
CANCER SCREENING

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CERVICAL CANCER SCREENING

The goals of this module are to provide a detailed overview of the HRSA’s Core Clinical Measure, **Cervical Cancer Screening**, outline the intended use for this measure, and highlight the benefits of implementing this measure into an organization’s quality improvement (QI) program.

Measure Description

Name	Description	Numerator	Denominator	Source	Reference
Cervical Cancer Screening	Percentage of women 21 to 64 years of age who received one or more Pap tests	Women in the denominator with one or more Pap tests during the measurement year or two years prior to the measurement year	All women patients 24 to 64 years of age during the measurement year or 2 years prior to the measurement year	NCQA / NQF	http://www.ncqa.org/tabid/432/Default.aspx

Part 1: Introduction

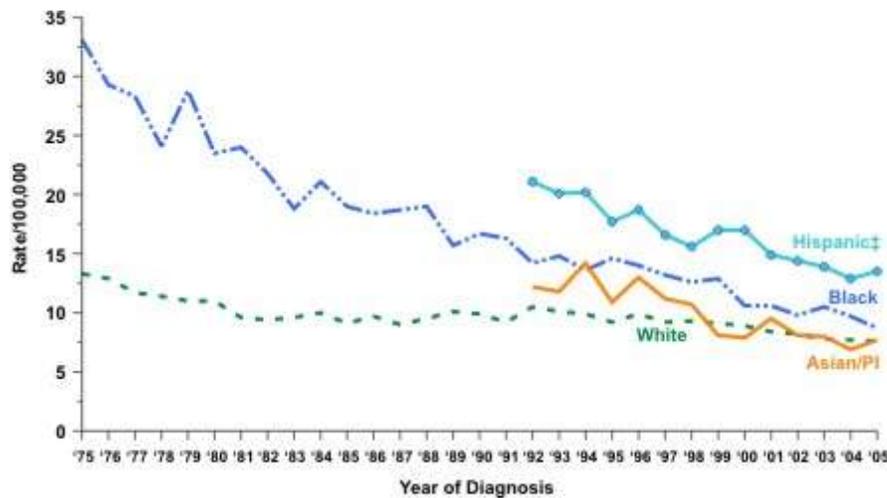
Cervical cancer is a slow-growing cancer that develops in the tissues of the uterine cervix. It does not typically have any symptoms and is almost always caused by human papillomavirus (HPV) infection. Effective screening and treatments continue to decrease the incidence of cases and deaths from cervical cancer. Women in developing countries account for the majority of cases and deaths related to this type of cancer. It was estimated that in 2009, there would be 11,270 new cases and 4,070 deaths from cervical cancer.¹ The lifetime probability of developing cervical cancer is 0.75 percent and 0.27 percent lifetime probability of death.²

Despite the low incidence numbers for cervical cancer, there are differences among racial and ethnic groups. **Table 1.1** summarizes the data displayed in **Figures 1.1** and **1.2**, which shows incidence rates are highest for Hispanics, followed by Blacks, Whites, Asian/Pacific Islanders, and American Indian/Alaska Natives. Death rates are highest for Blacks, followed by Whites, Hispanics, American Indian/Alaska Natives, and Asian/Pacific Islanders [see table and figures].³

Table 1.1: Cervical Cancer Incidence and Death Rates per 100,000 Persons in the United States

Race/Ethnicity	White	Black	Asian/Pacific Islander	American Indian/Alaska Native	Hispanic
Incidence rate	8.0	9.3	7.1	5.5	9.7
Death rate	2.5	3.8	1.7	2.1	2.2

Figure 1.1: Cervical Cancer SEER Incidence Rates* by Race and Ethnicity, U.S., 1975–2005



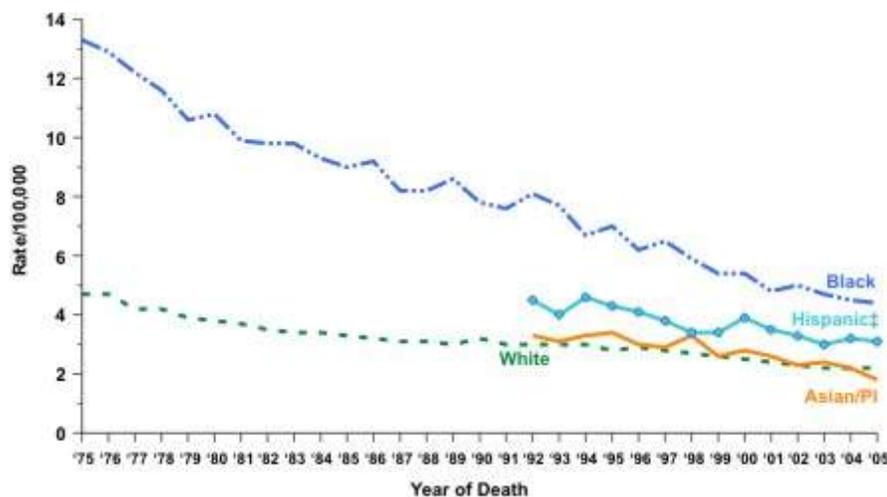
Incidence source: Surveillance, Epidemiology, and End Results (SEER) Program, National Cancer Institute (NCI) 1975–1991 = SEER 9; 1992–2005 = SEER 13.

*Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population (19 age groups - Census P25-1130).

Rates for American Indians/Alaska Natives are not displayed because fewer than 16 cases were reported for at least one year within the time interval.

‡Hispanics are not mutually exclusive from Whites, Blacks, Asians/Pacific Islanders, and American Indians/Alaska Natives. Incidence data for Hispanics are based on NHIA and exclude cases from the Alaska Native Registry.

Figure 1.2: Cervical Cancer U.S. Death Rates* by Race and Ethnicity, U.S., 1975–2005



Mortality source: U.S. Mortality Files, National Center for Health Statistics, CDC.

*Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population (19 age groups - Census P25-1130).

Rates for American Indians/Alaska Natives are not displayed because fewer than 16 cases were reported for at least one year within the time interval.

‡Hispanics are not mutually exclusive from whites, blacks, Asians/Pacific Islanders, and American Indians/Alaska Natives. Mortality data for Hispanics do not include cases from Connecticut, Maine, Maryland, Minnesota, New Hampshire, New York, North Dakota, Oklahoma, and Vermont. ⁴

The racial and ethnic differences are thought to reflect disparities in access to screening and treatment. The high death rate for Blacks implies they lack access to treatment. The higher incidence rate among Hispanics infers that a significant proportion is immigrants from countries where screening and treatment are less accessible. Rates of cervical cancer in Mexico and Latin America are three times higher than in the United States due to less screening.⁵

The link between cervical cancer and HPV infection highlights risk factors, screening priorities, and prevention strategies. There are over 100 types of HPV and several are considered high risk for causing cervical cancer—especially types 16 and 18. A study from the National Health and Nutrition Examination Survey (NHANES) showed 26.8 percent of women aged 14 to 59 years tested positive for at least one strain of HPV with higher incidence in young women.⁶ The sexually-transmitted virus does not typically present symptoms and persists for many years. An infection can resolve spontaneously, but a persistent infection can cause abnormal changes in cervical cells, which develop into cancer over the course of several years.

Gardasil® was approved in 2006 and provided another prevention strategy for cervical cancer. Females aged 9 to 26 years are vaccinated against HPV types 6, 11, 16, and 18 with three separate injections. In 2009, Cervarix® was introduced, which targets HPV types 16, 18, 31, 33, and 45, and was approved for boys. While vaccination may have an impact on cervical cancer incidence, it will not replace screening anytime soon.

Cervical and colorectal cancers are the only two that can be prevented through screening.⁵ There are clinical issues with determining who should be screened and how, such as, risk stratification, and what age to begin and stop screening. Screening guidelines have changed as clinicians gained a better understanding of HPV. As of November 2009, the American College of Obstetricians and Gynecologists (ACOG) recommends cervical cancer screening begin at age 21 years regardless of sexual history. Screening before age 21 should be avoided because young women are at very low risk of cervical cancer, and it may lead to unnecessary and harmful evaluation and treatment. Cervical cytology screening is recommended every 2 years for women aged 21 to 29 years. Evidence shows that annually screening women of average risk has little benefit over screening biennially.⁷ Screening is not required for women who have undergone hysterectomy including removal of the cervix.

Today, Papanicolaou (Pap) testing is the primary screening for cervical cancer. It is valuable for detecting pre-cancerous cells and lesions, which are simpler to treat than invasive cancer. The conventional Pap slide “smear” and the newer liquid-based cytology use similar technologies in examining cervical cells for abnormality. Evidence is mixed on which is more accurate.¹⁴¹⁵¹⁶

The HPV test is being studied for screening cervical cancer and pre-cancerous conditions. It is currently used with Pap cytology to assist clinical decision-making, and guidelines for its use will evolve over time.

The United States made significant progress with meeting cervical cancer challenges and ensuring screening procedures are an accepted routine for American women and health care professionals. Since cervical cancer is largely a preventable disease, improved screening rates should continue to be a priority.

Consensus Guidelines

Consensus recommendations were developed by the Cytopathology Education and Technology Consortium in 2006, based upon guidelines from the American Cancer Society (9,10) and the American Society for Colposcopy and Cervical Pathology.^{8 9 10 11} The guidelines recommend the following:

- Women with negative HPV testing and negative cytology should not be rescreened for at least three years.
- Women with a positive HPV test and negative cytology should repeat both tests in 12 months. If both tests at 12 months are negative, they can proceed to routine screening every three years. If HPV testing is persistently positive, they should undergo colposcopy. If the cytology is positive, they should have appropriate evaluation, regardless of HPV results.

An alternative is based upon the differential risk conferred by HPV types 16/18 compared with other high-risk HPV types. Women with positive HPV types 16/18 and a normal Pap smear have an 18 to 21 percent 10-year risk of developing CIN3, HPV genotyping test may prove useful, compared to women with non-16/18 high-risk types, whose risk is as low as 1.5 percent.^{12 13} It has been suggested that women with a negative Pap smear and positive HPV test could undergo HPV genotyping. Women who are HPV 16/18 positive should be referred directly for colposcopy. Those with a negative HPV 16/18 would return in 12 months for a Pap smear and HPV test; however, this strategy has not been evaluated.

Note: With the recent recommendations from the American College of Obstetricians and Gynecologists (ACOG), national authorities are looking at aligning measures with the new guidelines. Decisions on a clinical level and informing patients on the benefits and risks of screening remain essential in determining who should be screened for cervical cancer.

Performance Measurement: Cervical Cancer Screening

Measuring performance allows an organization to document how effectively care is provided and lays the foundation for improvement. The HRSA Core Clinical Measures (CCMs) are a set of performance measures, designed for use by HRSA programs as an integral part of their quality improvement programs, to improve care for the safety-net population. More information about the purpose and development of these measures can be found in the [HRSA Core Clinical Measures](#) module.

The HRSA **Cervical Cancer Screening** CCM is designed to measure the percentage of patients aged 21 to 64 years who have been screened with one or more Pap tests. This measure is intended to focus on appropriate screening for those women of average risk for cervical cancer. The goal is to further reduce the morbidity and mortality associated with cervical cancer by ensuring that patients access Pap tests, a highly effective screening test for cervical cancer, at least once in three years.

Measuring performance on this HRSA CCM encourages an organization to improve systems so that all women of appropriate age have access to regular and ongoing screening for cervical cancer. The performance measurement for the CCM focuses on systems for **Cervical Cancer Screening** for women of average risk, but work to improve performance on this measure will likely improve **Cervical Cancer Screening** for all women including those at high risk.

Consider the characteristics of a good performance measure and the Institute of Medicine (IOM) framework, ***Envisioning the National Healthcare Quality Report:***

- *Relevance:* Does the performance measure relate to a frequently-occurring condition or have a great impact on patients at an organization’s facility?
- *Measurability:* Can the performance measure realistically and efficiently be quantified given the facility’s finite resources?
- *Accuracy:* Is the performance measure based on accepted guidelines or developed through formal group decision-making methods?
- *Feasibility:* Can the performance rate associated with the performance measure realistically be improved given the limitations of the clinical services and patient population?

To ensure that a performance measure has these characteristics, it is often based on, or aligned with, current evidence-based guidelines and proven measures.

The HRSA CCMs were developed in alignment with national clinical practice guidelines and other performance measures that have been vetted through a national consensus process. The Cervical Cancer Screening measure aligns with measures endorsed by the National Committee for Quality Assurance (NCQA) and similar performance metrics used by HRSA grantees and programs. Similar measures also exist in the national measure set for Healthy People 2010.

HRSA Core Clinical Measure: Cervical Cancer Screening

Name	Description	Numerator	Denominator	Source	Reference
Cervical Cancer Screening	Percentage of women 21 to 64 years of age who received one or more Pap tests	Women in the denominator with one or more Pap tests during the measurement year or two years prior to the measurement year	All women patients 24 to 64 years of age during the measurement year or 2 years prior to the measurement year	NCQA / NQF	http://www.ncqa.org/tabid/432/Default.aspx

As with all performance measures, there are essential inclusions, exclusions, and clarifications that are required to ensure that an organization collects and reports data in the same way. This allows an organization using the measure to compare itself with others. Detailed specifications for the measure, with descriptions of inclusion and exclusion criteria, are found in the section, **Part 3: Data Infrastructure: Cervical Cancer Screening.**

Practical Considerations

Health care professionals should be familiar with several key topics to appropriately screen women for cervical cancer. Advanced discussion is beyond the scope of this module, but the reader is encouraged to review other resources for further information including those listed in **Part 6: Additional Resources.**

Risk Factors Associated with Cervical Cancer

Patients may ask health care professionals about risks associated with cervical cancer and what can be done to prevent it. Evidence reveals the following are risk factors for cervical cancer:

- HPV infection
- Lack of regular Pap tests
- Weakened immune system
- Age over 40
- Sexual history—many partners or partner with many partners
- Smoking cigarettes
- Using birth control pills for five or more years
- Having many children
- Diethylstilbestrol (DES) exposure

These risks can be used to guide screening but are not intended to predict individual risk. An organization should leverage opportunities to discuss modifiable risk factors to minimize cervical cancer risks with women, in addition to recommending Pap test screening. Since HPV is a virus transmitted through sexual contact, it is critical to have an understanding of cervical cancer as a sexually-transmitted disease. Behavior-change prevention strategies that can be discussed with patients include the following:¹⁷

1. Avoidance of HPV infection
 - Abstinence from sexual activity
 - Barrier protection and/or spermicidal gel during sexual intercourse
 - Vaccination against HPV infection
2. Cervical cancer screening
 - Regular gynecological examination and Pap testing
3. Avoidance of cigarette smoking (active or passive)
4. Reproductive behaviors
 - High parity
 - Long-term use of oral contraceptives

Understanding Benefits and Harms of Screening

Data indicates that women who have been screened are less likely to develop or die from cervical cancer, because screening reveals abnormalities in early treatable stages--a benefit that increases with age. Evidence shows that cervical cancer mortality usually occurs among unscreened women. The maximum mortality for White women is between the ages of 45 and 70 years and for Black women is in their 70's.^{18 19} Mortality among women with negative Pap screening is low for all ages.

Screening recommendations carefully balance the benefits and harms associated with various screening techniques. Approximately six percent of women who receive Pap tests are referred for additional testing or treatment based on abnormal results. The potential harm of those referrals deserves consideration. Procedures may result in significant expense, discomfort, and permanent alteration of cervical tissue. Since some abnormalities resolve spontaneously or do not progress to cervical cancer, these consequences can be categorized as harms. Other harms of screening may include the impact of false positive screenings or inappropriate education about the significance of abnormal test results.

The Importance of Shared Decision Making

The consensus on current cervical cancer screening guidelines is high but an organization should consider individual patient risks and benefits when making its screening recommendations. For example, shorter screening intervals for a woman infected with HIV or whose immunity is otherwise compromised may be warranted.

It is important for an organization to discuss factors with the patient that have an impact on her decision about screening, such as, individual risks, fears of diagnosis and harm from screenings, cultural influences, previous experiences, values, and perceived barriers to screening. Salient highlights of the discussion and decision should be documented in the medical record for all female patients.

Improvement Experience: Cervical Cancer Screening

The **Cervical Cancer Screening** measure was chosen to align with existing measures. The data demonstrating the experience with these measures is discussed briefly in this section.

The importance of **Cervical Cancer Screening** as part of comprehensive preventive care for women is widely accepted. Increased screening rates, since the Pap test was introduced in the 1940's, caused dramatic declines in cervical cancer incidence and mortality rates. A systematic approach achieves continued improvements in the quality of care delivery and reliable screening for patients.

Healthy People 2010 Objective 3-11b reports the percentage of women aged 18 years and older, who self-reported receiving a Pap within the past three years, decreased from 79 percent in 1998 to 76 percent in 2008 (with a 2010 target of 90 percent). In 2008, HRSA's Bureau of Primary Health Care introduced the **Cervical Cancer Screening** measure as part of a set of required core measures. Nationally-aggregated data from health centers revealed that 56.9 percent of women in the targeted age group received at least one Pap test documented in their medical records.²⁰

Note that self-reported Pap screening may result in an optimistically high rate compared to medical record documentation.

In 2009, Healthcare Effectiveness Data and Information Set (HEDIS) data showed stagnant rates of cervical cancer screening in recent years shown in **Table 1.2**. There are significant differences between rates for women with commercial insurance compared to Medicaid-insured women.

Table 1.2: Cervical Cancer Screening Trends 2003-2008

Year	Commercial (%)	Medicaid (%)
2008	80.8	66.0
2007	81.7	64.7
2006	81.0	65.7
2005	81.8	65.0
2004	80.9	64.7
2003	81.8	64.0

In 2003, 79 percent of women aged 18 years and over reported a Pap smear within the past 3 years. Among women 25 to 44 years of age, Pap smear use was lowest for women with less than a high school education (72 percent) and highest for women with at least some college education (91 percent).²¹

When an organization implements systems to track values, its effectiveness for screening a patient population for cervical cancer is understood. Women of the target age range comprise a significant percentage of the total number of patients in a practice. Systems must be robust to track interval care for large numbers of individuals. Tracking systems also facilitate management and follow-up for patients with positive screening tests and provide critical steps to promptly connect them with appropriate care.

Part 2: Characteristics for Success: Cervical Cancer Screening

Organizations that were successful in improving **Cervical Cancer Screening** for patients approached the issue in a systematic way, with careful attention to the factors that have an impact on effectively screening a targeted population. Although clinics may differ in specific workflow, documentation, and staffing models, organizations that experienced successful improvement efforts shared these three fundamental characteristics:

1. Clear direction
2. Functional infrastructure for quality improvement
3. Commitment from leadership

1. Clear Direction

Successful organizations found it is important to define clearly what they are trying to accomplish. Most often in improvement work, leadership defines an aim that guides an organization's efforts. An aim is a written, measurable, and time-sensitive statement of the accomplishments a team expects to achieve from its improvement efforts. The aim statement contains a general description of the work, the system of focus, and numerical goals. The aim statement includes a very specific indication of what success looks like and may include guidance that further frames the work, including methodologies to be used and budgetary and staffing limitations. Examples of tools used by QI teams to create their aim statements include an **Aim Worksheet** and **Aim Statement Checklist**. Additional information, including tools and resources to assist an organization in developing its aim statement, can be found in the **Readiness Assessment and Developing Project Aims** module. A completed aim statement for the measure, **Cervical Cancer Screening**, is shown in **Example 2.1: Assessing the Aim Statement for White Cloud Health Group (WCHG) Using the Aim Statement Checklist**.

The following hypothetical example provides an aim statement created by the fictional White Cloud Health Group's QI team, and the checklist the team used to assess its completed aim statement. Using the Aim Statement Checklist to assess the QI team's aim statement provides reassurance that the team included the necessary components of the aim statement for its improvement project.

Example 2.1: Assessing the Aim Statement for White Cloud Health Group (WCHG) Using the Aim Statement Checklist

Aim Statement: *Over the next 12 months, we will redesign the care systems of White Cloud Health Group to ensure that 80 percent of women aged 21 to 64 years have been screened for cervical cancer with at least one Pap test within the past three years. We will begin with women cared for by Julie Smiley’s practice and spread to Dr. Tom’s practice beginning in month 13 or sooner, if possible.*

Guidance:

- *Community partnerships should be leveraged*
- *A key focus will be systems for patient outreach*

Here is an example of how WCHG evaluated its aim statement using the Aim Statement Checklist.

Aim Statement Checklist for Example 2.1:²²

- ✓ What is expected to happen?
WCHG: More patients of the targeted age will complete cervical cancer screening with Pap testing
- ✓ Time period to achieve the aim?
WCHG: 12 months
- ✓ Which systems will be improved?
WCHG: Care systems that improve completion of Pap screening
- ✓ What is the target population?
WCHG: Female patients in Julie Smiley’s practice aged 21 to 64 years
- ✓ Specific numerical goals?
WCHG: 80 percent of eligible women will be screened

As noted, the WCHG improvement team will work together with its community partnerships and focus on patient outreach.

Evaluating what others achieved provides appropriate context for choosing the numerical portion of an organization’s aim. While the goal of *100 percent of patients completing cervical cancer screening with Pap testing* is optimal, an organization can set an appropriate and realistic goal based on the review of comparable data after consideration of the payer mix of the patient population served. For some measures, it may be possible to find examples of benchmark data, which demonstrates the performance of a best practice. It is important to consider an organization’s particular patient population when making comparisons to others’ achievements. An organization may consider socioeconomic status and race/ethnicity of the population served, organizational size, payer mix, availability of screening, and other criteria in an effort to achieve an accurate comparison. Reviewing what others accomplished may help an organization to understand what is feasible to achieve. The numerical part of the aim should be obtainable, yet high enough to challenge the team to substantially and meaningfully improve. Additional guidance about setting aims can be found in the **Readiness Assessment and Defining Project Aims** module.

The NCQA HEDIS data set is one source to consider when choosing an aim or comparing the performance of the measure, **Cervical Cancer Screening**.²³ Current data is accessible from the **Trending and Benchmarks** section. There is considerable variation among the regions, which correspond to the Health and Human Services Regions of the United States. Sources of data for additional comparisons vary regionally but may include payers, State programs, aggregate HRSA program data, and State or regional quality improvement programs.

2. Functional Infrastructure for Quality Improvement

Successful organizations found that improvement work requires a systematic approach to measuring performance, testing small changes, and tracking the impact of those changes over time. This section describes four essential components of an infrastructure to support quality improvement efforts, including:

- Quality improvement teams
- Tools and resources
- Organizing improvements
- Building on the efforts of others by using changes that worked

There is considerable variation in how this infrastructure is created and maintained. It is important that each component is addressed in a way that fits an organization.

Quality Improvement Teams

Multidisciplinary QI teams are typically tasked to carry out this work. For improvement focused on **Cervical Cancer Screening**, it is important to include a provider who wants to focus on increasing the number of patients screened for cervical cancer, i.e., a *provider champion* for improvement. In addition to the provider champion, other appropriate members of a QI team may include:

- Nurses
- Case managers
- Patient outreach specialist
- Patient navigator
- Scheduling staff
- Information specialist
- Community partners, such as, local hospitals, imaging centers, and breast and cervical cancer advocacy groups
- Other staff involved in the patient care process, such as, receptionists, wellness specialists, administrative staff, medical assistants, pharmacists, and health coaches

It should be noted that patients can add great value to the QI process when prepared to participate in a meaningful way. The reference manual by the National Quality Center

(NQC), *A Guide to Consumer Involvement*, has practical ideas to assist an organization on how to involve patients in its QI process.

There are no wrong answers here. Members of a team bring expert knowledge of the work they do to support cancer screening for patients. Together, the team learns where and how its individual actions intersect and how each can have an impact on a patient's cervical cancer screening. The ability to think from a systems perspective and the will to improve cervical cancer screening rates for patients are the primary prerequisites that contribute to a successful improvement team. A more advanced discussion on forming an improvement team can be found in the **Improvement Teams** module.

Tools and Resources

It is important that a QI team have the tools and resources necessary to achieve its established organizational aim. Some personnel may struggle shifting from the daily work of patient care to their roles on the quality improvement team. Those challenges can be straight forward, such as, coordinating meeting times or developing content for the meetings to support the team's quality improvement efforts. Successful QI teams learned that organizing meetings efficiently is essential in their improvement efforts. Tools, such as **Tips for Effective Meetings**, can help a QI team to structure meetings that focus its scheduled time on improvement efforts. Another useful tool includes one that displays data in a way that makes sense to the team members. These types of tools are commonly used by improvement teams to remain focused on the work of improvement. The most important resource needs are uninterrupted time to focus on quality improvement and autonomy to test changes responsibly. Additional team resources and tools can be found in the **Improvement Teams** module.

Organizing Improvements

Successful organizations learned that planning an approach to change is essential. Change is, by nature, unsettling for some and presenting a clear direction and methodology can be reassuring. Most organizations with quality improvement experience adopted methodologies to help them organize their improvements.

As a QI team approaches improvement of cervical cancer screening rates, it should use quality models already embraced by its organization. For example, many organizations adopted the Care Model to organize their approaches to implementing quality improvement changes. Others successfully embraced the LEAN approach; both of these models provide a framework for a health care organization to plan and move toward implementing its improvement efforts. There is no single model that is considered correct. Organizational alignment of methodology makes sense from the perspective of efficient training. A consistent quality improvement approach and the sharing of improvement ideas among members of a quality team can facilitate the replication of QI activities across an organization and maximize the impact of the overall QI program.

Just as organizations that are experienced in quality improvement activities adopted quality models that guide their work, many embraced a change methodology. A change

methodology guides the actual change process, which involves managing *how* changes are made as opposed to *what* changes are made.

For some organizations, all changes are approved by a decision leader and then implemented. Others use a committee structure to evaluate and implement changes. Again, there is no right or wrong methodology, but one change methodology that has been found to be particularly helpful in quality improvement is called the *Model for Improvement*. The Model for Improvement, developed by Associates in Process Improvement, is a simple, yet powerful tool for accelerating improvement. The model is not meant to replace a change model that an organization may already be using, but rather to accelerate improvement. This model has been used successfully by health care organizations to improve many different health care processes and outcomes.

The Model for Improvement encourages small, rapid-cycle tests of changes and learning from each test to improve processes and outcomes. In improvement, this has a distinct advantage in decreasing the time it takes for changes resulting in improvement to be implemented. This methodology also directly involves the individuals who do the work, which provides additional insights into how to rapidly improve care processes.

Building on the Efforts of Others by Using Changes that Worked

One hallmark that successful organizations found beneficial in advancing their quality improvement programs is that everyone across the organization uses the same tools and language to make continuous improvements. A motto of many QI training leaders is "steal shamelessly." This is not the unethical, criminal intent, but instead the sense of "Why reinvent the wheel?" What does it mean to "steal shamelessly"? It means "stealing" or using what has worked in other organizations and "shamelessly" testing and implementing it to create rapid change in one's own organization.

Specific *change ideas* that worked for others to successfully improve Pap screening rates are detailed later in this module in the **Changes that Work** section. Additionally, an organization that has improvement experience in another measurement area, such as, prenatal care, chronic disease care, or immunizations, often adapts the successful tools to use with this measure.

3. Commitment from Leadership

For quality improvement efforts to be effective and sustained, leaders must show commitment to them. Typically, leaders may make a commitment to specific target areas for improvement once they consider the overall needs of the organization, requirements of funders, and how the proposed efforts align with the organization's mission and strategic plan. Leaders that consider quality improvement efforts as an "add-on" may be unable to maintain QI as a priority as other realities compete for the organization's attention and resources. Successful leaders in quality improvement integrate and align QI activities as part of their daily business operations.

A quality improvement team needs to have leadership commitment expressed in a tangible way. Often, it is an explicit dedication of resources, which may include team meeting time, data support, and specific planned opportunities that communicate actionable improvement suggestions to an organization's leadership. The authority of the improvement team and any constraining parameters should be clear. Detailed information highlighting the important role of leadership in a QI project can be found in the **Quality Improvement** module.

Below is a case story that is followed throughout the module and depicts the effort of one QI team as it focuses on improving the rate of cervical screening of women accessing care in its organization. The case story may be read in its entirety by clicking [here](#).

The Problem:

White Cloud Health Group (WCHG) provides a full range of health services at multiple sites in an urban and suburban setting in the Midwest. The clinical staff consists of 11 FTE primary care providers (physicians, nurse practitioners and physician assistants), 14 medical assistants (MAs) and 2 Registered Nurses. The clinic serves about 15,000 unduplicated individuals and has a growing prevalence of young families and immigrants in its patient population. The organization has used electronic health records for five years. The clinic has had some experience with improvement and takes pride in its performance on chronic illness measures. In response to a new reporting requirement, WCHG began to monitor its Pap test rates and realized that they were performing well below national and State averages. WCHG's Quality Improvement Committee began to discuss why this was occurring.

Part 3: Implementation of HRSA CCM: Cervical Cancer Screening

Before following the steps in Part 3, an organization should first make a commitment to increase the rate of cervical cancer screening with Pap testing, and complete the initial steps outlined in the previous section that include:

- Developing an aim statement
- Creating an infrastructure for improvement
- Obtaining commitment from leadership

Performance on this measure indicates how effectively all the steps of the processes used to deliver care work together so that cervical cancer screening with Pap testing is optimized. Because there are so many factors that can have an impact on whether patients receive screening Pap tests, it helps to visualize how these steps are mapped. The next section defines a *Critical Pathway* and illustrates the application of this concept for testing improvements to improve cervical cancer screening in female patients.

The case story continues...

The Approach:

The organization agreed to focus on improving cervical cancer screening rates. The CEO recognized that resources needed to be dedicated to this effort but struggled to allocate them in challenging economic times. The team agreed to look further at the current cervical cancer screening rate for patients of one provider to better inform its decision. The organization then made several critical decisions:

1. Focus on the HRSA Core Clinical Measure, **Cervical Cancer Screening**, to guide its efforts.
2. Invest resources to evaluate how it was performing on that particular measure and where it wanted to be based on national benchmarks.
3. Limit this evaluation to the patients of one willing provider, Women's Health Nurse Practitioner, Julie Smiley.

For baseline information, the team approached the organization's IT director who performed an initial query of Ms. Smiley's patients in the target age category. The query result indicated that 24 percent of the women had documented Pap results during the current year or two previous years.

Critical Pathway for Cervical Cancer Screening

A critical pathway, also known as a clinical pathway, is a visual depiction of the process steps that result in a particular service or care. The sequence and relationship among the steps are displayed, which reveals a *map* of the care process. Additional information, including tools and resources regarding the mapping of care processes, can be found in the **Redesigning a System of Care to Promote QI** module. In an ideal world, the care process is reflective of evidence-based medical guidelines. Evidence-based medicine aims to apply the best available evidence gained from the scientific method for medical decision making that leads to improved outcomes. There are a number of evidence-based recommendations for **Cervical Cancer Screening**, including those referenced earlier in this module.

A map of the care process steps, which incorporates all of the known evidence and follows respected evidence-based medical guidelines, can be considered the *idealized critical pathway*. While the guidelines for **Cervical Cancer Screening** do not completely align, there are recommended steps that include shared decision making that incorporate individual risk, including age, known family history, individual risk factors, and patient preferences. The purpose of listing these steps is to reflect current best practices for cervical cancer screening and form a systematic method to consider the systems of care that underpin appropriate screening. It is important to emphasize that clinical evidence and guidelines will evolve as knowledge progresses; therefore, the idealized critical pathway may evolve over time and not meet the needs of every individual.

Note: Please consider the following regarding critical pathways:

- There can be more than one way to depict the idealized critical pathway.
- Authorities vary on critical issues that have an impact on important decisions in medicine, and there is latitude within guidelines for variation related to less critical matters.

It is important that an organization agrees on the guidelines with which to align. There are multiple specific guidelines that address processes to optimize Pap screening for cervical cancer. An organization may interpret those guidelines differently than illustrated in Figure 3.1. If so, creation of a different schematic that reflects its interpretation of the best evidence is encouraged. References are located in *Part 6: Supporting Information* at the end of this module.

In **Figure 3.1**, the schematic for **Critical Pathway for Cervical Cancer Screening** incorporates available evidence and represents an idealized critical pathway for care to optimize cervical cancer screening. The boxes represent typical steps in care delivery. If these steps happen reliably and well, effective screening is accomplished.

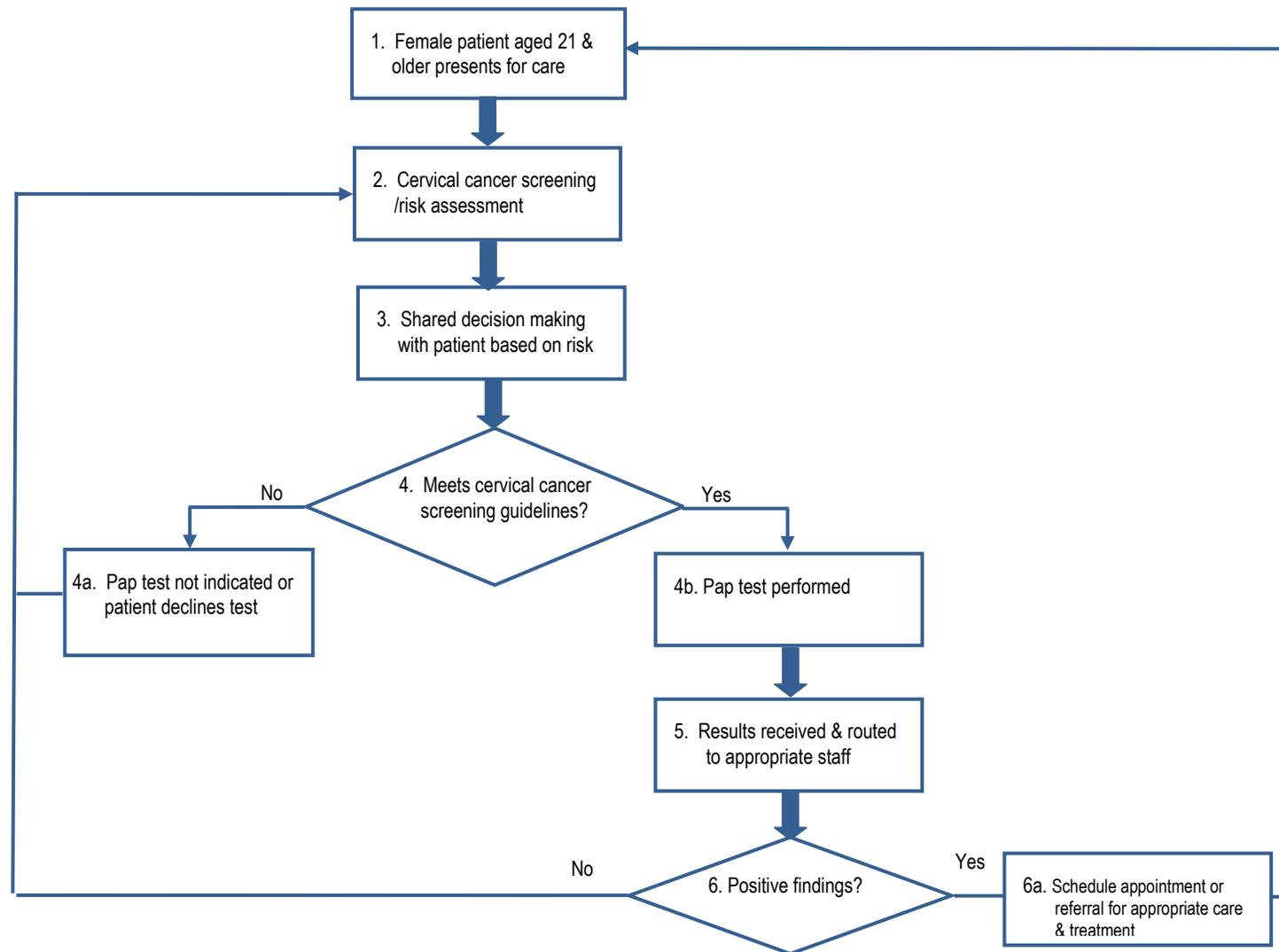


Figure 3.1: Critical Pathway for Cervical Cancer Screening

Walkthrough of the Idealized Critical Pathway

The steps illustrated in the schematic reflect a system for cervical cancer screening that is working well. This pathway extends beyond the boundaries of what is assessed with the **Cervical Cancer Screening CCM** as important aspects of care for women of high risk precede the age range targeted in the measure. These steps are pertinent to effective cervical cancer screening in general and encompass cervical cancer screening for patients of average risk:

1. All female patients should have readily-available information about cervical cancer and other age-appropriate screening. Data on natural history of HPV infection and the incidence of high-grade lesions and cervical cancer suggest that screening can safely be delayed until age 21.⁷ Family and personal medical histories should be obtained for all patients and used to guide screenings.²⁴
2. Prescreening and education using the recommended clinical guidelines that are tailored toward the patient's risk serve as opportunities for prevention. Female patients who are 21 years or older should be assessed specifically for risk factors for cervical disease and offered a cytologic screening test at least every three years until age 65. Discontinuation of cervical cancer screening in older women is appropriate, provided women have had adequate recent screening with normal Pap results. The optimal age to discontinue screening is not clear, but risk of cervical cancer and yield of screening decline steadily through middle age. The U.S. Preventive Services Task Force (USPSTF) found evidence that yield-of-screening was low in previously-screened women after age 65 who had previous normal test results.²⁵ The American Cancer Society (ACS) guidelines recommend that older women, who have three or more consecutive normal/negative cervical cytology tests that are technically satisfactory and documented and had no abnormal/positive cytology tests within the last 10 years, can safely stop screening.²⁶
3. A patient-provider partnership is needed to ensure that decisions respect a patient's wants, needs, and preferences, and she has the required education and support to make informed decisions and participate in her own care.²⁷ Patients who are aged 21 years or older should be strongly encouraged to complete cytologic screening.
4. Through the screening and risk assessment step, the provider and patient together determine that cytologic screening should be ordered.
 - 4a. If a patient does not meet screening guidelines, she is not screened; however, it is an opportunity to educate the patient on the importance of screening if her risk status changes or when it is age appropriate. Interim and follow-up care is then discussed to ensure that the patient has what is needed to prevent cervical cancer. Guidelines are emphasized so the patient understands the benefits of cervical cancer screening and its risk factors. Appropriate follow-up screening occurs in a timely manner and the cycle repeats. In addition, a patient may choose to decline screening even if strongly encouraged by the health care team. A patient should be periodically re-assessed and supported to complete screenings as per current guidelines.
 - 4b. Ensuring that cervical cancer screening has been completed is essential for preventive care. Care teams should invite a conversation about any barriers – real or perceived – to completing the cervical cancer screening and work together with a patient to mitigate those barriers.

5. Establishing a process to retrieve and review cytology results is important for tracking the number of completed screenings and a patient's adherence to recommended guidelines. Internal systems should clearly define who reviews the results of both positive and negative screenings.
6. Patient notification of the results provides an opportunity to involve the patient in her care plan and educate her about healthy behaviors to minimize cervical cancer risks. Appropriate follow-up to the screening is important and, regardless of the result, should include timely notification to the patient.
- 6a. Negative screening results should prompt interval screening recommendations per the adopted guidelines.
- 6b. Positive results should be communicated to the patient in a culturally-sensitive manner. Treatment information and advice should be provided to the patient with an appropriate appointment or referral for additional diagnostic testing or treatment.

The cycle repeats with appropriate interval screening, including outreach to patients as needed.

Note: With the recent recommendations from the American College of Obstetricians and Gynecologists (ACOG), national authorities are looking at aligning measures with the new guidelines. Decisions on a clinical level and informing patients on the benefits and risks of screening remain essential in determining who should be screened for cervical cancer.

A quality improvement team benefits from mapping out how care is actually provided. Once it is able to evaluate where there are potential opportunities for improvement, it can use some of the improvement ideas that have worked for others, as outlined in **Table 4.2: Sample Changes That Work**.

A couple of important notes:

- An organization may adopt additional guidelines that include other important preventive care parameters for women or focus on other cancer screening recommendations. The USPTF has recommendations for evidence-based screening based on age.
- A critical pathway can also be constructed to illustrate *how care is currently provided* within an organization (the existing pathway). Understanding the gap between an organization's *existing* critical pathway (how you provide care now), and the *idealized* critical pathway (how to provide reliable, evidence-based care aligned with current guidelines), forms the basis for the focus of its improvement efforts.

Factors That Impact the Critical Pathway

In addition to understanding the steps for **Cervical Cancer Screening**, factors that interfere with optimal care should be understood. As there may be several of these factors, a QI team may find it helpful to focus its attention on factors that interfere with ideal outcomes. This becomes especially useful as plans are developed to mitigate these factors.

Factors that have an impact on **Cervical Cancer Screening** can be organized into those that are patient-related, related to the care team, and a result of the health system. Overlaps exist in these categorizations, but it is useful to consider factors that have an impact on care processes from each perspective to avoid overlooking important ones.

Patient factors are characteristics that patients possess, or have control over, that have an impact on care. Examples of patient factors are age, race, diet, and lifestyle choices. Common patient factors may need to be addressed more systematically, such as, a targeted approach to address low health literacy, or a systematic approach to educate staff on the cultural norms of a new refugee population. Examples of how patient factors may influence cervical cancer screening include:

- **Age**—screening guidelines for cervical cancer are directly tied to the patient’s age
- **Cultural differences**—cultural norms and perceptions may affect the patient’s attitudes and behaviors related to cervical cancer screening
- **Health literacy**—lack of understanding and language differences create barriers in following a recommended care plan
- **Work status**— may create care access issues; shift work may influence care plan
- **Socioeconomic status**— may have an impact on transportation, insurance status, ability to pay, and access to screening
- **Urban versus rural**—access to screening may be limited in rural areas
- **Discomfort - "It hurts"**—patient physical and emotional discomfort are common deterrents to cervical cancer screening

Care team factors are controlled by the care team. These types may include care processes, workflows, how staff follows procedures, and how effectively the team works together. Care team factors that may influence **Cervical Cancer Screening** include:

- Processes staff use to outreach to or educate patients to ensure periodic care based on level of risk
- Procedures that provide culturally-competent care to address the patient’s cultural norms about cervical cancer screening
- Processes that provide comprehensive care for patients who are seen regardless of reason for visit
- Providers who may dislike doing Paps

Health system factors are controlled at the *high level* of an organization and often involve financial and operational issues. Health system factors that may influence **Cervical Cancer Screening** include:

- **Cost**—co-pays and availability of subsidies for cytologic evaluation (laboratory cost) and insurance coverage
- **Scheduling systems**—availability of evening and weekend appointments and wait times
- **Location**—no transportation or unsafe location

These factors, when added to the critical pathway, create another dimension to the map as shown in **Figure 3.2**:

Care Factors That May Have an Impact on the Critical Pathway:
 PT = Patient
 CT = Care Team
 HS = Health System

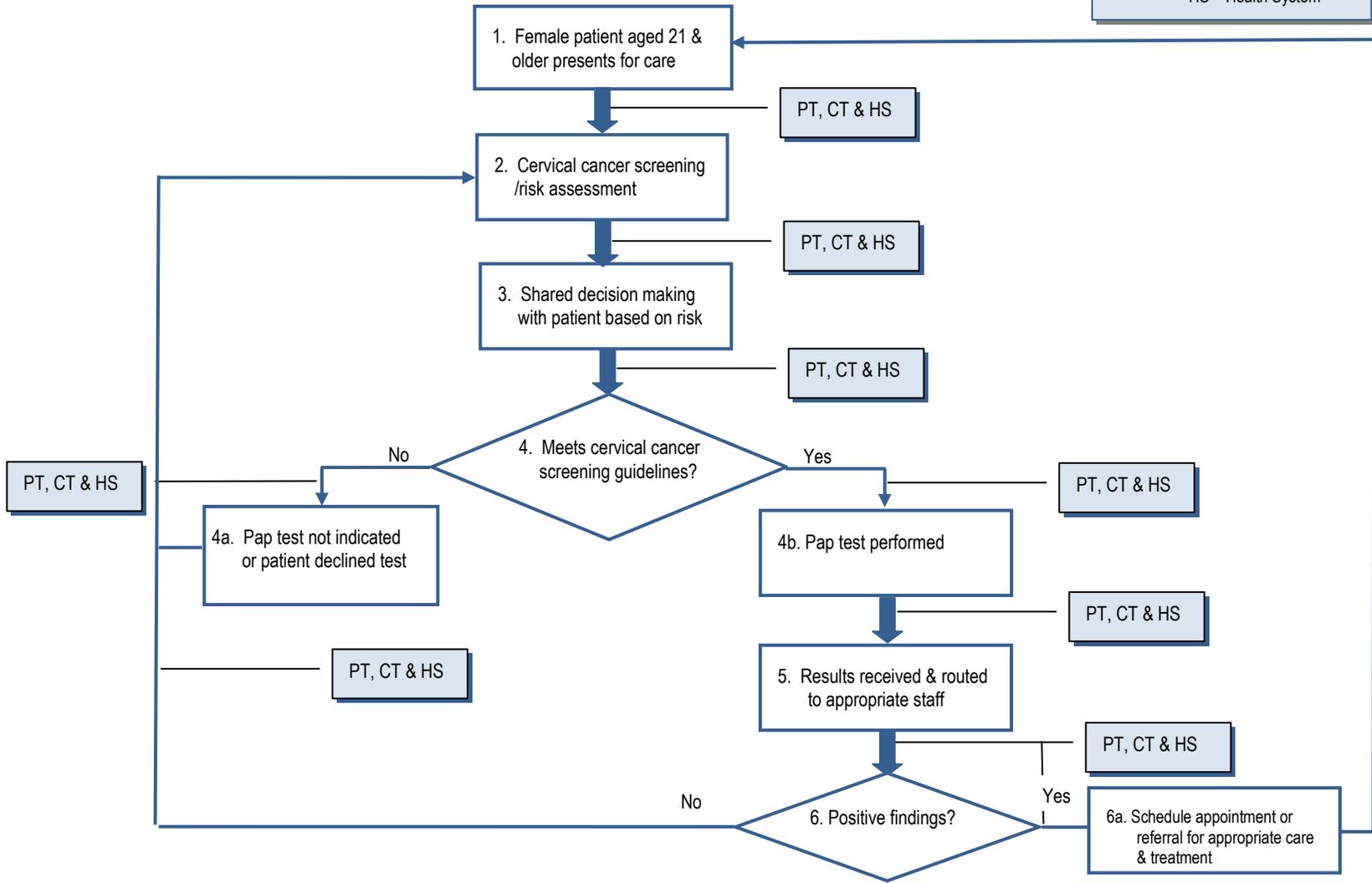
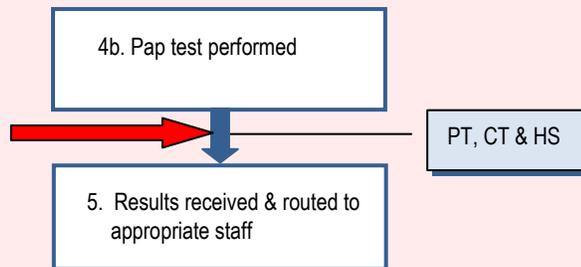


Figure 3.2: Care Factors that Impact the Critical Pathway for Cervical Cancer Screening

Next, a team may identify specific factors that pertain to the way care is provided for its patients. The team may look at **Step 4b: Pap test performed** and **Step 5: Results received and routed to appropriate staff** of the critical pathway. What factors have an impact on how effectively, timely, and reliably Step 5 follows Step 4b? It is tempting to consider the first thoughts that come to mind, but teams are best served by systematically thinking through the potential impact of each category. **Example 3.1** illustrates a team’s output:

Example 3.1: A Team’s Brainstorming Session



The team recalled that patients would often state a Pap test had been done but results were not known and no follow-up had been initiated. Using this information, the team brainstormed on factors that would likely have an impact on the arrow (or opportunity) between Steps 4b and 5 of the critical pathway for **Cervical Cancer Screening**.

Factor Category	Factors Pertinent to Our Organization – Steps
Patient	Some patients prefer to go to a private provider, health department, or family planning clinic for their Pap test. One small site of the organization is located in the same building as the health department and sends women there for gynecological examinations. Due to the close proximity, patients expect WCHG to have results on file.
Care Team	When a patient reports that she had a Pap test elsewhere, the staff requests that the patient provide information about the location and sign a records release. This is not routinely done for the site that refers to the health department.
Health Systems	Compliance with the measure requires documentation of Pap results; copies of reports are not consistently received from outside providers.
After the team thought through some of the challenges, it is able to focus improvement efforts on this part of the care system.	

The team continues to look at different parts of the pathway to identify relevant impacts for each part. Once it is able to evaluate where there are potential opportunities for improvement, it can use this information to target its efforts. Additional examples of strategies to improve care for the measure, **Cervical Cancer Screening**, are described in the **Improvement Strategies** section of this module.

Once the team visualizes the pathway and identifies opportunities for improved care processes, the next step is to collect and track data to test and document them. First, a QI team needs to determine *how* to collect data to support its improvement work. This step is essential for understanding the performance of its current care processes, before improvements are applied, and then monitoring its performance over time.

Data Infrastructure: Cervical Cancer Screening

This section begins to address the critical role of data throughout the improvement process. It is important to recognize that different types of data are collected during the improvement project. First, data is needed to calculate and monitor the **Cervical Cancer Screening** performance measure results. Monitoring a performance measure involves calculating the measure over time and is used to track progress toward a numerical aim. This section provides an overview of what is needed. A detailed and stepwise approach follows to explain the types of infrastructure elements needed to gather data to support improvement. Second, changes an organization is making to improve care processes and their effects must be tracked. Tracking the impact of changes reassures the team that the changes caused their intended effects.

Data Infrastructure to Monitor the Performance Measure—An Overview

There are three major purposes for maintaining a data infrastructure for quality improvement work:

- To know the starting baseline
- To track and monitor performance as changes are implemented
- To perform systematic analysis and interpretation of data in preparation for action

The first step to creating a data infrastructure for monitoring the performance measure is to determine the baseline. A baseline is the calculation of a measure before a quality improvement project is initiated. It is later used as the basis for comparison as changes are made throughout the improvement process. For the **Cervical Cancer Screening** measure, an organization can determine the percentage of patients aged 21 to 64 years who had one or more Pap tests during the measurement year or the previous two years. Performance reflects the current organizational infrastructure and the patient's interactions with existing care processes and the care team.

Baseline data is compared to subsequent data calculated similarly to monitor the impact of quality improvement efforts. The details of how to calculate the data must be determined to ensure that the calculation is accurate and reproducible. The difference between how an organization provides care now (baseline) and how it wants to provide care (aim) is the gap that must be closed by the improvement work.

The next step of data infrastructure development involves a process in place to calculate the measure over time as improvements are tested. A QI team's work is to make changes, and it is prudent to monitor that those changes result in achieving the stated aim. This involves deciding how often to calculate the measure and adhering to the calculation methodology.

Finally, an organization's data infrastructure must include systematic processes that allow analysis, interpretation, and action on the data collected. Knowledge of performance is insufficient for improvement. It is important for an organization to understand why performance is measured and to predict which changes will increase cervical cancer screening rates with Pap testing based on an organization's specific situation. Collecting data related to specific changes and overall progress related to achieving an organization's specified aim are important to

improvement work. The next section describes in more detail how to develop a data infrastructure to support improvement.

Implementation: Cervical Cancer Screening

This section explores each step to create the data infrastructure used to improve performance on the measure, **Cervical Cancer Screening**.

Note: If an organization is currently funded by HRSA, some performance measures, including the HRSA CCM set, may be among those that will be reported to HRSA. An organization should consult its program's Web site plus links to bureau- and office-required guidelines and measures for more information:

[BPHC](#) [MCHB](#) [HAB](#) [BHP_r](#) [ORHP](#) [OPAE/OHITQ](#) [ORO](#)

General information on HRSA grants, including searchable guidelines, is available and accessible at the [HRSA Grants Web site](#).

Grantees are encouraged to contact their project officers with questions regarding program requirements.

Source: NQF/NCQA

Description: The percentage of women 21 to 64 years of age who received one or more Pap tests to screen for cervical cancer.

Rationale/Purpose: Most cervical cancer can be prevented, and when found and treated early, most can be cured. Despite effective screening techniques, it was estimated that in 2009 there would be 11,270 new cases and 4,070 deaths from cervical cancer. The goal for this measure is to ensure adequate screening of women for cervical cancer using the Papanicolaou or Pap smear.

Numerator/Denominator:

Numerator: Women in the denominator with one or more Pap tests during the measurement year or two years prior to the measurement year.

Denominator: All women patients 24 to 64 years of age who received one or more Pap tests during the measurement year or 2 years prior to the measurement year.

Denominator Exclusions/Inclusions/Notes/Comments:

Denominator Exclusions: Women who had a hysterectomy, with no residual cervix, and the administrative data does not indicate a Pap test was performed. Note: Look for evidence of a hysterectomy as far back as possible in the patient's history through administrative or chart data. The hysterectomy must have occurred by December 31 of the measurement year.

Denominator Inclusions: Given the measurement look-back period, women aged 21 to 64 years will be captured in this measurement. Identify patients who had at least one office visit in the prior 12 months.

Numerator/Exclusions/Notes/Comments:

Numerator Exclusions: Do not count lab results that explicitly state the sample was inadequate or that “no cervical cells were present;” this is not considered appropriate screening. Do not count biopsies because they are diagnostic and therapeutic only and are not valid for primary cervical cancer screening.

Numerator Inclusions: Women from the denominator with one or more Pap tests during the measurement year or two years prior to the measurement year. Count any cervical cancer screening method that includes collection and microscopic analysis of cervical cells. Documentation in the medical record must include one of the following: a note or billing code indicating date the test was performed and its result; copy of a lab test performed by another provider, or a note documenting the name, date, and results of a test performed by another provider.

1. Step 1 - Determine and Evaluate the Baseline

As discussed above, a *baseline for improvement* is a calculation that provides a snapshot of the performance of the *systems* of care for a measure before improvements are applied. The baseline is determined by calculating the measure and collecting the information for the numerator and denominator.

Determination of a baseline is accomplished by actually calculating the measure and requires that the information for the numerator and denominator be collected. There are several methods to collect this information. While electronic methods are more efficient once established, manual chart audits using random sampling techniques are equally valid.

Consistent data collection sources and methodologies are critical to ensure reliable data. Please note that the tables referenced in this section are from the *NQF-Endorsed National Voluntary Consensus Standards for Physician-Focused Ambulatory Care Appendix A-NCQA Measure Technical Specifications*.

The following tables depict a decision algorithm for the measure, **Cervical Cancer Screening**. The algorithm outlines the steps that an organization follows to determine its baseline and monitor improvements for **Cervical Cancer Screening**:

Identify the Denominator	
The denominator for this measure is all women patients 24 to 64 years of age during the measurement year or 2 years prior to the measurement year.	
a. Use a three-year date range: the measurement year and the two years prior to the measurement year.	
b. Choose a selection method	Use date of birth or age from EHR or Practice Management System to identify women 24 to 64 years of age as of December 31 of the measurement year. Note: Given the measurement look-back period, women aged 21 to 64 years will be captured in this measure. Identify patients who have had at least one office visit in the prior 12 months.
c. Exclude women who had a hysterectomy and	Use these codes or operative reports to verify hysterectomy: a. CPT Codes: 51925, 56308, 58150, 58152, 58200, 58210, 58240, 58260, 58262,

Identify the Denominator	
with no residual cervix. Look for evidence of a hysterectomy as far back as possible in the patient's history, through administrative or chart data. The hysterectomy must have occurred by December 31 of the measurement year.	58263, 58267, 58270, 58275, 58280, 58285, 58290-58294, 58550-58554, 58951, 58953, 58954, 58956, 59135 b. ICD-9-CM Procedure: 68.4-68.8 c. ICD-9-CM Diagnosis: 618.5, V76.01, V76.47

Identify the Numerator	
Based on an organization's systems, evaluate all of the individuals who remain in the denominator and choose a method to determine those who should be included in the numerator--women in the denominator who received one or more Pap tests during the measurement year or the two years prior to the measurement year.	
a. Administrative Method: Audit all submitted claims or encounters for patients in the denominator and include those with the following codes:	
i. CPT: 88141-88143, 88147, 88148, 88150, 88152-88155, 88164-88167, 88174-88175, or	
ii. HCPCS: G0101, G0123, G0124, G0141, G0143-G0145, G0147, G0148, P3000, P3001, Q0091, or	
iii. ICD-9-CM Diagnosis: V72.32, V76.2, or	
iv. ICD-9-CM Procedure: 91.46, or	
v. UB Revenue: 0923, or	
vi. LOINC: 10524-7, 18500-9, 19762-4, 19764-0, 19765-7, 19766-5, 19774-9, 33717-0, 47527-7	
b. Medical Record Audit: Audit all patients in the denominator or use valid sampling methodology. The records audited may be electronic or paper. Include the patient in the numerator if the documentation in the medical record includes:	
i. a note indicating the date the test was performed and the result of the finding, or	
ii. a copy of a Pap result, or	
iii. a note that documents the date and results from a test ordered by another provider	

Calculate the Measure	
Divide the numerator by the denominator and multiply by 100 to get the percentage of women who received one or more Pap tests between the ages of 24 to 64 years.	

Compare an organization's performance to national benchmarks and other available data. The NCQA Web site updates national and State performance on this measure annually. Note that there is considerable variation among practices reporting. Other opportunities for comparison data are from payers, State cancer control programs, State and regional quality improvement organizations, and aggregate reports for specific HRSA-funded programs.

Decide if the performance is satisfactory based on available data from reliable sources. It is important to consider the organizational capacity and constraints, but it is recommended that an organization's aim is high. An organization with a low performance may want to allow a longer time to achieve excellence, but striving to reach a screening rate greater than 75 percent is feasible for most. If the performance is satisfactory, an organization may wish to choose another measure and focus on other systems of care.

Note: If an organization is currently funded by HRSA, some performance measures, including the HRSA CCM set, may be among those that will be reported to HRSA. An organization should consult its program's Web site plus links to bureau- and office-required guidelines and measures for more information:

[BPHC](#) [MCHB](#) [HAB](#) [BHP_r](#) [ORHP](#) [OPAE/OHITQ](#) [ORO](#)

General information on HRSA grants, including searchable guidelines, is available and accessible at the [HRSA Grants Web site](#).

Grantees are encouraged to contact their project officers with questions regarding program requirements.

If the performance is unsatisfactory, consider adopting the measure and using it to monitor improvements to the care delivery system. An organization should understand that if a measure is adopted for improvement, ongoing and regular measurement is necessary to reach and sustain its organizational goals. Advanced discussions can be found in the **Managing Data for Performance Improvement** module.

*Detailed specifications, including instructions to identify the denominator and numerator for the measure, **Cervical Cancer Screening**, can be accessed on the **HRSA Clinical Quality Performance Measures** Web site.*

Evaluate the baseline. Initially, a team compares its baseline to the performance it hopes to achieve. It is important to remember this gap in performance is defined as the difference between how the care processes work now (baseline) and how an organization wants them to work (aim). An organization may often modify its aim or timeline after analyzing its baseline measurement and considering the patient population and organizational constraints.

As an organization moves forward, the baseline is used to monitor and compare improvements in care over time. While it is important for an organization to stay focused on its aim, it is equally significant to periodically celebrate the interim successes.

2. Step 2 - Create a reliable way to monitor performance over time as improvements are tested.

An organization should standardize its processes and workflows to ensure the team collects and calculates performance data the same way over time. An organization should:

- a. Document exactly how the data is captured so staff turnover does not interfere with the methodology.
- b. Determine the frequency that performance will be calculated. Frequent data collection is often associated with higher levels of improvement. Monthly measurement is recommended, if feasible, as it is associated with a higher level of team engagement and success. If it is infeasible, quarterly measurements may be obtained. Less frequent performance measurements are adequate for reporting

purposes, but do not adequately support improvement efforts. An advanced discussion can be found in the **Managing Data for Performance Improvement** module.

- c. Chart and display results. A simple chart audit form is appropriate for manual audits and can be repeated frequently as desired. Results of multiple audits can be presented in a graphic format to demonstrate trends. Refer to **QI Implementation Section, Track and Analyze Data** for more information and examples of data displays that have been used to communicate information about improvement efforts to a variety of stakeholders.

Note: The frequency of team meetings is not necessarily prescribed for success. Many successful teams meet once a week while others may meet bi-weekly when focusing their improvement efforts on any given measure. Success of these meetings is rather the output of the team members' active engagement in the meeting and being prepared to report on recent improvement findings. More information, including resources and tools for developing and implementing effective team meetings can be found in the **Improvement Teams** module.

3. Step 3 - Create systematic processes that allow an organization to analyze, interpret, and act on the data collected.

Having the data is not enough. Improvement work involves thinking about the data and deciding what to do based on that analysis. A QI team needs to put processes in place – team meetings, scheduled reports, and periodic meetings with senior leaders, to use the data tracked. This section describes how a QI team may accomplish the work of creating actionable plans based on the data collected. In **Example 3.2: QI at White Cloud Health Group**, the scenario illustrates how a team may use these concepts to act on its data.

- a. **Analyze: What are the data trends?** Tracking performance over time for the measure, **Cervical Cancer Screening**, is critical to successful improvement, but calculation of performance is not enough. It is important for a team to meet to analyze the data on a regular basis. QI teams that are experienced in looking at data recognize these common patterns:
 - Performance is improving
 - Performance is decreasing
 - Performance is flat
 - Performance has no recognizable pattern

Additional examples of common data patterns are provided with further explanation in the **Analyze Data** module. It is typical for a team to see little movement in its data over the first several months. If a team has chosen to monitor an associated process measure, such as, the percent of no-show patients who are rescheduled for cervical cancer screening, performance improvement may be evident more quickly. Regardless, it is important that a QI team review performance progress regularly. A

- QI team that meets regularly and calculates performance monthly should spend part of one meeting each month reviewing its progress to date.
- b. **Interpret: What do these data trends mean?** A QI team needs to then interpret what these data trends mean within the context of its own organization. If performance is increasing, but has not yet reached the numerical aim, perhaps the changes in place are having the desired effect and the aim will be reached over time. If performance is decreasing, what has changed? Are there new care process changes, a failure of registry data input, or a large increase in those patients included in the registry? If performance is flat, did the organization maximize the benefits from changes implemented or was there some regression to the former way of doing things? Improvement trends that have reached a plateau may indicate that an organization needs to think differently about future changes. A few suggestions that an organization may consider when experiencing a plateau in performance improvement are listed below:
- i. Consider looking at outliers to determine barriers to patient access to screening, for example, lack of insurance, transportation, or language and cultural differences.
 - ii. Consider changes in a different part of the framework to get improvement back on track. If using a critical pathway approach, an organization may look at the steps prior to where the problem seems to be. If a Care Model approach is used and the team worked hard on delivery system design issues, opportunities to better leverage the clinical information systems or engage the community may be considered.

Interpretation of data over time is critical in determining where a team will target its efforts. Additional tools that can assist a team in understanding underlying causes for data trends are beyond the scope of this toolkit but are discussed in detail in a monograph that was published by the NQC, *A Modern Paradigm for Improving Healthcare Quality*.

- c. **Act: Make decisions based on data.** Once a QI team has a better understanding of what the data means, efforts should be targeted to further advance the performance toward the aim. Often the decisions are made at the team level about what to tackle first. Then small tests of change can be accomplished to determine what improvements could be implemented to enhance performance. The practice of using small tests of change actually allows multiple changes to be tested simultaneously.

Note: An advanced discussion on how to use the data collected to advance an organization's improvement, including resources and tools to support improvement, can be found in the **Managing Data for Performance Improvement** module.

Example 3.2: QI Team at White Cloud Health Group (WCHG)

The Quality Improvement (QI) Team at WCHG worked diligently to improve cervical cancer screening over the past several months. The team focused some of its efforts on patient education and outreach, and internal tracking systems. But during the last three months, the performance remained the same at 50 percent, which was below its aim of having greater than 80 percent of women aged 21 to 64 years screened for cervical cancer.

Analysis: The team noted improvement initially. Newly implemented care processes and patient volumes seemed to be stable but performance was flat for the last three months.

The team leader asked for a list of those patients who had been seen in the past three months and were not up to date on screening—outliers for the measure. Further study of these specific cases found that two thirds of those patients were seen for other complaints and chart records do not indicate any discussion of or attempt to schedule cervical cancer screening.

Interpretation: Because there was initial improvement followed by several months of flat performance, the team leader looked for obvious changes in processes that would have an impact on performance, but found none. The team leader interpreted the data to mean that initial changes provided some improvement, but not enough to achieve its aim and have the desired impact. More work was needed. The team leader employed a common strategy to find additional opportunities; i.e., she looked at the population not in compliance (the outliers) for a common cause to be addressed. In this case, a common thread was that patients were coming in for care but were not offered testing.

This information allowed the team to consider ways to remind staff to assess women's need for screening. It looked at *Sample Changes that Work* (Table 4.2) for ideas then added suggestions based on its own patient population. The team decided to increase focus on the medical record. The electronic health record's (EHR) key user created an automatic reminder system in the EHR to appear for any woman aged 21 to 64 years.

Act: The information gathered from the analysis and interpretation of the data allowed the team to focus its next efforts. Since numerous patients were not being offered testing, the team targeted its efforts on improving its risk assessment processes. This enabled the team to focus on PDSAs to test changes specific to these areas and monitor its progress.

A QI team leader needs to monitor the pace of the progress over time. If there is insufficient progress to meet the specified aim, reasons should be analyzed and addressed. One organization may choose to accelerate its improvement efforts; another may decide to extend its initial allotment of time to achieve its aim and consider other constraints within the organization.

Part 4: Improvement Strategies: Cervical Cancer Screening

The actual improvement process is composed of three steps that respond to the following questions:

1. What changes can an organization make?
2. How can an organization make those changes?
3. How can an organization know the changes caused an improvement?

What Changes Can an Organization Make?

It is important to understand that improvement requires change, but not all change results in improvement. Considering all of the possible changes that can be made to health care systems, considerable effort has been dedicated to creating various quality improvement strategies providing a framework that organizes possible changes into logical categories. Frameworks for change in health care quality improvement are known as *quality models* and have been tested to guide change. In fact, considering that there are limited resources to dedicate to improvement, most organizations adopt one or more quality models to guide their improvement efforts. There is not a right or wrong approach, and there are many areas of overlap in quality models. Experienced quality improvement teams often use multiple strategies to overcome challenges as they progress. Two approaches often used by teams that are working to improve performance on **Cervical Cancer Screening** include the *Care Model* and *Critical Pathway* approaches.

The case story continues...

The Improvement Journey:

Over the first three weeks of its work on this measure, the team monitored the charts of Ms. Smiley's patients for compliance with cervical cancer screening. This required a modification in the EHR to indicate when a Pap test result was received from a source outside of WCHG, since these charts were not counted as compliant in the original EHR query. Using the parameters specified for the measure's numerator and denominator, performance was calculated as 38 percent of patients without a timely Pap test. Although Ms. Smiley knew things were not good, she was disappointed by the findings and strongly advocated for improvements. Because there was such a gap in performance and its goal, the organization decided on a formal effort. It took the following steps:

1. Received support from leadership. The team requested that all clinical staff be involved, but the CEO felt that the organization could not afford that level of resource support. It negotiated four weekly meetings at lunchtime, with lunch provided, for a workgroup of three members. The team decided that only Ms. Smiley would actively participate from the clinician staff and the project would initially focus on her patients only. In addition, the MA would continue to have a few additional hours each week to run monthly progress reports. Although active participation was limited to one provider, everyone would be kept up to date during monthly staff meetings.
2. A Cervical Cancer Screening Improvement Team was formed. Ms. Smiley played a clinical leadership role and her MA was invited to attend. The receptionist had an interest in women's health and was anxious to participate. Because of the diversity of the population served, the team decided to get some ideas from patients about their experiences to understand opportunities for improvement. The receptionist agreed to keep track of all documentation related to the project and ensure meetings stayed on track. The MA agreed to monitor the time, provide insights into her role on the care team, and monitor the data. Ms. Smiley agreed to provide clinical leadership and provide or facilitate training that would benefit the team.

The team developed the following aim statement: *Over the next 12 months, we will redesign the care systems of White Cloud Health Group to ensure that 80 percent of women aged 21 to 64 years have been screened for cervical cancer with at least one Pap test within the past three years. We will begin with women cared for by Julie Smiley's practice and spread to Dr. Tom's practice beginning in month 13 or sooner, if possible.*

Guidance:

- *Community partnerships should be leveraged*
 - *A key focus will be systems for patient outreach*
3. The team agreed to try out strategies to ensure the MA monitored the records of all patients seen by Ms. Smiley on a weekly basis. It also decided to review the preceding month's data during its team meeting on the second Thursday of each month.
 4. The team focused on how it could improve cervical cancer screening as quickly as possible and chose the Care Model improvement strategy.

1. **Care Model Approach:** Implementing the changes described in the Care Model is a proven method to improve care delivery. The Care Model is an organizational framework for change and is organized into six domains:
 - a. Organization of Health Care
 - b. Clinical Information Systems
 - c. Delivery System Design
 - d. Decision Support
 - e. Community
 - f. Self-Management Support

Changes within these domains can effectively leverage transformation of a current reactive care system to one that better supports proactive or preventive care. If an organization does not have general experience with the Care Model, reading the Care Model section before proceeding is recommended. The Care Model recognizes that preventive care is ongoing and requires more proactive care than the health care system often provides. The Care Model is implemented to improve care by working in six domains, defined below, that transform the way care is delivered:

Community—To improve the health of the population, a health care organization reaches out to form powerful alliances and partnerships with State programs, local agencies, schools, faith organizations, businesses, and clubs.

Organization of Health Care—A health care system can create an environment in which organized efforts to improve the preventive care of people takes hold and flourishes.

Self Management—Effective self management is very different from telling patients what to do. Patients have a central role in determining their care and one that fosters a sense of responsibility for their own health.

Delivery System Design—Delivery of patient care requires not only to determine what care is needed, but to clarify roles and tasks to ensure the patient receives the care; all clinicians who take care of a patient have centralized and up-to-date information about the patient's status, and make follow-up a part of their standard procedures.

Decision Support—Treatment decisions need to be based on explicit, proven guidelines supported by at least one defining study. A health care organization integrates these guidelines into the day-to-day practice of primary care providers in an accessible and easy-to-use manner.

Clinical Information System—A registry, that is, an information system that can track individual patients and populations of patients, is a necessity when managing chronic illness or preventive care.

The definitions above are adapted from the Institute for Healthcare Improvement Web site.²⁸

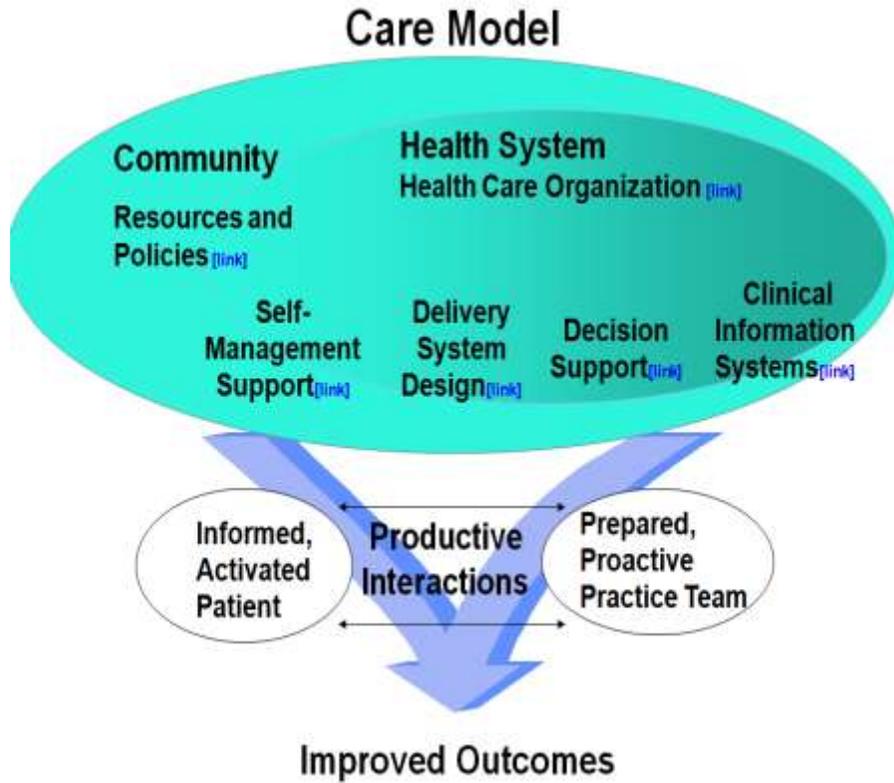


Figure 4.1: The Care Model

In **Table 4.1: Care Model Key Changes**, key changes are presented that have been used successfully to improve cervical cancer screening within the Care Model framework.

Table 4.1: Care Model Key Changes

Community	Organization of Health Care	Self Management	Delivery System Design	Decision Support	Clinical Information System
Partner with local specialists to provide free screenings for uninsured women	Integrate Care Model and Model for Improvement into organization’s infrastructure	Short education sessions with patients to explain the purpose and procedure of screening	Empower MAs to assess need for screening and make appointments for patients to have screenings done when presenting for another purpose	Ensure that providers and other staff receive education regarding ethnic/cultural diversity	Use database or information system to identify special needs of ethnic/cultural patients in various areas, such as interpreter services, preferred language for written materials, and primary language spoken
Partner with local health department and family planning agency to ensure access to screening for all women	Conduct initial and ongoing organizational cultural competency self-assessments	Ensure that patients get relevant information and education; make appointments for screenings, and ensure follow-up on results is done onsite as much as possible	MAs or nursing staff discuss cancer screening and address apprehension with patients (if appropriate) before PCP sees patient	Use a cancer screening card that lists screening tests and dates performed; this prompts PCP to discuss during patient visit	Track and review measures regularly and provide systematic feedback
Partner with AmeriCorps to do outreach to patients, such as, calls to remind them of their appointments for screenings; patient education on various screening tests, and follow-ups if patients missed or rescheduled appointments	Integrate cultural and linguistic competence-related measures into their internal audits, performance improvement programs, patient satisfaction assessments, and outcome-based evaluations	Easy-to-read instructions and patient education tools with pictures concerning cancer screening, procedures, and follow-up	Transportation is provided or arranged for patients who need it	Provider report cards serve as important and useful tools for providing feedback on quality of care being provided	Use the registry or EHR to generate reminders and care-planning tools for individual patients

Community	Organization of Health Care	Self Management	Delivery System Design	Decision Support	Clinical Information System
Create links to referral sites and screening centers for follow-up of abnormal tests	Senior leadership makes quality improvement and Care Model a priority within organization and cultivates an organization of excellence	Develop or adopt instruction pamphlets and patient education tools to facilitate discussions and patient self-management	Assess comfort of gynecologist's examination rooms and optimize conditions	Adopt and train clinical staff regarding evidence-based guidelines and practices for testing and screening throughout organization	Continuous monitoring of data to help create and facilitate excitement about the work
Recruit interns (paid or voluntary) from local schools, community organizations, and volunteer centers	Determine most appropriate process for screening at all levels and institutionalize it into the entire system, including competency testing, audits, job descriptions, annual reviews and performance appraisals, workflows, policies, procedures, scheduling, and budgetary impact for overall system reengineering	Send personalized letters to patients that alert them of need for screening--especially for patients who do not come in often for care	Develop or adopt patient release forms for patients who go to other providers for screening or follow-up to ensure that test results are provided to the organization	Prompts and reminders for providers, including chart-based and computerized reminders, audits, and feedback to improve cancer screening	Perform quality assurance checks to ensure that data is being captured and entered appropriately

This toolkit is meant as a guide to help organize ideas, but is also designed to allow flexibility for creative planning.

Note: An organization may choose to adapt and refine a tool to assist improvement for the measure, **Cervical Cancer Screening**. Testing the measure before fully implementing it offers a way to try something new and modify it before additional resources are spent.

The case story continues...

The QI Team:

The initial meeting was the launch meeting and time was spent looking at the baseline data, understanding the Care Model, and doing a baseline assessment with the Assessing Chronic Illness Care (ACIC) tool adapted for cancer screening. [link to tool] The team also reviewed the model for improvement change methodology. It was asked to reflect on opportunities within the delivery system design domain as it had scored particularly low there. Changes that worked for others in that area were distributed to energize the team's thinking.

2. **Critical Pathway Approach:** As with all critical pathways, good performance relies on many different systems and processes working together efficiently. An organization is encouraged to map its own critical pathway for **Cervical Cancer Screening** or refer to the schematic in **Figure 4.2**. Often when a QI team maps its pathways, it readily can see how complex each step is. It is common for different team members to do the same step differently. Workflow inefficiencies become clear when an organization visualizes how each step is completed and the interdependencies among the steps. Some teams are overwhelmed by the possibilities of changes that can be made in their systems; others focus only on a specific group of factors.

One way to organize the factors that have an impact on the systems is to consider that some are controlled by the patient, others are primarily controlled by the care team, and still others are inherent in the system of care delivery. All three sets of changes must be considered to improve systems of care. In general, these categories can be defined as follows:

- **Patient changes**—efforts to support self management, patient engagement, and navigation of the care system
- **Care team changes**—changes in job duties or workflows that assist to retain patients in care and ensure timely evidence-based cervical cancer screening
- **Health system changes**—changes that have an impact on how care is delivered, independent of who delivers it

A team should use the steps along the critical pathway to target improvements. For this measure, **Cervical Cancer Screening**, influences on performance begin by ensuring that female patients are screened appropriately for risk factors for cervical cancer beginning in their twenties.

An organization should ensure that patients are appropriately educated regarding the importance of regularly updating the health care team about their risks and have enough knowledge to participate in shared decision making as they grow older. Providing education to patients also affords an organization the opportunity to assess patient barriers to testing, such as, lack of insurance or cost. Successful organizations have often aligned

resources in the community for Pap test screening at a reduced cost for patients creating a true partnership in patient care.

An organization can think through each part of the critical pathway in turn, teasing out what happens and what could be improved. In **Table 4.2**, changes that have worked for other QI teams are matched with the part of the system on which they have the most impact. These ideas are not meant to be inclusive, but to start a dialogue of what may improve each part of the critical pathway in an organization, and thus improve it overall.

Changes That Work

In **Table 4.2: Sample Changes That Work** are linked to the critical pathway for cervical cancer screening.

Table 4.2: Sample Changes That Work Are Aligned with the Critical Pathway for Cervical Cancer Screening in Figure 4.2

	Area of Critical Pathway	Patient Changes	Care Team Changes	Health System Changes
1	Female patients aged 21 years & older present for care	<ul style="list-style-type: none"> Educate patients with resources that describe cervical cancer & age-appropriate screening Assess barriers to cervical cancer screening; address barriers in partnership with patients 	<ul style="list-style-type: none"> Promote cervical cancer screenings (Pap tests) for patients aged 21 to 64 years every patient encounter Ensure messaging from the care team regarding importance of screening based on age & risk Query electronic medical records or billing system monthly (female patients aged 21 to 64 years) 	<ul style="list-style-type: none"> Prompts for cervical cancer screening (pap tests for patients 21 to 64 years) due at point of care – registry and flow sheets Implement standing orders for screening per protocol
2	Cervical cancer screening and risk assessment	<ul style="list-style-type: none"> Education for patients on importance of cervical cancer screening including guidelines & risk assessment Assess patient beliefs for screenings Assist with appropriate self-management goal setting and strategies to overcome barriers Consider health literacy screening 	<ul style="list-style-type: none"> Designate care team member to outreach to patients due for cervical cancer screening Culturally-competent education for patients to support cervical cancer screening Continued education for age-appropriate screening and risk assessment Providers should agree on guidelines so that care among providers is congruent 	<ul style="list-style-type: none"> CME's for providers that support culturally-competent screening and education supporting appropriate cervical cancer screening Display culturally-appropriate posters and brochures in patient areas to encourage patients to talk to providers about cervical cancer screening and pap test Clinical guidelines for cervical cancer risk assessment and age-appropriate screenings
3	Shared decision making based on risk	<ul style="list-style-type: none"> Education for patients on importance of cervical cancer screening, including guidelines in a culturally-competent manner and at appropriate literacy level 	<ul style="list-style-type: none"> Share clinical guidelines in patient-friendly format Share screening procedure Ensure screening is ordered when it is due, regardless of reason for visit Document current care plan and share copy with the patient Ensure access for patients who need additional support Attempt to hire clinicians to accommodate language needs and gender preference of patients served 	<ul style="list-style-type: none"> Provide list of free or low-cost pap test and cervical cancer screening services Develop routine cervical cancer screening referrals (where appropriate) for female patients 21 to 64 years of age

Cervical Cancer Screening

	Area of Critical Pathway	Patient Changes	Care Team Changes	Health System Changes
4	Meets cervical cancer screening guidelines	<ul style="list-style-type: none"> • Provide evidence-based guidelines for cervical cancer screening including risk assessments • Consider health literacy screening 	<ul style="list-style-type: none"> • Continued education for age- appropriate screening and risk assessment • Providers should agree on guidelines so that care among providers is congruent 	<ul style="list-style-type: none"> • Clinical guidelines for cervical cancer risk assessment and age-appropriate screenings • Providers have continuing educational opportunities to stay current with appropriate interventions • Prompts for screening are not turned off when test is ordered, but rather when results received
4a	Pap test not indicated or patient declined	<ul style="list-style-type: none"> • Education for patients on importance of cervical cancer screening including guidelines and risk factors • Assist with appropriate self management 	<ul style="list-style-type: none"> • Continued education for age- appropriate screening and risk assessment • Providers should agree on guidelines so that care among providers is congruent 	<ul style="list-style-type: none"> • Patient routinely given documentation of current care plan • Tools to support cervical cancer screening • Providers have continuing educational opportunities to stay current with appropriate interventions • Display culturally-appropriate posters and brochures in patient areas to encourage patients to talk to providers about screening
4b	Pap test completed	Education on follow-up & importance of receiving test results once complete	<ul style="list-style-type: none"> • Document current care/treatment plan and share copy with patient • Recall system/log to ensure screening complete 	<ul style="list-style-type: none"> • Implement patient follow-up and recall system to ensure screening follow- through • Clear procedures for how screening results are routed once received – usually to a provider or another health professional who can act on the results by protocol
5	Results received and routed to appropriate staff	Education for patients on importance of receiving test results	<ul style="list-style-type: none"> • Ensure outreach to patient with test results and achieving targets per guidelines; <i>no news is good news</i> strategy for notifying patients about pap test results is not aligned with good care • Set clear expectations for follow-up 	<ul style="list-style-type: none"> • Monitor patient contacted with results • Set data tracking and evaluation systems for timely patient contact • Implement a tracking system that monitors screening results and prompts if results not logged as expected
6	Positive findings?	<ul style="list-style-type: none"> • Education on the importance of treatment of positive findings • Resources for patient support 	<ul style="list-style-type: none"> • General referral for treatment • Help patients to make follow-up appointments • Assess current care plan, barriers to following care plan, and collaborate with patient on care plan modifications 	<ul style="list-style-type: none"> • Partnerships with specialist for low-cost interventions • Culturally-competent education materials readily available for specialist referral

Cervical Cancer Screening

	Area of Critical Pathway	Patient Changes	Care Team Changes	Health System Changes
6a	Referral for appropriate care & treatment	<ul style="list-style-type: none"> • Schedule self-management support between visits as indicated • Ensure patients get the relevant information, education, and make appointments for follow-up care 	<ul style="list-style-type: none"> • Set clear expectations for follow-up • Assess current care plan, barriers to following care plan, and collaborate with patient on care plan modifications • Patient satisfaction survey on navigating system 	<ul style="list-style-type: none"> • Ensure patient receives guidance about access to the practice with interim concerns • Financial considerations and referral source for low-cost interventions • Implement Patient Satisfaction Survey for Breast & Cervical Health Screening Navigation

This toolkit is meant as a guide to help organize ideas, but is also designed to allow flexibility for creative planning. Change concepts that have been used by organizations focusing their improvement efforts on other measures can be found in the **QI Tools and Resources** module.

Note: An organization may choose to adapt and refine a tool to assist improvement for the measure, **Cervical Cancer Screening**. Testing the measure before fully implementing it offers a way to try something new and modify it before additional resources are spent.

How Can an Organization Make Those Changes?

Earlier in this module, examples are provided of changes (Critical Pathway and Care Model) that have led to improved organizational systems of care and better patient health outcomes. Because every change is not necessarily an improvement, changes must be tested and studied to determine whether the change improves the quality of care. This concept is addressed in detail in the **Managing Data for Performance Improvement** module.

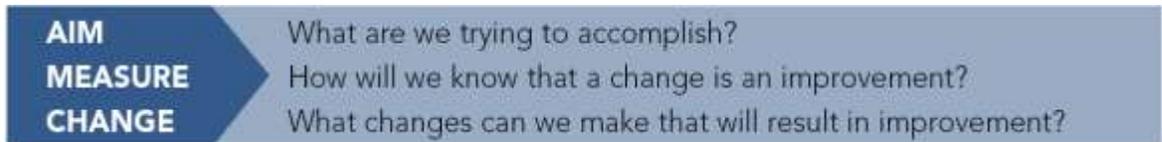
It is important that these changes be tested in the context of an organization's staff, current processes, and patients. The goal is that the change results in lasting improvements within an organization.

Organizations commonly use tools to manage change as they work to improve their systems. For a comprehensive discussion of change management, refer to the **Redesigning a System of Care to Promote QI** module. Here are a couple of tools that are worth mentioning in the context of this measure:

1. Small tests of change – **Model for Improvement and PDSA** (Plan-Do-Study-Act)
2. Process mapping

1. *Model for Improvement*

The *Model for Improvement* identifies aim, measure, and change strategies by asking three questions:²⁹



These questions are followed by the use of learning cycles to plan and test changes in systems and processes. These are referred to as PDSA (Plan-Do-Study-Act) cycles. The PDSA Cycle is a test-and-learning method for discovering effective and efficient ways to change a current process. In **Figure 4.3: The PDSA Cycle**, the graphic provides a visual of the PDSA process:



Figure 4.3: The PDSA Cycle

An organization focusing its improvement efforts on **Cervical Cancer Screening** for its patients benefits from implementing PDSAs to test change processes that have an impact on access to preventive care. Those organizational processes tested may focus on outreach, operational procedures, or patient education interventions ensuring that patients have timely access to care. A few examples of such processes relating to **Cervical Cancer Screening** are listed below:

- What system is in place to provide patients with timely reminders regarding cervical cancer screening?
- What are the assigned roles, duties, and tasks for planned visits to a multidisciplinary care team? Are members of the team cross-trained?
- Does the patient population understand its specific role in cervical cancer screening or is there an opportunity for education?
- Is there an opportunity to educate the community on the importance of cancer screening including cervical cancer in a group visit setting?
- Are there cultural, linguistic, and literacy barriers that the organization may need to address?

As an organization plans to test a change, it should specify the *who*, *what*, *where*, and *when* so that all staff know their roles clearly. Careful planning results in successful tests of change. Documentation of what happened – the *S* or study part of the PDSA – is also important. This can help a team to understand the impact of changes to a process as unanticipated consequences may occur.

Tips for Testing Changes

- Keep the changes small and continue testing
- Involve care teams that have a strong interest in improving cancer screening
- Study the results after each change. All changes are not improvements; do not continue testing something that does not work!
- If stuck, involve others who do the work even if they are not on the improvement team
- Make sure that overall aims are improving; changes in one part of a complex system sometimes have an adverse effect in another

2. *Process Mapping*

Process mapping is another valuable tool that an organization focused on improvement often uses. A process map provides a visual diagram of a sequence of events that result in a particular outcome. Many organizations use this tool to evaluate a current process and again when restructuring a process.

The purpose of process mapping is to use diagramming to understand the current process; i.e., how a process currently works within the organization. By looking at the steps, their sequence, who performs each step, and how efficiently the process works, a team can often visualize opportunities for improvement.

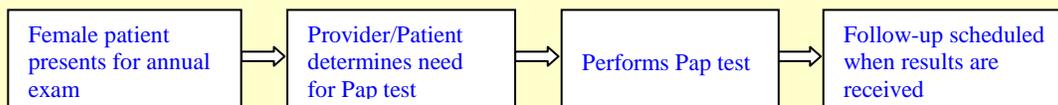
Process mapping can be used before or in conjunction with a PDSA cycle. Often, mapping out the current process uncovers unwanted variation. In other words, different staff may perform the process differently, or the process is changed on certain days or by specific providers. By looking at the process map, a team may be able to identify gaps and variation in the process that have an impact on cervical cancer screening.

The case story continues...

PDSA Cycles in Action:

At the second meeting, the team was very excited to think about all the ideas it had considered. The team leader recognized that the change needed to be manageable and not disrupt the flow of the clinic. The team decided to map out its current system of care using process mapping. Then it agreed to address each step of the process, combining what it knew about its patients and organization and stealing shamelessly from ideas that worked for others, to improve delivery system design. The team agreed that as it prioritized each step for improvement, it would create PDSAs to test the changes.

The current process of care for cervical cancer screening was straight forward:



With the patient advisory group's help, the team tackled the process, *determines need for Pap test* first. The risking tool was incorporated into the workflow of all female patients aged 21 years or older (regardless of reason for visit); standing orders for MAs were developed based on practice guidelines, and the processes for scheduling and performing Pap tests were streamlined. An algorithm for determining the need for a Pap test was also created. An update on the latest guidelines was provided at the monthly meetings to clinicians, clinical support staff, and receptionists.

Process mapping, when used effectively, can identify opportunities for improvement, and support testing changes in the current system of care. Additional information, including tools and resources to assist an organization in adapting process mapping as an improvement strategy within its organization, can be found in the **Redesigning a System of Care to Promote QI** module.

How Can an Organization Know That Changes Caused an Improvement?

Measures and data are necessary to answer this question. Data is needed to assess and understand the impact of changes designed to meet an organization's specified aim. Measurement is essential in order to be convinced that changes are leading to improvement. Organizations that have experienced successful improvement efforts found that data, when shared with staff and patients outside the core improvement team, led to the *spread of improvement* strategies, in turn generating interest and excitement in the overall quality improvement process.

Measures are collected prior to beginning the improvement process and continue on a regularly scheduled basis throughout the improvement program. Once an organization reaches its specified goal, frequency of data collection may be reduced. Additional information regarding

frequency of data collection, tracking, and analyzing data can be found in the **Managing Data for Performance Improvement** module.

Part 5: Holding the Gains and Spreading Improvement

Holding the Gains

Once an organization has redesigned the process for cervical cancer screening, it can be tempting to move on to other issues and stop monitoring the process. Ongoing monitoring ensures that an organization *holds the gains* over time.

Although an organization may be able to reduce the frequency of monitoring the process, some ongoing assessment of the measure is necessary to ensure an organization continues to meet its intended goal. Processes that work well now may need to change as the environment shifts. Because all systems are dynamic, they change unless efforts are made to ensure that the improvements continue. Organizations often do a few simple things to ensure that successful changes are embedded in the daily work. Examples include:

1. Change the procedure book to reflect the new care process.
2. Include key tasks in the new process as part of job descriptions.
3. Adjust the expectations for performance to include attention to quality improvement and teamwork to improve care.
4. Re-align hiring procedures to recruit individuals who are flexible and committed to quality improvement.

The case story continues...

Sustaining Improvements:

A year later...

About 83 percent of Ms. Smiley's patients had their Pap tests as indicated based on the last audit, and the team is celebrating its success in reaching its goal of over 80 percent. Samplings of organization-wide medical records are not as encouraging, however. Since Ms. Smiley's practice is focused on women's health, it is not surprising that she has been able to make significant improvements over a year. Even though the team realizes that they will have more work ahead of them, it has made considerable progress and learned much along the way. Because the results have been communicated at staff meetings, other providers are interested in adopting some of these changes that work and to follow the results through monitoring. Confident it could make meaningful changes as a team, it expanded the team quality improvement project to include other metrics pertinent to cervical cancer screening and plan to tackle colorectal cancer screening in the near future. It used the HRSA CCMs and the NCQA Physician Recognition Program as a guide to choose measures and to develop appropriate aims. It remained focused on one care team to test changes to achieve its aim initially, but the organizational leadership was committed to do more; excellence in cancer screening across the organization became a strategic priority. Over the subsequent two years, the clinic made substantial improvement and is now known countywide for the excellence of its cancer screening programs.

Spreading Improvement

Spread can be defined differently based on an organization's defined target population for the improvement effort. An organization often begins an improvement intervention on a smaller scale, possibly focusing on one site or one provider's patient panel, and then increases the population of focus (POF) or the number of providers. Spread can mean spreading improvements to another area of an organization. An organization can still focus on cervical cancer screening but also include other or all providers that provide care to women. Ideally, others can learn from the initial improvement experience and implement the interventions of the improvement team in their own environments. Spread of this kind is often at an accelerated pace as there is experience about changes that work within the organization. Once it has successfully reached its goal for **Cervical Cancer Screening**, an organization may choose another measure to improve other aspects of care for women or cancer screening. Good sources for cancer screening measure sets include:

- NCQA
- NQF
- PQRI
- PCPI

Another option is to target a different topic or another population of patients. An organization may evaluate organizational priorities as it did when initially choosing the **Cervical Cancer Screening** measure and begin to plan for its next improvement effort. Additional information on *Holding the Gains and Spreading Improvements* , including specific resources and tools to support an organization's improvement program, can be found in the **Redesigning a System of Care to Promote QI** module.

Part 6: Supporting Information

Case Story

To gain insight into how one QI team approached this measure, review a hypothetical case study highlighting a fictional health center, White Cloud Health Group, and its approach to improving **Cervical Cancer Screening** performance.

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