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Quality improvement frameworks

Quality improvement (QI) includes "all actions taken throughout the organization to increase the effectiveness and efficiency of activities and processes in order to provide added benefits to both the organization and its customers" (Ontario Chil d Welfare Quality Network, 2009, p. 20).[1] In other words, QI helps ensure that programs and services continue to improve, innovate and evolve, contributing to optimal outcomes. There is a broad collection of structured frameworks and approaches that can be used to tackle the improvement of systems and their specific processes, which will be discussed in this resource.[2]

The frameworks

Many QI models and approaches originated in the manufacturing sector and have since been adapted to the health and social service sectors.[3] The most common QI frameworks in healthcare are the Model for Improvement and those that fall under Lean, Six Sigma and Lean Six Sigma. The Strengths-Based Lean Six Sigma approach is particularly well suited to work in the child and youth mental health context, given its strengths-based and solution-focused orientation. It uses an appreciative inquiry lens, focused largely on aspects of the system that we want to enhance (rather than focusing on things we need to "fix").[4]

Each of these approaches has been used across healthcare settings to improve client outcomes, increase client satisfaction, reduce operating costs, strengthen financial performance, enhance employee engagement, design spaces and places, and contribute to the client and family-centred care movement.[5-12]

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This project was funded by the Province of Ontario. The views expressed herein are those of the Knowledge Institute and do not necessarily reflect those of the Province of Ontario.

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The model for improvement framework

<table>
<tr><th>BACKGROUND</th><th colspan="2">ABOUT</th><th>EXAMPLES</th></tr>
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Developed by Associates in Process Improvement (API) and inspired by the work of W. Edwards Deming in the late 1980s and early 1990s.
Initially devised for automotive, electronics and manufacturing.
Extended into healthcare systems by the Institute for Healthcare Improvement (IHI) community.
When applied to healthcare, the aims ideally balance patient (client) experience, cost, and population health.[13]

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Model is rooted in three fundamental questions:

What are we trying to accomplish? (aim)
What change can we make that will result in improvement? (changes to test)
How will we know that a change is an improvement? (measures)

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One team of physicians working in a QI collaborative documented their experience with the model in 21 teams from different healthcare organizations across the United States. Using 15–20 PDSA cycles each, they demonstrated improvement in self-management by 74% for patients with heart failure, and 20% for patients with diabetes.[14]
Some in the United States have introduced the Model for Improvement into the regular certification program for radiologists. They use a case example to demonstrate the change by continuously collecting data, rather than just pre- and post- changes. By doing so, more ideas can be tested concurrently and projects can move forward at a faster rate.[15]

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Test cycle – PDSA: Plan Do Study Act

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<td>
PLAN

What is our objective?
What are our questions to be answered and predictions?
What is the plan to carry out the cycle (who, what, where, when)?
What is our plan for data collection?

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DO

Carry out the plan
Document problems and unexpected observations
Begin data analysis

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STUDY/ASSESS/CHECK

Complete data analysis
Compare data to predictions
Summarize results

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<td>
ACT

Use results to make changes
Repeat cycle if necessary

</td>
</tr>
</table>

Further Reading

- Institute for Healthcare Improvement: www.ihi.org
- Langley, G. J. (1996). *The improvement guide: A practical approach to enhancing organizational performance*. San Francisco: Jossey-Bass Publishers.
- Health Quality Ontario. (2013). *Quality Improvement Science*. Retrieved from: www.hqontario.ca/portals/0/documents/qi/qi-science-primer-en.pdf

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Lean framework

BACKGROUND	ABOUT	EXAMPLES
• Originated in the automotive industry as early as the 1920s with Henry Ford and the Toyota Production System in 1940s-1950s. • Due to its success, it has moved into other sectors such as business sectors and most recently healthcare.[16] • Improves the quality of processes by focusing on what brings value to the customer and removing waste to make the value flow with minimal interruption.	• Management philosophy and methodology with five key principles: 1. **Specify value from the point of view of the customer** ○ Much of what an organization does doesn't actually add value to the customer. 2. **Identify and map the value stream** ○ The entire set of activities involved in the process from beginning to end for the customer. 3. **Create flow** ○ Ensure that the product or service flows to the customer without interruption. 4. **Respond to customer pull** ○ Produce only what the customer wants when it is wanted. 5. **Pursue perfection** ○ As the Lean journey progresses, more waste becomes evident and improvement continues.	• Numerous healthcare organizations globally report positive results using the approach to lower patient wait times, decrease length of stay and increase cost savings in health care.[17] • Canadian examples: ○ BC Mental Health reduced wait times in an eating disorders clinic by 75%. ○ Children's Hospital of Saskatchewan used Lean principles to design a more patient-oriented space that also saved millions in costs.[17]

FURTHER READING

- American Society for Quality: asq.org/
- The Conference Board of Canada. (2014). *"Lean" in Canadian health care: Doing less while achieving more*. Retrieved from: www.conferenceboard.ca/e-library/abstract.aspx?did=6267
- Health Quality Ontario. (2013). *Quality Improvement Science*. Retrieved from: www.hqontario.ca/portals/0/documents/qi/qi-science-primer-en.pdf
- Sarkar, Debashis. (2008). *Lean for service organizations and offices*. American Society for Quality: Milwaukee.
- Virginia Mason Institute: www.virginiamasoninstitute.org/knowledge-base/

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Six sigma framework

BACKGROUND	ABOUT	EXAMPLES

• Originated from manufacturing: Motorola during the mid-80s and General Electric during the mid-90s.
• Improves the quality of processes by identifying and removing causes of defects and minimizing variability.
• The goal is to improve all processes to lower long-term defect levels below 3.4 defects/million repetitions.
• Differs from other QI approaches given its focus on achieving measurable financial return.[18]
	• Rigorous five-step process (DMAIC):
	  ○ **Define** the problem, set project goals.
	  ○ **Measure** current process performance and collect information on potential root causes.
	  ○ **Analyze** the data to verify causal relationships.
	  ○ **Improve** the current process by implementing changes to reduce or eliminate the problem (or root cause).
	  ○ **Control** or monitor the newly implemented changes to ensure fidelity is maintained.
		• Six Sigma has been used to decrease unnecessary laboratory tests, improve magnetic resonance image quality, reduce surgical wait times, reduce catheter infections, and decrease excess length of stay in hospitals.
		• Six Sigma has been used by behavioural/ developmental health organizations to redesign intake processes resulting in a 43% increase in access to care, an 81% decrease in bad debt and uncontrolled funds, and improved cash flow while maintaining a high client satisfaction rate.

Further reading:

- Tennant, G. (2001). *Six Sigma: SPC and TQM in Manufacturing and Services*. Burlington: Gower.
- Harry, M. J., Mann, P. S., De Hodgins, O. C., Hulbert, R. L., Lacke, C. J. (2010). *Practitioner's guide to statistics and Lean Six Sigma for process improvements* (1st ed.). Hoboken: John Wiley & Sons, Incorporated.

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Lean six sigma framework

BACKGROUND	ABOUT	EXAMPLES
• Combines Lean and Six Sigma approaches as complementary processes with the common goal of driving organizational excellence overall. • Uses a combined toolbox of techniques from each approach depending on what's relevant to the situation. It doesn't matter where the tool comes from, but that they do solve the problem.[20]	• Combines the principles of Lean and Six Sigma, using Lean to reduce waste and improve flow and Six Sigma to reduce defects and process variation. • Lean Six Sigma adopts the DMAIC process from Six Sigma to drive improvements.[20]	• Using a Lean Six Sigma methodology, a private not for profit healthcare system in the United States rolled out a coordinated discharge procedure that decreased readmission rates by 9.7% for heart failure, acute myocardial infarction, and pneumonia while increasing patient satisfaction by 14%.[21] • A health system in the United States used Lean Six Sigma to improve the effectiveness and efficiency of their referral process, reducing the number of days to referral by 23 days in one group and 100.1 days in another group.[22]

Further reading

- George, M. L. (2002). *Lean Six Sigma: Combining Six Sigma Quality with Lean Production Speed* (1st ed.). McGraw-Hill Education: New York.
- George, M. L.; Rowlands, David; Kastle, Bill (2003). *What is Lean Six Sigma?*. McGraw-Hill Education: New York.
- Goleansixsigma: goleansixsigma.com/

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Strengths-based lean six sigma framework

BACKGROUND	ABOUT	EXAMPLES
• A relatively new approach that began in 2007 by David Shaked, with roots in strengths-based approaches to change (such as Appreciative Inquiry, Solution Focus coaching[23] and Positive Deviance).[24] • Moves away from a focus on the problem, what isn't working well, and how to reduce/eliminate something to a focus on what is working well and how can we do more of that?	• Uses the 5D approach from Appreciative Inquiry: ○ **Identify:** the appreciative topic to focus and grow. ○ **Discover:** Explore what works (or has worked) well – the best of 'what is'. ○ **Dream:** Envision what could work well in the future – the best of 'what can be'. ○ **Design:** Plan and prioritize what will work well in the future. Find ways to move toward the shared dream. ○ **Deliver/Destiny:** Implement the proposed design.	• Strengths-Based Lean has been used to make improvements in a number of large-scale change initiatives: ○ Creating a new vision for a failing manufacturing company, moving it from being slated for closure to being recognized as best in class over a 3-year period. ○ Helping organizations identify ideas for improvement and building team commitment toward large change initiatives.

Further reading

- Shaked, D. (2014). *Strength-based Lean Six Sigma: Building positive and engaging business improvement*. London: Kogan Page Limited.
- Shaked, D. (2014). *Strength-based Lean thinking. Training*. Retrieved from: trainingmag.com/strength-based-lean-thinking

Knowledge Institute

Bibliographie

1. Ontario Child Welfare Quality Network. (2009). *A Handbook for Building Quality Capacity in Ontario Child Welfare Organizations*. Toronto, ON: Ontario Child Welfare Quality Network.
2. Canadian Centre on Substance Abuse. (2013). *Systems approach workbook: Quality improvement and a systems approach to substance use*. Ottawa, ON: Canadian Centre on Substance Abuse.
3. Sarkar, D. (2008). *Lean for Service Organizations and Offices*. Milwaukee, Wisconsin: ASQ Quality Press.
4. Watkins, J. M., Kelly, R., & Mohr, B. J. (2011). *Appreciative inquiry: Change at the speed of imagination* (2nd ed.). San Francisco, Calif: Pfeiffer.
5. Moraros, J., Lemstra, M., Nwankwo, C. (2016). Lean interventions in healthcare: do they actually work? A systematic literature review. *International Journal for Quality in Health Care*, 28 (2), 150-165, doi.org/10.1093/intqhc/mzv123.
6. The Conference Board of Canada. (2014). *Current State of Lean in Canadian Health Care*. Ottawa, ON: William Hall, Jennifer Mackenzie.
7. Hicks, C., McGovern, T., Prior, G., & Smith, I. (2015). Applying lean principles to the design of healthcare facilities. *International Journal of Production Economics*, 170, 677-686, doi.org/10.1016/j.ijpe.2015.05.029
8. DiGioia, A.M., Greenhouse P.K., Chermak, T., & Hayden M.A. (2015). A case for integrating the Patient and Family Centered Care Methodology and Practice in Lean healthcare organizations. *Healthcare*, 3 (4), 225-230, doi.org/10.1016/j.hjdsi.2015.03.001
9. Taylor, M.J., McNicholas, C., Nicolay, C., Darzi, A., Bell, D., & Reed, J.E. (2013). Systematic review of the application of the plan–do–study–act method to improve quality in healthcare. *BMJ Quality & Safety*, 23 (4), 290-298, dx.doi.org/10.1136/bmjqs-2013-001862
10. Reid, D., Leyland, J., & Gill, L. (2005). Does client self-booking reduce 'did not attends' (DNAs) in a counselling service? *Counselling and Psychotherapy Research*, 5 (4), 291-294, dx.doi.org/10.1080/14733140500510275
11. Taner, M. T., Sezen, B., & Antony, J. (2007). An overview of six sigma applications in healthcare industry. *International Journal of Health Care Quality Assurance*, 20(4), 329-340. doi.org/10.1108/09526860710754398
12. Shaked, D. (2014). *Strength-based Lean Six Sigma: Building positive and engaging business improvement*. London: Kogan Page Limited
13. Langley, G. J. (1996). *The improvement guide: A practical approach to enhancing organizational performance*. San Francisco: Jossey-Bass Publishers.

14. Glasgow, R., Funnell, M., Bonomi, A., Davis C., Beckham V., Wagner E.H. (2002). Self-management aspects of the improving chronic illness care breakthrough series: implementation with diabetes and heart failure teams. *Annals of Behavioral Medicine*, 24 (2), 80-87, doi.org/10.1207/S15324796ABM2402_04

15. Lee, C.S., Larson, D.B. (2014). Beginner's Guide to Practice Quality Improvement Using the Model for Improvement. *Journal of the American College of Radiology*, 11 (12 Part A), 1131-1136, doi.org/10.1016/j.jacr.2014.08.033.

16. Womack, J.P., & Jones, D.T. (1996). *Lean thinking: banish waste and create wealth in your corporation* (2nd ed.). New York: Simon & Schuster.

17. The Conference Board of Canada. (2015). *Mapping the Journey: Success and Failure with Lean*. Ottawa, ON: William Hall, Jennifer Mackenzie.

18. Tennant, G. (2001). *Six Sigma: SPC and TQM in Manufacturing and Services*. Burlington: Gower.

19. Lucas A.G., Primus K., Kovach, J.V., Fredendall, L.D. (2015). Rethinking behavioral health processes by using design for six sigma. *Psychiatric Services*, 66 (22), 112-114, doi.org/10.1176/appi.ps.201400384

20. George, M. L. (2002). *Lean Six Sigma: Combining Six Sigma Quality with Lean Production Speed* (1st ed.). McGraw-Hill Education: New York.

21. Breslin, S.E., Hamilton, K.M., Paynter, J. (2014). Deployment of Lean Six Sigma in care coordination: An improved discharge process. *Professional Case Management*, 19(2), 77-83, doi.org/10.1097/NCM.0000000000000016

22. Deckard, G. J., Borkowski, N., Diaz, D., Sanchez, C., Boisette, S. A. (2010). Improving timeliness and efficiency in the referral process for safety net providers: Application of the Lean Six Sigma methodology. *Journal of Ambulatory Care Management*, 33 (2), 124-130, doi.org/10.1097/JAC.0b013e3181d91670

23. O'Connell, B., Palmer, S., Williams, H. (2012). *Solution Focused Coaching in Practice*. East Sussex: Routledge.

24. Pascale, R.T., Sternin, J., Sternin, M. (2010). *The power of positive deviance: how unlikely innovators solve the world's toughest problems*. Boston: Harvard Business Press.