

outlines issues for consideration when obtaining registry software and integrating registry products into an organization’s work routine.

- [Do Disease Registries = \\$\\$ Rewards](#)
- [Using a Simple Patient Registry to Improve Your Chronic Disease Care](#)
- [Chronic Disease Electronic Management System \(CDEMS\)](#) is a Web site developed by the Washington State Department of Health that provides information about the CDEMS.
- [COMMAND Patient Registry](#) is a free chronic disease patient registry developed by the Mississippi Quality Improvement Organization: Information & Quality Healthcare.

Paper Records

If a team maintains paper records and has over 100 patients in a measure’s denominator, it typically chooses random sampling to decrease the team’s burden, while maintaining data integrity. Sampling with paper charts becomes inconvenient; however, when the charts are out of circulation during the time of the audit. When a QI team plans the data collection process, coordinates effectively with medical records staff for chart access, and completes the audit efficiently, it minimizes disruption to the organization.

Many organizations have developed and refined data collection tools over time, which can be easily adapted by a QI team to save time and resources. The chart below provides examples of proven tools used by other health care organizations that ensured the quality of their data collection:

Table 2.3: Data Collection Tools

Name of Tool	Description and Use of Tool	Web Site Address for Tool
<u>Provider and Staff Satisfaction Survey</u>	This survey, developed by IHI, provides a template for testing provider and staff satisfaction within an organization.	http://www.ihl.org/knowledge/Knowledge%20Center%20Assets/Tools%20-%20ProviderandStaffSatisfactionSurvey_fda0a349-1f41-45c0-a492-2cf8d33c3417/ProviderStaffSatisfactionSurveyTantau.pdf
<u>The Consumer Assessment of Healthcare Providers and Systems (CAHPS)</u>	The Consumer Assessment of Healthcare Providers and Systems (CAHPS) program is a public-private initiative to develop standardized surveys of patients' experiences with ambulatory and facility-level care. A CAHPS Survey and Reporting Kit explains how to prepare and field a CAHPS questionnaire, analyze the results, and produce consumer-friendly reports.	https://www.cahps.ahrq.gov/cahpskit/CAHPSKIT_main.asp
<u>Short Survey (IHI Tool)</u>	Short surveys provide simple and prompt feedback to assess whether attempts to improve performance are going in the right direction. They can also be used to pinpoint certain areas of interest (e.g., did patients find the new form easy to understand?).	http://www.ihl.org/IHI/Topics/Improvement/ImprovementMethods/Tools/Short+Survey.htm
<u>Data Collection Check Sheet for observations American Society for Quality</u>	A generic tool that can be adapted for a wide variety of purposes; the check sheet is a prepared structured form for collecting and analyzing data.	http://www.asq.org/learn-about-quality/data-collection-analysis-tools/overview/check-sheet.html

Sample Measurement Assistant Spreadsheet American Academy of Family Physicians	The Sample Measurement Assistant Spreadsheet is provided in an Excel worksheet.	Measurement Assistant Spreadsheet
Clinical Improvement Worksheet	This Excel worksheet is a sample for organizations to modify and use to collect clinical improvement data.	http://clinicalmicrosystem.org/assets/materials/worksheets/clinical_improvement.pdf
Observation worksheet	This Excel worksheet is a sample for organizations to modify and use when observing a process and focusing on improvement.	http://clinicalmicrosystem.org/assets/materials/worksheets/observation_worksheet.doc
Various Chart audit forms for collecting data	This site provides a variety of disease-specific chart audit forms for data collection. Do a Search.	http://www.migrantclinician.org
CDEMS sample data collection	This is a three-page Word document containing three CDEMS Sample Asthma Data Collection forms.	http://www.healthdisparities.net/hdc/hdcsearch/?IW_DATABAS E=library&IW_FIELD_TEXT=8-3-2006.4401+IN+documentidtbl
Medication Therapy Management Data Collection Form	This form is used to record demographics; medication prescribing record; chronic conditions; vital signs, labs, and diagnostic test results; hospitalization and ER visits, and pharmacist intervention log.	http://www.healthdisparities.net/hdc/hdcsearch/?IW_DATABAS E=library&IW_FIELD_TEXT=10-2-2009.4338+IN+documentidtbl
NQC Quality Academy: Collecting Performance Data	This NQC Quality Academy Tutorial provides instructions on how to effectively and efficiently collect quality data and translate it into quality improvement activities.	http://nationalqualitycenter.org/index.cfm/6101/15395

Standardize the Process

A well-documented data collection plan is essential to a successful start of a QI project, because it standardizes the various processes required to collect and measure data. It establishes a work plan with committed resources and target dates that promotes efficiency within the project. One important task is to have performance data available for a QI team’s review according to the schedule defined in the data collection plan. A strategy employed by most teams is to designate a person who is accountable for gathering the data and having it available when the information is due. When the roles and responsibilities of that person are documented, it decreases the risk of disruption during staff transitions.

Another issue to overcome with a detailed data collection plan is when an organization’s electronic systems are standalone or do not integrate easily. Since measuring performance may require data from various systems, a QI team needs to develop a process for capturing data from these different sources. Documenting the workaround procedures for compiling the data eliminates re-learning the process next month.

Designing and implementing procedures to examine the data ensures validity, reliability, completeness, timeliness, integrity and confidentiality. Standardized procedures may cover any relevant process to the project--communication, training, system checks, and routine data QI activities. When a QI team documents a data collection methodology for each measure calculated, it ensures reliable and reproducible data over time.

Performance measurement data is only as effective as the data collection process. A QI team should assess the reliability and effectiveness of the process before finalizing the plan. Often organizations conduct random chart audits of the collected data and reports to assess their accuracy. There are a number of chart audit forms available to QI teams that are measure specific, which are listed in **Table 2.4**:

Table 2.4: Chart Audit Tools and Resources

Name of Tool	Description and Use of Tool	Web Site Address for Tools and Forms
Chart audit tool	This tool is used to chart audits for diabetic patient, Paps, and mammograms.	http://www.healthdisparities.net/hdc/hdcsearch/?IW_DATABASE=library&IW_FIELD_TEXT=10-13-2009.7962+IN+documentidtbl
Various chart audit forms for collecting data	This site provides a variety of disease-specific chart audit forms for data collection.	http://www.migrantclinician.org
Dental peer review chart audit forms	This tool is a sample dental peer review chart audit form that could be used for quality assurance programs.	http://www.healthdisparities.net/hdc/hdcsearch/?IW_DATABASE=library&IW_FIELD_TEXT=7-28-2009.8587+IN+documentidtbl
Blank chart audit form— Homeless	This is a one-page Excel spreadsheet containing a blank chart audit form specifically geared for homeless patients. This form is used to assess adherence to the chart documentation requirements for this health center's providers.	http://www.healthdisparities.net/hdc/hdcsearch/?IW_DATABASE=library&IW_FIELD_TEXT=5-26-2006.4400+IN+documentidtbl
Blank chart audit form-- Perinatal NH	This is a one-page Excel spreadsheet containing a blank chart audit form specifically geared for perinatal patients.	http://www.healthdisparities.net/hdc/hdcsearch/?IW_DATABASE=library&IW_FIELD_TEXT=5-26-2006.1461+IN+documentidtbl

Part 3: Tracking Data

Calculate Each Measure Over Time

When the performance is calculated, a QI team then decides how often to monitor it. As a general rule, a QI team that is actively making changes to systems of care monitors performance frequently. The following guidelines are suggestions that a team may use for determining performance measurement frequency:

Table 3.1: Guidelines for Performance Measurement Frequency

Frequency	Team’s Position in the Process
Monthly	Actively changing the underlying systems
Quarterly	After aim or goal is achieved
Annually (or periodically)	After aim or goal is achieved and performance is stable

There are measure-specific performance improvement tracking tools available to QI teams, which are listed in **Table 3.2**:

Table 3.2: Performance Improvement Tracking Tools

Name of Tool	Description and Use of Tool	Web Site Address for Tools and Forms
Improvement Tracker	The Improvement Tracker allows an organization to track measures currently available in the Topics area of IHI.org; it automatically graphs data which creates customizable reports for specific audiences	http://app.ihl.org/Workspace/tracker/
Worksheet for Tracking Performance Results	This tool tracks an organization’s performance results over several evaluation periods, and document ideas for interpreting and responding to the results.	http://ww3.harvardbusiness.org/corporate/demos/hmm10/performance_measurement/worksheet_for_tracking_performance_results.html
Measuring Clinical Performance: A Guide for HIV Health Care Providers	The New York State Department of Health AIDS Institute developed a guide that provides a step-by-step process for measuring clinical performance with the goal of improving quality of care.	http://www.ihl.org/knowledge/Pages/Tools/MeasuringClinicalPerformanceAGuideforHIVHealthCareProviders.aspx

Share Progress with the Practice Team

As a QI team makes changes in its systems of care, the performance measurement data reassures the team that changes are resulting in improvement. Because improvements are added periodically, measuring performance over time is important. Most QI teams schedule some time on the monthly team meeting agenda to review the data and share their findings.

Note: As a QI team reviews the data, it should keep its findings in perspective. Unsatisfactory performance data for one measure does not necessarily reflect the quality of care provided by an organization as a whole. Performance that appears deficient can be caused by exceptional factors, such as, access to equipment. It is important that a QI team recognizes unsatisfactory performance as an opportunity to improve current systems and, ultimately, performance on the measure.

Data displays are effective tools for sharing information throughout the data management process. Data that is displayed graphically or summarized in a concise format provides a quick view of the team’s progress—from baseline to aim. The following sections provide examples of commonly-used data display techniques.

Run Charts

Run charts show trends in data over time, are easy to interpret, and provide a picture of how a process is performing. They can be annotated to indicate when a particular change is implemented, which may explain a marked improvement or decrease in performance. A sample run chart for tracking the immunization rate of two-year olds is shown in **Figure 3.1**:

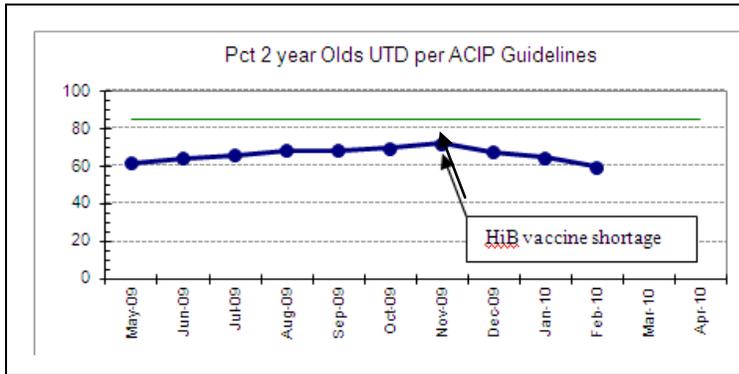


Chart Description:

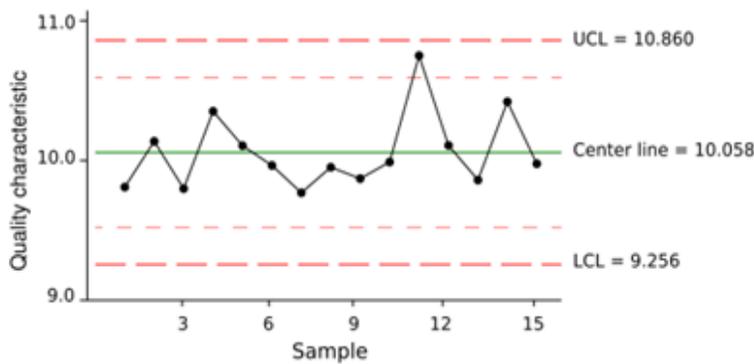
- X axis is the date when performance was measured
- Y axis is performance as a percentage
- First point indicates the baseline
- Green line indicates the aim
- Annotation (H1B vaccine shortage) explains significant impact on the system, which can be positive or negative

Figure 3.1: QI Project—Improve the Immunization Rate of Two Year Olds

The [Improvement Tracker](#) provided by the Institute for Healthcare Improvement allows a team to track predefined standard measures using run charts in several topic areas. Additionally, a QI team can create its own custom measures to track any data for its QI efforts.

Control Charts

Similar to run charts, control charts show data over time; however, they provide limits on which observed variation can be detected as either random or expected. [Control charts](#) are used less frequently in performance improvement but are helpful for understanding if the variation in data is beyond mathematical expectations. **Figure 3.2** shows an example of data displayed in a control chart.



- X axis may be defined as a specific sample or performance measurement date
- Y axis is a quality characteristic (performance)
- First point indicates baseline
- Green line is the mean
- Between the upper and lower confidence limits (UCL, LCL) is data within the normal variation. If data falls outside of the expected range, it may indicate something unusual occurred.

Figure 3.2: Example of Data Tracking with a Control Chart

Other Commonly Used Displays

Additional graphing types, such as bar graphs or pie charts, are useful for visually telling a performance story. A team’s creativity for display design is unlimited if improvement efforts are visually displayed and easily interpreted.

Dashboard

Dashboard data displays, similar to the dashboard in an automobile, provide several performance indicators at a glance, and are more commonly used as organizations increase their number of measures. Dashboards are created to display various aspects of one quality improvement project or used to convey performance across the organization, as these next two examples demonstrate.

This dashboard in **Figure 3.3** depicts the performance of a small practice that is trying to improve several aspects of comprehensive diabetes care. The dashboard is a compilation of the run charts and represents the registry size and performance for each measure over time. The initial point is the baseline and the aim is represented by the green line. At a glance, the team can see the performance for all monitored measures, which can be used to focus improvement efforts for the next month.

- [Cancer Trends Progress Report](#) (National Cancer Institute (NCI), NIH): This report summarizes progress in the United States against cancer in relation to Healthy People 2010 targets set forth by the Department of Health and Human Services. The report includes key measures of progress along the cancer control continuum and uses national trend data to illustrate where advancements have been made.
- [CDC Data and Statistics](#) (Centers for Disease Control and Prevention (CDC))
- [Data and Surveys](#) (Agency for Healthcare Research and Quality (AHRQ))
- [Gateway to Data and Statistics](#) (HHS Data Council, Department of Health and Human Services): This Web-based tool compiles key health and human services data and statistics.
- [GlobalHealthFacts.org](#) (Henry J. Kaiser Family Foundation (KFF)): Global data on HIV/AIDS, malaria, tuberculosis, and other key health and socio-economic indicators are found on this Web site. The data is displayed in tables, charts, and color-coded maps and can be downloaded for custom analyses.
- [Health Data](#) (Pan American Health Organization (PAHO))
- [Health, United States](#) (National Center for Health Statistics (NCHS), CDC): This is an annual report on trends in health statistics. The report consists of a chart book that illustrates major trends in the health of Americans, and a trend tables section with detailed data tables. Refer to Appendix I for data sources.
- [HRSA Geospatial Data Warehouse](#) (Health Resources and Services Administration (HRSA)): The Geospatial Data Warehouse and its associated applications provide access to information about HRSA programs and related health resources, including data on health professional shortage areas, medically-underserved areas, and primary care service areas.
- [Kaiser State Health Facts](#) provides free, up-to-date, and easy-to-use health data on all 50 States. Statehealthfacts.org provides data on more than 450 health topics and is linked to both the Kaiser Family Foundation Web site and KaiserNetwork.org.
- [Maternal and Child Health Bureau Data](#) (Health Resources and Services Administration (HRSA))
- [National Association for Public Health Statistics and Information Systems \(NAPHSIS\)](#)
- [National Center for Health Statistics \(NCHS\)](#) (Centers for Disease Control and Prevention (CDC)): The Nation's principal health statistics agency that review outcomes, access, literature synthesis, public reporting, underserved, quality, data collection methods, access data, reports, surveys, and tools.
- [National Health Interview Survey \(NHIS\)](#) (National Center for Health Statistics (NCHS), CDC): NHIS provides data on a broad range of health topics collected through personal household interviews.
- [National Notifiable Diseases Surveillance System](#) (Centers for Disease Control and Prevention (CDC)): This is a list of nationally notifiable diseases and summaries of reports submitted by health care providers and clinical laboratories to local, county, or State health departments.

- **National Program of Cancer Registries (NPCR)** (Centers for Disease Control and Prevention (CDC)): Data is collected by regional and State cancer registries. This site provides access to U.S. Cancer Statistics (USCS), the U.S. County Cancer Incidence Dataset, and the USCS Expanded Dataset.
- **SEER (Surveillance Epidemiology and End Results)** (National Cancer Institute (NCI), National Institutes of Health (NIH)): SEER provides cancer statistics in the United States. It collects information on incidence, survival, and prevalence from specific geographic areas representing 26 percent of the U.S. population, and compiles reports on these plus cancer mortality for the entire Nation.
- **State Snapshots** (Agency for Healthcare Research and Quality (AHRQ)): The State Snapshots provide State-specific health care quality information, including strengths, weaknesses, and opportunities for improvement. The goal is to help State officials and their public- and private-sector partners better understand health care quality and disparities in their State.
- **Substance Abuse and Mental Health Statistics** (Substance Abuse and Mental Health Services Administration (SAMHSA)): This provides the latest national data on alcohol, tobacco, illicit drug use and dependence, and State treatment planning areas, and includes data on mental health topics, such as, depression, serious psychological distress, and suicidal thoughts and attempts.
- **Surveillance Research: Where can I find cancer incidence statistics?** (National Cancer Institute (NCI), NIH): This is a list of reports and research tools to find cancer incidence statistics.
- **Unintentional Injury Prevention and Behavioral Science Web Site** (Society for Public Health Education (SOPHE))
- **WHOSIS Statistical Information System** (World Health Organization (WHO)): This is an interactive database bringing together core health statistics for the 193 WHO Member States. It comprises more than 70 indicators, which can be accessed with a quick search by major categories, or user-defined tables.
- **Women's Health USA 2007** (Health Resources and Services Administration (HRSA)): Women's Health USA provides data and information on emerging issues and trends in women's health. Racial and ethnic, sex/gender, and socioeconomic disparities are highlighted where possible.

Part 5: Acting on the Data

The Plan-Do-Study-Act (PDSA) cycle is integral to rapid-cycle change methodology with emphasis on the “S” or *study* part of the cycle. In data management, *study* is the analysis and interpretation phase, and when it is completed, an organization can proceed to “A” or *acting* on the data. A team’s analysis and interpretation of the data drives its subsequent actions on performance. The following summaries provide common scenarios that result from the study process and a team’s actions based on that information.

When Progress is Insufficient

When a team decides there is insufficient progress, which may prohibit the organization to reach its goal within the specified time period, the team has the following options to guide its actions:

Ensure Data Systems Are Reliable

If the team is using a registry-generated report for performance data, the first step is to validate the reliability of its data systems. A current, updated registry, timely data entry, and compliance with the data collection methodology avoid a less-than-expected performance.

Re-evaluate Potential Causes of Underlying System Problems

At the start of the QI project, the team brainstormed on potential local factors that could impact the system's improvement. A team may want to re-evaluate those potential causes of system problems that can hinder progress. The fishbone diagram, shown in **Figure 5.1**, is the tool used by the QI team from the women's health center example to analyze why Pap smears were not occurring.

The team's analysis showed the internal systems to recall patients due for Paps, reduced no-show rates, and performed Paps when due, regardless of the reason for the visit; however, the issue of creating systems to retrieve documented Paps performed elsewhere was not addressed. The follow-up review of the data, in the context of the Quality Improvement Plan, provided an opportunity for the team to further improve its systems, and the team achieved its aim of 90 percent by the project due date.

Re-evaluate Changes Made for Improvement

A common cause of a change failing to result in improvement is because the change was implemented inconsistently or unexpectedly discontinued. There are a number of reasons this occurs--communication issues, insufficient training, or resistance to change are the typical challenges that may contribute to a unsuccessful change.

Increase Number of Changes per Week

When a team has insufficient resources or time, it may implement only one change every week or two, which slows the rate of performance improvement. A recommendation for this scenario is to include other staff members to assist with incremental tasks, such as testing the changes, so the QI team can work on multiple factors simultaneously to improve systems.

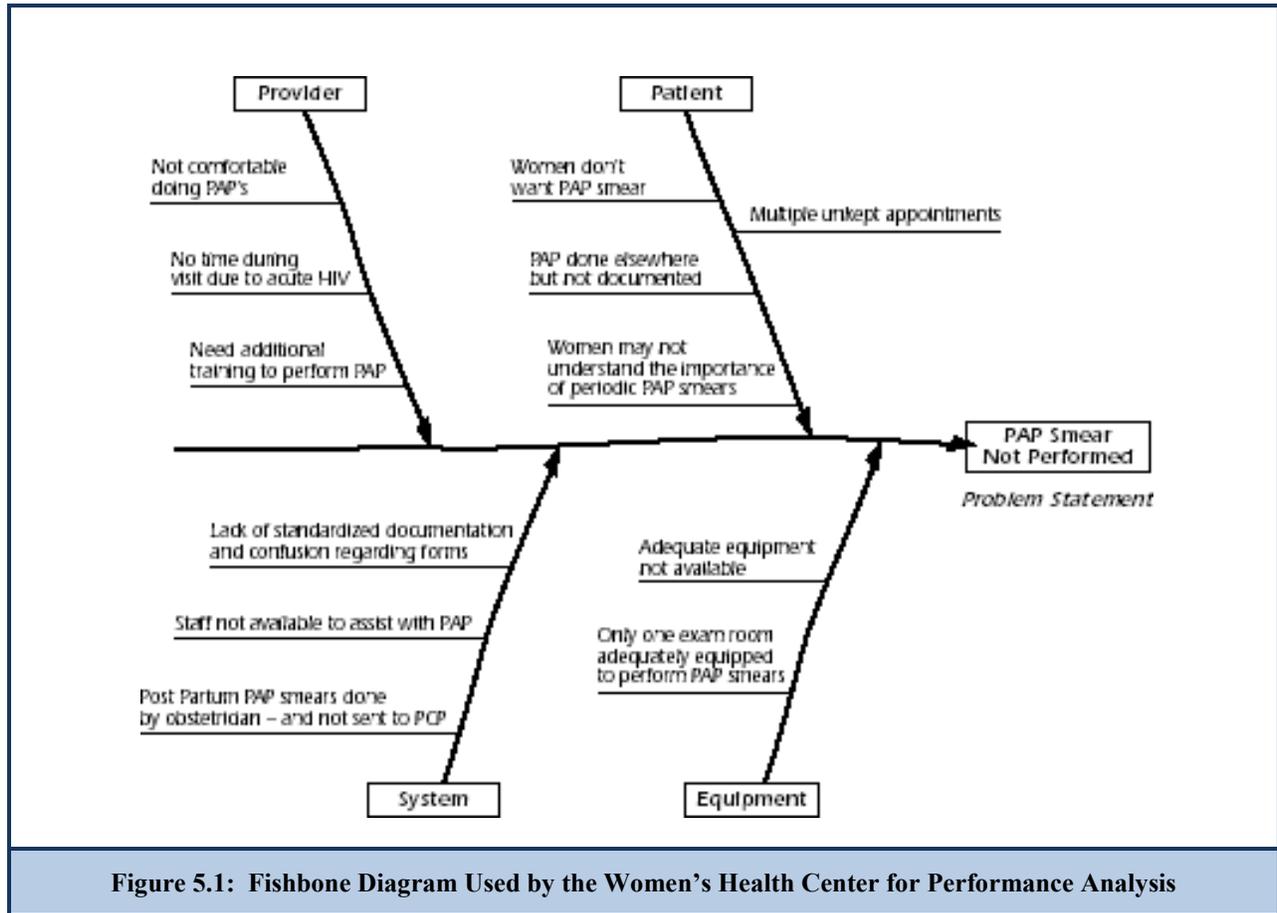


Figure 5.1: Fishbone Diagram Used by the Women’s Health Center for Performance Analysis

Remove Barriers

Insufficient performance improvement may occur due to factors beyond an internal system change, such as barriers to care. Women who do not have access to mammography, or transportation issues that prevent patients to get routine HbA1c tests, are examples of barriers. One solution is for care providers to partner with other agencies, such as the Cancer Control Program, to schedule the mobile mammography van once a month, or seek funding to offer HbA1c tests on site. These types of creative solutions to common problems are included in the *Changes that Work* grids within each module.

When Progress is Sufficient

When an improvement project goes smoothly with steady incremental progress on pace to meet the aim, that is a time to celebrate the team’s hard work and success. After the celebration, a team may need to look for other opportunities for improvement. With complex systems, it usually requires more than a few changes to meet the aim. In evaluating next steps, a team may consider these options:

- Continue on the same path

- Work on a different part of the system
- Test changes in more situations
- Spread the improvement

Continue on the Same Path

This action is appropriate especially for measures of annual screenings. If systems are honed so eligible patients receive their needed care during clinic visits, improvement efforts can focus on outreach and assurance that patients are seen in accordance with their care requirements. Over time, the number of patients who are current on their annual screenings will steadily increase.

Work on a Different Part of the System

Systems of care delivery may have multiple factors that have an impact on performance improvement. In this scenario, the QI team focused on increasing the rate of foot exams for diabetics. System changes, including patient and provider awareness, resulted in adequate improvement but performance eventually leveled off. The QI team considers potential improvements, such as, additional time to perform foot exams during the busy clinic schedule, or sufficient qualified personnel to perform foot exams. In this case, awareness needed for foot exams was improved, but the ability to meet that need was inconsistently met. The QI team is advised to look at the underlying critical pathway, which is especially helpful in these situations. Additional information on critical pathways is found within each module.

Test Changes in More Situations

When changes result in performance improvement as planned, a team may consider testing the changes further to ensure they will work under all conditions. The ultimate goal is to embed the new and improved process until it is consistently performed each time.

Spread the Improvement

When the team achieves success in its QI project for a population of focus (POF), the work should be spread to other providers, care teams, or sites within the organization. The same strategies, planning, methodologies, and tools discussed in this module are applicable for spreading the improvement to other POFs.

Part 6: Conclusion

The collection, tracking, analyzing, and interpretation of data followed by action continues periodically throughout the QI project. At the end of the time period specified by the aim statement, the QI team consults with the organization's leadership and decides to either: 1) continue monitoring the measure; 2) leverage more improvement, 3) or focus on other topics. Considerations regarding these and related issues are covered in the [Quality Improvement](#) module.

Part 7: Resources

1. Building Measurement and Data Collection into Medical Practice, *Annals of Internal Medicine* - Eugene C. Nelson, DSc, MPH; Mark E. Splaine, MD, MS; Paul B. Batalden, MD; and Stephen K. Plume, MD <http://annals.highwire.org/content/128/6/460.abstract>
2. [HRSA HAB Essential Steps in Data Flow](http://careacttarget.org/library/rsr/EssentialStepsinDataFlow1111.pdf)
<http://careacttarget.org/library/rsr/EssentialStepsinDataFlow1111.pdf>.
3. Control Charts <http://www.itl.nist.gov/div898/handbook/pmc/section3/pmc31.htm>
4. Improvement Tracker: <http://app.ihl.org/Workspace/tracker/>
5. CDEMS—[Public Health Information & Data Tutorial: Health Statistics Module](#) - (National Network of Libraries of Medicine (NN/LM)) - Online instruction on how to retrieve statistical information and access data sets relevant to public health.