



Tips and Tools for Learning Improvement

Developing Changes

What are changes in improvement?

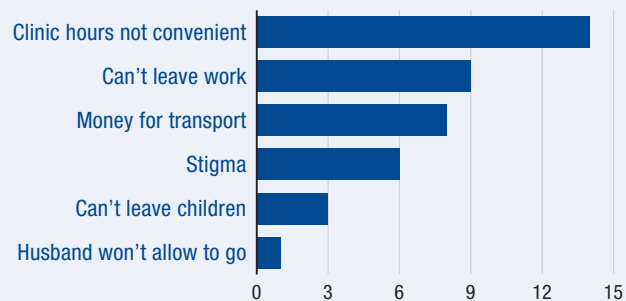
Making improvement requires change. Changes are any possible solutions to problems identified by improvement teams during the process of improving health care. Changes are usually interventions that alter the process of care in some way. For example, a clinic may have a problem that oxytocin, which must be refrigerated, cannot be given to a woman who delivers at night because it is stored in the pharmacy refrigerator and the pharmacy is locked at night. Change ideas to address this problem may be to either give a nurse a key to open the pharmacy when needed or to find a way to keep the medication cool in the labor ward overnight. It is important to remember that not every solution or change will lead to improvement. However, improvement cannot happen without change. A few examples of categories of common changes¹ include finding ways to:

- Solve customer problems (see **Figure 1**).
- Eliminate mistakes through reminders, double checks, or checklists.
- Standardize processes (e.g., reporting, clinical processes, laboratory).
- Eliminate waste and duplicated work.

An improvement team at a rural health clinic was trying to determine how to improve HIV patients' timely pick up of antiretrovirals (ARVs) to support adherence to their treatment regimen. The team started by asking 41 patients who had not picked up their medication or did so late why they did not do so. This was a simple exercise that gave them valuable information, but did not take a lot of time or money. The team put the answers into a Pareto chart – a bar chart that displays data in ascending or descending order of frequency to show the popularity of each category.

Figure 1: Example of developing changes

HIV patients' responses to why they did not pick up their ARVs (number of responses)



To develop change ideas, the team first looked at the data to try to understand what the most common problem was: the clinic hours were not convenient. This problem was also related to patients not being able to leave work or children. The team therefore hypothesized that changing clinic hours would improve patients' ability to pick up their ARVs on time. They developed a few change ideas: to provide easier access to medications, open clinic on Sunday; have clinic stay open late a few days per week; have clinic open early a few days per week; and assign someone to deliver medications to the patients at home who do not come into the clinic. Since the clinic did not have enough staff to do all of these things, the team decided they would start by testing the change idea to open the clinic on Saturday for a few hours to hand out medications.

¹ Langley GJ, Moen RD, Nolan KM, Nolan TW, Norman CL, Provost LP. 2009. *The Improvement Guide: A Practical Approach to Enhancing Organizational Performance Second Edition*. San Francisco, CA: Jossey-Bass.

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- Improve organization of care and work or patient flow including minimizing hand-offs between providers, eliminating bottlenecks, move steps closer together, and task shifting.
- Reduce wait times, laboratory turn-around times, and other delays in providing care

How do you develop changes?

Changes should be developed based on data, knowledge, and beliefs about likely causes of problems. Before developing changes, it is important to do a simple analysis of the current situation using existing data, root cause analysis (“fishbone diagram” or “why why why”), process analysis (“flowchart”), client and provider interviews, or other techniques to better understand the problem and its causes. See **Figure 1** for an example of using interviews and a Pareto chart to guide actions for improvement. After analyzing the current situation, the team chooses one problem or cause of the problem and develops change ideas to address it. Ideas for changes could come from a variety of sources including evidence in the literature, a new guideline, learning from others, brainstorming (see **Figure 2**), creative thinking from the team, and innovative uses of technology.

When you are part of an improvement team developing changes, you need to think about:

- Something you have never done before
- Something you can do tomorrow
- Something that worked elsewhere
- Something that addresses identified gaps

Teams should avoid:

- More of the same: more people, more money, more time, more requests
- Adding inspection or punishment for not improving
- Trying to develop one perfect change; most improvement takes testing and refining multiple changes to reach the goal

A lot of teams will start addressing problems by developing changes such as writing a directive, creating awareness or providing some education. While it is critical that providers have competency in the clinical areas they cover, awareness creation and short trainings do not usually solve problems caused by broken processes.

Figure 2: How to brainstorm

Step 1. Write down the topic

Step 2. Review the rules of brainstorming:

- Do not discuss ideas during the brainstorming
- Do not criticize any idea
- Be unconventional: every idea is acceptable
- Build on the ideas of others
- Quantity of ideas counts

Step 3. Gather ideas. Make sure everyone has a chance to speak.

Step 4. Write down all ideas.

Step 5. Review, clarify, and combine related ideas.

Step 6. Agree on ways to judge ideas, such as voting or prioritization matrices.

How do you prioritize changes?

Once a team has developed changes based on their best knowledge and understanding of the root cause of the problem, they need to determine which change to test first. After prioritizing one change, the team will conduct a Plan-Do-Study-Act (PDSA) cycle to see if that change results in improvement [See **Tips and Tools for Learning Improvement: Plan-Do-Study-Act**]. There are several things to consider when prioritizing a change, including:

- **Development of the team:** If it is a new team, they should focus on starting with a simple change that will give them a chance to practice the PDSA cycle. Testing a simple change and seeing results quickly will help motivate the team.
- **Most relevant:** The team should look again at the analysis and discuss which change will be most relevant and likely to address the cause of the problem.
- **Sequence:** Some of the ideas may need to be done in sequence. For example, in trying to improve pregnant women’s attendance at antenatal care, the team may need to start with a change that helps identify pregnant women and then move on to a change that will encourage registration at the clinic.

If the teams are having trouble coming to a decision on which change to test first, they can try using one of these methods:

- **Majority or straight voting:** This method is where each participant has one vote. Voting is most useful when the improvement options are straightforward or time is limited. It encourages equal participation of all team members by equalizing decision making between dominant and quiet participants.
- **Multi-voting:** This allows participants to vote more than once and is useful when the group wants to pick more than one item to improve or when the list of items is very long and needs to be reduced to two or more. This voting method increases the likelihood that everyone will have at least one of the items for which they voted on the reduced list.
- **Prioritization matrix:** A multiple criteria or prioritization matrix is a tool for evaluating options based on a set of explicit criteria the group has determined is important for making an appropriate, acceptable decision. Matrices work best when options are more complex or when multiple criteria should be considered in determining priorities or making a decision. Criteria can be weighted and ranked to help in the decision-making process. Although the prioritization matrix is the method most likely to result in consensus, at times it can be time-consuming and complex. Examples of criteria might be impact, cost, difficulty of implementation, evidence from others who have tried it, or potential risk.
- **Rank ordering:** Each team member ranks all the proposed ideas. The team agrees to average the rankings and select the alternative with the highest score.
- **Decision made by expert on the team:** The team may include someone who knows more about the issue, and the other members may turn to this person to make the decision. This approach would be used rarely and probably most often in cases involving clinical decisions.

Exercise 1: Choosing a problem and first step

The national treatment guidelines and policy in one country recommend that the diagnosis for all patients suspected of severe malaria should be confirmed with microscopy. An improvement team in one hospital conducted a baseline assessment which revealed that only 14.5% of the suspected malaria cases in children under five years of age were confirmed with microscopy. The facility had good levels of drugs and commodities. The health workers had been trained in malaria case management only a few months prior to the assessment. Still, almost 85% of suspected cases of severe malaria were treated presumptively and/or based on the malaria rapid diagnostic test (mRDT) result, contrary to the national guidelines. The improvement team decided to carry out a problem analysis using a fishbone diagram to determine the root causes of low microscopy rates in pediatric patients suspected of severe malaria. Some of the root causes found included:

- Clinicians were ordering an mRDT test for suspected cases of severe malaria instead of microscopy as per guidelines.
- Samples for blood smear for malaria parasites for microscopy were not collected because the health workers felt that the process of taking the samples was too long. They wanted to use the faster method of using the malaria rapid test.
- Those few samples that were collected were delayed in the ward and were poorly collected, thus the laboratory rejected them.
- In the ward, there was no health worker assigned to follow up on the samples and collection of results from the laboratory.
- The laboratory technicians did not prioritize processing and reading of the blood smears for malaria diagnosis. As a result, clinicians and nurses used malaria rapid diagnostic tests or no diagnostic testing as alternatives.

Once the team uncovered these problems, the team members had different reactions. See what each of the three team members below had to say about what the team's first action should be. Which opinion do you think represents the best starting point? Circle one.

Team Member 1

"This is unacceptable. The staff were trained in the new guidelines a few months ago, and there is no reason why they should be continuing to rely on mRDT or simply treating on suspicion. We need to review the records and find out who is responsible and tell them that they have to follow the guidelines or else there will be consequences. We can check again in a few weeks to make sure that they have started following the guidelines."

Team Member 2

"We really need to ask management to hire more people. The laboratory needs someone who can focus on microscopy and diagnosing malaria. We should make sure that there is a microscope purchased and dedicated to malaria diagnosis since it is so common. It would also help to hire someone to be responsible for taking smears to the lab and then waiting for the results and bringing them back to the clinician or nurse. This would mean samples don't get lost."

Team Member 3

"This analysis shows a lack of clarification in the process of taking samples and testing by the lab. It would probably help for us to clarify the process. I think I heard about another hospital that had a similar problem but was able to solve it. Maybe we could talk to their team to get ideas. Let's choose one of these problems to start with and think of ideas that might help solve the problem. We can brainstorm some ideas of what would work in our ward."

Exercise 2: Matching a problem with a change idea

A neonatal intensive care unit is having a hard time ensuring sterile care while putting in central lines. There are several problems. Draw a line between each problem and the change idea that would best address the problem.

Problems

Staff are unaware of the extent of the problem related to line infections.

Staff do not know the correct steps for sterile technique when putting in a central line.

The sink is in another room, and it is hard to reach when emergencies come up.

Supplies for central lines are kept in different places so can't be gathered quickly.

Change ideas

Change protocol to allow use of alcohol hand wash instead of soap and water.

Create central line tray with all required equipment.

Collect and display number of line infections weekly.

Develop central line protocol. Train staff on the protocol and the importance of adhering to the protocol.

Exercise 3: Determining the best change idea

For the following scenarios, choose which change idea is most likely to address the problem.

Scenario 1

An improvement team in a health clinic has found that oxytocin is not being given to women immediately following the delivery of the placenta per the protocol. When the team did an analysis of the situation, they realized that oxytocin was not being given because it meant that the attending midwife had to leave the mother and baby to go to the nurses' station to get the drug. At the nurses' station, she would need to take the oxytocin from the refrigerator and fill a syringe. Very often the mother seemed fine and was not showing signs of hemorrhaging, so the midwife did not bother to go get the oxytocin.

Which of these changes most directly addresses the problems in the process described above? (Check one):

- Head of the health center writes policy that oxytocin should be given
- Head of the health center trains staff on importance of oxytocin
- Midwife preloads syringe with oxytocin and keeps it on a cold pack by the bedside for each delivery

Scenario 2

In a maternity ward in one hospital, health care providers are concerned because many of the newborn babies are becoming hypothermic. The improvement team aims to reduce the incidence of hypothermia among newborns. A few team members observe 10 births over two days to determine the process that is currently being used to keep

newborns from becoming hypothermic and if there are any problems with it. The team found that providers are clamping cords of newborns before drying and wrapping them, which results in anemia and hypothermia in babies.

Which of these changes most directly addresses the problems in the process described above? (Check one):

- Put up poster informing nurses to wrap babies before other procedures
- Re-organize equipment so that cord clamp is kept under the towels for wrapping newborns
- Have nurse in charge observe deliveries and give performance reviews

Scenario 3

A busy HIV clinic improvement team is working on improving the nutritional status of their HIV patients. A first step in improving their health is to know which patients are malnourished. Previously, providers had been assessing patients for malnutrition only when a patient looked malnourished. They did not have a consistent way of assessing patients. The team had previously tested creating a place, down the hall from the registration desk, where a volunteer could measure height and weight and then record the information. The registration officer reminded the patients to have their height and weight taken, but more than half of the patients skipped that step and went straight to the waiting area.

Which of these changes most directly addresses the problems in the process described above? (Check one):

- Tell patients to not skip the station
- Do not give drugs to patients who have skipped the station
- Move the place for assessing height and weight right next to the registration desk

Exercise 4: Prioritizing a change idea

Read the scenario below and decide which team member you agree with.

An experienced improvement team, made up of patients and providers at a district health center, is trying to decide between different change ideas that can address the problem of adherence among HIV patients. After doing a root cause analysis, they learned that some patients' reasons for not returning monthly for their ARVs include the time it takes to come to the facility, not being able to leave work or children, the cost of transport, and/or HIV-related stigma. The team has learned of possible solutions from other health centers doing similar work. They are now trying to decide between three possible changes to address these concerns:

- Provide medications for 3 months at a time to stable patients.
- Have a community health worker deliver medications to patients who have trouble reaching the facility.
- Use peer supporters who can collect medications for patients who live near them and pass the medications on to those patients.

The team had a lot of discussions around these changes and is having trouble reaching consensus. Some people on the team are worried about the implications on community health worker time; others are thinking about patient convenience; and some members are concerned about pharmacy rules and procedures.

All of these changes could address the problems that patients have to varying degrees. They have decided that it is time to use a prioritization tool. Members of the team have different opinions on prioritizing the problem to start with. Circle the team member who you agree with.

Team Member 1

“We are having a lot of trouble figuring out what to do. I think we should just ask the head of the facility to make a decision. He hasn’t been part of these discussions, so he will have fresh eyes on the situation.”

Team Member 2

“We all seem to have different opinions on what is best to do. Let’s just vote on it and everyone can accept that the idea with the highest vote wins. It isn’t hard to choose between these three.”

Team Member 3

“These all have implications for health worker time, patient acceptance, management support, pharmacy supply chain planning, and other resources. I think we should use a prioritization matrix to weigh the options and determine which is most likely to be successful for everyone involved.”