

Continuous Quality Improvement (CQI) Strategies to Optimize your Practice

Primer

Provided By:

The National Learning Consortium (NLC)

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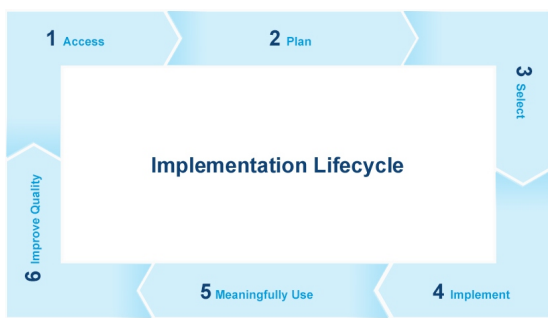
NATIONAL LEARNING CONSORTIUM

The National Learning Consortium (NLC) is a virtual and evolving body of knowledge and resources designed to support health care providers and health IT professionals working toward the implementation, adoption, and Meaningful Use of certified electronic health record (EHR) systems.

The NLC represents the collective EHR implementation experiences and knowledge gained directly from the field of ONC's outreach programs ([REC](#), [Beacon](#), [State HIE](#)) and through the [Health Information Technology Research Center \(HITRC\)](#) Communities of Practice (CoPs).

The following resource can be used in support of the [EHR Implementation Lifecycle](#). It is recommended by "boots-on-the-ground" professionals for use by others who have made the commitment to implement or upgrade to certified EHR systems.

EHR Implementation Lifecycle



DESCRIPTION AND INSTRUCTIONS

Continuous Quality Improvement (CQI) is a quality management process that encourages all health care team members to continuously ask the questions, "How are we doing?" and "Can we do it better?" (Edwards, 2008). To address these questions, a practice needs structured clinical and administrative data. EHRs can, if properly designed and implemented, capture these data efficiently and effectively, thereby transforming patient care in ways that might have been difficult or impossible with paper records alone.

This Primer introduces CQI concepts, strategies, and techniques a practice can use to design an effective CQI strategy for EHR implementation, achieve Meaningful Use of the system, and ultimately improve the quality and safety of patient care. A practice can use CQI throughout the EHR implementation lifecycle. CQI strategies have been successfully implemented in many industries, including health care. The CQI conceptual framework presented in this Primer provides a foundation to design and manage CQI initiatives and offers points to consider when deciding which strategy works best for a particular practice or organization. A CQI toolkit, currently under development, will elaborate in more detail the concepts provided in this Primer.

Section 1 of this Primer defines CQI and its relationship to Meaningful Use and EHR implementation and presents a case study of CQI concepts. Section 2 describes the leading strategies to be considered when designing a CQI program for a practice. Section 3 provides guidance for planning a CQI initiative and selecting a CQI strategy that matches the needs of various practice settings.

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1 Continuous Quality Improvement (CQI) in the EHR Implementation Lifecycleⁱ

1.1 INTRODUCTION

The quest to use health information technology (IT), specifically EHRs, to improve the quality of health care throughout the health care delivery continuum is a consistent goal of health care providers, national and local policymakers, and health IT developers. The seminal Institute of Medicine (IOM) report, *Crossing the Quality Chasm: A New Health System for the 21st Century* (IOM, 2001), was a call for all health care organizations to renew their focus on improving the quality and safety of patient care in all health care delivery settings.

Since the IOM report, the health care industry has emphasized the design and implementation of health IT that supports quality improvement (QI) and quality monitoring mechanisms in all levels of the health care delivery system. Many QI strategies currently used in health care, including Continuous Quality Improvement (CQI), have been adopted from other industries that have effectively used QI techniques to improve the efficiency and quality of their goods and services. Experience and research have shown that CQI principles, strategies, and techniques are critical drivers of new care models such as Patient-Centered Medical Homes (PCMHs) or Accountable Care Organizations (ACOs). As practice leaders and staff learn more about CQI strategies and identify what works best for the desired type and level of changes in the practice setting (i.e., moving from the current state to the desired future state), they will recognize the value in designing an EHR implementation to meet both the Meaningful Use requirements and their own QI goals.

This Primer provides an overview of CQI concepts and processes and will:

- Define CQI and how it applies to EHR implementations and practice improvement strategies;
- Identify a conceptual framework to consider when implementing CQI techniques in a practice setting;
- Explore tools, techniques, and strategies that health care and other service industries use to guide and manage CQI initiatives;
- Guide the selection of the most appropriate CQI technique or strategy for the type and scale of improvements the practice is considering; and,
- Provide tips to help the practice leaders tailor the approach, tools, methods, and processes to the unique CQI initiative and practice setting.

1.2 WHAT IS CONTINUOUS QUALITY IMPROVEMENT?

Put simply, CQI is a philosophy that encourages all health care team members to continuously ask: “How are we doing?” and “Can we do it better?” (Edwards, 2008). More specifically, can we do it more efficiently? Can we be more effective? Can we do it faster? Can we do it in a more timely way? Continuous improvement begins with the culture of improvement for the patient, the practice, and the population in general.

Besides creating this inquisitive CQI culture in an organization, the key to any CQI initiative is using a structured planning approach to evaluate the current practice processes and improve systems and processes to achieve the desired outcome and vision for the desired future state. Tools commonly used in CQI include strategies that enable team members to assess and improve health care delivery and services.

Applying CQI to a practice’s EHR implementation means that the health care team must understand what works and what does not work in the current state and how the EHR will change care delivery and QI aims. The CQI plan identifies the desired clinical or administrative outcome and the evaluation strategies that enable the team to determine if they are achieving that outcome. The team also intervenes, when needed, to adjust the CQI plan based on continuous monitoring of progress through an adaptive, real-time feedback loop.

1.3 HOW CAN CQI HELP A PRACTICE MAKE THE MOST OF MEANINGFUL USE?

Meaningful Use is an important means to achieving the triple aims of health care—improving the experience of patient care, improving population health, and reducing per capita costs of health care (Berwick et al., 2008). The Centers for Medicare and Medicaid Services' EHR Incentive Program provides eligible professionals, eligible hospitals, and critical access hospitals incentive payments that support the optimal use of technology for health care ([Incentive Programs—Regulations and Guidance](#)). Although a practice can implement an EHR without addressing Meaningful Use, practices that do so are less likely to realize the full potential of EHRs to improve patient care and practice operations (Mostashari, Tripathi, & Kendall, 2009).

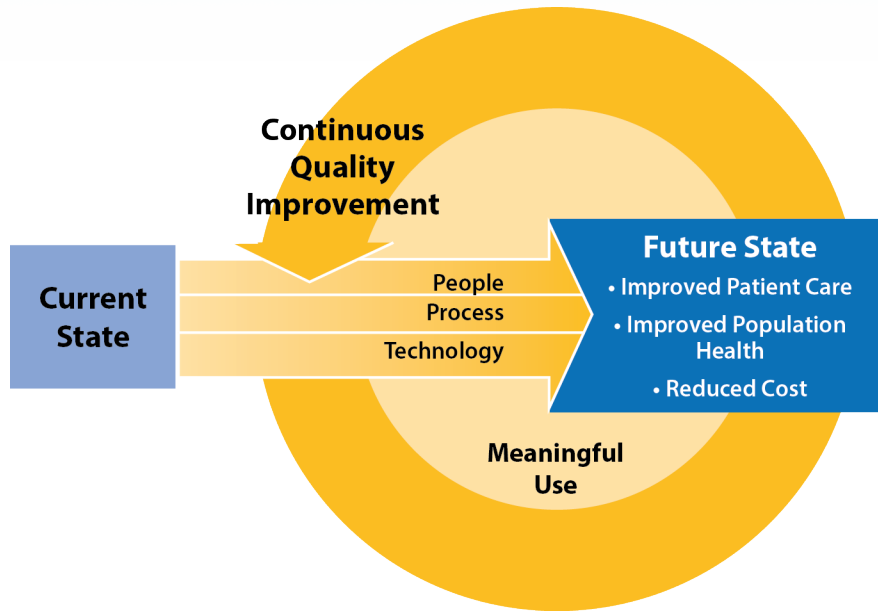
Attesting to Meaningful Use, although it is an important milestone for a practice, is not an end unto itself. Practices that can achieve Meaningful Use will be able to use their EHR to obtain a deep understanding of their patient population and uncover aspects of patient care that could be improved. Using a planned, strategic approach to CQI will help a practice move from reporting the requirements for Meaningful Use to improving patient care and meeting other practice goals. The literature shows a strong link between an explicit CQI strategy and high performance (Shortell et al., 2009). Thus, applying CQI principles and strategies will transform numbers on a spreadsheet or a report into a plan for action that identifies areas of focus and the steps and processes needed to improve those areas continually and iteratively.

To establish an effective CQI strategy, a practice should (Wagner et al., 2012)

- Choose and use a formal model for QI.
- Establish and monitor metrics to evaluate improvement efforts and outcomes routinely.
- Ensure all staff members understand the metrics for success.
- Ensure that patients, families, providers, and care team members are involved in QI activities.
- Optimize use of an EHR and health IT to meet Meaningful Use criteria.

Put together, CQI and Meaningful Use can move a practice from its current state to a more desirable future state. As depicted in Exhibit 1, CQI begins with a clear vision of the transformed environment, identification of necessary changes to achieve that vision, and input from engaged team members who understand the needs for the practice. In short, the journey to the desired future state involves a transformation of people, process, and technology. Meaningful Use of health information and an explicit commitment to CQI can help a practice establish that clear vision and implement it successfully.

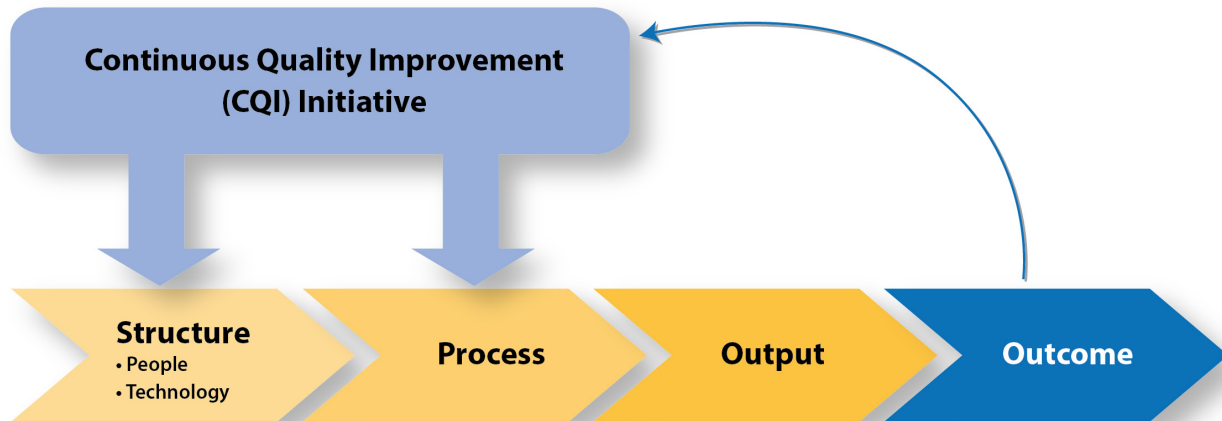
Exhibit 1. Using CQI to Move From Current State to Future State



1.4 WHAT DOES CQI LOOK LIKE IN PRACTICE?

In undertaking any CQI initiative, a practice must consider three components: (1) structure, (2) process, and (3) outcomes (Donabedian, 1980). Exhibit 2 builds on these three components within the context of health information technology and illustrates the basic premise of CQI: any initiative involving an EHR to improve patient care must focus on the structure (especially technology and people) and process that lead to the expected outputs and then ultimately to the desired outcomes.

Exhibit 2. CQI Framework Model



Structure. Structure includes the technological, human, physical, and financial assets a practice possesses to carry out its work. CQI examines the characteristics (e.g., number, mix, location, quality, and adequacy) of health IT resources, staff and consultants, physical space, and financial resources.

Process. The activities, workflows, or task(s) carried out to achieve an output or outcome are considered process. Although CQI strategies in the literature focus more commonly on clinical processes, CQI also applies to administrative processes. The EHR functions that meet Meaningful Use Stage I Core Objectives support key clinical and administrative processes (see this link: [MU Objectives](#)).

Output. Outputs are the immediate predecessor to the change in the patient's status. Not all outputs are clinical; many practices will have outputs tied to business or efficiency goals and, accordingly, require changes to administrative and billing processes.

Outcome. Outcomes are the end result of care (AHRQ, 2009) and a change in the patient's current and future health status due to antecedent health care interventions (Kazley, 2008). Desired changes in the cost and efficiency of patient care or a return on investment in the EHR can also be considered outcomes.

Feedback Loop. In Exhibit 2, a feedback loop between the output/outcome and the CQI initiative represents its cyclical, iterative nature. Once a change to the structure and process is implemented, a practice must determine whether it achieved the intended outcome and, if not, what other changes could be considered. If the outcome is achieved, the practice could determine how to produce an even better outcome or achieve it more efficiently and with less cost.

It's not just a model: CQI in action

Consider structure, process, and outcomes and how they apply to a CQI initiative to improve obesity screening and follow-up in an adult primary care practice that has attested to Meaningful Use (MU) Stage 1.

- The **structural** assessment of an obesity screening CQI initiative would examine the functionality of the EHR for weight management tasks; staff's knowledge and expertise to counsel overweight and obese patients; and the adequacy of the space and materials to provide education and social support. The CQI initiative might also consider the acquisition of a separate Adult Body Mass Index (BMI) Improvement module that would randomly survey patient charts at two different times to monitor BMI changes in the clinic's overweight and obese patient population.
- A **process** assessment of an obesity screening CQI initiative would ensure that the EHR can record and chart vital signs such as BMI (MU Core Measure # 8) so providers can easily capture, monitor, and trend a patient's weight from visit to visit. The CQI initiative would also assess the clinical summaries given to the patient (MU Core Measure # 13) and whether these summaries effectively educate patients about what they need to do between visits to maintain or reduce their BMI.
- An **output** leading to an improvement in BMI could be ensuring that BMI is recorded in the EHR at each visit for every patient so that the provider can track the patient's progress. Another output might be to ensure that every patient receives nutrition and exercise counseling between office visits.

A primary **outcome** for an obesity CQI initiative is reducing BMI by a certain amount within a specified time frame that the provider/patient believes is achievable. Longer term outcomes for the individual patient are improved quality of life and a longer life. For the practice that is part of an ACO or PCMH, reducing BMI in its patient panel may result in better reimbursement and receipt of financial incentives. A CQI initiative supported by an EHR allows the practice to monitor progress towards the outcome for a patient. Equally important, however is the ability to monitor the progress of the practice's obese population by establishing a disease registry. Thus, a practice can monitor changes in BMI for each patient, estimate the proportion of patients in the practice that are overweight and obese, and identify patients who are outliers. These powerful data can transform how a provider chooses to care for these patients.

If the obesity CQI initiative reveals that efforts to screen and counsel are successful in reducing BMI in patients, the next question is whether the enhanced screening works for everyone equally well. A closer look at the data may reveal, for example, that screening had almost no effect on older male patients. These insights would be used to consider additional modifications to the structure and process of the screening to help older male patients achieve weight management goals.

2 Strategies for CQI

2.1 LEADING CQI STRATEGIES IN HEALTH CARE

Fortunately, a practice can choose many well-established CQI programs and strategies to achieve its QI aims. The specific strategy a practice selects depends on several factors. For example, a practice incorporating CQI in an initial EHR implementation will have different goals and objectives than a practice that has already achieved Stage 1 Meaningful Use and wants a more targeted CQI effort directed at Meaningful Use Stage 2. The following sections briefly describe four strategies for CQI widely used in the health care industry today. The descriptions cover the basic principles of each strategy followed by the specific action steps each strategy recommends. An accompanying case study illustrates the use of the strategy in a practice setting. This section concludes with a side-by-side comparison of the strategies and guidance on selecting the appropriate strategy. Again, the final CQI strategy the practice uses could be a combination of tools, methods, and processes that best meet the practice culture and the unique CQI initiative.

2.1.1 The Institute for Healthcare Improvement (IHI) Model for Improvement

The IHI Model for Improvement is a simple strategy that many organizations currently use to accelerate their improvement strategies. A CQI initiative based on the IHI Model for Improvement focuses on setting aims and teambuilding to achieve change. As depicted in Exhibit 3, it promotes improvement by seeking answers to three questions:

- What are we trying to accomplish?
- How will we know that a change is an improvement?
- What changes can we make that will result in improvement?

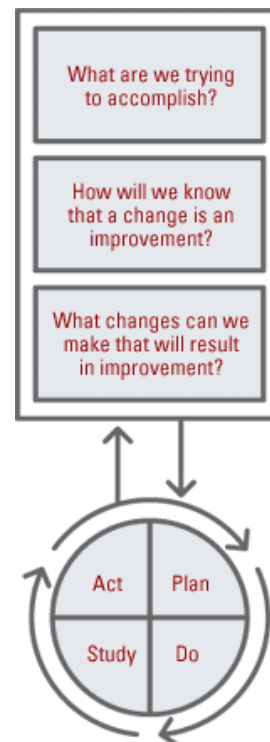
Principles

To answer these questions, a CQI initiative uses a Plan-Do-Study-Act (PDSA) cycle to test a proposed change or CQI initiative in the actual work setting so changes are rapidly deployed and disseminated. The cycle involves the following seven steps:

Form the team. Including the appropriate people on a process improvement team is critical to a successful effort. The practice (or provider) must determine the team's size and members. Practice staff persons are the experts at what works well in the practice and what needs to be improved. Include them in identifying and planning the implementation of any CQI initiative.

Set aims. This step answers the question: What are we trying to accomplish? Aims should be specific, have a defined time period, and be measurable. Aims should also include a definition of who will be affected: patient population, staff members, etc. For practice transformation, the aims should ideally be consistent with achieving one or more of the triple aims previously discussed.

Exhibit 3. IHI Model for Improvement



Establish measures. This step answers the question: How will we know that a change is an improvement? Outcome measures should be identified to evaluate if aims are met. Practices should select measures using data they are able to collect.

Select changes. This step answers the question: What changes can we make that will result in improvement? The team should consider ideas from multiple sources and select changes that make sense.

Test changes. First, the changes must be planned and downstream impacts analyzed to assess whether they had the desired outcome or output. Once the changes are implemented, the results should be observed so that lessons learned and best practices can be used to drive future changes.

Implement changes. After testing a change on a small scale, learning from each test, and refining the change through several PDSA cycles, the team may implement the change on a broader scale—for example, for a pilot population or on an entire unit.

Spread changes. After successful implementation of a change(s) for a pilot population or an entire unit, the team can disseminate the changes to other parts of the organization.

Big Sandy Health Care in Eastern Kentucky used the Plan-Do-Study-Act cycle to develop and test a new patient portal. The staff first identified the priority functions for the portal and the workflow changes involved. Then, staff received training and pilot tested the portal with volunteer patients. Issues from the pilot testing were addressed before the rollout, and a patient survey on the portal provided feedback to aid further improvements.

When to use. The IHI Model for Improvement is best used for a CQI initiative that requires a gradual, incremental, and sustained approach to QI so changes are not undermined by excessive detail and unknowns (Hughes, 2008).

To find out more:

<http://www.ihl.org/knowledge/Pages/HowtoImprove/ScienceofImprovementHowtoImprove.aspx>

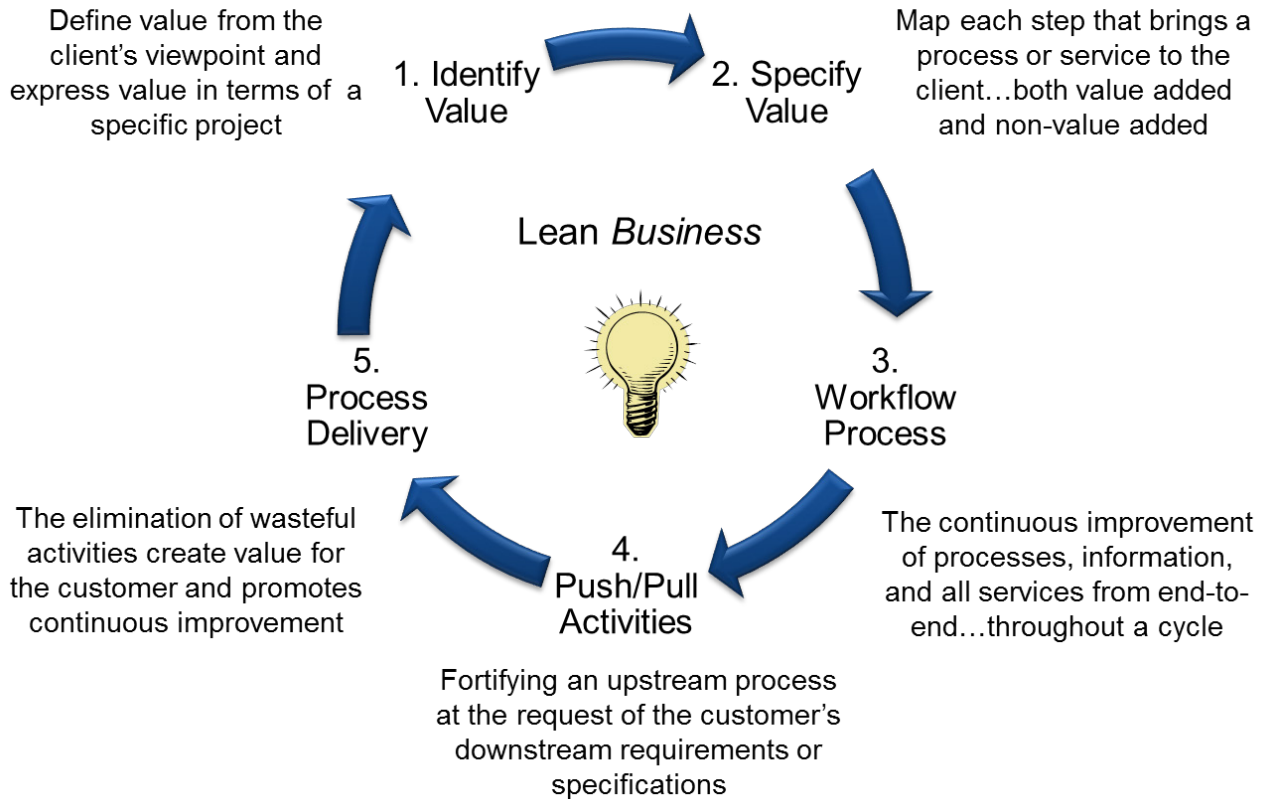
2.1.2 Lean

Lean is a continuous improvement process that gained international recognition when Womack, Jones and Roos published a book on the Toyota Production System. Many hospitals have borrowed the key Lean principles of reducing non-value added activities, mistake-proofing tasks, and relentlessly focusing on reducing waste to improve health care delivery. Lean helps operationalize the change to create work flows, handoffs, and processes that work over the long term (see Exhibit 4). A key focus of change is on reducing or eliminating seven kinds of waste and improving efficiency (Levinson & Renick, 2002):

- Overproduction
- Waiting; time in queue
- Transportation
- Nonvalue-adding processes
- Inventory
- Motion
- Costs of quality, scrap, rework, and inspection

Exhibit 4. Lean Principles for Operational Efficiency¹

Five principles to guide the activities for operational efficiency



Principles

A Lean CQI initiative focuses mainly on alleviating overburden and inconsistency while reducing waste to create a process that can deliver the required results smoothly (Holweg, 2007). Teams frequently use these principles once they know what system change will result in an improvement.

Identify which features create value. Identifying value is determined through both internal and external perspectives. For example, patients might value reduced phone time on hold, while providers value having all the information at hand available when making an appointment. The specific values depend on the process being streamlined.

Identify the value stream (the main set of activities for care). Once value is determined, practice leaders should identify activities that contribute value. The entire sequence of activities is called the value stream. Activities that fall outside that realm are considered waste and should be streamlined.

Group Health in Seattle, Washington used Lean principles to standardize a PCMH model across 26 sites over 14 months. The initiative focused on improving the efficiency of clinic workflow and processes to accommodate smaller panel sizes, longer appointment times, proactive chronic care, and greater use of licensed practical nurse and medical assistants for pre-visit preparation, follow-up and outreach (Hsu et al., 2012).

¹ <http://www.pmvantage.com/leanbusiness.php>

Improve flow so activities and information move in an efficient process. Once value-added activities and necessary nonvalue activities are identified, practice leaders should ensure that improvement efforts are directed to make the activities flow smoothly without interruption.

Test the clinical and/or administrative process. Once the improved flow is identified and documented, it should be tested. Testing can include a pilot of a few patients or a one-day test where the new process is used throughout the practice.

Perfect the process. Lessons learned and tensions that arise from this process can be identified and changes can be made before the final process is rolled out.

When to use. The Lean approach is useful in simplifying overcomplicated processes and takes a holistic approach that considers interrelated processes and workflows. Lean is not as well suited to small, discrete changes to a process as it is to whole groups or clusters of processes. Typically, Lean is applied in large health care settings although individual practices that belong to a physician network or a hospital may be engaged in a Lean initiative. Teams frequently use Lean once they know what system change will result in improvement from tried and tested best practices adopted in other settings.

To find out more:

<http://www.lean.org/whatslean/>

<http://www.pmvantage.com/leanbusiness.php>

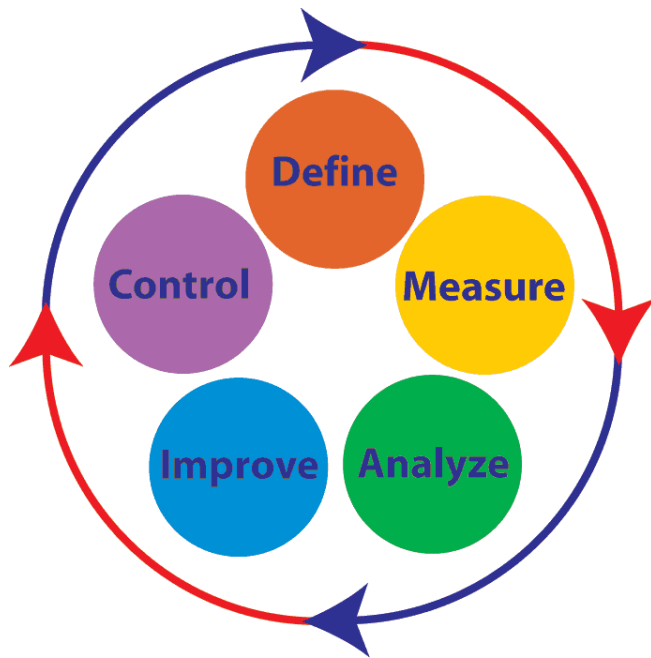
<http://asq.org/learn-about-quality/lean/overview/overview.html>

<http://www.lean.org/WhoWeAre/HealthcarePartner.cfm>

2.1.3 Six Sigma

Six Sigma is a business management and QI strategy that originated in the U.S. manufacturing industry; it seeks to improve efficiency by identifying and removing the causes of defects (errors) and minimizing variability in manufacturing and business processes (as shown in Exhibit 5). The term *Six Sigma* originated from terminology associated with the statistical modeling of processes. This QI strategy, thus, combines statistical analysis with quality management methods. Six Sigma also creates a special infrastructure of people within the organization [Green Belts (beginner) to Black Belts (most advanced)] who are experts in these methods. Lean and Six Sigma are often combined when a key goal is to reduce waste and errors.

Exhibit 5. Six Sigma Model²



Six Sigma was used to improve coordination between primary care physicians and diabetic specialists, reduce unnecessary appointments and reduce waiting times for appointments with specialists. The initiative defined and measured process indicators, analyzed descriptive statistics, and developed strategies based on the results. These strategies involved changing clinical protocol for hospitalized patients, increasing the autonomy of nursing staff, reorganizing the scheduling office, and specializing diabetic clinics to provide certain types of diabetic care. (Paccagnella et al., 2012).

Principles

Six Sigma relies on the ability to obtain data and on process and outcome measures. A CQI initiative using Six Sigma adheres to five principles:

Define. The first step is to define the process and outcome to be improved, define their key characteristics, and map the relevant inputs into the process that will lead to the desired outputs and outcomes. This step also involves defining the boundary for the CQI project.

Measure. Once the process and outcome to be improved are defined, the CQI initiative must track performance through data collection. Performance measures can be captured through structured observation, surveys, and the EHR.

Analyze. After measures are put in place, data can be collected and analyzed to determine how the practice is doing. Ideally, baseline data would be collected prior to putting new processes into place and at regular intervals. A CQI initiative would review these data as part of a process review to identify the causes of problems.

Improve. The results of the analysis are used to inform improvements. For example, if process changes result in workarounds, adjustments should be made. Similarly, if quality measures do not show improvement

² <http://archian.wordpress.com/2012/11/05/marketing-wisdom-of-understanding-six-sigma/>

after a change is implemented, the CQI initiative should examine what additional or alternate changes could be implemented to improve the process.

Control. Control involves ongoing monitoring and improvement as needed.

When to use. In health care settings, Six Sigma is often combined with aspects of Lean to focus on both quality and efficiency, particularly when practices embark on a large-scale EHR implementation. When smaller changes are involved, one method may make more sense.

To find out more:

<http://www.isixsigma.com/dictionary/dmaic/>.

<http://asq.org/healthcaresixsigma/lean.html>

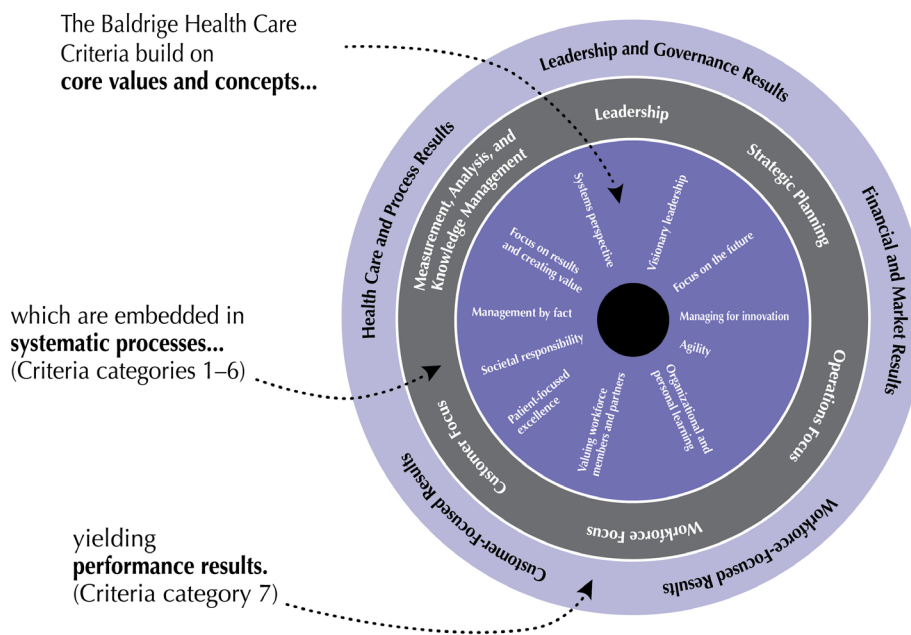
<http://archian.wordpress.com/2012/11/05/marketing-wisdom-of-understanding-six-sigma/>

2.1.4 Baldrige Quality Award Criteria

The Malcolm Baldrige Quality Award has evolved from an honor to recognize quality to an approach and methodology that enables continued excellence through self-assessment. This QI strategy is focused on total organizational improvement and instituting a culture of CQI. As depicted in Exhibit 6, it promotes the achievement of strategic goals through the alignment of resources and improved communication, productivity, and effectiveness in the seven criteria categories:

- Leadership
- Strategic planning
- Customer focus
- Measurement, analysis, and knowledge management
- Workforce focus
- Operations focus
- Results

Exhibit 6. Baldrige Core Values and Concepts³



From Baldrige Performance Excellence Program, 2013, 2013-2014 Health Care Criteria for Performance Excellence (Gaithersburg, MD: U.S. Department of Commerce, National Institute of Standards and Technology, http://www.nist.gov/baldrige/publications/hc_criteria.cfm).

Principles

Examining the Baldrige criteria thoroughly can help a practice identify strengths and opportunities for improvement. These areas can shape future organizational plans. Because award criteria have been widely used, they provide a common language and principles on which to base improvement. A CQI initiative using the Baldrige Award criteria follows these principles (NIST, 2010).

Identify the boundaries/scope of the self-assessment. This assessment could be the entire practice or a particular function (structure, process, or outcome) in the practice.

Select champions. Because Baldrige involves an organization-wide change, each of the seven criteria areas requires a champion. Some champions may lead more than one criteria area.

³ <http://www.nist.gov/baldrige/graphics.cfm>

Select teams for each champion. The purpose of the team is to work with the champion to conduct the self-assessment. This group should be interdisciplinary so multiple stakeholders are represented.

Collect data and information to answer questions. The core self-assessment is guided by 10 critical questions for each Baldrige criterion. Some examples of questions are: What are the organization’s core competencies? What are your key work processes? How do you build and manage relationships with your customers? Champions can prepare an organizational profile describing the practice and its challenges as a starting point for the data collection.

Share the answers to the Baldrige criteria questions among the category teams. The goal of this exercise is to identify common themes in the answers to the 10 structured questions for each criterion.

Create and communicate an action plan for improvement. Each criterion team creates and communicates an action plan for improvement based on the answers and organizational priorities. Teams identify strengths and opportunities, set priorities, and develop action plans.

Evaluate the self-assessment process and identify possible improvements. Practice leaders, champions, and teams evaluate the self-assessment and think about improvement mechanisms.

The Southcentral Foundation (SCF), a not-for-profit health care organization serving Alaska Natives and American Indian peoples in Anchorage and the surrounding area, used the Baldrige Criteria to create the Nuka system of care, which is owned, managed, designed, and driven by Alaska Native people, referred to as “customer-owners”. This focus on the customer-owner helped SCF to achieve the highest level of Patient-Centered Medical Home™ recognition from the National Committee on Quality Assurance (NCQA) in 2010 (National Institute of Standards and Technology http://www.nist.gov/baldrige/award_recipients/southcentral_profile.cfm).

When to use. Baldrige Award criteria focuses more on identifying problems and setting up teams to take ownership of them and less on the specific steps to carry out the planned improvement. This strategy is holistic and may require the organization to make significant cultural changes.

To find out more:

<http://www.nist.gov/baldrige/>




<http://asq.org/learn-about-quality/malcolm-baldrige-award/overview/overview.html>

2.2 WHICH CQI STRATEGY IS RIGHT?

A practice should choose a CQI strategy based on its goals and objectives for adoption, implementation, and Meaningful Use of its EHR, and could include practice transformation priorities beyond Meaningful Use (i.e., becoming a PCMH, etc.). The strategies described have similarities and differences. Exhibit 7 summarizes the key features of these strategies and the CQI initiatives for which they are most appropriate.

Exhibit 7. Summary of Leading Strategies for CQI

Strategy	Brief Description	Type of CQI Initiative	Example	References
IHI Model for Improvement	Emphasizes the use of the Plan-Do-Study-Act methodology to establish aims, define the problem, identify measures of success, and systematically test them in short, rapid cycles. Can be combined with other strategies.	<ul style="list-style-type: none"> • Emphasis on process and outcome. • Best for specific problems whose solutions can be refined over time. • Is a gradual, incremental approach to CQI. • Ideal for achieving small, quick wins; applying lessons learned to new cycles and identifying best practices. 	Big Sandy HealthCare uses PDSA to pilot test a new patient portal.	<ul style="list-style-type: none"> • Institute of Healthcare Improvement • MN Department of Health
Lean	Alleviates overburden and inconsistency in processes by eliminating waste, redundancy, and unnecessary effort. Emphasis is on developing efficient systems that involve whole groups or clusters of related processes. Is focused on groups or whole categories of related processes.	<ul style="list-style-type: none"> • Emphasis on process. • Simplifies overcomplicated processes and considers interdependencies. • Best for known problems with known system change solution. • Integrated throughout the organization or practice. • Ideal for large complex health care organizations and practice networks that want to standardize operations across multiple units or practice sites. 	Group Health uses Lean to standardize PCMH processes across 26 diverse practices.	<ul style="list-style-type: none"> • http://www.lean.org/w/hatslean/ • http://asq.org/learn-about-quality/lean/overview/overview.html • http://www.lean.org/WhoWeAre/HealthcarePartner.cfm • Practice White Paper • Creating a Lean Practice

Strategy	Brief Description	Type of CQI Initiative	Example	References
Six Sigma	Emphasizes identifying and removing the causes of defects (errors) and minimizing variability in manufacturing and business processes. Uses statistical methods and a hierarchy of users within the organization (Black Belts, Green Belts, etc.) who are experts in these methods.	<ul style="list-style-type: none"> • Emphasis on processes and outcomes. • Best for processes plagued by wide variability—logging of pharmaceuticals, standardizing referral processes, etc. • Is a heavily quantitative approach to CQI. • Can be adapted for targeted changes to specific processes. • Typically combined with Lean when the focus is on efficiency and quality. • Ideal for practices that want to rigorously quantify improvements in safety, quality, and cost effectiveness. 	An integrated provider network uses Six Sigma to reduce appointment times for diabetic care.	<ul style="list-style-type: none"> • SixSigma • Six Sigma Online  • How to Develop a Lean Six Sigma Deployment Plan  • 6sigma.us/  • ASQ • Wisdom of Six Sigma
Baldrige Award Criteria	Emphasizes identifying problems and setting up teams to take ownership of those problems. Promotes culture of continued excellence via team-based self-assessment in seven criteria areas. Is less focused on the specific steps to achieve improvement.	<ul style="list-style-type: none"> • Emphasis on structure and outcomes. • Best for practice-wide problem assessment and goal setting. • A broad, holistic approach to CQI initiated at strategic times. • Ideal for practices that want to establish a new CQI system or overhaul an existing one. 	Southcentral Foundation uses Baldrige Award to completely redesign patient care and achieve the highest level of PCMH recognition	<ul style="list-style-type: none"> • NIST—Baldrige • Baldrige Overview

2.3 BEST PRACTICES TO CONSIDER IN USING A CQI STRATEGY

2.3.1 Have the Right Data and Use the Data Well

Regardless of the strategy, a practice must analyze quality data to properly conduct CQI; thus, every effort should be made to ensure data are timely, accurate, and measure what they are intended to measure.

Consider the source of the data for each metric needed to assess performance. The EHR cannot collect every kind of data needed for CQI. Some data may have to be collected by someone watching and tracking activities in real time or through surveys of staff and patients.

Ensure that the EHR collects the data needed to support CQI efforts as structured data in the EHR. Data stored in free text fields or document images will not automate data collection. Ideally, it is best to know this before an EHR is purchased or upgraded.

Establish targets and benchmarks. The results of a CQI analysis are meaningless if no data exist for comparison. Many clinical measures have national and regional benchmarks (e.g., HEDIS for process of care measures). The best benchmark, however, is generated within the practice through the collection of

baseline data which the practice uses to set a reasonable target for improvement over a specified period. Improvement is tracked by periodic comparison of pre- and post-data.

Establish a broad set of measures—structure, process, and outcomes. Although quality (outcome) measurement is a prime concern, on its own it tells nothing about why outcomes occur. Collecting structure and process measures will help uncover and address the underlying causes of poor performance.

Aggregate data to assess the practice population. One of the most efficient ways to carry out CQI initiatives focused on quality of care is to aggregate the data for patients with similar conditions into a registry. These patients often experience similar issues with treatments, medication adherence, and coordination with specialists so it makes sense to view them as a distinct population that a practice monitors and tracks over time. In addition, a disease registry allows the practice to identify patients who are outliers and may need even more attention and follow-up.

Conduct periodic data quality audits. Most measures are captured as simple statistics (e.g., counts, percent, mean and mode) so ensure that the EHR is producing accurate and complete denominator and numerator data.

2.3.2 Have the Resources to Finish the Job

Align the scope of your CQI initiative to the time and resources to carry it out. Although the EHR can make the CQI process more efficient by automating some data collection, staff members will still need to analyze and interpret the data and then translate those interpretations into action.

Establish reasonable budgets and time frames for any given CQI initiative. The inputs for any given CQI initiative are more likely to be sufficient if the practice considers up front what is needed to complete the initiative. A dedicated staff and a timeline also establish accountability for the CQI initiative.

Break down larger CQI initiatives into smaller ones. No matter how expansive and complex, almost any CQI initiative can be achieved if it can be broken down into smaller projects that build on one another. Successfully completing one small project builds enthusiasm and energy for the next project.

Establish a stopping point where success is defined and new initiatives started. Almost any process could be refined and improved indefinitely—a practice should determine what is “good enough” so CQI resources can be directed to other quality improvement needs.

Invest in a CQI infrastructure. CQI requires a certain set of inputs (e.g., a culture of learning; skills to collect, analyze, and use data from the EHR) that take time and money to acquire but are investments in the practice’s long-term viability. Like any new skill or task, CQI gets easier and more efficient over time as staff members become competent in CQI methods and figure out the best ways to integrate CQI into practice operations.

Celebrate Success. Any CQI effort, no matter how big or small, involves time and effort that should be recognized by the participating staff and leadership. Taking time to reflect on the CQI team’s accomplishments will build enthusiasm and energy to tackle the next problem.

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