

Overview

Model for Improvement

There are many methods or frameworks that can be used to improve clinical care. The ABP uses The Model for Improvement based on quality improvement principles developed by Associates in Process Improvement. The Model for Improvement is an approach to planning, implementing, and evaluating ideas for improving processes and systems of care. It has been used extensively in health care and other settings and provides a robust approach to moving from ideas to action in human systems.

The Model for Improvement uses Plan-Do-Study-Act (PDSA) cycles to test small changes in a rapid fashion to increase your knowledge about the impact the changes have on the processes you are seeking to improve. You can use PDSA cycles to:

- Test changes you predict will help improve care.
- Implement practice-wide the changes proven to improve care.

The Model for Improvement provides clinicians and their teams with a framework to support quality improvement activities. It has been tested across many health care settings (e.g. inpatient and outpatient, general and sub-specialty clinics) and has proven an effective method for identifying, testing, and evaluating changes to improve healthcare processes and outcomes.

Gaps in Quality of Care are Well Documented

Significant documented gaps exist between current performance and desired performance. For example, almost all children would benefit from influenza immunizations and yet children die each year because immunization rates are significantly lower than they should be.

Physicians want to provide their patients with excellent care at all times and work hard to do this. It is a challenge then to read reports such as the Institute of Medicine's Crossing the Quality Chasm and To Err is Human and multiple other published articles that document significant gaps in quality and safety. Even in the absence of external documentation of gaps in quality most physicians are aware of the significant problems in their own systems of care.

Making Changes is Challenging

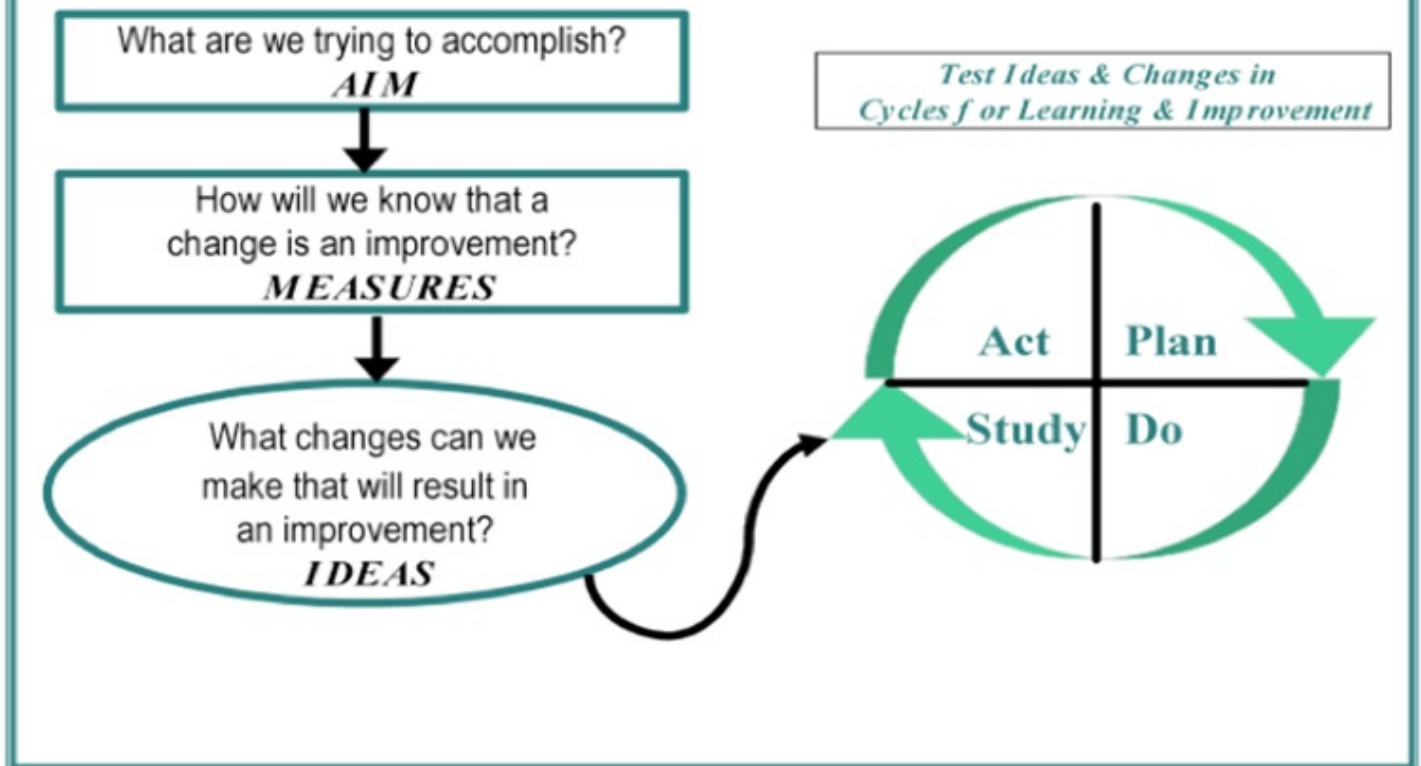
The reasons for making change are clear. The motivation to make change is the professionalism that drives most physicians' behavior. The challenge is that we often don't know how to make changes-especially in complex settings like hospitals and clinics. Anyone in medicine recognizes that thinking about improving patient care is often easy-actually making a change is far more challenging.

The Model for Improvement combines the best of two approaches to change: understanding problems before trying to change them and then systematic testing of ideas or interventions (real time science) to see what works. The Model for Improvement can be thought of as a "trial-and-learning" method that will help you apply knowledge about what works in your setting to improve care for your patients.

The Three Key Questions for Improvement

Model for Improvement

3 Key Questions for Improvement



Before you change anything, you need to ask yourself three fundamental questions:

- AIM: What are you and your care team trying to accomplish?
- MEASUREMENT: How will you know that a change is an improvement?
- IDEAS: What changes can you make that will result in an improvement?

These questions will help you focus on implementing changes that will have the most impact on your practice. This is because you will be learning by testing ideas specific to your setting on a small scale. What you learn from each small test will guide the next step of your improvement effort. Using the three questions will help you stay focused on improvement in spite of the many forces competing for your attention.

In order to conduct an improvement project, you will need to:

- Develop an aim statement
- Define measures
- Identify and test changes
- Evaluate the impact of those changes

The following sections will guide you through this process.

AIM Statements

Introduction

In order to begin any quality improvement project, you need to establish the scope of your activities. Often this begins by considering questions such as:

- What is the issue or concern at hand?
- Why is the status quo no longer good enough?
- Why should we change?
- What will happen if we don't change?
- What should the future look like?

As you begin to answer these questions and create the will for change (i.e. the sense of urgency that the care team must do something different), you will want to gather your team to draft an aim statement.

Aim Statement Defined

It can be helpful to think in very specific terms about the changes you want to make in your practice. You can do this with an **aim statement**. An aim statement is a written description of the accomplishments expected from the improvement effort. In other words, this statement articulates the results you hope to see because of the changes you implement.

Aim statements include:

- A general description of the purpose
- A description of the specific patient population that is the focus of the improvement efforts, and
- Some guidance for carrying out the work

This statement is based on the improvements you would like to see relevant to the performance gaps you identified through chart review or some other process of assessment of practice performance.

An Aim Statement is a Balance -- not too easy, not too hard

An effective aim is not something that can be accomplished by making minor "tweaks" or adjustments to existing processes or systems of care -- they need to be a stretch. Finding the balance between creating an aim statement that is neither too easy nor impossible to achieve can be challenging. This is often where senior leaders can help. They are well positioned to look at the larger systems of care and consider the impact of the improvement project.

Start Crafting with the Six Aims for all Health Care

In addition, many teams begin drafting their aim statements by considering the six aims outlined in the Institute of Medicine's Crossing the Quality Chasm report, calling for changes to ensure all health care is:

- **Safe:** avoids injuries to patients from the care that is intended to help them
- **Effective:** matches care to science; avoids overuse of ineffective care and underuse of effective care
- **Patient-Centered:** honors the individual and respects choice
- **Timely:** reduces waiting for both patients and those who give care
- **Efficient:** reduces waste
- **Equitable:** closes racial and ethnic gaps in health status

TIP: Many organizations have published their aim statements on their websites along with their improvement stories. A quick internet search is often an effective place to start your process to create an aim statement to unify and describe your work.

TIP: It is very easy for QI teams to lose focus and/or momentum over time, resulting in an unintentional shift away from the original aim. Thus, aim statements should be re-visited on a regular basis, ideally at each team meeting, to ground team members in the specific purpose you are working to achieve together.

Pitfalls in Crafting Aim Statements

Watch out for these common pitfalls:

- The aim statement is **too big** to be compelling -- an effective aim statement should create a sense of tension and a bit of uncertainty among team members, but the overall consensus of the group should be that it is achievable.
- The aim statement is **too broad or lacks focus** -- One way to test this is to ask each team member to write down in his/her own words what the team is trying to accomplish -- if the answers differ, this is a good sign that the aim statement needs to be refined and the focus clarified.
- Don't set an aim that is **outside of the care team's ability to influence** -- For example, if an outpatient clinic is trying to improve referral processes and follow-up for a population of at-risk patients, the aim should focus on the processes within the clinic (i.e. identification of the population, tracking, timeliness of referrals, etc.) not on bottlenecks in the referral agencies outside the team's control. In this example, if the most significant barrier to improvement is the bottleneck, this may not be an appropriate aim for this team. Perhaps a new intra-agency team is needed to address the issue or perhaps the care team needs to re-define what it is trying to accomplish.
- Even in the best systems, **achieving 100% (or 0%) may not be feasible**; make sure to select a numeric goal that is a stretch, but is achievable. It is ok, in fact it is often preferable, to set a goal at 80% or 90% and have the team accomplish the aim.

Use the SMART Framework to Clarify and Establish Aim Statements

Most teams find the **S-M-A-R-T** framework helpful in clarifying and establishing their aim statement.

An effective aim statement is:

- **Specific.** People reading the statement can understand it, without interpretation, and know what you are trying to do accomplish through your efforts. To be effective, the aim statement must focus on only one thing your team is working to achieve.

- **Measurable.** The aim statement includes quantifiable measures that will be used to track progress.
- **Actionable.** The aim is set high enough that it will have a significant impact on your patients, but not so high that it is unrealistic. Note that the "how" of achieving the Aim is NOT included in the aim statement as this would preclude identification of other potential solutions.
- **Relevant.** The aim is specifically defined and includes statements about the limitations on your improvement effort. A focused aim statement will help the improvement team avoid becoming overwhelmed or discouraged by the work.
- **Time-Bound.** The aim should set an expectation for how long the care team anticipates it will take to achieve the stated aim. It should allow the improvement team sufficient time to explore several different solutions to resolve the performance gap, but not so much time that the sense of urgency for accomplishing the aim is diminished. Many teams find that 9-12 months is a reasonable period of time to accomplish their aim.

Anatomy of a Well-Crafted Aim Statement

Over time you will start to recognize that effective aim statements are formulaic in nature- they describe the five "Ws": What, Why, Who, Where, and Which in one succinct statement.

For example:

Within 12 months, >90% of all patients in your practice who qualify will receive an appropriate influenza immunization.

The diagram shows the aim statement broken down into four parts with red brackets underneath:

- Time-bound:** Within 12 months
- Measurable:** >90%
- Specific: Who, Where, Which:** of all patients in your practice who qualify
- Actionable: What:** will receive an appropriate influenza immunization.

In this example, the team felt the aim was relevant because they had noted an increase in hospitalizations due to influenza last winter and in a review of their medical records they identified that fewer than 40% of their patients had received influenza immunizations during that period of time. The team did not feel it was necessary to answer the "why" explicitly in the aim statement because the "case" for immunization to prevent disease and/or death was so well known to them.

Who should be involved with Crafting Aim Statements?

It is perfectly appropriate to use your judgment on what needs to be spelled out, just remember, everyone on your team needs to be working towards the same aim with the same degree of clarity on the first day of the project as on the last day. Also, you may want to consider other individuals/groups you want to engage in the process improvement activities (i.e. senior leaders, patients, colleagues) and determine whether additional information is needed in the aim statement to clarify your intentions for these audiences.

Examples of Effective Aim Statements

- Shadow Hospital will reduce adverse drug events (ADEs) in critical care by 75 percent within 1 year
- Lake Forest Clinic will reduce average patient waiting time to see a physician to less than 15 minutes within 9 months
- Within 9 months, 95% of children birth- 3 years will receive appropriate developmental screening in the medical home using a validated screening tool
- Essex Pediatrics will reduce patient no-show rates for health supervision visits by 80% within 6 months

Choosing Measures

What Are Measures?

Measures are one of the key features of the Model for Improvement. Measures help answer the second question in the Model: "How do I know a change in my practice is an improvement?" In general, measures are directly linked to the aim statement.

Methods of Collecting Data

There are many ways to collect data to inform improvement activities such as:

- Encounter forms collected by clinic/hospital staff or patients during a visit
- Chart review
- Surveys
- Use of electronic health records , and claims
- Claims data

Further, many successful quality improvement projects also collect informal data by soliciting observations and feedback from team members and others impacted by the system under review (e.g. administrative staff, patients, support staff) -- these data are often qualitative in nature and are used to help interpret the impact of the improvement strategy being tested as well as to identify any potential problems you may have encountered as a result of the change being tested.

Understanding how to collect and analyze data is essential for demonstrating competence in quality improvement.

Expressing Measures as Numeric Goals

Measures are often expressed as numeric aims or goals that help provide guidance to the improvement team about where to focus their efforts. For example, the key measure for an effort aimed at improving hand hygiene is: % of patient encounters where appropriate hand hygiene was done both before and after touching the patient.

Taking the time to be specific will help you know what needs to be changed, measured, and adopted throughout your practice. A Measure will usually have a numerator and denominator as well as a list of any important exclusions (i.e. patients on whom data will not be collected).

Use Nationally-Developed and Endorsed Measures

When possible it is desirable to use measures that are nationally-developed and endorsed by the National Quality Forum and other national bodies. Measures developed by these organizations will have well-defined specifications and instructions for when and how to collect the data to ensure that it can be compared to existing benchmarks and to others conducting similar improvement work.

Collect Data Regularly

Collecting data regularly will help you answer the question, "How do I know my change is an improvement?" It informs your process and helps you decide whether the changes you are testing should be more widely implemented, revised, or abandoned. It is important to note that not all changes result in improvement, in fact, some can have unintended negative consequences, so having a set of core measures and a measurement plan from the outset of your project helps you determine whether or not changes really are an improvement. You need only enough information to answer the question, "Has this change made an improvement?"

Keeping Measures Useful and Meaningful

To keep measures useful and meaningful it is helpful to:

- Use clear and specific definitions of your measures
- Collect samples of data, rather than collecting large amounts of data (just enough)
- Collect both qualitative and quantitative data
- Plot data over time
- Display data on run or control charts to aid in analyzing the data and identifying trends
- Integrate measurement into daily routines
- Use existing data when possible

A measures table (similar to a checklist) is a useful tool to make sure each selected measure has all the necessary components:

Measure type	Measure name	Goal	Exclusions	Numerator/Denominator	Data Collection	Data Reporting
Process	Measure A	90%	none	# of patients with test/# of patients seen	Visit template	Monthly run chart

Common Mistakes When Selecting Measures

Common mistakes when selecting measures:

- Cannot easily collect data
- Data are not related to the aim statement or the changes being tested
- Numerator and denominator are not properly defined

To learn more about establishing measures, see the Tips for Effective Measurement on the Institute for Healthcare Improvement web site (<http://www.ihl.org/resources/Pages/Measures/default.aspx>).

Data Collection and Sampling

Data collection should be planned to assure high data quality with accuracy, completeness, and consistency. Prospective data collection is often preferable to chart review because recognized variation in the quality and completeness of medical records. A sampling strategy should allow for a large enough sample size to assure that the data represents the process being studied. Often this can be accomplished by collecting data on 10-30 encounters.

TIP: If the event you are trying to measure is rare, you will need to consider increasing the sample size or looking for other relevant measures. For example, as surgical site infections decrease, your measure may need to look at the days between infections or the number of cases between infections.

Assessing Baseline Performance

Before you begin to try to improve quality of care, it is important to measure how well your practice is doing currently and whether your quality of care is getting better or worse.

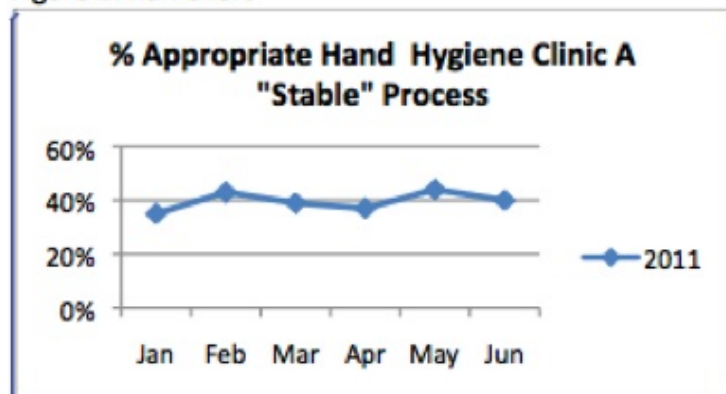
Why is it important to collect baseline data for more than one point?

Data collected at one point in time allows you to assess whether there is a gap in the quality of your care, but processes vary over time and before you begin to try to improve, it is important to know if your care is staying the same, getting better, or getting worse. This "secular" trend is important to know in evaluating whether the changes you make to improve care produced real change that is different from what would have occurred regardless of the change you were testing.

QI Depends on Analysis of Data Over Time

A distinguishing feature of quality improvement is the analysis of data over time to determine whether a process is improving as changes are tested to reach an aim. For instance, data collected on a monthly basis over six months may indicate that nurses and physicians in a practice use appropriate hand hygiene on average only 40% of the time. One month the results may be 37% and the next 43% and the next 39% and so on with the average over six months being 40% (see Fig 1).

Figure 1: Run Chart



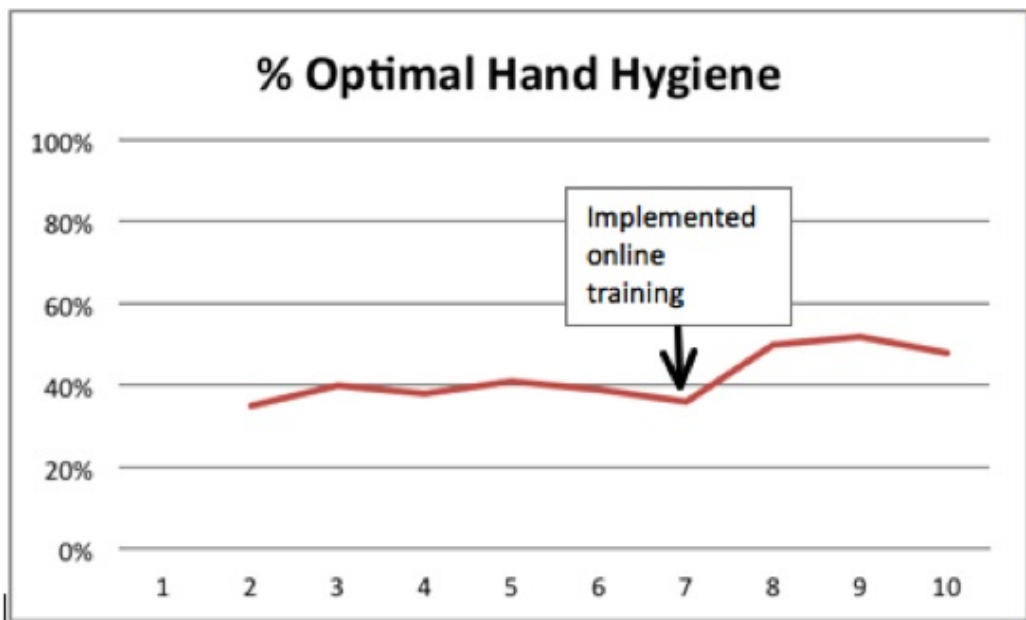
If the rate is neither increasing nor decreasing, the process is "stable" and, assuming nothing changes, one can predict within a defined range that the rate for next month will be around 40%. Deming and others have argued that one should not try to improve a process unless it is stable, otherwise a change in the process may be misinterpreted as an improvement when it actually a continuation of an already existing trend.

Measurement Tool: Run Chart

Data plotted over time in a linear graph, such as Figure 1 above, is called a run chart. Time is plotted on the x axis and the variable being measured is plotted on the y axis. This visual display of data makes it easy to see if a process is changing over time and by how much.

If comments are added to the chart indicating what changes have been made to the process and when (see Figure 2) the display of data is called an "annotated" run chart. There are statistically based rules that allow one to determine when a change in the process is statistically significant and not just the normal variation that all processes display. For example, a shift of seven consecutive points above or below the mean represents a statistically significant change. Additional rules can be found in textbooks on quality improvement or on the internet.

Figure 2: Annotated Run Chart



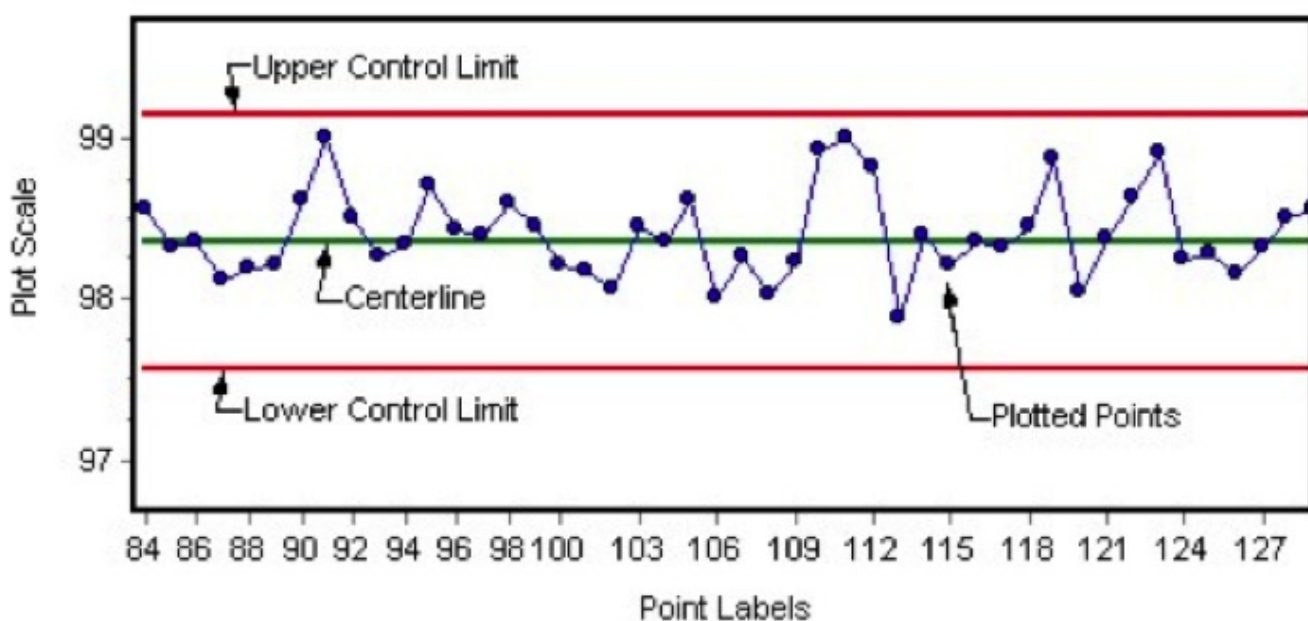
Measurement Tool: Control Chart

A more sophisticated tool for analyzing data over time is a control chart. Like a run chart, a control chart displays data about a process on the y axis and time on the x axis. By analyzing the variation in data collected at each point or by analyzing the variation from point to point, one can calculate "control limits" that represent three standard deviations from the mean or average of the process. Points that lie within the control limits are considered part of the normal variation within the process (common cause variation) and points that lie outside the limits are considered to be statistically significant and are usually the result of a "special cause" impacting on the system(see Figure 3).

If one is retrospectively analyzing a process to understand what causes change, one should investigate all special cause variations that are either making the process perform worse or significantly better. If one is prospectively testing changes to improve the process, one looks for special cause variation to confirm that significant improvement has occurred. It is often helpful to consult someone with a background in improvement science to help you determine which control chart is appropriate for your measures based on the type of data being collected and additional rules for statistical significance for change.

Figure 3: Control Chart

X-Chart: 1



Generate/Test Ideas

Generate List of Ideas

The third key question in The Model for Improvement is: "What changes can I test that will result in improvement?" To answer this question, start by generating a list of changes or ideas. It is important to begin with a literature search and an environmental scan to determine if there are ideas that have been already tested or that have a strong evidence base from research. Remember that even evidence-based guidelines need to be tested in local environments of care. Make sure to involve your staff in this process as they often have insights into aspects of the care process that you are less familiar to you.

Brainstorm Ideas with Staff

In addition to a literature search and environmental scan, it is helpful to use brainstorming as a technique to generate ideas and to involve everyone who is a part of the care process. You do not need to analyze or edit ideas initially. The first step is to consider the possibilities. Take time to understand the barriers that prevent change. This will help you plan initiatives that anticipate and overcome these barriers.

Use Process Flow Chart and a Site Diagram

There are many useful tools that can help your team improve their understanding of what changes to make and where to make them -- two of the most useful to clinicians are a process flow chart and a site diagram. A process flow chart can be used to map out the individual components of care in the process you are trying to change while a site diagram can be a helpful tool to determine if the clinic workspace should be redesigned or altered to improve the care processes.

A great source to consult is the Institute for Healthcare Improvement's [Improvement Map](#) for ideas about the best knowledge available on key process improvements that led to optimal patient care.

Testing Ideas using PDSA Cycles

The Plan, Do, Study, Act (PDSA) cycle is a technique for planning, executing, studying, and implementing changes. PDSA cycles begin with ideas or theories and involve prediction about the impact of a change idea. Some have called the PDSA cycle the application of the scientific method to human systems. It is an iterative process for learning and improvement structured upon rapid, small scale "tests" of change that provide learners with a mechanism to build knowledge about what works (and what doesn't) so that after you complete the first cycle, the results inform the next cycle of tests, and so on. A key step in the PDSA cycle is the reflecting on and learning from the consequences of your changes.

PDSA Cycles typically have four steps: Plan, Do, Study, Act

PDSA: Step 1 - 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?
- What do we expect will happen?

Making a prediction will assist in anticipating what might come next and whether or not the cycle was a success. If you can answer the above questions with some specificity, you are probably done planning!

For example: I predict that if we install alcohol dispensers immediately inside the door of each exam room, our observed rate of appropriate hand hygiene will improve.

Build on your existing systems during this test. What processes exist in your office or practice setting that could support patient safety/quality?

PDSA: Step 2 - DO: Carry out the PDSA Cycle

While you are running the test, you should collect data as outlined in your measurement plan as well as seek opinions and informal feedback about the results (both favorable and unfavorable) of the test. Be sure to begin analyzing your data as soon as it becomes available. Make note of any problems encountered or special circumstances that arose during the test.

Successful PDSA cycles pilot the change on a small scale by trying the change with just a few patients for a very limited

period first. This minimizes the "cost" of the test in terms of time, resources, and need to obtain buy-in from a broader group. For example, place reminder posters for good hand hygiene in one physician's exam rooms and survey that physician's patients over the next five days. If this test works and does not interrupt your office or practice 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.

PDSA: Step 3 - STUDY: Reflect on what you've learned

Complete your analysis during this step and clearly articulate what you learned from this test.

- 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. Some practices have plotted key measures each week and displayed it for others in the office to see. Seek input from everyone in your setting.

PDSA: Step 4 - ACT: Use what you've learned to plan your next step

Identify what adaptations need to be made to the current improvement cycle, and from this, identify your next cycle (or series of cycles). 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 it or drop it and try something else to accomplish your goal.

The science in PDSA is in the act of reflection, learning from what one did. Those who want improvement to occur need to reserve specific times to ask, "What did we learn?" and "How can we build on it?"

Key Features of PDSA Cycles

- Small-scale tests are very small: 1 patient, 1 staff person, 1 small process change, 1 day, 1 visit.
- Results from one PDSA cycle are used to develop subsequent PDSA cycles.
- The technique is low-risk and involves few resources.

Use the PDSA cycle repeatedly to gain knowledge and confidence in the changes you are testing to achieve your Aim. Make sure to continue to collect and analyze data to determine if your changes are resulting in improvements.

PDSA Cycles - A "Test" versus a "Task"

Many clinicians new to quality improvement get confused when trying to identify the steps they need to take to prepare to run a PDSA cycle (test of change) and end up focusing their time and energy on the tasks associated with the test rather than the test itself. A test involves implementing a change for a defined period of time and learning whether it works or not. It is a way to gather quick feedback about a change to determine whether it should be adjusted, adopted, or abandoned.

In order to conduct tests of change, many tasks need to be defined, assigned, and accomplished. For example, the care team needs to decide who will manage vaccine supplies and ensure enough vaccines are on hand before beginning an influenza immunization QI project or a care team may need to get permission from a hospital committee before a new form can be added to a health record. These are vital steps to the improvement process, but they are not tests of change, they are tasks or activities to be accomplished in order to effectively run the test.

Thus, a test of change involves defining and accomplishing tasks in order to execute the plan, but the test itself is not:

- Scheduling a meeting
- Creating a form or project plan
- Ordering necessary supplies or printing materials
- Developing educational materials
- Assigning roles and responsibilities
- Defining, collecting, or analyzing data
- Writing a policy or procedure

Learning through Repeated PDSA Cycles

Rarely will the first change or intervention achieve the goal in one try. PDSA cycles are small tests designed to help you make progress toward a goal. Small tests do not necessarily mean small changes; rather, small tests represent small steps needed to achieve significant improvement. Additional cycles of change will naturally spread from affecting patients in your office to other areas in the health care system.

PDSA - Tips for success

- Improvement occurs in small steps. Start very small and run cycles in rapid succession.
- Repeated attempts are often needed to refine your strategies or implement new ideas.
- Assess regularly to improve or revise the plan.
- Study failed changes for learning opportunities.
- Plan communication with all of those who will participate in the tests during the planning
- Plan communication with all staff to inform them of the progress toward Aims, to celebrate success and increase buy-in and interest in the improvement work.
- Engage leadership support

Teamwork/Tools

Team Approach to Improving Care

In most circumstances and settings, involving a team of people in an improvement effort makes sense. Most health care is delivered by teams. Thus, involving a variety of members of the healthcare team will increase the likelihood that the changes you implement will be lasting ones. Use team members for new ideas, to participate in testing, and to analyze your data. Sharing the work of improvement will make the effort more rewarding and less time consuming if you have multiple people involved.

Involve Patients

Patients are critically important members of healthcare teams and both soliciting patient feedback on experience of care and involving patients in improving their own care is essential. There are established survey tools that assess team function and to measure the degree of a "culture of quality or safety" within a clinical setting. There are also validated, nationally endorsed survey tools for obtaining patient feedback on their experience of care and their ability to assess quality of care. Refer to the Resources page for examples of patient surveys.

Improvement Tools for Teams

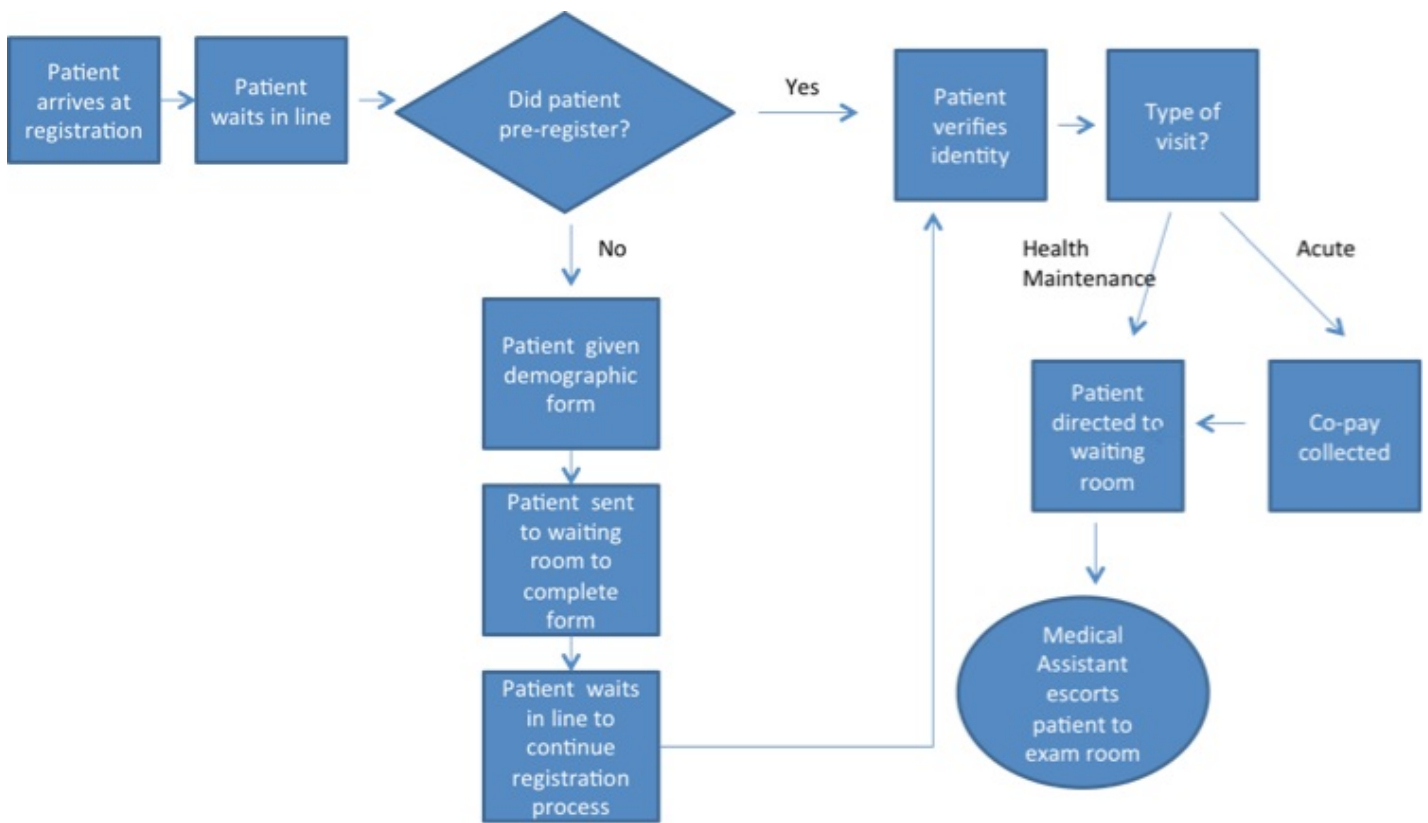
Many improvement tools exist to help teams conduct the various aspects of successful quality improvement projects (e.g. setting aims, forming teams, identifying change ideas, prioritizing techniques, collecting data, measuring progress, testing and sustaining changes, and spreading improvements); however, several key tools have proven so useful across quality initiatives that they warrant special mention here: process flow maps, site diagrams, and key driver diagrams.

Process Flow Chart

This is a useful tool for understanding what changes to make and where to make them. A process flow chart can be used to map out the individual components of care and identify gaps, bottlenecks, and redundant steps in the process. It can also help you uncover variations in clinical practice.

In order to create an effective process flow chart you will need to gather input from multiple people on the care team as each may have unique knowledge and perspectives on particular steps in the process. One easy-to-use technique to flow chart a process is to use sticky notes to detail the steps and post them on an empty wall, shifting them around until you have captured all of the necessary steps and decision points in the process. Next, take a picture of the wall to document the flow before transferring it into a more permanent format (by computer or pen/paper).

Example Process Flow Chart

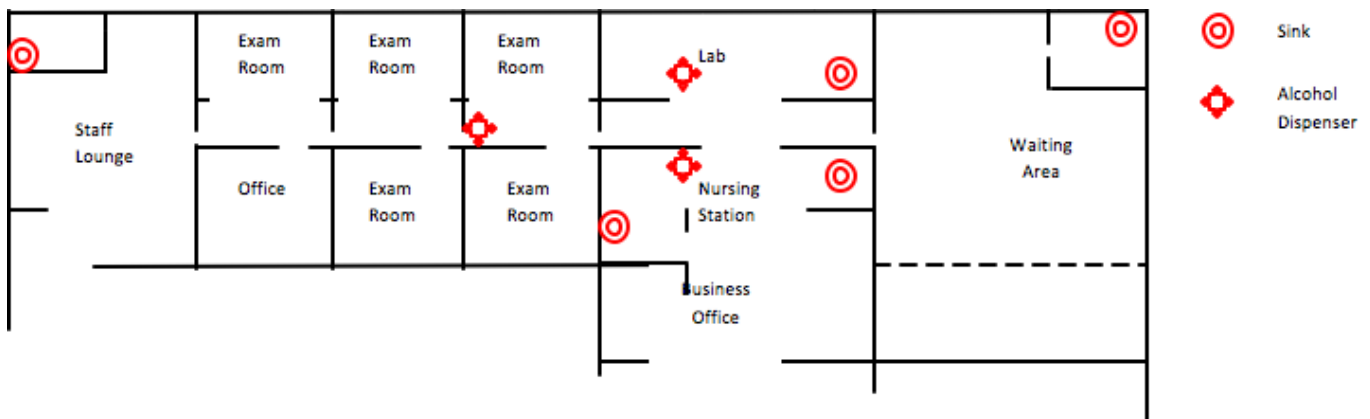


Clinical Site Diagram

A clinical site diagram can be particularly helpful for improvement projects that need to address spatial relationships and flow between settings or when considering where to place equipment and supplies.

For example, in a hand hygiene improvement project, a site diagram could be used to determine if the clinic workspace should be redesigned and/or where, specifically, to place hand sanitizer containers.

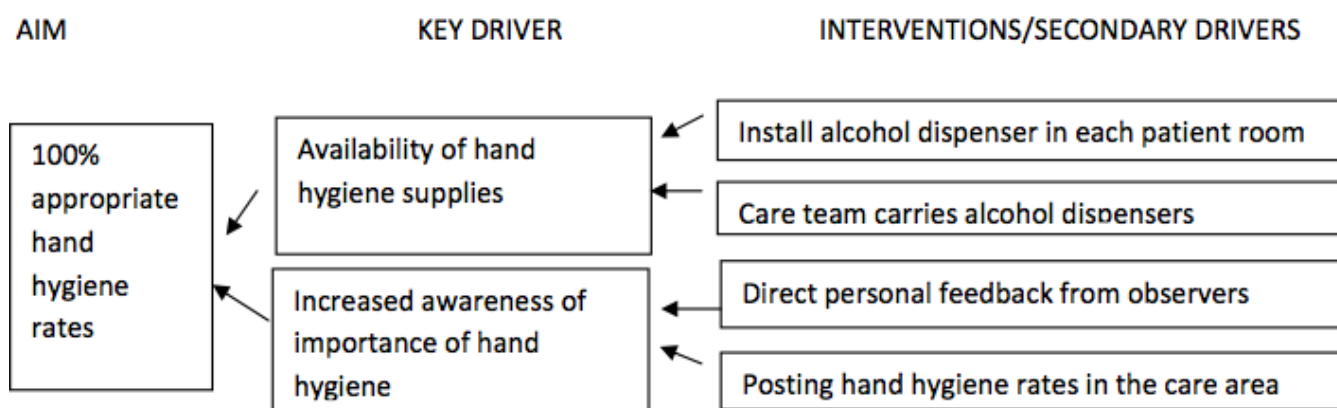
Example Site Diagram



Key Driver Diagram

Finally, a very useful tool for synthesizing the planning and implementation for a QI project is a logic diagram or a key driver diagram that explains the reasoning behind the proposed changes. The aim or goal of the improvement effort is listed on the left. The key drivers or changes that the team feels would have the biggest impact on outcomes are listed in the middle and the specific interventions or changes that will be tested are listed on the right.

Example Key Driver Diagram



Resources

General

- Batalden P, Nelson E, Lazar J. [Practice-Based Learning and Improvement: A Clinical Improvement Action Guide, 2nd Edition. Oak Brook Terrace, IL: Joint Commission on Accreditation of Healthcare Organizations; 2008.](#) A practical workbook that shows clinicians how to use quality improvement methods to provide high-quality and cost-effective care
- Langley G, Nolan K, Nolan T, Norman T, Provost L. [The Improvement Guide: A Practical Approach to Enhancing Organizational Performance. San Francisco, CA: Jossey-Bass Publishers; 1996:293.](#) The Jossey-Bass Business & Management Series. Offers practical approach to testing and improvement designed to deliver quick and substantial results
- [Committee on Quality of Health Care in America. Crossing the Quality Chasm: A New Health System for the 21st Century. Washington, DC: Institute of Medicine; 2001](#) A landmark report that makes an urgent call for fundamental change to close the quality gap in health care; offers a set of performance expectations for the health care system, a set of 10 rules to guide patient-clinician relationships, a suggested organizing framework to better align incentives inherent in payment and accountability with improvement in quality, and key steps to promote evidence-based practice and strengthen clinical information systems
- [Improving Chronic Illness Care](#) National program of the Robert Wood Johnson Foundation to better the health of chronically ill patients by helping health systems, especially those that serve low-income populations, improve their care through implementation of the Chronic Care Model, a coordinated program of quality improvement, research, and dissemination
- [Improving Performance in Practice](#) State-based, nationally led quality improvement initiative designed to improve outcomes for patients with diabetes, asthma, and other chronic conditions
- [Institute for Healthcare Improvement](#) Offers comprehensive programs that aim to improve the lives of patients, the health of communities, and the joy of the health care workforce. Strategies include refining existing solutions to health care problems and inventing new ones with a small number of forward-thinking organizations and expanding learning through strategic relationships and memberships, courses, campaigns, the Internet, professional education, and fellowship programs
- [National Committee for Quality Assurance](#) Develops quality standards and performance measures for a broad range of health care entities and certifies, accredits, and recognizes health care organizations and programs
- [National Initiative for Children's Healthcare Quality](#) Highlights need for better children's health care and spreads success stories of improved care that produce better outcomes, identifies and develops promising practices in children's health care, provides tools and methods to improve care, helps health care providers make changes based on the best available evidence, and formulates policies that support and accelerate improvement
- [National Quality Forum](#) Sets national priorities and goals for performance improvement, endorses national consensus standards for measuring and publicly reporting performance, and promotes attainment of national goals through education and outreach programs
- [Physician Consortium for Performance Improvement](#) Consortium convened by the American Medical Association and representing national health care leadership for the development, testing, and maintenance of evidence-based clinical performance measures and measurement resources for physicians
- The Improvement Guide, A Practical Approach to Enhancing Organizational Performance, by Gerald J. Langley et. al, Jossey-Bass, 1996.
- Fundamentals of Health Care Improvement: A Guide to Improving Your Patient's Care by Greg Ogrinc MD and Linda Headrick MD, Joint Commission Resources 2008.
- Practice-Based Learning and Improvement: A Clinical Improvement Action Guide by Eugene Nelson D. Sc, Paul Batalden MD, and Joel Lazar, Joint Commission Resources 2007.
- www.improvementskills.org
- www.childhealthimprovement.org
- www.ihl.org

Aim Statements

- [Assessing Readiness and Developing Project Aims](#) (website) - Tools and guidance to support the creation of aim statements with examples from several health care communities.
- [Tips for Setting Aims](#) (website) - Quick tips to consider when building aim statements, developed by the Institute for Healthcare Improvement.
- [Identifying the Problem and Stating Your Aim](#). (PDF - 5 pages) GO!Diabetes.- This article developed by GO! Diabetes describes how providers should go about identifying issues and developing aims to address those issues.
- [The Key Components of a Quality Improvement Project: A Step by Step Process](#) (PPT - 225KB) Moran, John, and Duffy, Grace. (2008, November 7). - A webinar with links to the recording and slides from a presentation developed by the Public Health Foundation which provides a step for step process for a quality improvement project.
- [Sample Aim Statement and Worksheet for Developing a Spread Aim](#). (PDF - 2 pages) Robert Wood Johnson Foundation. - This worksheet developed by the Robert Wood Johnson Foundation lists questions that providers should consider when writing spread aims.
- [Making Aim Statements More Robust](#) (PDF - 10 pages) - Published by Moran, J and Riley, B (April 16, 2012) - Examines the importance of describing and accounting for benefits, both tangible and intangible and provides tools and examples to support the creation of effective aim statements.

Measures

- To learn more about establishing measures, see the Tips for Effective Measurement on the Institute for Healthcare Improvement web site (<http://www.ihl.org/resources/Pages/Measures/default.aspx>).

PDSA Testing & Cycles

- To learn more about the PDSA cycle, see the Testing a Change: The PDSA Cycle on the Institute for Healthcare Improvement web site (<http://www.ihl.org/resources/Pages/HowtoImprove/ScienceofImprovementTipsforSettingAims.aspx>).
- To download a worksheet summarizing the four steps in this model for improvement, click here.
- To learn more about testing, see the Tips for Testing Changes on the Institute for Healthcare Improvement web site (<http://www.hrsa.gov/quality/toolbox/methodology/readinessassessment/part5.html>). This site also includes an excerpt from The Improvement Guide, which discusses ways to mitigate the risks of running improvement tests while maximizing the learning (<http://www.hrsa.gov/quality/toolbox/methodology/readinessassessment/part6.html>).
- To learn more about the science of quality improvement and even more thoughtful PDSA testing, read Quality Improvement through Planned Experimentation by Ronald Moen, Thomas Nolan and Lloyd Provost, McGraw-Hill 1999

Patient Surveys

- [Consumer Assessment of Healthcare Providers and Systems](#) (website) - Find detailed information about patient surveys examining experience with health care including example surveys, a bibliography, and other resources.
- [Clinical Microsystems Outpatient Primary Care Survey](#) (.Doc 10 pages) - An example of a patient survey for use in outpatient primary care settings.

Process Flow Chart

- A detailed [guide](#) produced by the National Health Service's Institute for Innovation and Improvement can support your team in developing a process map.
- [A Practical Guide to Creating Better Looking Process Maps](#) (website) - Developed by HT Abubakker and published on February 26, 2010, this site provides the common rules for symbols in process maps and provides tips for developing your process map in Microsoft PowerPoint or Visio.
- Microsoft Office allows users to download free templates to support flowchart/process map creation. Here are versions in [Word](#); [Excel](#); [PowerPoint](#); and [Visio](#). Additional templates are available free online.

Driver Diagrams

- [The Science of Improvement: Driver Diagrams](#) (Youtube video) - Dr. Robert Lloyd, Director of Performance Improvement at the Institute for Healthcare Improvement explains driver diagrams.
- [Key Driver Diagram Template](#)