

PDSA/Deming Cycle

The Deming cycle is the base of CARIHI's path to continuous healthcare improvement. We promote an incremental and empirical approach.



PDSA Cycle

The following is a breakdown of the Plan Do Study Act Cycle

PDSA Cycle		
Phase		Detailed Steps
Plan	Develop Hypothesis	Define problem
		Understand current state
		Set target state
		Conduct root cause and gap analysis
		Identify potential countermeasures
Do	Conduct Experiment	Develop and test countermeasures

		Refine and finalize countermeasures
Study	Evaluate Results	Measure process performance
Act	Refine Standardize Stabilize	Implement Countermeasures
		Standardize process
		Update improvement management system
		Monitor process performance
		Reflect and share learning

Plan: Define problem

Goal

Get clear on the problem.

Pointers

- Break down broad and complex problems
- Prioritize problems that have a demonstrable impact on organizational performance and customer value.
- Understand the limits of the problem.

Pitfalls

- Avoid broad problem definitions. These are often too complex or vague to be tackled in a single project

Plan: Create an aim (Understand current state/Set Target State)

Goal

The goal here is to focus your efforts. This should reflect a desired shift of the current state to the target state. There are three steps involved.

1. One is to understand the current state.
2. Propose a desired target state.
3. Select a measure. Use a set of two or three measures instead of one.
 1. Outcome Measures- The effects of care on the patient and other stakeholders. E.g. - Average haemoglobin A1c level for population of patients with diabetes
 2. Process Measures- Adherence to the processes that lead to outcomes. E.g. - Ratio of patients who had haemoglobin A1C level measurement at least twice in the past year.
 3. Balancing Measures (looking at a system from different angles). This measure is to make sure that gains on one hand are not causing adverse effects on another. E.g. For reducing patients' length of stay in the hospital: Make sure readmission rates are not increasing

Pointers

- The resulting aim statement should be Specific, Measurable, Actionable, Realistic, and Time- Bound (SMART).
- It should also align with at least one of the aims for healthcare improvement as laid out by the Institute of Medicine (IOM). The IOM encourages healthcare providers to aim for care that is safe, efficient, effective, timely, patient centred and equitable.
- Conduct research- look for validated or standard metrics for similar aims (Try the AHRQ's National Quality Forum for ideas. <https://goo.gl/vBRDSC>)

Pitfalls

- Attempting to set a target state without understanding the current state may end in fruitless or deleterious improvement efforts.
- Forgetting to add a balancing measure.
- Including illogical/irrelevant measures. Avoid measures that do not tie directly to the aim or that the countermeasures do not directly affect.

Plan: Conduct Root cause analysis

Goal

Arriving the real cause of the problem. So that the countermeasures can be formed to address the real issues. Otherwise, the issues will keep coming back.

Tools

Five Whys analysis:

The five why's analysis asks why five times for each problem being tackled. This repeat questioning allows problem solvers to get to the root cause of an issue.

Pointers:

- There may be more than one root causes. This occurs when multiple valid reasons exist at a single step of analysis. Do not be afraid to probe multiple root causes in turn.
- Even though the tool is called five why's, one may need more or fewer questions to arrive at a root cause.

Fishbone Diagram

Used for more complex problems, this method is a brainstorming tool. It ensures that the team considers all possible contributors to the problem.

1. Put the problem at the head of the fishbone
2. Add major labels to the spine
 1. Labels can come from domain knowledge of the experts in the area being studied
 2. Labels can come from literature e.g. aspects of the sociotechnical system
 3. Use data collection and analysis to figure out which of the causes contributes significantly to the problem.

Pitfalls:

- Failing to understand the background of an issue. Root cause may be because of compliance with regulatory requirements. If the root cause analysis points here, there is not much elbowroom to change the cause. Analysis should focus in that case on the reasons that compliance is causing problems.
- Assuming that the factors (regulatory or otherwise) that compelled a practice are still valid.
- Stopping at a root cause that blames a person.

Plan: Identify potential countermeasures

Goal

To put forward potential solutions to the root cause found in the earlier step

Tools

Impact effort matrix- Allows the team to classify countermeasures according to the impact expected, and the effort needed to achieve such an impact. The best countermeasure is one with little effort and high impact.

Pointers

1. If countermeasures are difficult to come by, then something has gone awry in the preceding steps. Either the team does not have all the expertise it needs, or did not properly grasp the problem.

Pitfalls

1. Selecting a countermeasure that is unlikely to impact the root cause
2. Selecting an unrealistic countermeasure

Do: Test countermeasures

Goal

Implement the countermeasures on a small scale to test the effect to learn and to hone the countermeasure in preparation for large-scale implementation.

Pointers

- Ideally, test countermeasure in a live scenario. However, if impractical, use alternatives such as cardboard models and role-playing.
- An iterative process that should hone the countermeasure for the problem at hand.

Pitfall

- Jumping to a wide scale implementation.
- Stopping at one test. Testing is not a one and done thing. Testing should be an iterative process until the team achieves success at which point implementation is widely done or an irredeemable failure at which point the team goes back to the drawing board. Sometimes when a test results in a suboptimal result, the right thing to do here is to tweak implementation.

Study: Measure Process Performance

Goal

To track the performance of the test implementation to decide whether to go ahead with this countermeasure.

Pointers

- Done synergistically with the do phase
- This step and the one before combine to form a Mini PDSA cycle.
- Get feedback from the persons doing the work.

Pitfalls

- Failing to iterate on countermeasures

Act: Implement countermeasures

Goal

Embed the new process into the organization on a wider scale.

Pointers

- Must be hands on process where you train people to understand what they should be doing and why. If the process is rare, simulate a scenario. Classroom training is a waste of time.

Pitfalls

- Substituting email and phone call for the hands on face to face training
- Not accepting feedback from the staff
- Delay between training and implementation can hamper efforts. Implementation must follow training.

Act- Standardize

Goal

To make sure that the process is done the same way by all involved.

Pointers

- Standardization should make it clear what should be done
 - Use process maps
 - Floor markings
 - Clear signage

Pitfalls

- Being so specific as to stamp out worker creativity
- Being so general as to be useless for standardization.

Act- Update improvement management system

Goal

To make sure that team responsible for managing improvement in the work area incorporates managing the new process into their workflow.

Pointers

- Begin with visual controls
- Make sure process metrics are highly visible

Pitfalls

- Delaying implementation of lean management system until process regression prompts action.

Act- Monitor process

Goal

As part of the lean/improvement management system, this activity ensures preservation and continuous improvement of the standard.

Pointers

- Keep the process KPI's to two or three metrics.
- Authorize the process owner to take action when deviation from target occurs.

Pitfalls

- Not changing KPI's once they become irrelevant
- Picking KPI's for the future with no present relevance

Reflect and share learning

Goal

Share what you have learned with other parts of the organization

Pointers

- A3 sheet can be used here to record activities and stored in a form determined by the organization
- A3 sheet can also be printed in large format and posted for public viewing