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RETAIN Resource: Continuous Quality Improvement Strategies

RETAIN | Retaining Employment and Talent After Injury/Illness Network

MAKING RESEARCH **RELEVANT**

RETAIN Resource: Continuous Quality Improvement Strategies

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Introduction

This resource provides state Retaining Employment and Talent After Injury/Illness Network (RETAIN) demonstration projects with an in-depth look at continuous quality improvement (CQI), including processes, activities, and the identification of the root causes of problems.

As part of the state RETAIN implementation process, your program will use CQI to monitor efforts and outcomes, and take action to continuously improve implementation. Continuous improvement may include assessing service and process gaps and strengths, and identifying and addressing needs, problems, or opportunities.

This resource describes how to identify systemic problems through root cause analysis and presents five CQI methods, strategies, and techniques and related tools to assist you with potential approaches for fixing them, which are described in the table below.

Approaches to CQI	When to Use
Plan Do Study Act (PDSA)	This approach is used to test changes to establish whether they lead to improvement, which can help your program evaluate expected improvement from changes as well cost and potential side effects (Institute for Healthcare Improvement, n.d.).
Institute for Healthcare Improvement's Model (IHI-QI)	Your program should consider IHI-QI if looking for a gradual, incremental, and sustained approach to CQI (Health Information Technology Research Center, 2013).
AIDE (assess, identify root causes, develop an action plan, and evaluate)	This comprehensive approach incorporates the process of root cause analysis and concludes with an evaluation. The Action Plan Template is helpful for tracking plans, steps, and responsibilities.
Six Sigma	This approach is best for procedures burdened by wide variability. Also ideal for programs wanting to quantify quality, cost, and effectiveness (Health Information Technology Research Center, 2013).
Lean management principle	Useful for simplifying complicated processes by taking a more comprehensive approach at examining interrelated processes and workflow (Health Information Technology Research Center, 2013).

For each method, the model components and/or steps are described and links to additional resources are provided. You can use the information in this resource to:

- identify one or more CQI methods or approaches that you plan to implement during your program planning and/or implementation phases;
- identify approaches that you can use in conjunction with your program-monitoring activities to guide your efforts to continuously improve the quality of your program; and
- provide content for training RETAIN program team members to conduct CQI initiatives.

Approaches to Root Cause Analysis

Before reviewing CQI strategies, this resource highlights ways to conduct root cause analysis (RCA). The RCA process identifies systemic problems and is essential to attaining CQI. For example, the PDSA model is a strategy that you can use after you have identified both the problems and the root causes of the problems. Root causes are the underlying problems that often lead to errors.[1] If your program team identifies one or more priority processes or outcomes to improve, there are several strategies that you can use individually or in combination to better understand the issue, including the strengths and weaknesses that are directly relevant to the issue or concern. These strategies are summarized in the table below.

Approaches to RCA	When to Use
Traditional RCA	The RCA process may examine physical causes, human causes, and/or organizational causes. The RCA process involves reviewing data to identify problems and then reconstructing the steps in a process or sequence of events that have led up to problems.
	Two traditional RCA techniques discussed in this resource are the Five Whys and Fishbone Diagram: • 5 Whys— Process of asking the question Why? repeatedly to better understand the processes and problems (iSixSigma, n.d.). • Fishbone Diagram – Tool or diagram that highlights the cause-and-effect of a problem; used as part of a brainstorming process that may involve the use of the 5 whys
Process Mapping	Process mapping is another approach for identifying the root causes of problems. Process mapping is a description and/or picture of the step-by-step actions taken to accomplish an activity or produce an outcome (Marrelli; Strategos; Southern Institute on Children and Families, 2009). Although this approach does not require conducting a traditional RCA beforehand, doing an RCA first can improve process maps by highlighting where errors or deficiencies occur.

[1] Errors refers to systemic problems that can lead to inefficiencies; these may be steps or processes that are missing, problems with the implementation of a process, or inadequate, incorrect or problematic processes.

Root Cause Analysis

The focus of RCA is to find the underlying problems that lead to errors rather than treat or fix the symptoms of the problems. These are often systems errors rather than specifically human errors. Determining why a problem has occurred allows you to identify solutions that can prevent the problem from happening again. The RCA process may examine physical causes, human causes, and/or organizational causes.

The RCA process involves reviewing data to identify problems and then reconstructing the steps in a process or sequence of events that have led up to problems (Figure 1).

Figure 1. RCA Process Diagram



Steps in Root Cause Analysis

An RCA may be conducted using a series of steps, as listed below:

Step 1: Identify what happened.

- Define the problem and describe what you have observed or what has occurred.

- Collect information (i.e., qualitative and/or quantitative data) about the problem, including the frequency of the problem, duration, and effect.
  - » An example of this may be meeting and talking with the people who may have different perspectives, including those who do the work, frontline employees, stakeholders, and experts.



Step 2: Determine and specify what should have happened.

- Identify and describe what should have happened under ideal circumstances.
- Create a flowchart that displays the ideal situation and related steps.



Step 3: Determine the causes.

- Determine why the problem happened.
- Identify possible causal factors, including root causes. This step includes
  - » studying the sequence of events that occur and may lead to the problem;
  - » studying the conditions in which the problem occurs;
  - » drilling down and breaking a problem into small, detailed parts to better understand the picture;
  - » creating cause-and-effect diagrams, also known as fishbone, or Ishikawa, diagrams; and
  - » identifying the root causes using strategies such as the 5 Whys approach to determine the factors behind each issue.

- Note: You can continue the steps in this process, using one or more of the CQI approaches presented in this resource. The CQI approaches presented in this resource begin on page thirteen.

Hypothetical Example of Applying RCA to RETAIN

A RETAIN program leadership team reviewed its participant enrollment data and noticed that the number of enrolled participants was only about 75 percent of the projected target enrollment for the first quarter of the project.

- **Step 1: Identify what happened.**
  - *Define the problem and describe what you have observed or what has occurred.*
    - » The RETAIN leadership team defined the problem as insufficient enrollment of participants in the RETAIN program.

- *Collect information about the problem, including the frequency, duration, and effect of the problem.*
  - The RETAIN leadership identified a small subgroup of team members to investigate this problem in greater depth; this group will be referred to as the "Enrollment Task Force."
  - The Enrollment Task Force analyzed and summarized the enrollment data to identify the number of persons enrolled per week; enrollment per clinic or other source; and distribution of various characteristics of enrolled participants, such as diagnostic groups, age, and sex.
  - The Enrollment Task Force found that participant enrollment was progressing well at three of the four clinical sites; the fourth clinic, Clinic Z, was not performing well.
  - The Enrollment Task Force members met with physicians, nurses, and medical assistants at the four clinical sites to ask about the participant recruitment and enrollment processes.
  - The Task Force members also talked with the return-to-work coordinators to determine what steps they were taking in the recruitment and enrollment process.

- **Step Two: Determine and specify what should have happened.**
  - *Identify and describe what should have happened under ideal circumstances.*
    - The Enrollment Task Force team reviewed project operational procedures to identify the ideal steps in the recruitment and enrollment process.
    - The team discussed and verified these steps with the larger RETAIN leadership team and finalized an ideal process for recruitment and enrollment.
  - *Create a flowchart that displays the ideal situation and related steps.*
    - The Enrollment Task Force created a flowchart that displayed the ideal situation and related steps.

- **Step Three: Determine the causes.**
  - *Determine why this happened.*
    - The Enrollment Task Force members met further with physicians, nurses, and medical assistants at the four clinics to ask about the enrollment and recruitment processes in further detail.
    - The team focused heavily, but not exclusively, on Clinic Z to identify other potential problems.
    - The team asked to observe the recruitment process and map out the steps in detail.
    - When a process, as described or observed, didn't seem to match the ideal process, the observer or interviewer from the Task Force asked a series of

questions to drill down to try to identify the root cause of the enrollment problem, often using *Why* questions to determine the rationale for a process.

- *Identify possible causal factors, including root causes.*
  - Through this process, the team discovered that several employees of Clinic Z believed that it was not fair to randomize patients to an intervention versus comparison group; therefore, they were not explaining the study in a favorable way to potential participants.
  - The results of this RCA were then used to plan, implement, and evaluate possible solutions to this problem.

The 5 Whys

One part of the RCA process is to ask the question *Why?* repeatedly to better understand the processes and problems (iSixSigma, n.d.). This technique is called the 5 whys (iSixSigma; Mind Tools, n.d.).

To apply the 5 Whys approach:

- First, document the specific problem.
- Second, ask key people why the problem occurred and document the responses.
- Third, ask the key people why the previous event or step occurred.
- Continue this process until the team agrees that the root cause has been identified.

Hypothetical Example of 5 Whys:

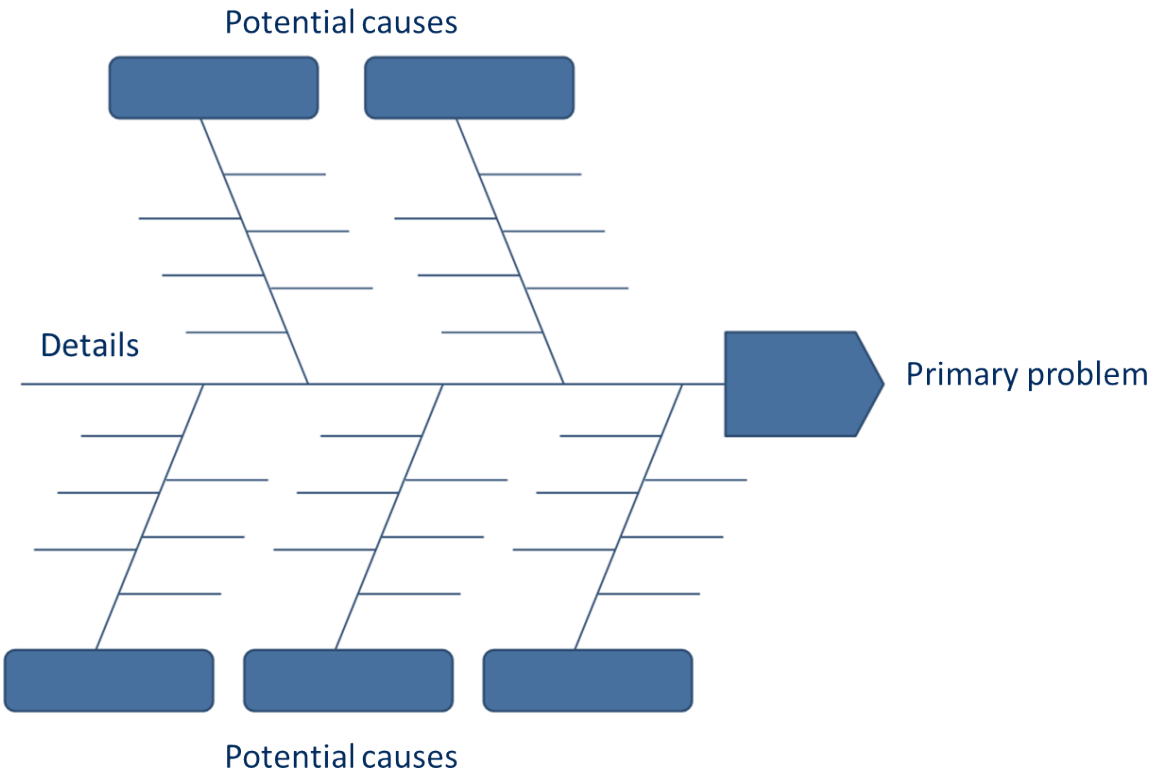
- Problem: According to survey responses, a large proportion of consumers did not get the information they needed from the Help Line. Respondents further indicated that the information, on benefits and coverage, was difficult to understand.
- Why didn't consumers get the information they needed? The Help Line employees didn't fully understand the benefits or how to explain them to callers.
- Why didn't employees understand the benefits? The employees did not consider the training to be sufficient.
- Why was the training insufficient? Employees were rushed into their positions with minimal training.
- Why were employees asked to assume responsibility for the Help Line before training was complete? The organization was growing, and Help Line employee turnover was relatively high, so employees needed to be rushed into positions.
- Why was employee turnover high? Employees felt unsupported in their roles.
- Continue the questions as needed.

The use of 5 Whys can help to get to the root cause(s) of problems to make it more feasible for you to improve processes and outcomes.

Fishbone Diagram

RCA may also be supported by the development of a fishbone diagram or cause-and-effect diagram (Figure 2). This is also called an Ishikawa diagram (iSixSigma, n.d.).

Figure 2. Fishbone Diagram Template



Summary of Root Cause Analysis
Description: *The RCA process involves reviewing data to identify problems and then reconstructing the steps in a process or sequence of events that have led up to problems.*
Step 1: Identify what happened
Step 2: Determine and specify what should have happened.
Step 3: Determine the causes
Use one or more of the CQI approaches to continue the steps in this process.

Root Cause Analysis Resources

Determine the Root Cause: 5 Whys

This article from iSixSigma (n.d.) describes the benefits of the 5 Whys, when to use this approach, and how to complete it. It also provides examples of the types of problems the 5 Whys can address, as well as links to external tools.

Fishbone (Ishikawa) Diagram

This resource from the American Society for Quality provides tips for creating a cause-and-effect or fishbone diagram.

Patient Safety 104: Root Cause and Systems Analysis

This resource from the Institute for Healthcare Improvement Open School (n.d.) provides a summary of how RCA helps us learn from mistakes and provides the steps involved in conducting an RCA.

Process Mapping

Process mapping is another approach to identifying the root causes of problems. Other names for process mapping are process charting, flow charting, system task analysis, process task analysis, process diagramming, and work mapping (Marrelli, 2005; Strategos, 2014). Process mapping is a description and/or picture of the step-by-step actions taken to accomplish an activity or produce an outcome (Marrelli; Strategos; Southern Institute on Children and Families, 2009). Mapping out the steps in a process may reveal missing steps, redundancies in steps, and other problems that may lead to less than optimal performance (Marrelli).

A process map often includes descriptions and displays of the actions, inputs, sequential steps, points where critical decisions are made, outputs, the flow of information, and the various roles people have within the process (Marrelli, 2005; Southern Institute on Children and Families, 2009). A process map may also include the time to complete each step (Strategos, 2014). Process maps may be displayed in a matrix, spreadsheet, or flowchart and include a combination of graphics and text. Process maps vary in scope; they may be completed for entire organizations or may map the work of one person in an organization. Although this approach does not require conducting a traditional RCA beforehand, doing an RCA first can improve process maps by highlighting where errors occur. Often, the techniques of process mapping is combined with RCA and the 5 whys. The brainstorming process conducted through RCA and the 5 whys can supplement the findings obtained when mapping the processes.

Figure 3. Process Map Diagram



Developing a Process Map

You can develop a process map using a series of steps, as listed below:

***First:* Develop a plan that includes the processes you will map, clearly specifying which processes you will examine** (Marrelli, 2005). This plan should also indicate the degree of specificity that is presented in the process map, the media or format of the map, the timeline for completion, and the logistics for the mapping process, such as needed supplies and space (Performance Reporting Solutions, 2010).

***Second:* Form a process mapping team, including a director or manager of the process, other team members, and possibly a skilled facilitator to obtain the input needed** (Marrelli, 2005; Strategos, 2014). Generally, limit the team to a relatively small group of employees, approximately eight to 10 people. Include people who understand the processes well, can describe the processes, and can direct the processes, and those who are known to perform the activities well.

***Third:* Train the project team to conduct the process mapping.**



***Fourth:* Complete a document review process.** Obtain and review documents that describe the processes to be mapped; this information can be used when creating the process map(s).



***Fifth:* Conduct process mapping group sessions or structured interviews to identify the specific steps in the process.**

- If you conduct this step with a group, you can map out processes by describing each step or activity on a sticky note and arranging the notes on large sheets of paper.
- It can be helpful to start the mapping process by identifying major steps or activities and then drilling down within each major step to provide details to the level needed to identify potential problems.



***Sixth:* After drafting a process map, have it reviewed by a larger group of stakeholders to validate the processes or steps and obtain feedback; then review the process map as needed.**



***Seventh:* After finalizing the initial process map that reflects the existing processes, create a future state map that describes and displays an improved process** (Southern Institute on Children and Families, 2009).

Mapping Processes Electronically

Various software packages can be used to map the processes electronically. These include the following:

- Lucidchart
- Microsoft Visio Professional
- ASCIIFlow Infinity
- Gliffy
- yEd Graph Editor
- Graphviz
- Libre Office Draw
- Dia
- draw.io
- Pencil Project
- (http://www.maketecheasier.com/5-best-free-alternatives-to-microsoft-visio/)

Some software programs will allow you to enter the processes; the software will then organize the information automatically into a process map.

Summary of Process Mapping
Description: *Process mapping is a description and/or picture of the step-by-step actions taken to accomplish an activity or produce an outcome.*
Step 1: Develop a plan that includes the processes to be mapped, clearly specifying which processes will be examined.
Step 2: Form the process mapping team, including the director or manager of the process, other team members, and possibly a skilled facilitator to obtain the input needed.
Step 3: Train the project team to conduct the process mapping.
Step 4: Complete a document review process.
Step 5: Conduct process mapping group sessions or structured interviews to identify the specific steps in the process.
Step 6: Validate the processes or steps and obtain feedback.
Step 7: Create a future state map that describes and displayed an improved process.

Process Mapping Resource

How To Chart (map) Your Process: A Step-by-Step Tutorial

This tutorial from Strategos describes the benefits of process mapping and provides step-by-step instructions on how process maps are constructed.

Continuous Quality Improvement Methods

After conducting an RCA to identify underlying problems, you can apply a CQI approach to begin addressing those problems. Choosing what approach to use will require you and your team to think through what is best for your program. For instance, one CQI approach may me best for implementing large scale challenges whereas another approach may be best for tackling smaller challenges.

This section describes the following are CQI methods, approaches, or techniques:

- Plan-Do-Study-Act (PDSA) or Plan-Do-Check-Act (PDCA)
- Institute for Healthcare Improvement Approach to Quality Improvement (IHI-QI)
- AIDE process for CQI
- Six Sigma

- Lean management principle

The CQI table referenced in the introduction is once again provided below. You and your team may refer to this table when deciding which approach is best for your specific problem or opportunity for improvement.

Approaches to CQI	When to Use
PDSA	This approach is used to test changes to establish whether they lead to improvement, which can help your program evaluate expected improvement from changes as well cost and potential side effects (Institute for Healthcare Improvement, n.d.).
IHI-QI	Your program should consider IHI-QI if looking for a gradual, incremental, and sustained approach to CQI (Health Information Technology Research Center, 2013).
AIDE	This comprehensive approach incorporates the process of root cause analysis and concludes with an evaluation. The Action Plan Template is helpful for tracking plans, steps, and responsibilities.
Six Sigma	This approach is best for procedures burdened by wide variability. Also ideal for programs wanting to quantify quality, cost, and effectiveness (Health Information Technology Research Center, 2013).
Lean management principle	Useful for simplifying complicated processes by taking a more comprehensive approach at examining interrelated processes and workflow (Health Information Technology Research Center, 2013).

Plan-Do-Study-Act

PDSA, sometimes referred to as plan-do-check-act (PDCA), is a four-step rapid-cycle process for carrying out change or improving performance. The PDSA model is cyclical; you should repeat it for continuous improvement. Even though this is a rapid-cycle approach, it is important for you to invest sufficient time in each phase of the process to create meaningful change.

The PDSA model is a strategy that you can use after you understand both the problem and the root causes of the problem. This approach generally assumes that one root cause of the problem is being assessed (Gorenflo & Moran, 2010). If you work on multiple root causes, then the effect of each root cause and change should be measured.

Figure 4. PDSA Model



The phases or steps of the PDSA model are as follows:

Plan: **Identify an issue and plan a process improvement or change, including the potential solutions to the problem** (for example, through an RCA). This may involve describing the current process if it hasn't been done prior to initiating PDSA.

Do: **Implement the performance improvement plan and collect data.**

Study: **Review and analyze the data collected on the performance improvement plan; identify what you've learned.**

Act: **Take action based on what was learned in the "Study" step.** The action options are to

- adopt the improved process if your team has met the aims;
- adapt the intervention and repeat the four-phase process; or
- abandon the solution if the changes have not led to improvements; if you abandon the change, then you may test other options that were not implemented.

Summary of PDSA
Description: *PDSA is a four-step rapid-cycle process for carrying out change or improving performance.*
Plan: Identify an issue and plan a process improvement or change, including the potential solutions to the problem. For example, through an RCA.
Do: Implement the performance improvement plan and collect data.
Study: Train the project team to conduct the process mapping.
Act: Take action on the basis of what you learned in the "Study" step.

PDSA Resources

PDSA Cycle Template

This template from Associates in Process Improvement is for documenting progress for each of the four PDSA phases.

The ABCs of PDCA

This document details what needs to be completed before beginning the PDCA process and provides a step-by-step breakdown of the PDCA phases.

Institute for Healthcare Improvement Approach to Quality Improvement

The Institute for Healthcare Improvement approach to quality improvement (IHI-QI) emphasizes rapid-cycle improvement. It includes several methods, including the Model for Improvement, and three questions to ask, a concept of "profound knowledge," and five steps (Figure 5).

There are three questions to ask:

- What are you trying to accomplish?
- How will you know that the changes made are actual improvements?
- What change(s) can you make that will lead to improvements?

The concept of "profound knowledge" emphasizes the need for skills and knowledge to improve performance. These knowledge areas are as follows:

- ***Appreciation for a system:*** systems thinking
- ***Theory of knowledge:*** understanding what works
- ***Psychology:*** understanding human behaviors, interactions, biases, perceptions, and motivations
- ***Understanding variation:*** using measures and data to guide future actions (Scoville & Little, 2014)

Figure 5. IHI-QI Approach



There are five major steps within the IHI-QI approach:

Plan: Create a plan that includes a theory about what needs to be improved, system identification, driver diagram, aim statement, process and outcome measures, and execution theory and plan.

Develop, test, and pilot proposed changes: Map the processes, prioritize change, use PDSA cycles, and measure progress.

Implement, sustain, and control: Implement and test the proposed changes; develop a performance measurement and monitoring system.

Disseminate changes throughout the organization or system: Plan and implement dissemination; communicate

Evaluate and pass forward: Prepare evaluation reports; celebrate and reward successes

Summary of IHI-QI
Description: *IHI-QI is an approach that emphasizes rapid-cycle improvement and includes several methods.*
Step 1: Create a plan and execute it.
Step 2: Develop, test, and pilot proposed changes.
Step 3: Implement, sustain, and control proposed changes.
Step 4: Disseminate changes throughout the organization or system.
Step 5: Evaluate and pass forward.

IHI-QI Resources

How To Improve

This resource from IHI provides a quick overview of the Model for Improvement.

Quality Improvement Essentials Toolkit

This toolkit from IHI provides tools and templates for engaging in successful quality improvement and performance management.

Comparing Lean and Quality Improvement

This white paper from IHI provides an overview of definitions, issues, and descriptions of the Lean and IHI approach.

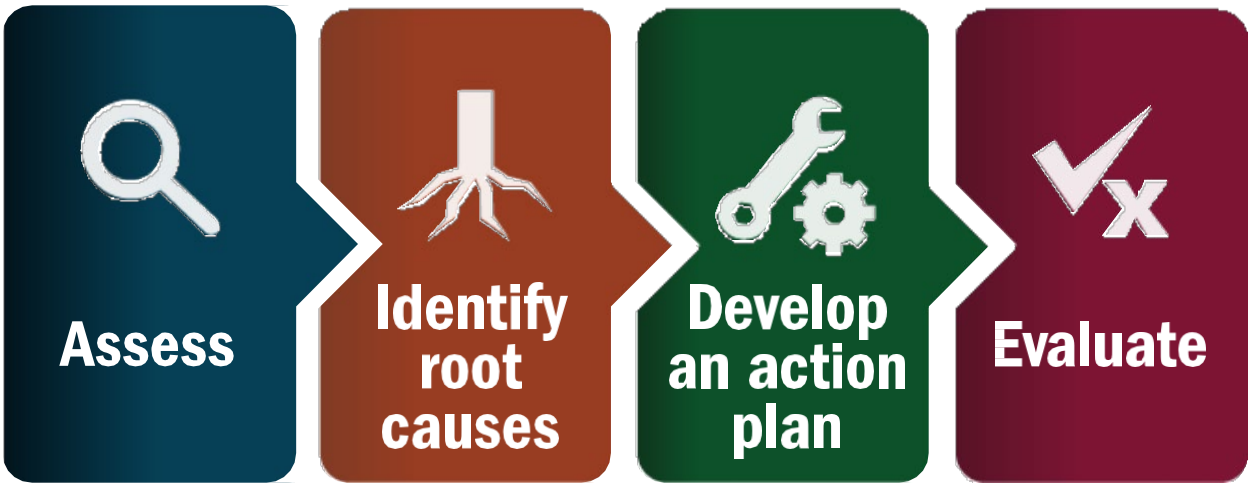
Module 4: Approaches to Quality Improvement: Practice Facilitation Handbook

This module from the Agency for Healthcare Research and Quality describes the Model for Improvement and highlights the steps in best practices research.

AIDE Process for Improving Performance

The AIDE process is another team-based rapid-cycle improvement approach (Figure 6). The acronym stands for the four steps in the process: assess, identify root causes, develop an action plan, and evaluate.

Figure 6. AIDE Process



The steps in the AIDE process are as follows:

Assess: **Assess the situation using data, such as key indicators**. Data may be displayed in graphs, spreadsheets, control charts, or other formats. During this step, develop a problem statement that is specific and measurable, and that describes the negative consequences of the problem.

Identify Root Causes: **Identify and verify the root causes of the problem** using such methods as RCA and process mapping, as well as tools like a cause-and-effect diagram, also known as a fishbone diagram or Ishikawa diagram.

Develop an Action Plan: **Develop and implement an action plan that addresses each root cause that has been identified and is amenable to change**. Document the specific steps to conduct and evaluate the performance improvement initiative; you can document these actions in a matrix that specifies the steps, persons responsible, methods to be used, timelines, status, and expected outcomes (Table 1).

Evaluate: **Track one or more outcomes or indicators to assess the effect of the change on specified outcomes**. Establish metrics (if they do not already exist) that target specific outcomes to monitor the success of your improvement efforts.

Table 1. Sample Action Plan Template

Performance Improvement Action Plan					
Problem statement, describing the root cause:					
Goal(s) or expected end point(s):					
Steps or action(s)	**Person(s) responsible**	**Methods or strategies**	**Time line**	**Expected outcomes**	**Status**

Summary of the AIDE Process
Description: *The AIDE process is a team-based rapid-cycle improvement approach that you can use after you understand the problem but have not yet identified the root causes of the problem.*
Assess: Assess the situation, using data such as key indicators.
Identify root causes: Identify and verify the root causes of the problem.
Develop an action plan: Develop and implement an action plan that aims to address each root cause that has been identified and is amenable to change.
Evaluate: Track one or more outcomes or indicators to assess the effect of the change on specified outcomes.

Six Sigma

Six Sigma is a quality improvement strategy that aims to identify and reduce variation in processes to improve outcomes or eliminate errors (iSixSigma, n.d.).

The Six Sigma approach to improving processes includes five phases: define, measure, analyze, improve, and control (DMAIC) (Figure 7).

Figure 7. Six Sigma Approach



Define: In this phase, form a project team to define the problem; the needs of your consumers, clients, or patients; and the project goals.

Measure: In this phase, your team needs to identify what needs measuring, develop a data collection plan, measure the current process, and collect the necessary data, including input, process, and outcome variables.

Analyze: In this phase, your team needs to analyze the data to investigate and verify potential cause-and-effect relationships; consider and include the appropriate factors in the analysis; and identify the root causes of problems, using strategies such as RCA or process mapping.



Improve: In this phase, your team should work to improve or optimize the current process; this will involve generating ideas for possible solutions and conducting pilot tests of the newly proposed methods.



Control: In this phase, your team needs to develop and implement a monitoring plan and processes or systems; integrate the new processes or systems into standard operations to reduce future variations; institutionalize the new processes; and transfer ownership of the process to the appropriate department or program.

Summary of Six Sigma
Description: *Six Sigma is a quality improvement strategy that aims to identify and reduce variation in processes to improve outcomes or eliminate errors.*
Phase 1: *Define*: form a project team to define the problem.
Phase 2: *Measure*: identify and measure relative data.
Phase 3: *Analyze*: analyze the data to investigate and verify potential cause-and-effect. relationships
Phase 4: *Improve*: optimize the current process
Phase 5: *Control*: develop and implement a monitoring plan

Six Sigma Resources

What is Six Sigma

This article from iSixSigma provides an overview of Six Sigma in terms of its approach and methodology, objectives, and process.

Tips and Suggestions for Six Sigma Project Success

This article from iSixSigma provides a list of tips, tools, and suggestions for Six Sigma practitioners to help them avoid the pitfalls of project management.

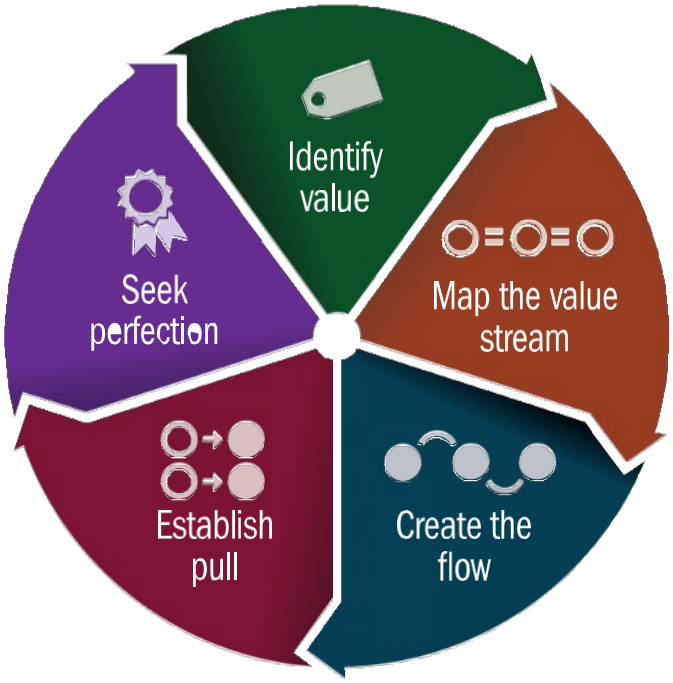
Six Sigma DMAIC: Quick Reference

This quick reference from iSixSigma was developed to help improvement teams prepare for their DMAIC milestone review.

Lean Management Principle

The Lean management approach to quality improvement focuses on reducing or eliminating waste in systems and creating or maximizing value (Scoville & Little, 2014). The goal is to create the greatest value for consumers with the fewest resources. The types of waste include defects or rework, waiting, inventory, over processing, overproduction, transportation, and motion. The Lean approach may be used with or without other quality improvement methods, such as Six Sigma. There are five major principles or steps of Lean (Lean Enterprise Institute, 2009), illustrated in Figure 8. Each major principle is briefly described below.

Figure 8. Lean Management Approach



Identify value: Specify value from the perspective of the consumer with respect to a specific product or service; the aim is to meet the consumers' needs within an acceptable time frame while adhering to price, cost, or resource estimates.

Map the value stream: Identify the steps in a process that add value to the product or service; this would involve mapping a process that is waste free and includes only the steps that are necessary; necessary steps may include those needed to deliver the service(s) or create the product, in addition to the steps needed to monitor the process or serve other administrative purposes.



Create the flow: Improve the flow in the steps or processes so that the steps occur in a tight sequence; this will likely involve eliminating barriers that may slow down a process; a simple example is to reduce distance between two activities that are linked.



Establish pull: Produce outputs at the same rate of demand; reduce excess capacity; replace only what has been consumed.



Seek perfection: Work to continuously improve; always try to achieve the perfect system for a given operation.

As with other quality improvement strategies, the commitment of senior leaders and managers in an organization is important for creating an organization that supports change. The support for Lean should be visible.

The following are several strategies that you can use to implement Lean:

- Involve employees in the quality improvement process; help them understand the logic. Employees need to believe in the process.
- Bring together participants from the process you plan to improve for an intensive session that may last 4 to 5 days, to analyze the current processes and discuss changes (2005).
- Map the process you want to improve; in the process map, include the value from the standpoint of consumers; and indicate waste in steps or between steps (Institute for Healthcare Improvement, 2005).
- Map the future or ideal process.
- Use PDSA cycles to test small changes.
- Continuously measure the processes.

Summary of Five Steps of Lean Management Principle
Description: *The Lean management approach to quality improvement focuses on reducing or eliminating waste in systems and creating or maximizing value.*
Step 1: *Identify value*: specify value from the perspective of the consumer.
Step 2: *Map the value stream*: identify the steps in a process that add value to the product or service.
Step 3: *Create the flow*: improve the flow in the steps or processes so that the steps occur in a tight sequence.
Step 4: *Establish pull*: produce outputs at the same rate of demand.
Step 5: *Seek perfection:* work to continuously improve

Lean Resources

Principles of Lean
This resource from the Lean Enterprise Institute provides a five-step thought process for guiding the implementation of Lean and its techniques.

The Five Steps of Lean Implementation
This resource from the Lean Enterprise Institute outlines the five required steps for implementing Lean.

Learning to Think Lean: Six Steps with Review Points
This article from iSixSigma provides an overview of six steps that, if taken, can provide a strong foundation for any organization wanting to incorporate Lean.

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