Lean, Six Sigma, and Lean Six Sigma are now among the most popular process improvement methodologies used in healthcare internationally (Jorma et al., 2016; Teeling et al, 2020, 2021).

A Person-centred Approach to Improvement



Hardiman and Dewing (2019) discuss the relationship between person-centredness, person-centred care and person-centred cultures, noting that person-centredness is about practices embedded within a culture that enables and facilitates the delivery of person-centred care.

McCormack and colleagues (2017) clarify that person-centred cultures are necessary for the delivery of person-centred care. They suggest that person-centred care is about every person involved in the patient's care, not only the patient (McCormack and McCance 2006, 2010; McCormack et al., 2017). From a staff perspective, it includes judicious skill mix, effective relationships and shared decision-making.

McCormack and McCance (2010) are clear that the use of the term 'person' in their work encompasses all those involved in what they designate 'caring interactions' and therefore includes not only patients, their families and carers but also all members of the multidisciplinary healthcare team. To be person-centred, there is a need for 'healthful' relationships between health professionals, their patients or clients and their significant others (McCormack et al., 2015).

Dewing and McCormack (2017a) suggest that, regardless of definition, person-centredness speaks to a culture that includes and applies to everyone in an organisation and does not isolate but incorporates care.

Dewing et al., (2015) and Dewing and McCormack (2017b) identified the need for locating process improvement in person-centredness, with McCormack and Watson (2018) noting that healthcare can often rely exclusively on a narrow range of volume-based metrics, which are not necessarily facilitators of person-centredness.

Locating process improvement in person-centredness

Dewing and McCormack (2015) discuss the concept of ‘human flourishing’, relating it to individuals being in a continued state of well-being and being at their best for prolonged periods of time (Seligman 2011, p. 70) and, when they’re not, having the resilience to bounce back stronger.

Dewing et al. (2015) and Dewing and McCormack (2017b), visualising the requirements of flourishing workspaces within the Compliance, Service Improvement and Innovation Model (CoSII) model (figure 2), located service improvements (such as those undertaken using Lean Six Sigma methodologies) in relation to person-centredness and person-centred cultures.

This model suggests that service improvement generates person-centred patterns, moving on from a focus on compliance and performance that demonstrate person-centred moments, and eventually moving towards a person-centred culture that is innovative and flourishing. Importantly, Dewing and McCormack (2015) state that workplaces and organisations are never, in their entirety, in one cycle only.

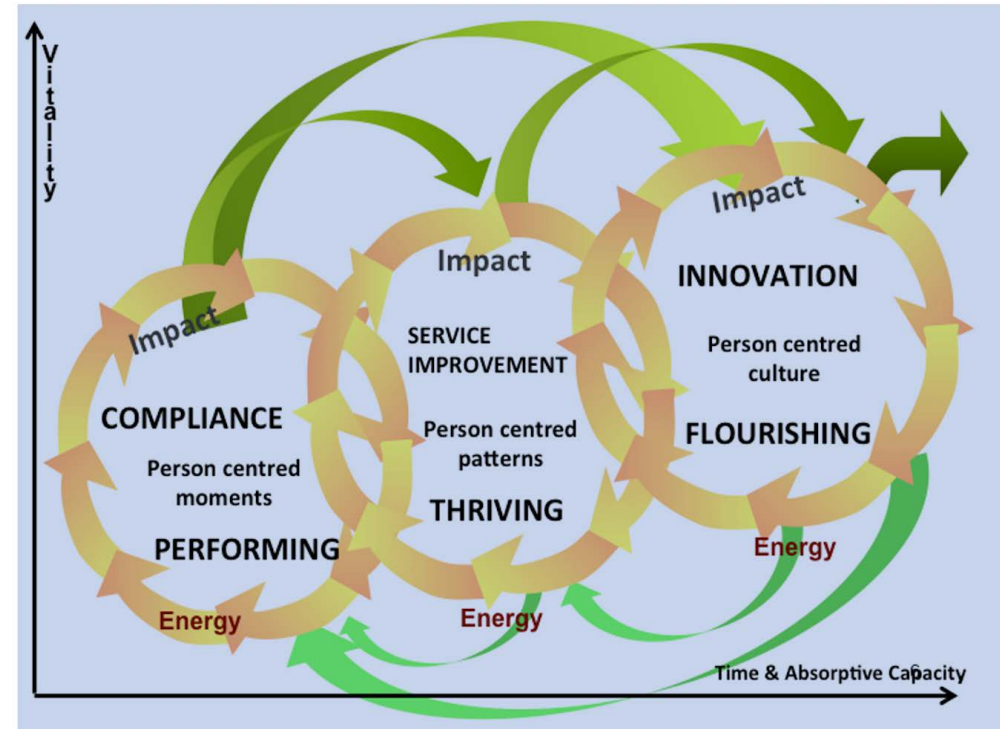


Figure 2 | The Compliance, Service Improvement and Innovation Model (CoSII)

Source: With permission from the authors: Dewing and McCormack (2017b).

In developing the Person-centred Lean Six Sigma Model, the CoSII model was influential in its finding that process improvement methodologies (such as Lean Six Sigma) contain person-centred patterns. The CoSII model suggested that further work was required to identify and strengthen any synergies and reconcile areas of divergence between Lean Six Sigma and person-centred approaches. To address this, a review of the synergies and divergences that exist between person-centred and Lean Six Sigma methodologies was undertaken (Teeling et al., 2020,2021). That review was the foundation for the development of the Person-centred Lean Six Sigma Model.

The Person-centred Lean Six Sigma Model

A combined person-centred Lean Six Sigma approach

Recent research (Teeling et al., 2020, 2021, 2023b) identifies and clarifies the synergies and divergences between Lean Six Sigma and Person-centred care. These are represented in Figure 3.

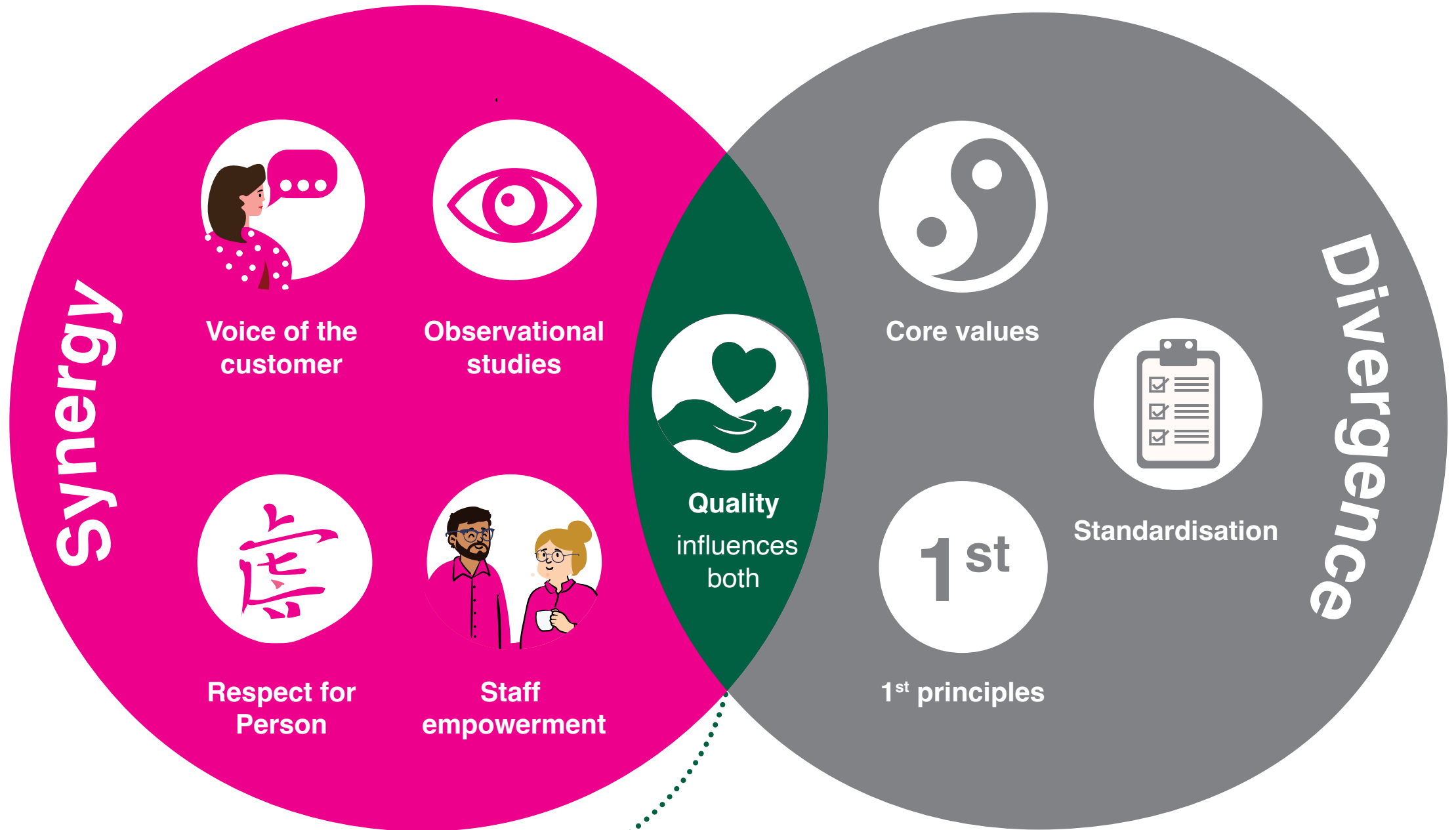


Figure 3 | The Person-centred Lean Six Sigma Model

Source: Teeling, Dewing and Baldie (2020, 2021)

The purpose of the Person-centred Lean Six Sigma Model

The model provides a lens through which practitioners can inspect their Lean Six Sigma practice and critically evaluate whether, to what extent and how it is synergistic with person-centred approaches. This empowers and enables practitioners to pay attention to areas where practice might stray from the intent and purpose of improvement.

The colours in the model were developed with inspiration from Japanese colour symbolism and meaning (Akal Japanese Academy, 2021).

Synergy

The synergy between person-centred and Lean Six Sigma approaches is denoted by the colour pink, which represents a child-like personality, curiosity and openness to the world.

Quality

Quality as an influencer is represented by the colour dark green, which depicts fertility, vitality and energy. Quality is the fertile ground between person-centred and Lean Six Sigma approaches to improvement;

Divergence

The colour silver represents the divergence between person-centred and Lean Six Sigma approaches, denoting security and reliability, and symbolises how Lean Six Sigma practitioners may diverge from potential areas of synergy towards the security and comfort of the familiar, thus moving away from the more curious and open creativity of person-centred approaches.

The work of Dewing and McCormack (2015, 2017b) locating 'person-centred patterns' within service improvement was corroborated by the findings of the research that led to the development of the Person-centred Lean Six Sigma Model (Teeling et al., 2020, 2021).

A realist inquiry (Teeling et al., 2021), comprising a realist review and realist evaluation, developed an understanding of how Lean Six Sigma implementation relates to aspects of organisational culture, an organisation's receptivity to Lean Six Sigma interventions and the self-perception of staff who were Lean Six Sigma practitioners. This inquiry facilitated an understanding of whether, to what extent and in what ways Lean Six Sigma works in the healthcare system. The results of the realist inquiry were aligned to the Person-centred Lean Six Sigma model (figure 3), which facilitated an increased understanding of how a combined model of Lean Six Sigma can enhance efficiency and contribute to the development of person-centred cultures (Teeling et al., 2021).

The inquiry utilised person-centred approaches throughout for data collection. The use of person-centred principles with their inherent critical creativity was appropriate for data collection and can be threaded through a realist evaluation approach (Cook et al., 2021; Teeling et al., 2022)

Learn more

01 **A Discussion of the Synergy and Divergence between Lean Six Sigma and Person-Centred Improvement Sciences**

To learn more about the synergy and divergence between Lean Six Sigma and Person-centred approaches to improvement.

Teeling, S.P., Dewing, J. and Baldie, D. (2020) 'A discussion of the Synergy and Divergence between Lean Six Sigma and Person-centred Improvement Sciences', *International Journal of Research in Nursing*, 11(1), pp. 10-23.

02 **A Realist Inquiry to Identify the Contribution of Lean Six Sigma to Person-Centred Care and Cultures**

To learn how the model was tested by healthcare staff within their organisations.

Teeling, S.P., Dewing, J. and Baldie, D. (2021) A realist inquiry to identify the contribution of Lean Six Sigma to person-centred care and cultures. *International Journal of Environmental Research and Public Health*, 18(19)10427.

03 **The application of a person-centred approach to process improvement in ophthalmology services in the North East of the Republic of Ireland**

To learn how the model was deployed in a specific practice setting.

Teeling, S.P., Keown, A., Cunningham, Ú. & Keegan, D. (2023) "The application of a person-centred approach to process improvement in ophthalmology services in the North East of the Republic of Ireland", *International Practice Development Journal*, 13 (1), pp.1-18

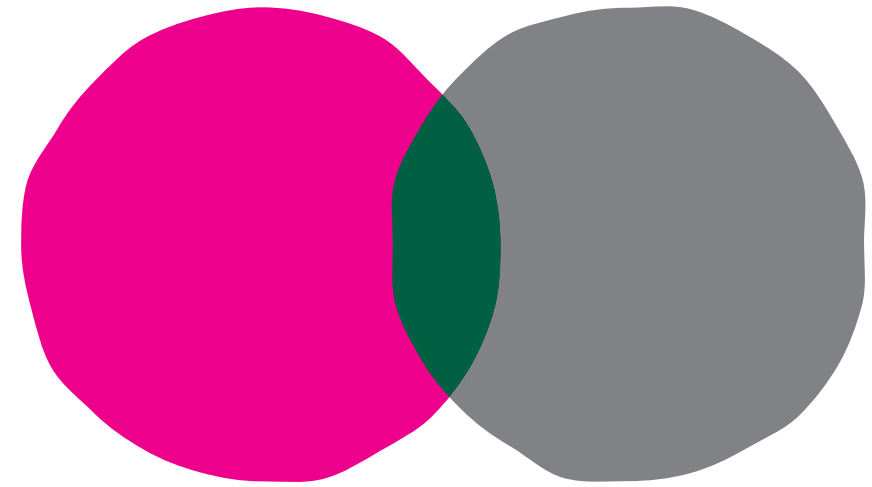
04 **Developing New Methods for Person-Centred Approaches to Adjudicate Context-Mechanism-Outcome Configurations in Realist Evaluation.**

To learn about the use of person-centred methods for data collection within the realist framework underpinning this research.

Teeling, S. P., Dewing, J., & Baldie, D. (2022). Developing New Methods for Person-Centred Approaches to Adjudicate Context-Mechanism-Outcome Configurations in Realist Evaluation. *International Journal of Environmental Research and Public Health*. 19(4), 2370.



Applying the Person-centred Lean Six Sigma Model



The model functions as a lens to allow improvement practitioners using Lean Six Sigma methodologies to critically review their approach to practice in a systematic and evidence-based way. The model generates a series of questions, derived from research, that practitioners can ask of themselves and their colleagues in order to reflect on whether and to what extent their Lean Six Sigma improvement practices are located within a person-centred framework.

Key questions and considerations prompted by the Person-centred Lean Six Sigma Model

Improvement practitioners should reflect on and use the questions contained within the model to align their improvement work with person-centred approaches.



Voice of the customer

The Voice of Customer involves engaging directly with service users and providers to gather their feedback about their experiences with and expectations of your service.

Questions to aid reflection

To ensure that you are hearing the voice of the customer

1. Do I understand what is meant by Voice of the Customer?
2. Have I engaged with all of those who touch the care process, whether patients, relatives or healthcare staff?
3. Is my engagement with persons involved in the improvement (stakeholders/customers) collaborative, inclusive and participatory?
4. Is my engagement with these persons formulaic or authentic?
5. Do I continue to keep all persons informed?
6. Do I give persons the opportunity to have ownership of the change (e.g., collect, analyse data, co-design solutions) rather than be participants?
7. Have I used appropriate Lean Six Sigma tools to capture the customer voice, such as the Critical To Quality Tree (CTQ)? - see page 17 for an example.

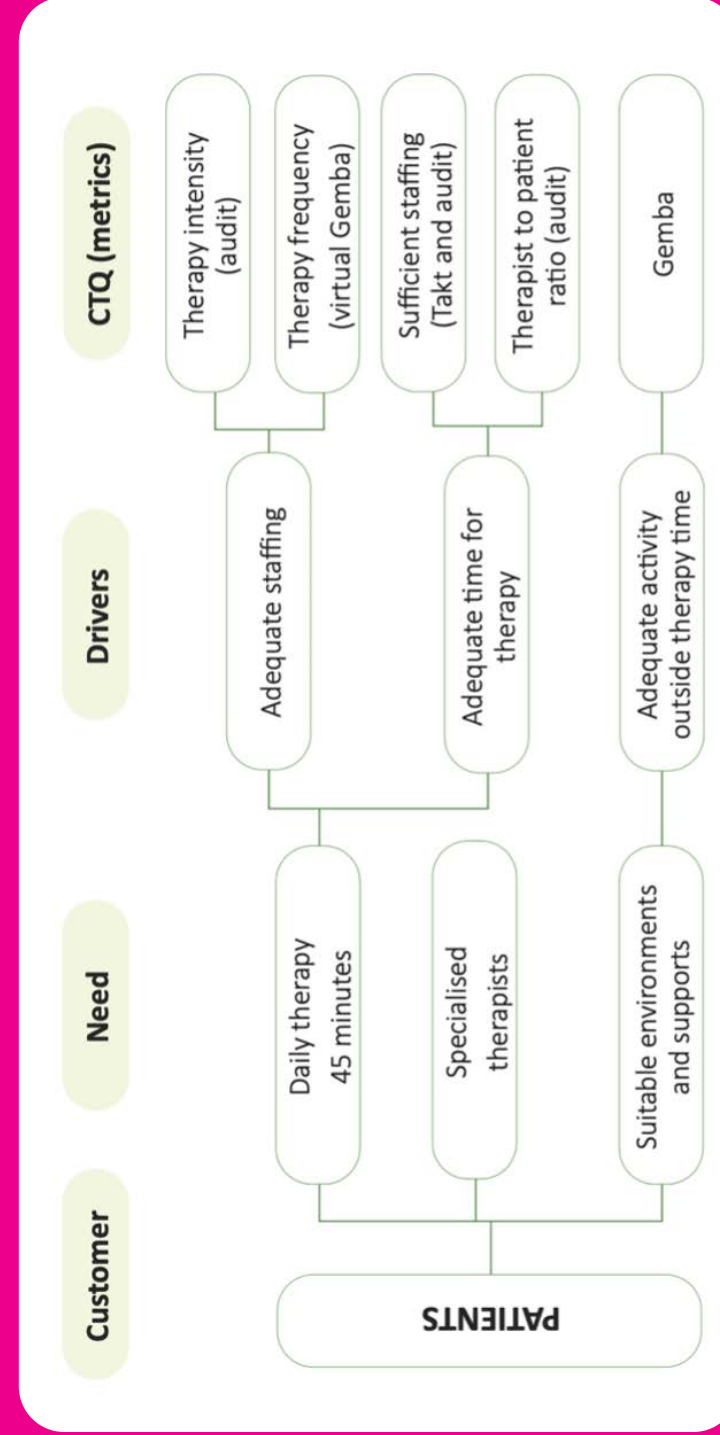


Figure 4 | An example CTQ from a case study
Source: Connolly, Teeling & McNamara (2020, p 7)

Turn to see image

Respect for person



Lean operates from the twin pillars of continuous improvement and respect for person. Person-centred approaches are based upon the concept of respect for person, but also acknowledge everyone involved in the continuum of care as 'moral peers', with healthcare organisations recognising the importance of shared values (Williams, 2015; Teeling et al., 2020).

Questions to aid reflection

To ensure that you embody respect for person

1. Do I know or have I sought to understand the values and beliefs of those persons involved in the improvement and those impacted by the improvement?
2. Have I clarified their values and beliefs?
3. Do I appreciate the values and beliefs of my colleagues on the improvement team?
4. Do I value equality, diversity and inclusion within my team?
5. Do I practice the person-centred principles of collaboration, inclusion and participation?
(Manley et al., 2014; Dewing et al., 2015)



Observational studies

One of the key strengths of Lean Six Sigma is that it seeks to find the 'root cause' of problems, which means that it utilises real-time observational data collection (Graban, 2012), a process referred to as 'Gemba' in Lean (Womack, 2013). The original Japanese term derives from 'gembutsu', which translates into English as 'real thing'. Gemba is effectively a real-time observational study of a person in the place where the work or activity occurs, mirroring the Japanese concept of Kaizen (change for the better) (Teeling et al., 2021). The mantra, 'if you can observe - you can measure, if you can measure - you can improve' applies to Gemba walks.

Questions to aid reflection

To ensure that you understand how to complete a Gemba

1. Do I understand that Gemba observes the process and not the person?
2. In undertaking Gemba do I show respect for person?
3. Do I appreciate that Gemba is a form of non-judgemental observational study?
4. Do I understand that a Gemba walk is always approached from a place of mutual respect and of making thinking better?
5. Am I mindful and respectful of the trust that is placed in me in undertaking a Gemba walk?
6. In completing my Gemba, rather than talking, do I adhere to the mantra: 'look, listen, learn'?

Staff empowerment



Scales and colleagues (2017) suggest that a person-centred approach recognises staff knowledge, skills and expertise as integral to empowerment. Staff empowerment and an organisational culture that encourages improvement are cornerstones of Lean deployment in healthcare (Ballé & Regnier, 2007) and are synergistic with person-centred cultures that encourage and enable staff to engage in ongoing development and quality enhancement (Dewing & McCormack, 2017a).

Questions to aid reflection

To consider whether you are creating the conditions for empowered staff

1. Do staff feel valued and respected in the organisation?
2. Do staff feel actively engaged to be involved in or lead Lean Six Sigma improvement?
3. Have I considered the synergies of respect for person and voice of the customer and how they can empower staff involved in improvement?
4. Is my engagement with staff authentic?
5. Do staff have access to training and education in Lean Six Sigma?
6. Do I understand the elements of any change initiative may be perceived as being against staffs interests?
7. Can I articulate 'what's in it for me' for staff?

Synergy



Quality as an influencer

Our research has shown how interpretations of quality can be influenced by contextual factors and circumstances, and how the literature differentiates between the idea of results-focused quality as opposed to the concept of a quality culture (Teeling et al., 2020,2021). McCormack and Watson (2017) suggest that improvement methodologies should aim for improvement through consensus and culture change with continuous improvement and innovation being key components in the development of person-centred care and cultures (Dewing et al., 2015).

Questions to aid reflection

To consider whether you are ensuring quality

1. Do I appreciate that quality improvement is more than a decontextualised toolkit?
2. Do I appreciate that any improvement requires consensus and culture change?
3. Do I rely exclusively on volume-based metrics which may not facilitate person-centredness?
4. Do I realise the value of authenticity in collaborating with all who are involved in change initiatives through:
 - Active listening, empathy and understanding?
 - Clear communication and keeping everyone informed?
 - Shared decision making?
 - Cultural sensitivity?
 - Respect for person?

Synergy and divergence

Core values



Williams (2015) notes that value is seen in a wider context in person-centred care with a focus on patients, families, and staff and social values, whereas Lean focuses on improving processes. This suggests that wider social values could be excluded if process improvement does not occur incrementally and with the inclusion of key persons.

Questions to aid reflection

To ensure that you understand core values.

1. Do I appreciate that value reflects a person's social values, not just the value created by improving processes?
2. Do I understand that the value of improvement is more than can be measured by certain outputs or metrics?
3. Do I appreciate the features of effective healthcare in the workplace by engaging with staff and attending to:
 - Whether specific values are shared by staff in the workplace?
 - How staff values are realised in practice.
 - How we can adapt, innovate and be creative as a workforce.
 - How appropriate change is driven by the needs of patients, services users and communities. (After Manley et al., 2011)

Divergence

1st

First principles

Lean has, as a first principle, the concept of understanding value (as opposed to values) whereas Person-centred care has as a prerequisite the assessment of professional competence, commitment to practice and clarity of beliefs and values (William, 2015).

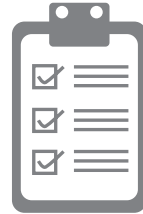
Questions to aid reflection

To ensure that you understand the first principles of Lean and Person-centred care.

1. Have I have accounted for persons' core values?
2. Do I understand the difference between the contrasting concept of value between Lean Six Sigma and Person-centredness?
3. Do I understand the individual and personal principles underpinning the concept of Kaizen 'good change', which require attention to both a person's working and social lives?

Divergence

Standardisation



Research has shown that there is potential for inappropriate insistence on standardisation when using Lean Six Sigma that can conflict with the individualised approach inherent in person-centredness (Langabeer et al., 2009; Teeling et al, 2020,2021).

Inappropriate standardisation can result in wide variation in the use of the principles and steps of Lean Six Sigma (Wackerbarth et al., 2021), the use of a specific the use of a narrow set of tools or techniques (Radnor et al., 2012; McNamara and Teeling, 2019) and variation in in Lean Six Sigma application (Burgess and Radnor, 2013).

Questions to aid reflection

To ensure that you understand standardisation.

1. Do I understand that within healthcare variation is often required (because of different specialities, different teams and different patient needs) to deliver individual holistic person-centred care?
2. Do I understand that I should not have an inappropriate insistence on standardisation?
3. Do I consult, and involve persons in the development of process standardisation where they deem it appropriate and respect their opinions and advise as end users?

Divergence

Conclusion

The Person-centred Lean Six Sigma Model highlights the synergies that exist between Lean Six Sigma and person-centred methodologies and how their divergences may be reconciled. This directly impacts the design and implementation of improvement interventions that support the development of quality, person-centred care that take account of the outcomes for, and experiences of, patients, their families and staff.

The use of this Person-centred Lean Six Sigma Model as a lens to apply to your Lean Six Sigma improvement interventions, reflects the fact that Lean Six Sigma deployment is not just about the quality improvement itself (Hochman et al., 2016) but also creating a supportive institutional culture (Graban, 2012; Andersen and Røvik, 2014; Kaplan et al., 2014; Teeling et al, 2021).It is also synergistic with the cultural aspect of person centredness that promotes and incorporates care (Dewing and McCormack, 2017b).

I hope you find the model useful in guiding a person-centred approach to your process and quality improvement work, and that it highlights the positive impact an integrated person-centred Lean Six Sigma approach to improvement has on both patient outcomes and health care culture.

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November 2023

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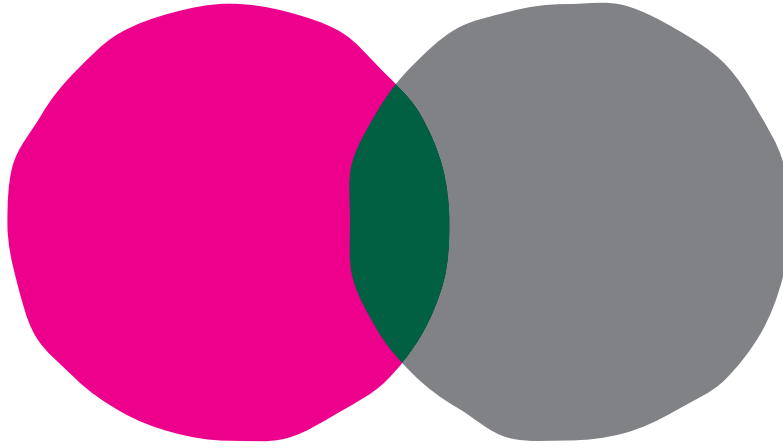
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