



Testing and Refining Changes through PDSA Cycles

The PDSA cycle is a technique for planning, executing, studying and implementing changes. *Plan, Do, Study, Act* provides a process for implementing small changes and evaluating the impact of those changes and is analogous to hypothesis testing in the scientific method. This is a cycle for *learning* and improvement. After you complete the first cycle, the results inform the next cycle of the test and so on.

PDSA cycles begin with ideas or theories. The PDSA cycle helps establish more information about the ideas and theories and facts about how it will work (or not) in your setting. A key step in the PDSA cycle is the reflecting on and learning from the consequences of your changes. PDSA cycles have four steps:

- 1) PLAN:** Make a plan for what you will change, identify the steps you will take, assign who will be responsible and determine which patients will be involved.
- 2) DO:** During this step, you will try your change with a few patients or for a short period.
- 3) STUDY:** Here you will check to see if you were able to make the change you planned and if you did, find out if it resulted in an improvement.
- 4) ACT:** Based on what you learned in the Study phase, you would decide how to increase the scope if it worked, or refine or plan another test if it did not go as well as you planned.

A key feature of the PDSA cycle is to test on a small scale. It offers an opportunity to understand how to maximize the impact from a change and to refine your idea to ensure success. Consider trying PDSA cycles on a very small scale. “Small scale” can mean testing something different with 1-5 patients (or staff) over a couple days. The number of patients or staff you involve in tests is only as many as you need to provide information about how the system needs to change to promote improvement.

A Closer Look at the Phases of a PDSA Cycle

PLAN: Determine the purpose of your PDSA cycle

When planning, ask the following questions:

- What are we testing?
- On whom are we testing the change?
- When are we testing?
- Where are we testing?
- Who will implement the cycle?
- What is our measurement plan?
- Who will collect the data?
- What do you expect will happen?

Making a *prediction* will help you anticipate what might come next and whether the cycle was a success. If you can answer the above questions with some specificity, you are probably done planning!

Build on your existing systems during this test. What processes exist in your practice setting that could support the patient safety issue you are addressing?

DO: Carry out the PDSA Cycle

While you are running the test, you can collect data and begin analysis. Don't forget to seek opinions about changes tested in this cycle.

It is better to test the change on a small scale. Try the change with just a few patients for a very limited period. For example, you could start by asking 20 patients about medication allergies at check in tomorrow. If this test works and does not interrupt your office flow, you can test under different conditions (different day, different team, etc.). Such linked tests will help build your confidence that your idea is a good one that's worth implementing on a broader scale.

You can test several ideas simultaneously. The approach allows you to learn more rapidly than sequential testing. It is, however, important to determine what you need to learn from each test ahead of time.

STUDY: Reflect on what you've learned

Did you accomplish what you set out to do? Did it result in an improvement as you expected? If so, continue on this path!

If not, then identify what didn't work and plan a revised test. You will have the most impact when you take the time to reflect on what worked (or didn't) and why. Ask:

- Was this change an improvement? If yes, what additional information do we need before implementing the change with others?
- If not, what have we learned from this test? What could we do differently next time to make it an improvement over the current system? What additional information do we need to achieve an improvement?

Share your results. Discuss results with your team and staff in your practice setting. In some settings it is helpful to plot key measures each week and display them for others you work with to see. Seek input from everyone involved in your clinical area.

ACT: Use what you've learned to plan your next step

Identify what changes are to be made in the current cycle, and from this, identify your next cycle (or series of cycles). The science in PDSA is in the act of reflection, learning from planned tests of change. Those who want improvement to occur need to reserve specific times to ask, 'What did we learn, and how can we build on it?'

If the first cycle was successful, you should plan to expand it. Try it with more patients or with more staff involved. If it was not successful, either:

- Change it to work better and retest; or
- Drop it and try something else to accomplish your goal.

Continue repeating the process. Use your data to determine if your change is resulting in an improvement.

Plan your new change, test it and reflect. Continue through the cycle until you have met your goals and aim.

PDSA cycles provide input for the third part of the Model for Improvement, generating ideas that can result in improvement. The most powerful element of the PDSA cycle is in reflection. By implementing small changes, you can quickly learn from the change and build upon it.