

## **Health Information Technology Enabled (or Electronic) Clinical Quality Improvement (eCQI) Toolkit**

**Version 4: March 2017**

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## **Introduction**

Quality improvement (QI) consists of systematic and continuous actions that lead to measurable improvement in health care services and the health status of targeted patient groups (this definition supplied by HRSA).

Health IT enabled or sometimes called electronic clinical quality improvement (eCQI) is the use of health information technology, the functionality and data in your EHR along with clinical best practices to support, leverage and advance your quality improvement initiatives.

This eCQI Toolkit was created as a practical guide to assist organizations with leveraging health information technology (HIT) and the Plan Do Study Act (PDSA) process improvement methodology to support and advance their health quality improvement initiatives. This toolkit is;

- Designed to provide eCQI tools and resources that may be used by organizations to help manage their eCQI priorities in an organized, efficient and repeatable manner
- Developed for use by inpatient and outpatient organizations who are currently utilizing certified electronic health record (EHR) software to manage their patient encounters. (See appendix K for more information on certified EHRs)
- Meant to help identify, align and manage quality initiatives for both internal and external QI goals
- Focused on use of standardized clinical quality measures (CQMs) and tracking and monitoring this data in your EHR when possible
- Encourages physical, electronic and data workflow review as part of each eCQI project to insure consistent, reliable and quality data and improvement.

Development of this document was completed by Health Technology Services, a department of Mountain-Pacific Quality Health Foundation and funded by the Montana Department of Public Health and Human Services.

## **eCQI Methodology Overview**

Using Health IT does not automatically translate to improved outcomes. Using Health IT for quality improvement requires purposeful and thoughtful planning, effort and allocation of resources.

This toolkit will combine aspects of the Agile/Scrum delivery cycle (created for the IT industry) with the PDSA quality improvement methodology. The goal of this combined approach is to help produce valuable quality results in a quick and streamlined manner.

## **Quality Improvement Model**

This toolkit will utilize aspects of the Agile/Scrum delivery cycle, which focuses on achieving value added changes quickly and efficiently, one change (or one group of changes) at a time. These systematic improvement cycles are called “sprints”. The goal of each sprint is to provide value added results for your organization approximately every 2-6 weeks. They also enable you to balance your improvement initiatives with your current workload. Each sprint should focus on one change (or logical group of changes) and may include one Plan-Do-Study-Act (PDSA) iterative cycle (multiple times through the cycle).

The PDSA quality improvement methodology is an iterative, four-stage problem-solving model used for improving a process. PDSA is a simple yet powerful tool for accelerating change. (See appendix G for more information about PDSA). To insure stabilization of the changes that are implemented and to spread the improvements or best practices once they are defined and proven, we recommend you add phases to stabilize and spread the changes at the end of the final PDSA cycle, once goals are met.

The foundation of the PDSA methodology is the recognition that quality improvement is an ongoing cycle with strong emphasis on the use of data for decision making and to verify performance. (See appendix H for more information on the effective use of data and appendix I for a review of 7 basic data collection tools). This methodology will also incorporate the use of SMART (specific, measurable, attainable, relevant and time-based) goals as the foundation for planning and evaluating the success of your QI projects. (See appendix B for more information on SMART goals).

### **Project Management:**

This toolkit is based on a “lightweight” project management approach, incorporating aspects of the Agile /Scrum delivery cycle for your quality improvement initiatives, which focuses on a minimum of structure and documentation, and instead, focusing on value added requirements necessary to insure success. It includes a process for helping you monitor and control the responsibilities, activities, changes and data for your project.

There are tools included in the appendices that will assist with the project management and implementation of your quality improvement initiatives.

### **Electronic Clinical Quality Measures:**

As noted by CMS in their online eCQI Resource Center, “clinical quality measures (CQMs) allow for performance tracking as improvements are made, and progress toward national shared goals of better care, smarter spending, and healthier people to be quantified.

Electronic clinical quality measures (eCQMs) are a tool used to quantify and track healthcare quality performance in a standard way. eCQMs are derived from information stored in and shared by health IT systems, such as EHRs and patient registries. They convert information about care processes or outcomes into a rate or percentage that allows providers, facilities, and patients to measure and evaluate aspects of care including: clinical management, intervention effectiveness, patient safety, efficient use of health care resources, care coordination, patient and family engagement, population and public health. eCQM reporting, including population health indicators, is required for several federal incentive programs.

Measuring quality provides tangible feedback to clinicians and other health care team members on their improvement efforts. Quality measures also drive provider and facility reimbursement now that federal and private insurers are shifting to value-based payment programs. Measurement is thus a key engine for optimizing healthcare.” <https://ecqi.healthit.gov/>

Since the ability for EHRs to report standard clinical quality measures is part of the process for EHR vendors to obtain CMS/ONC Certification for their products, and the reports should be available in all certified EHRs, this eCQI toolkit and process encourages the use of standardized clinical quality measure (CQMs) whenever possible and appropriate for outcome and process evaluation metrics for your eCQI projects.

## How to use this Toolkit

We understand that based on the scale of your eCQI project, the changes you wish to undertake, the availability of resources or the quality improvement culture of your organization, your needs for eCQI support may be unique.

This toolkit and its resources can provide a step-by-step walk through of the entire process or you can use those components that make sense for your current QI project or objective. We have included a high level project plan for those already comfortable with the process, and a more detailed plan for others.

The templates and information in the appendices are to provide basic tools and additional information on some of the concepts discussed in this process.

Please feel free to use whatever information and tools make the most sense for your organization. You may also use them as a template or starting point and customize them to best benefit your organization or project. Below are some key elements you may want to keep in mind to help your eCQI project be successful:

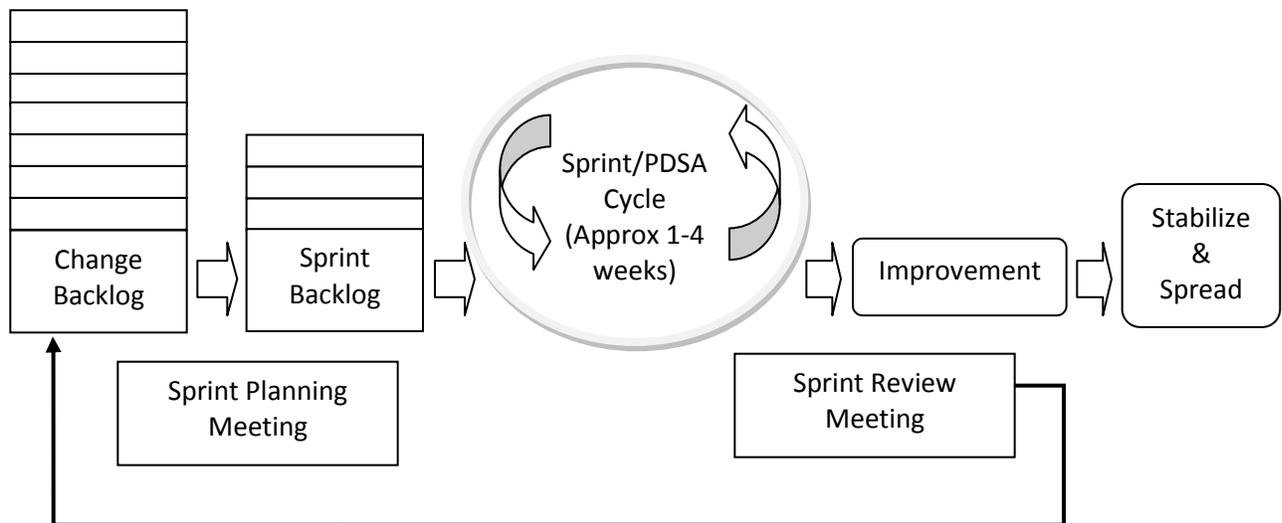
- Make sure your teams are represented with the needed subject matter experts. eCQI involves the whole organization, not just IT, quality, etc.
- Create QI initiatives that make sense for your organization (align with other business or QI priorities)
- Use SMART goals (specific, measurable, attainable, relevant and time based)
- Standardize your data goals (outcome measures); Use nationally recognized (CMS/NQF/USD/IQR/MIPS, etc.) goals when possible
- Identify data goals that are easily measured and consistently obtained, with data available from your EHR or other system. Do not make the data tracking/reporting a difficult or manual task
- Establishing your baseline data and identifying the correct electronic/data entry workflow of your measure should be the first step of your project.
- Utilize and incorporate the functionality of your EHR to support your eCQI efforts
- Identify and use existing clinical or workflow best practices when possible. Solutions may have already been identified for the issue you are trying to improve or change
- Use 1 PDSA process (may have many iterative cycles) for each process measure/change (or logical group of changes)
- Use data for decision making and to validate change
- Provide necessary communication and training to staff on the eCQI process and changes being implemented
- Fully test theories before full implementation
- Once changes are in place, continue to monitor these changes to insure performance continues as expected

## eCQI High Level Generic Project Plan

1. Identify Project Scope (Outcome Measure - top level item you want to change)
2. Choose a project team
3. Create Change Backlog (a list of possible changes/process measures that will help improve the outcome measure)
4. Prioritize Change Backlog based on “value” of each change
5. Create Sprint Backlog (identify item(s) to be included in first “sprint” or PDSA Cycle)
6. Plan “Sprint”/PDSA Cycle
7. Complete PDSA Cycle
8. Perform a Sprint Review
9. Review, update and reprioritize Change Backlog
10. Begin new Sprint

See appendix L for an eCQI Project Management Checklist

## eCQI Process Cycle Diagram



## eCQI Generic Detailed Plan

The following eCQI project plan focuses on utilizing HIT functionality and data, along with clinical best practices to advance your quality improvement projects. Sprints or PDSA cycles will be utilized for each planned change. Following is a detailed generic project plan that can be used for most eCQI projects, focusing on the use of HIT to advance your QI goals (see appendix L for an eCQI Project Management checklist):

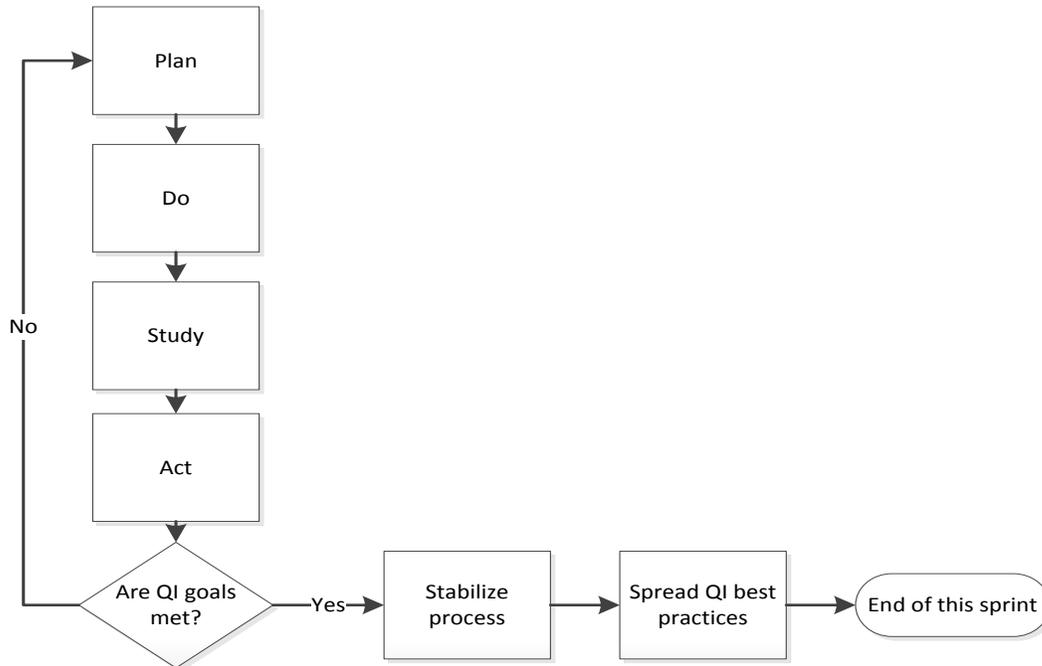
1. Step 1: Identify Project Scope
  - a. Choose project goal
    - i. Answer this question: “What are we trying to accomplish?” (below are some possible ways of how you might identify possible goals)
      1. Identify quality reporting requirements that are evaluated and used for payment reform/reimbursement or ranking (examples include: Merit-based Incentive Payment Program (MIPS), Patient Centered Medical Home, HRSA UDS reporting, Inpatient Quality Reporting (IQR), CPC+/ACOs, etc.)
      2. Internal QI goals already established or mandated
      3. Quality improvement requirements from funding opportunities/grants
      4. Data analysis determinations (biggest quality issue, quality issue with the highest cost, issue affecting the most patients, etc.)
      5. Utilize data obtained by completing the Organization eCQI Assessment Survey (appendix J)
    - ii. When applicable, the project goal should be an outcome measure (see appendix A for more information on outcome and process measures)
    - iii. Use SMART criteria (see appendix B for more information on choosing SMART goals)
    - iv. Use standardized or nationally recognized measures when possible (e.g. CMS, NQF, IQR, MIPS UDS, measures, etc.) easily and consistently obtained from your EHR (do not make the data tracking/reporting a difficult task, save your resources for the change process)
    - v. Align your QI project with other quality reporting requirements and programs (MU, PCMH, MIPS, IQR, CPC+, UDS, etc.)
  - b. Identify the evaluation measure(s) you will use to monitor your performance to your project goal.
    - i. Establish and document the baseline data (starting point) for your evaluation measure.
  - c. Identify boundaries for project (guidelines for project)
    - i. Boundaries include; what should be included in the project as well as what should not be included, what is the expected timeframe, budget and use of resources
  - d. Document the project scope (see appendix C for sample eCQI Project Scope and Change Backlog Template and a completed example)
2. Step 2: Choose Project Team
  - a. Assemble a team that has knowledge of the problem or opportunity for improvement. (including the right people on a process improvement team is critical to a successful improvement effort)
3. Step 3: Create Change Backlog
  - a. Answer this question: “What changes can we make that will result in an improvement?” to the project goal selected

- b. If the evaluation measure(s) for your project needs data validation, or you have questions on the correct workflow or data entry for the measure, or if your staff needs training of on the correct workflow/data entry for the evaluation measure, this should be the first item you include on your Change Backlog, and should be prioritized as the first sprint or PDSA/cycle.
  - c. Brainstorm ideas for possible changes that will ultimately improve the project goal/outcome measure (see appendix F for an eCQI worksheet to help identify possible changes). Other items to review for possible ideas for improvement:
    - i. Identify possible physical or electronic workflows that need to be reviewed for possible improvement or streamlining (see appendix M to learn more about the process of workflow mapping)
    - ii. Identify possible EHR functionality changes (see appendix E to learn more about EHR functionality that can impact QI)
      - 1. Review staff use and workflows (based on clinical best practices for QI topic)
        - 1. Computer provider order entry (CPOE)
        - 2. Care coordination and transition of care
      - 2. Determine available options, decide on applicability (based on clinical best practices for QI Topic)
        - 1. Clinical Decision Support (CDS)
        - 2. Patient Portal/eSecure messaging
        - 3. Patient Education materials
        - 4. Care Coordination
        - 5. Interfaces
        - 6. Etc.
    - iii. Determine how to optimize point of care documentation to ensure accurate and streamlined data entry (based on clinical best practices for QI topic)
  - a. Ideas for change may come from the insights of those who work in the system, from previous PDSA cycles, from change concepts or other creative thinking techniques, or by borrowing from the experience of others who have successfully improved
  - b. Document the list of possible changes/improvements (changes could include, process or workflow changes, EHR changes, education/outreach to patients, data entry changes, etc) (see appendix C for sample eCQI Project Scope and Change Backlog Template and a completed example)
4. Step 4: Prioritize the Change Backlog based on “value” of each change
- a. Prioritize or order the list of possible changes. You can determine the order based on your organization’s priorities. Priorities can be based on cost, resources, timeframes, most ROI, alignment with other quality initiatives, etc.
  - b. Document the list of changes (see appendix C for a sample eCQI Project Scope and Change Backlog Template and completed example)
5. Step 5: Create Sprint Backlog (identify item(s) to be included in first “sprint” or PDSA Cycle)
- a. Based on the priority identified on the Change Backlog, choose one change (or one group of changes) for the first sprint/PDSA (each sprint should be able to be completed in 2-6 weeks)
6. Step 6: Plan “Sprint”/PDSA Cycle
- a. Plan
    - i. Based on the chosen change for this sprint, answer this question: “how will we know that a change is an improvement?”
    - ii. Choose evaluation measures for this change (choose SMART evaluation measures, with standardized data easily obtained from EHR or other system. Do

- not make the data tracking/reporting a difficult task, save your resources for the change process). (See appendix B for more information on SMART goals)
- iii. Establish and document baseline data points for the evaluation measure(s)
    1. Create standard/customized reports and verify accuracy
    2. Create documentation (chart, graph, etc.) for baseline data and for tracking
  - iv. If the evaluation measure(s) for this change needs data validation, or you have questions on the correct workflow or data entry for the measure, or if your staff needs training on the correct workflow/data entry for the evaluation measure, this should be the first task of your PDSA/cycle.
  - v. Create PDSA worksheet (see appendix D for a sample PDSA Worksheet Template and completed example). Use one PDSA worksheet for each proposed change.
7. Step 7: Complete PDSA Cycle
- a. Do
    - i. Communicate plans to all staff/stakeholders involved in change
    - ii. Implement changes as identified on PDSA worksheet
      1. Provide training for staff on changes
        1. EHR functionality
        2. New workflows
        3. Clinical best practices
        4. Reports and use of data
        5. other
  - b. Study
    - iii. Monitor progress/collect data (see appendix I for info on standard data collection methodologies and tools)
    - iv. Analyze data (see appendix H for more information on data validation and use)
    - v. Identify areas of needed improvement
  - c. Act
    - vi. If goal(s) identified in “plan” step are met; continue on with the Stabilize/Improve steps.
    - vii. If goal(s) are not met, create new PDSA cycle using data analysis and revise as necessary until goal(s) identified in “plan” step are met (Go to Step 8)
  - d. Stabilize/Spread
    - viii. Stabilize new processes - verify changes have been implemented, staff are performing new tasks, train or coach staff as needed
    - ix. Create ongoing data collection, tracking and reporting to insure changes continue to meet original goals
    - x. Identify areas to improve the newly established standard process
    - xi. Propose new QI project based on new possible improvements
8. Step 8: Perform a Sprint Review
- a. Identify best practices from sprint
  - b. Identify lessons learned to be applied to next or future sprints
  - c. Identify recommended updates to Change Backlog (add, remove, or change items)
9. Step 9: Review, update and reprioritize Change Backlog and prepare for new Sprint
10. Step 10: Begin Next Sprint/PDSA Cycle
- a. Choose next change from list (to support overall project goal/outcome measure)
  - b. Continue cycle again starting with Step 5: Create Sprint Backlog
  - c. Keep creating new sprints/ PDSA cycles for this QI project until the high level goal/outcome measure is met, the project scope is revised or the project is canceled

Remember to celebrate your improvement success and document lessons learned for use in future eCQI projects.

### PDSA Quality Improvement Cycle Diagram



### Conclusion

This toolkit is meant to provide some structure and information to help support your electronic clinical quality improvement initiatives. The appendices that follow provide additional detailed information and tools that might assist you in improving your processes and outcomes.

If you would like any technical assistance or have any comments or questions about this toolkit, please contact either Health Technology Services or Montana Department of Public Health and Human Services.

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## Appendix A: Outcome and Process Measures

- **Outcome measures:** The high-level outcome targets that you are aiming to improve. Outcome measures should represent a true effect or outcome. An improvement in an outcome measure should represent unquestionable improvement and value for your organization and patients.
  - Improvement to outcome measures may take longer to see, and it may take change to many process measures to see improvement
  - When choosing outcome measures, try to choose a standardized, nationally recognized data point that is easily and readily obtainable. Do not choose measures that take a lot of your resources to obtain and track, or that you cannot validate for accuracy.
  - For eCQI projects, you may want to consider outcome measures associated with reimbursement programs, such as value-based payment initiatives (MIPS), Meaningful Use, Patient Centered Medical Home or other quality reporting programs, to capitalize on your improvement efforts.
  
- **Process measures:** These measures are the specific steps in a process that lead — either positively or negatively — to a particular outcome measure.
  - Often it may take improvement on more than one process measure to affect an outcome measure.
  - Improvement in process measures should happen more quickly than outcome measures and should show value to your organization/patients in a shorter timeframe.
  - Choose process measures that have reliable evaluation measures to confirm performance.
  - You may find it useful to identify process measure/changes applicable to a outcome measure by completing the brainstorming form in appendix F, and available with more detail on the Health IT.gov website here: <https://www.healthit.gov/providers-professionals/planning-and-implementing-improved-care-processes>. And on measuring care processes: <https://www.healthit.gov/providers-professionals/measuring-care-processes-and-outcomes>
    - Here is a direct link to the inpatient form:  
<https://www.healthit.gov/sites/default/files/cds/eCQI-Worksheet-Inpatient-Essential-05-15.pdf>.
    - Here is a direct link to the outpatient form:  
<https://www.healthit.gov/sites/default/files/cds/eCQI-Worksheet-Ambulatory-Enhanced-05-15.pdf>

## Appendix B: SMART Goals

The benefits of using SMART criteria when determining your goals is that being SMART means your goals are not vague, progress is easy to monitor, it is easy to identify missed targets and they help you create your action plans. Below describes each SMART criteria:

### 1. Specific

This criterion stresses the need for a specific goal rather than a more general one. This means the goal is clear and unambiguous; easy to determine if goal is met or not met.

A specific goal will usually answer the five 'W' questions:

- What: What do I want to accomplish?
- Why: Specific reasons, purpose or benefits of accomplishing the goal
- Who: Who is involved?
- Where: Identify a location
- Which: Identify requirements and constraints

### 2. Measurable

The second criterion stresses the need for concrete criteria for measuring progress toward the attainment of the goal. If a goal is not measurable, you will not know whether a team is making progress toward successful completion.

A measurable goal will usually answer questions such as:

- How much?
- How many?
- How will I know when it is accomplished?
- Indicators should be quantifiable

### 3. Attainable (or achievable, agreed upon, action oriented)

The third criterion stresses the importance of goals that are realistic and also attainable. While an attainable goal may stretch a team in order to achieve it, the goal is not extreme.

An achievable goal will usually answer the question How?

- How can the goal be accomplished?
- How realistic is the goal based on other constraints?

### 4. Relevant (or realistic, results oriented)

The fourth criterion stresses the importance of choosing goals that matter. Relevant goals (when met) drive the team, department and organization forward. A goal that supports or is in alignment with other goals would be considered a relevant goal.

A relevant goal can answer yes to these questions:

1. Does this seem worthwhile?
2. Is this the right time?
3. Does this match our other efforts/needs?
4. Are you the right person?
5. Is it applicable in the current socio- economic environment?

## 5. Time-based (or time bound)

The fifth criterion stresses the importance of setting goals within a time-frame, giving them a target date. A commitment to a deadline helps a team focus their efforts on completion of the goal on or before the due date.

A time-based goal will usually answer the question

- When?
- What can I do six months from now?
- What can I do six weeks from now?
- What can I do today?

## Appendix C: Project Scope and Change Backlog - Template

### eCQI PROJECT SCOPE/ CHANGE BACKLOG - Template

Location Name: XXXXXXXX

<b>Project Aim:</b> (what are we trying to accomplish)
<b>Goal:</b> (make sure goal is SMART)

<b>Project Constraints:</b> (what are the boundaries for this project)
Budget:
Schedule:
Quality:
Other: (Policies, Regulations, Management Decisions)

<b>Evaluation Measure</b> (use standardized data, easily obtainable if possible - examples include CMS, NQF, MIPS, IQR and or UDS measures)					
Measure	Description	Data Source	Target Performance	Current Performance	Current Performance Date

Project Team			
Name	Title/Department	Role	Responsibilities

### Possible Changes - Backlog

Possible Change (process measures)	Priority ranking (low, medium, high)	Estimated Sprint Assignment	Notes

## Appendix C: Project Scope and Change Backlog – Completed Example

### eCQI PROJECT SCOPE/ CHANGE BACKLOG

Location: Northwest Pediatric Clinic

<b>Project Aim:</b> Achieve and maintain control for asthma patients
<b>Goal:</b> Improve the % of active patients with asthma diagnosis with an ACT score $\geq 20$ by 20% by Dec 31, 2017

<b>Project Constraints:</b> (what are the boundaries for this project)
Budget:
Schedule: Quality Reporting for this measure is due by Feb 28, 2018
Quality: Focus on Northwest Clinic location only
Other: (Policies, Regulations, Senior Management requirements)

<b>Evaluation Measure</b> (use standardized data, easily obtainable if possible - examples include MIPS, NQF, CMS, IQR and or UDS measures)					
Measure	Description	Data Source	Target Performance	Current Performance	Current Performance Date
Custom (NIH Asthma guidelines)	% of active patients with any asthma diagnosis with ACT score greater than or equal to 20	EHR/EPIC Asthma flow sheet	67%	47%	3/1/17

Project Team			
Name	Title/Department	Role	Responsibilities
Jane Doe	Clinic Administrator	Project Leader	Work with EHR Vendor for data reports. Assist with communication to staff
John Doe	PCMH Coordinator	Clinical Leader	EHR expertise, workflow and process development, training and communication
Mary Smith	Quality Coordinator	Project Manager	Provide eCQI resources and templates, provide project management structure and reporting

### Possible Changes - Backlog

Possible Change (process measures)	Priority ranking (low, medium, high)	Estimated Sprint Assignment	Notes
Improve workflow for documenting ACT score and other assessment info in EPIC	High	In process	
Improve follow up appts for active asthma patients with prescription for daily inhaled steroid medication	High	3	FU appts every 6 months – check into EHR functionality for patient reminders and best practice alerts
Improve follow up appts for active asthma patients with ACT score less than 20			FU appts every 2-6 weeks until ACT score is over 19
Improve % of active asthma patients who have a care plan established and documented in HER			
Improve % of active patients diagnosed with persistent asthma who are on appropriate medication	High	2	CMS 126 Percentage of patients 5-64 years of age who were identified as having persistent asthma and were appropriately ordered medication during the measurement period

## Appendix D: PDSA Worksheet - Template

<b>Current Date:</b>	<b>Location Name:</b>	<b>Sprint Start Date:</b>	<b>Sprint/PDSA Cycle #</b>

**Outcome Measure:** (Project Goal – from Project Scope/Change Backlog Template)

**Sprint/PDSA Cycle Aim:** (make a SMART goal)

<b>Evaluation Measure(s) for this Aim:</b> (use standardized data, easily obtainable if possible)					
Measure	Description	Data Source	Target Performance	Current Performance /date	Final Performance /Date

<b>Sprint/PDSA Cycle Team</b>			
Name	Title/Department	Role	Responsibilities

<b>Current status:</b>

### **Plan**

List the tasks needed to set up this test of change	Person responsible	When to be done	Notes
Task 1:			
Task 2:			
Task 3:			
Task 4:			
Task 5:			
Task 6:			
Task 7: (add more rows if needed)			

**Do** Describe what actually happened when you ran the test

**Study** Describe the measured results and how they compared to the predictions

**Act** Describe what modifications to the plan will be made for the next cycle from what you learned

## Appendix D: PDSA Worksheet – Completed Example

<b>Current Date:</b>	<b>Location Name:</b>	<b>Sprint Start Date:</b>	<b>Sprint/PDSA Cycle #</b>
3/15/17	Northwest Clinic	3/1/17	2

**Outcome Measure:** Achieve and maintain asthma control; Improve the % of active patients with asthma diagnosis with an ACT score  $\geq$  20 by 10% by Dec 31, 2017.

**Sprint/PDSA Cycle Aim:** Improve performance by 20% for percentage of patients 5-64 years of age who were identified as having persistent asthma and were appropriately ordered medication during the measurement period (CMS 126) by June 1, 2017

<b>Evaluation Measure for this Aim:</b> (use standardized data, easily obtainable if possible - examples include MIPS, NQF, CMS, IQR and or UDS measures)					
Measure	Description	Data Source	Target Performance	Current Performance /date	Final Performance /Date
CMS 126	<p><b>Denominator:</b> Patients 5-64 years of age with persistent asthma and a visit during the measurement period</p> <p><b>Numerator:</b> Patients who were ordered at least one prescription for a preferred therapy during the measurement period</p>	EHR CQM report	60%	40% 3/5/17	

<b>Sprint/PDSA Cycle Team</b>			
Name	Title/Department	Role	Responsibilities
Jane Doe	Clinic Administrator	Project Leader	Work with EHR Vendor for data reports. Assist with communication to staff
John Doe	PCMH Coordinator	Clinical Leader	EHR expertise, workflow and process development, training and communication
Mary Smith	Clinical Staff	Medical Assistant	Provide clinical best practices and guidelines for asthma, help train staff and develop workflows

<b>Current status:</b>
Team established baseline data for evaluation measure on 3/5 and confirmed correct workflow in EHR for CQM 126. Team is in process of training staff on correct electronic workflow. Jane working with EHR vendor to identify process for using EHR functionality for clinical reminder/alert to support measure. Mary is working on creating workflow to include chart prep procedure.

### Plan

List the tasks needed to set up this test of change	Person responsible	Due Date	Notes
Task 1: Establish baseline measure criteria for cycle/sprint (see above)	Jane	Complete	
Task 2: Confirm correct electronic data entry workflow to populate CMS 126	Jane	Complete	
Task 3: Work with EHR Vendor to identify any clinical decision	Jane	3/15	

support (CDS) rules or alerts that can be set up to support measure and include in new workflow			
Task 4: Create workflow for chart prep to include asthma patient encounters	Mary	3/15	
Task 5: Train staff on new workflows: electronic data entry, chart prep and using reminders/alerts	Mary	3/20	
Task 6: Create and perform audit to confirm adherence to new workflow adjust workflows/training as needed	Jane	3/27	
Task 7: Run updated evaluation measure report for current performance information	Jane	3/30	Run each week to confirm improvement/process
Task 8: Make changes in workflow or training as needed based on updated data	Mary	4/15	
Task 9: Continue cycle until performance target is achieved	Team	5/30	
Task 10: Create plan to sustain or continue to improve measure	Team	6/5	
Task 11: Perform sprint/cycle review meeting and discuss this sprint, update change backlog and identify next sprint	Team	6/5	

**Do** Describe what actually happened when you ran the test

**Study** Describe the measured results and how they compared to the predictions

**Act** Describe what modifications to the plan will be made for the next cycle from what you learned

## Appendix E: eCQI EHR Functionality

### 1. Computerized Provider Order Entry

**The basic functionality and purpose of CPOE** is to encourage the direct entry of orders into the EHR by providers, or someone licensed that is close to the provider, who understands the purpose of the order and can determine whether or not it is clinically relevant and safe for the patient. This is a standard component to CEHRT; however the workflow differs greatly between software systems.

It is important to understand system securities should be in effect with CPOE allowing or not allowing certain “job roles” to enter, edit or view provider orders. This is typically determined by the facility, not just the software company, when a system is initially implemented.

#### ***What does using CPOE mean to Quality Improvement efforts?***

There are a multitude of data points that can be retrieved from CPOE to effect care improvement. Examples of data collected through order entry models would be antibiotic usage, narcotic prescription monitoring, and lab and diagnostic test usage to name a few. Using CPOE also provides the facility the opportunity to implement clinical decision support rules or guidelines at the point of care, which will be discussed later.

### 2. Patient Portals

**The basic functionality and purpose of the patient portal** is to provide patients and beneficiaries electronic access to **some** health information and ultimately promote active engagement of a patient in their care.

In 2014, all CEHRT had to be upgraded to a version that had some form of patient portal to meet Meaningful Use. Again, while the requirement is standard, the workflow and approach to implementation differs by software and facility. The requirement is that a patient must have the ability to “view, download and transmit” their electronic health information. Functionality that is available with most portals is to:

- ▶ Allow the patient to view/edit demographic & insurance information
- ▶ View lab test results
- ▶ View imaging reports
- ▶ Review clinical visit summary
- ▶ Review medication list
- ▶ Review/edit allergy list
- ▶ Request an appointment
- ▶ Request a refill
- ▶ Pay a bill
- ▶ Send a secure email to a provider/nurse

*Use your portal to engage patients in monitoring blood pressure or blood sugar as well as to direct them to credible patient education resources.*

While most portals have the above functions available, it is ultimately decided by the organization/provider what functions are “active” or “turned on” for the patient to be able to utilize. For example, clinic A may choose not to show any lab test results where clinic B may choose to show all lab test results after they are reviewed by a provider.

In addition, portals are sometimes a stand alone or 3<sup>rd</sup> party application, and may be a different vendor than the primary EHR. This will be an important consideration when we discuss what data is available from a patient portal.

***What does having a Patient Portal mean for Quality Improvement efforts?***

A patient portal can provide you with direct, “outside the office” access to your patients. Use it for patient education - most patients are searching the internet regarding their medical condition; why not have patients search using your site or a credible source you have directed them to? Engaging patients in reporting their own measurements for blood pressure or blood glucose online could be an effective way to collect data as well as improve the care of your patients with real time monitoring.

*Health Information Exchange = Continuity of Care for our patients.*

**3. Health Information Exchange Overview**

**The basic concept of Health Information Exchange (HIE)**

is to allow health care professionals and patients to appropriately access and securely share vital medical information electronically. HIE is sometimes used as a noun or a verb – with Meaningful Use, there were HIEs created to act as central repositories for patient information while at the same time a facility/provider can exchange health information with another individual facility/provider (Office of National Coordinator, 2014).

Participating in and using the functionality of health information exchange can be a key factor in successful transitions of care between providers and facilities as well as communicate information to data registries.

The process to successful information exchange at the facility / provider level (also known as Directed Exchange) is:

- 1) Outline how you see the process working
- 2) Start small – test with one other provider/organization that is willing to help.
- 3) Pilot the process with involvement from those who will be doing it on a day-to-day basis.
- 4) Take the time to review the process.
- 5) Try again.
- 6) When successful, move on to performing the task more frequently – ie, all transfers to “x” facility/provider will have a clinical summary sent electronically.
- 7) Review the process as a continuous improvement indicator – monitoring successful and failed exchanges until the process is hardwired.

***What does using Health Information Exchange mean for Quality Improvement?***

Health information exchange is all about improving communication between providers and/or facilities. This is potentially one of the areas where patients stand to gain through the continuity of care delivery. Moving through the steps noted above to improve our ability to communicate with one another can only be a benefit to the patient.

#### 4. Clinical Decision Support (CDS) - More than just alerts!

“CDS is an interactive part of an application that assists clinicians with decision-making tasks—it is a hallmark of any clinical information system. Its primary objectives are to prevent errors of commission (the wrong thing was done) and of omission (something was not done that should have been), through alerts and templates with required data entry elements; and improve quality of care, through reminders and other forms of guidance.” (Stratis Health, 2009)

To improve targeted healthcare decisions/outcomes with well developed & deployed CDS interventions, the interventions must provide:

- the **right information**,
- to the **right people**,
- in the **right intervention formats**,
- through the **right channels**,
- at the **right points in workflow**

CDS Functionality differs by software in the level of sophistication that is available.

The different levels of sophistication are:

- ▶ **Data Display:** data review tools such as flow sheets, patient data reports and graphic displays, search tools
- ▶ **Workflow Assistance:** task lists, patient status lists, integrated clinical and financial tools, and instant messaging / internal communication tools
- ▶ **Data Entry:** templates to guide documentation and structured data collection
- ▶ **Decision Making:** access to resources on a topic from within the EHR, rule based alerts, clinical guidelines or pathways, patient / family preferences, and diagnostic decision support

CDS rules can be **active** - require user action or **passive** and do not require user action.

##### a. Using CDS to target conditions and standardize treatments

Most CEHRT software will have a “starter set” of clinical decision support rules to coincide with the Clinical Quality Measures in addition to being able to set up some individual facility specific rules.

The following considerations need to be given to evaluate the usefulness of a CDS function when setting up CDS to improve quality of care delivery and patient safety:

- ▶ Specificity
  - Relevance to the patient
  - Accurate information
  - Consistent with standard of care
  - Promote action, or alternative actions
- ▶ Sensitivity and workflow
  - Directed to the right person/role based user

*Think  
beyond  
pop-ups  
when using  
CDS!*

- Directed to the right situation
- ▶ Safe/efficient handling
  - Overrides should not be easy or frequent in use
  - Reasons for noncompliance should be requested
  - Consider screen design, size
  - Minimize scrolling, keystrokes, typing, clicks, steps and screen changes

Taking the time to map the process associated with the QI goal and identify exactly where in the workflow data exists to support the QI goal is a worthwhile exercise. Then establish CDS interventions at those points to support data collection and achieve goals.

Some specific examples of CDS functionality being used to support specific conditions:

- ▶ Tdap reminder / screening tool
- ▶ Coumadin regimen documentation templates
- ▶ Links to clinical guidelines/pathways within the EMR
- ▶ Chlamydia screening tools
- ▶ Tobacco cessation counseling triggers & templates
- ▶ Weight counseling for elevated BMI
- ▶ Documented use of aspirin or anti-thrombotic in ER patients
- ▶ Standing orders for admission of a pneumonia patient
- ▶ Chronic disease self-management education materials and documentation templates

*Translate clinical goals & objectives into specific Clinical Decision Support tools.*

**b. What does using CDS mean for Quality Improvement? - Management of CDS function and aligning the quality program**

A key part of implementing CDS and using them effectively for QI is responsibility for the ongoing management of the functionality. It is highly recommended that management of CDS rules and activities is done in alignment with quality reporting and data collection and not a silo function of any one department or individual. It may even be suggested that the task of managing CDS is done by an existing quality improvement committee. This may also mean that IT staff will need to be part of the committee to effectively monitor and implement what is needed.

The responsibilities associated with managing the CDS functionality for effective QI collection and reporting are:

- ▶ Evaluation of current CDS rules (Appendix A – CDS evaluation tool). A review or compilation of what rules / templates / guidelines currently in use at the practice / in our workflow? Do you have rules set up that do not apply?
- ▶ Review and approval process for adding or dropping rules with a formal change management request and IT involvement.
- ▶ Communicate the change in the CDS.
- ▶ Follow up on changes made with reviewing alert usage/overrides, monitoring for template usage, chart reviews.
- ▶ Ensure resources used in CDS are kept up-to-date. Not all systems are connected to a service that updates reference materials. This would also include review and upkeep of internal or customized documents.

## 2. Patient Level Alerts

**The basic functionality and purpose of the patient level alert** is to provide an option other than, or in conjunction with CDS alerts, to target a specific patient. Unlike CDS alerts, which have a “global” affect, different alerts can be set for the same condition, for different patients, based on individual needs, time frames or provider preference. (Not all EHRs may have this functionality). Also unlike CDS, these alerts do not “automatically fire” based on criteria and existing data in the EHR, instead are manually created individually and customized for each patient.

### **What does using Patient Level Alerts mean for Quality Improvement?**

You can use patient level alerts to act as a note, alert or reminder to providers and staff on specific needs of an individual patient, or to address a specific aspect of care for a specific patient. For example, you can set up a patient level alert for a pre hypertensive patient, to provide reminders or notes on care specific to that patient’s condition and based on information from the previous encounter.

## Health IT-enabled Quality Improvement [eCQI] Worksheet (Ambulatory, Essential Version)

This tool can help users document and analyze current approaches to specific quality improvement targets and plan enhancements.

### Instructions for using this worksheet

**Step 1:** Document the improvement target and current performance.

**Step 2:** Think about pertinent information flows and workflows driving performance.

**Step 3:** After discussion with pertinent stakeholders, document current state information flows and workflows for the target. Brainstorm potential enhancements to the current state with the QI team, and document these in the pertinent boxes beneath the current state.

**Step 4:** Review all entries, and summarize them in the overview table.

**Step 5:** Use this completed worksheet with the QI team to help prioritize and implement high-yield enhancements to current workflows and information flows; consider beginning with those that will yield the greatest benefits with the least effort and resources (see ONC eCQI Process Improvement page for further details).

### Worksheet Provided By:

Jerome A. Osheroff, MD, TMIT Consulting, LLC

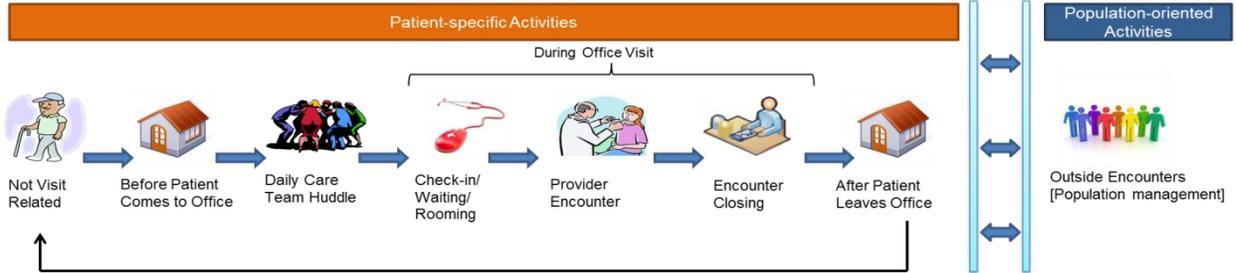
*This tool has been refined based on experience using the eCQI worksheets in quality improvement (QI) projects. It builds on QI tools sponsored by the Office of the National Coordinator for Health IT (ONC). Those ONC tools were based on work of the CDS/PI Collaborative (supported by the California Healthcare Foundation), which builds, in turn, on the HIMSS CDS Guidebook Series. The information in this document is not intended to serve as legal advice nor should it substitute for legal counsel. Users are encouraged to seek additional detailed technical guidance to supplement the information contained within.*

Version 2.0; May 22, 2015

More information on this worksheet and completed sample worksheets for both ambulatory and inpatient QI initiatives can be found at: <https://www.healthit.gov/providers-professionals/planning-and-implementing-improved-care-processes>

## Ambulatory QI Worksheet (Simplified Version)

<b>Target</b>	
<b>Current Performance on Target</b>	



	Not Visit Related	Before Patient Comes to Office	Daily Care Team Huddle	Check-in/Waiting/Rooming	Provider Encounter	Encounter Closing	After Patient Leaves Office	Outside Encounters [Population management]
Current Information flow								
Planned Enhancements								

### **Section 1: Activities that occur with specific patients**

*(Note: population management activities, e.g. Registry use, belong in Section 2)*

A. These activities occur when the patient is not in the office (see C. below for activities "After Patient Leaves Office")

	<b>Not Visit-Related</b>	<b>Description:</b> Not related to a patient's visit to the office/clinic or just before or after that visit
	Current Information flow	•
	Planned Enhancements	•

	<b>Before Patient Comes to Office</b>	<b>Description:</b> After a patient has an office visit scheduled but before they arrive for that appointment
	Current Information flow	•
	Planned Enhancements	•

*B. These activities occur when the patient is in the office*

	<b>Daily Care Team Huddle</b>	<b>Description:</b> Provider team preparations for all patient visits scheduled for the day
	Current Information flow	•
	Planned Enhancements	•

	<b>Check-in/ Waiting Rooming</b>	<b>Description:</b> After patient checks in, before encounter with clinical team
	Current Information flow	•
	Planned Enhancements	•

	<b>Provider Encounter</b>	<b>Description:</b> Main encounter with Provider
	Current Information flow	•
	Planned Enhancements	•

	<b>Encounter Closing</b>	<b>Description:</b> After main provider encounter, but before patient leaves the office
	Current Information flow	•
	Planned Enhancements	•

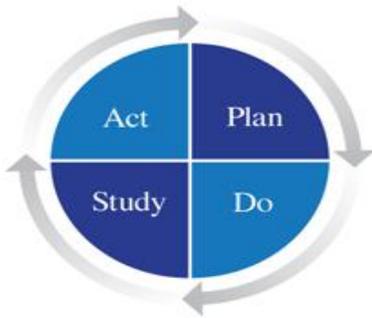
*C. These activities occur after the patient leaves the office*

	<b>After Patient Leaves Office</b>	<b>Description:</b> The particular encounter has concluded and the patient is no longer in the office
	Current Information flow	•
	Planned Enhancements	•

	<b>Outside Encounters</b>	<b>Description:</b> Activities focused on the entire patient panel
	Current Information flow	•
	Planned Enhancements	•

## Appendix G: PDSA Cycle

The PDSA Cycle is a systematic series of steps for gaining valuable learning and knowledge for the continual improvement of a product or process. Also known as the Deming Wheel, or Deming Cycle, the concept and application was first introduced to Dr. Deming by his mentor, Walter Shewhart of the famous Bell Laboratories in New York.



The cycle begins with the Plan step. This involves identifying a goal or purpose, formulating a theory, defining success metrics and putting a plan into action. These activities are followed by the Do step, in which the components of the plan are implemented, such as making a product. Next comes the Study step, where outcomes are monitored to test the validity of the plan for signs of progress and success, or problems and areas for improvement. The Act step closes the cycle, integrating the learning generated by the entire process, which can be used to adjust the goal, change methods or even reformulate a theory altogether. These four steps are repeated over and over as part of a never-ending cycle of continual improvement.

Reference: The Deming Institute: <https://www.deming.org/theman/theories/pdsacycle>

### The Institute for Healthcare Improvement (IHI) Model for Improvement

The IHI Model for Improvement is a simple strategy that many organizations currently use to accelerate their improvement strategies. A CQI initiative based on the IHI Model for Improvement focuses on setting aims and teambuilding to achieve change. It promotes improvement by seeking answers to three questions:

- What are we trying to accomplish?
- How will we know that a change is an improvement?
- What changes can we make that will result in improvement?

#### Principles

To answer these questions, a CQI initiative uses a Plan-Do-Study-Act (PDSA) cycle to test a proposed change or CQI initiative in the actual work setting so changes are rapidly deployed and disseminated. The cycle involves the following seven steps:

**Form the team.** Including the appropriate people on a process improvement team is critical to a successful effort. The practice (or provider) must determine the team's size and members. Practice staff persons are the experts at what works well in the practice and what needs to be improved. Include them in identifying and planning the implementation of any eCQI initiative.

**Set aims.** This step answers the question: What are we trying to accomplish? Aims should be specific, have a defined time period, and be measurable. Aims should also include a definition of who will be affected: patient population, staff members, etc. For practice transformation, the aims should ideally be consistent with achieving one or more of the triple aims previously discussed.

**Establish measures.** This step answers the question: How will we know that a change is an improvement? Outcome measures should be identified to evaluate if aims are met. Practices should select measures using data they are able to collect.

**Select changes.** This step answers the question: What changes can we make that will result in improvement? The team should consider ideas from multiple sources and select changes that make sense.

**Test changes.** First, the changes must be planned and downstream impacts analyzed to assess whether they had the desired outcome or output. Once the changes are implemented, the results should be observed so that lessons learned and best practices can be used to drive future changes.

**Implement changes.** After testing a change on a small scale, learning from each test, and refining the change through several PDSA cycles, the team may implement the change on a broader scale—for example, for a pilot population or on an entire unit.

**Spread changes.** After successful implementation of a change(s) for a pilot population or an entire unit, the team can disseminate the changes to other parts of the organization.

Reference:

<http://www.ihl.org/resources/Pages/HowtoImprove/ScienceofImprovementHowtoImprove.asp>  
[X](#)

## Identifying and Selecting Changes

While all changes do not lead to improvement, all improvement requires change. The ability to develop, test, and implement changes is essential for any individual, group, or organization that wants to continuously improve. There are many kinds of changes that will lead to improvement, but these specific changes are developed from a limited number of change concepts.

A change concept is a general notion or approach to change that has been found to be useful in developing specific ideas for changes that lead to improvement.

Creatively combining these change concepts with knowledge about specific subjects can help generate ideas for tests of change.

After generating ideas, run Plan-Do-Study-Act (PDSA) cycles to test a change or group of changes on a small scale to see if they result in improvement. If they do, expand the tests and gradually incorporate larger and larger samples until you are confident that the changes should be adopted more widely.

- **Eliminate Waste**—look for ways of eliminating any activity or resource in the organization that does not add value to an external customer.
- **Improve Work Flow**—improving the flow of work in processes is an important way to improve the quality of the goods and services produced by those processes.
- **Optimize Inventory**—Inventory of all types is a possible source of waste in organizations; understanding where inventory is stored in a system is the first step in finding opportunities for improvement.

- **Change the Work Environment**—changing the work environment itself can be a high-leverage opportunity for making all other process changes more effective.
- **Producer/Customer Interface**—to benefit from improvements in quality of products and services, the customer must recognize and appreciate the improvements.
- **Manage Time**—an organization can gain a competitive advantage by reducing the time to develop new products, waiting times for services, lead times for orders and deliveries, and cycle times for all functions in the organization.
- **Focus on Variation**—reducing variation improves the predictability of outcomes and helps reduce the frequency of poor results.
- **Error proofing** - organizations can reduce errors by redesigning the system to make it less likely for people in the system to make errors. One way to error proof a system is to make the information necessary to perform a task available in the external world, and not just in one's memory, by writing it down or by actually making it inherent in the product or process.

Reference: Institute for Healthcare Improvement:

[http://www.reachoutandread.org/FileRepository/QI\\_ImprovementMethods\\_0311\\_FINAL\\_POST.pdf](http://www.reachoutandread.org/FileRepository/QI_ImprovementMethods_0311_FINAL_POST.pdf)

## Appendix H: Use of Data

### Overview: Have the Right Data and Use the Data Well

For all eCQI projects, a practice must use quality data; thus, every effort should be made to ensure data are timely, accurate, and measure what they are intended to measure.

- **Consider the source of the data for each metric needed to assess performance.** The EHR cannot collect every kind of data needed for CQI. Some data may have to be collected by someone watching and tracking activities in real time or through surveys of staff and patients.
- **Ensure that the EHR collects the data needed to support eCQI efforts as structured data in the EHR.** Data stored in free text fields or document images will not automate data collection. Ideally, it is best to know this before an EHR is purchased or upgraded.
- **Establish targets and benchmarks.** The results of a eCQI analysis are meaningless if no data exist for comparison. Many clinical measures have national and regional benchmarks (e.g., HEDIS for process of care measures). The best benchmark, however, is generated within the practice through the collection of baseline data which the practice uses to set a reasonable target for improvement over a specified period. Improvement is tracked by periodic comparison of pre- and post-data.
- **Establish a broad set of measures—structure, process, and outcomes.** Although quality (outcome) measurement is a prime concern, on its own it tells nothing about why outcomes occur. Collecting structure and process measures will help uncover and address the underlying causes of poor performance.
- **Aggregate data to assess the practice population.** One of the most efficient ways to carry out eCQI initiatives focused on quality of care is to aggregate the data for patients with similar conditions into a registry. These patients often experience similar issues with treatments, medication adherence, and coordination with specialists so it makes sense to view them as a distinct population that a practice monitors and tracks over time. In addition, a disease registry allows the practice to identify patients who are outliers and may need even more attention and follow-up.
- **Conduct periodic data quality audits.** Most measures are captured as simple statistics (e.g., counts, percent, mean and mode) so ensure that the EHR is producing accurate and complete denominator and numerator data.

Reference:

[http://www.healthit.gov/sites/default/files/continuousqualityimprovementprimer\\_feb2014.pdf](http://www.healthit.gov/sites/default/files/continuousqualityimprovementprimer_feb2014.pdf)

### Specific steps you can take to understand, use and validate your data:

#### 1. *First, understand your reporting capability*

The following factors can affect what level of reporting functionality you have at your facility:

- ▶ Reporting functionality differs between software companies.
- ▶ Even with the same software, functionality may vary between facilities based on what was purchased by the facility.
- ▶ Functionality at the facility level can vary between individuals based on permissions and security access levels. You may need to obtain permission from your system administrator for the access to run or create reports.

*Standard or “Canned” Reports*

Most facilities will have purchased a basic level of reporting that allows the creation of required reports such as, Meaningful Use, Clinical Quality Measures and Physician Quality Reporting. These may be referred to by your software as “canned or standard” report options.

There may also be canned reports available to other departments such as pharmacy or accounting and executive level staff that may be surprisingly useful in QI projects. It would be a useful exercise to query other departments or get a list from the software company of the types of “canned” reports available within your facility. For example, the pharmacy may have access to a drug use evaluation report that you could use for monitoring an antibiotic stewardship program.

The standard reports used by a software company may be from third party software (such as Iatric Systems with Meditech) that you may need to gain

access to. It is important for you to find out which reports are standard for your facility.

*Data validation is a key step to ensuring the credibility of your data.*

*Query other departments or get a list from the software company of the types of “canned” reports available within all areas of your facility.*

#### *Customized or “Ad Hoc” Reports*

You may or may not be able to generate customized reports internally. If they cannot be generated internally you may need to request them from the software company. However, only do this if the first step above still does not get you the reports that are needed as often times there is a cost associated with generating customized reports.

If there is the ability to generate customized reports internally, it is important to learn the following from your software company about the reports:

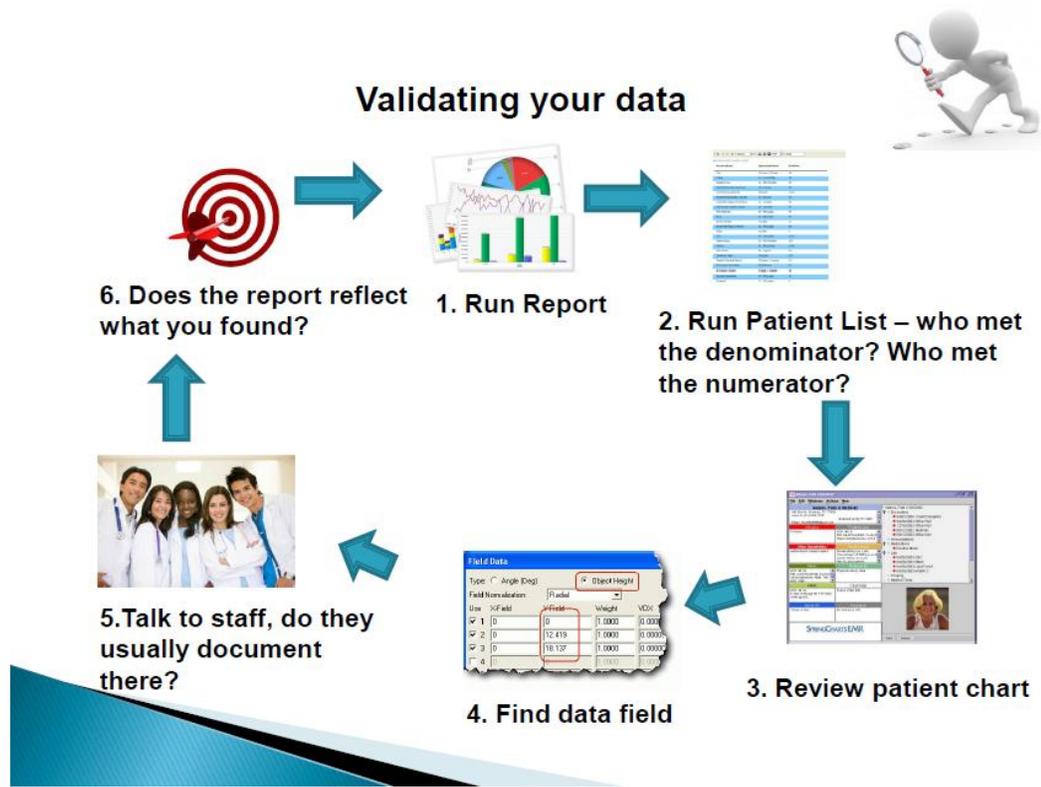
- ▶ What kind of operators or “query strings” are available (commands like, AND, OR, EQUALS, LESS THAN, MORE THAN, etc.)?
- ▶ What fields are identified as “available” or “not available” to pull data from and where do you find this information (software manual, etc.)?
- ▶ What databases can you run reports from? As noted in section 1, if you have separate databases for clinical and practice management information, you may have to run separate reports to get all the information you need.
- ▶ Can you pull data from customized documentation templates?
- ▶ How to pull data and export into another program such as Excel so that you can work with the data. Pulling into a pdf file is not useful if you need to do any manipulation of the information.

However, we know that reporting alone does not equal improvement....

## **2. EHR Data collection and use**

Once you understand what reports you have to work with, you can move on to using what data is available to make real improvements.

Once a metric is defined and a data element on a report identified, you will need to validate the data that is being pulled to the report. This process involves working backward from a report all the way to the data field it is pulled from to **validate the accuracy of the information**. It is much like the process of a root cause analysis. You are following the data all the way back to its “root” and then discovering why it may not be entered or pulled to the report correctly.



The following are key factors promoted by HIMSS to ensuring you are collecting useful and accurate data from an EHR (Ellen Harper DNP, 2015):

- ▶ Promote/utilize standardized terminologies – using ANA terminology, SNOMED and LOINC – most of these terminologies are in place for you if you are on CEHRT as it is part of the certification process for Meaningful Use.
- ▶ Use research based, nationally recognized assessment scales or tools as they are evidence based, can be more cost effective than designing unique tools, and allow for QI purposes as an opportunity for care delivery comparison with potential national benchmarking capability.
- ▶ Consistent use of discrete data = little to no free text in important fields. Free text entry has its purpose, but not in fields from where you are trying to collect accurate useful data. Entries of “within normal limits” also do not provide useful data.

Streamlining the workflow of the clinician as opposed to making them chart “one more thing” is a significant contributor to user success. The following strategies can be used to optimize documenting with an EHR:

- ▶ Directly observing how staff utilizes the EHR
- ▶ Evaluating for a need for additional training on the EHR software or computer skills, utilizing user “favorites” for ease of use, sensitivity of CDS, etc.
- ▶ Mapping process and workflows (this includes EHR processes and workflows) with frontline staff to identify where they are performing workarounds, avoiding alerts, running into issues.
- ▶ Evaluate the effect of the physical environment. Is the layout and placement of computers or laptops/tablets conducive to productivity and accurate charting? Or do you have to walk a long distance from the patient’s room before you can chart? Are there enough devices? How many staff can be logged into a patient’s chart at the same time?
- ▶ Evaluate what information is being collected and how often it is duplicated by another role or the same user. This should be done on an ongoing basis before any “new” item/assessment tool, etc. is added to the EHR, be sure the information is not already captured elsewhere.
- ▶ Determine alternative sources for data entry – for example, previous admission information, demographics, office visit information, ER visit information, etc. There is the potential for the patient/family to enter some of their information into the record on a device at the bedside or in the waiting room.
- ▶ Supply value for and feedback on the data that is being collected to the clinicians. Involvement in choosing QI metrics as well as information flow back to the clinicians provides a value for time spent on data entry.

## Appendix I: Basic QI Data Collection Tools

### Introduction

Most organizations use quality tools for various purposes to improve, control and assure quality.

Although a number of quality tools are available for certain domains, fields and practices, some of the quality tools can be used across industries. The quality tools included in this guide are intended to be generic for use in any setting for various disease conditions, or improvement to workflows or any other outcome.

There are primarily seven basic quality tools. When used appropriately, these tools can provide objective insight to problems in the organization as well as assist with developing solutions. Typically brief training, mostly a self-training, is sufficient for someone to start using the tools.

We will briefly review each of the seven tools.

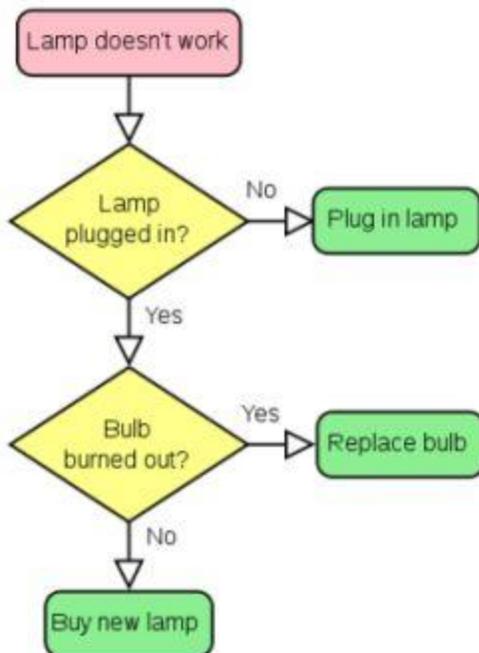
### 1. Flow Charts

A basic quality tool that can be used for visual analysis regarding the sequence of events is a flowchart.

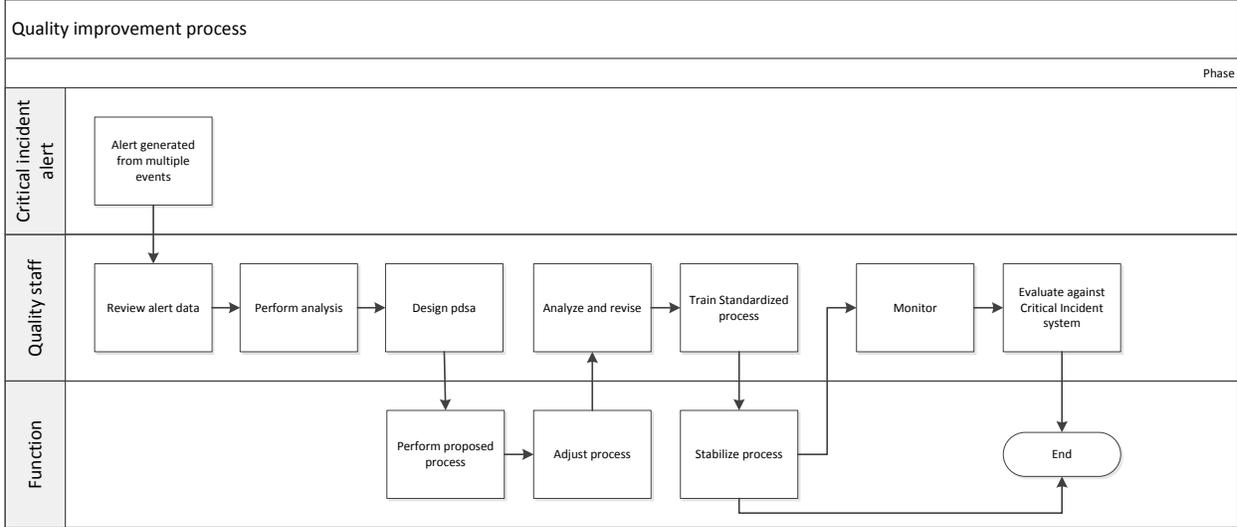
Flowcharts map out a sequence of events that take place sequentially or in parallel. The flow chart can be used to understand the relationships and dependencies between events of a complex process.

You can also determine the critical path of the process and the events pertinent to the critical path with a flowchart.

There are specific software tools developed for drawing flow charts, such as MS Visio and some flowchart tools available in Excel or you can download some of the open source flow chart tools for free.



A swim lane diagram is another type of flow chart. The swim lane flowchart differs from other flowcharts in that processes and decisions are grouped visually by placing them in lanes. Swim lane (or swim lane diagram) is a visual element used in process flow diagrams, or flowcharts, that visually distinguish job sharing and responsibilities for sub-processes of a business process. Swim lanes may be arranged either horizontally or vertically.

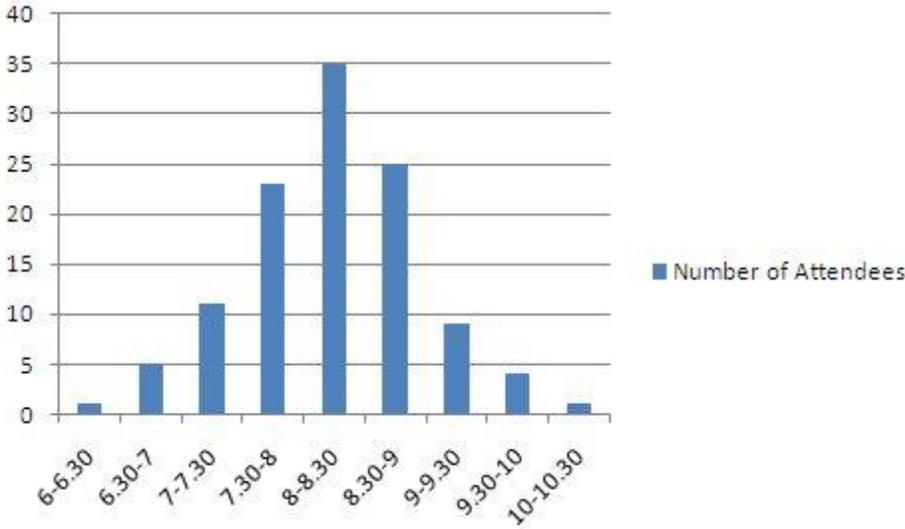


Reference: Wikipedia (Swim lane only) [http://en.wikipedia.org/wiki/Swim\\_lane](http://en.wikipedia.org/wiki/Swim_lane)

**2. Histogram**

A histogram is used for illustrating the frequency and the extent in the context of two variables. The histogram is a chart with columns that represent distribution by mean. If the histogram is normal, the graph takes the shape of a bell curve. If it is not normal, it may take different shapes based on the condition of the distribution. A histogram should always be two variables measured against each other.

Consider the following example: The histogram below shows morning attendance of a class. The X-axis is the number of students and the Y-axis the time of the day.



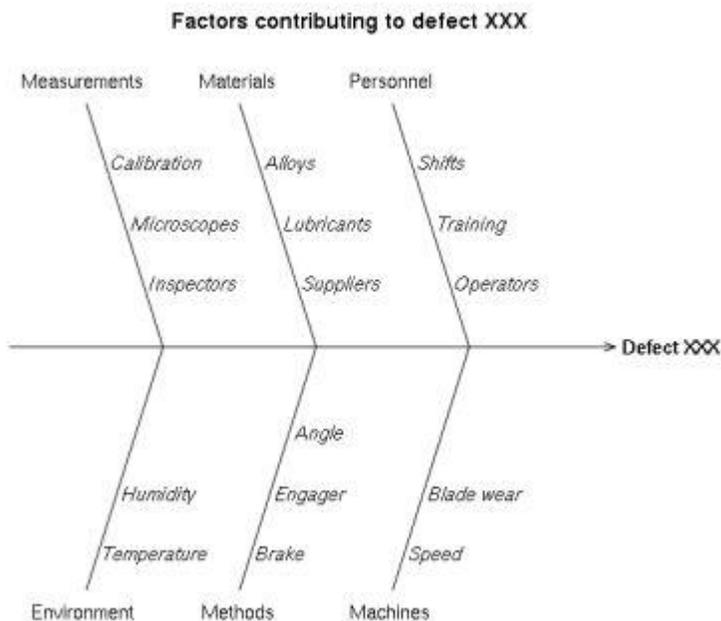
### 3. Cause and Effect Diagram

Organizations face problems everyday and it is important to understand the causes of these problems in order to solve them effectively. Cause and effect diagrams (Ishikawa Diagram) are used for understanding organizational or business problem causes.

Developing a cause and effect diagram should be a teamwork exercise and consists of the following steps:

1. A brainstorming session is required in order to come up with the components of the cause and effect diagram.
2. All the main components of a problem area are listed and possible causes from each area are listed.
3. Then, most likely causes of the problems are identified to carry out further analysis.

Below is an example of a completed cause and effect diagram:



### 4. Check Sheet

A check sheet can be introduced as the most basic tool for quality. A check sheet is basically used for gathering and organizing data as well as standardizing processes.

When this is done with the help of software packages such as Microsoft Excel, you can derive further analysis graphs and automate through available macros.

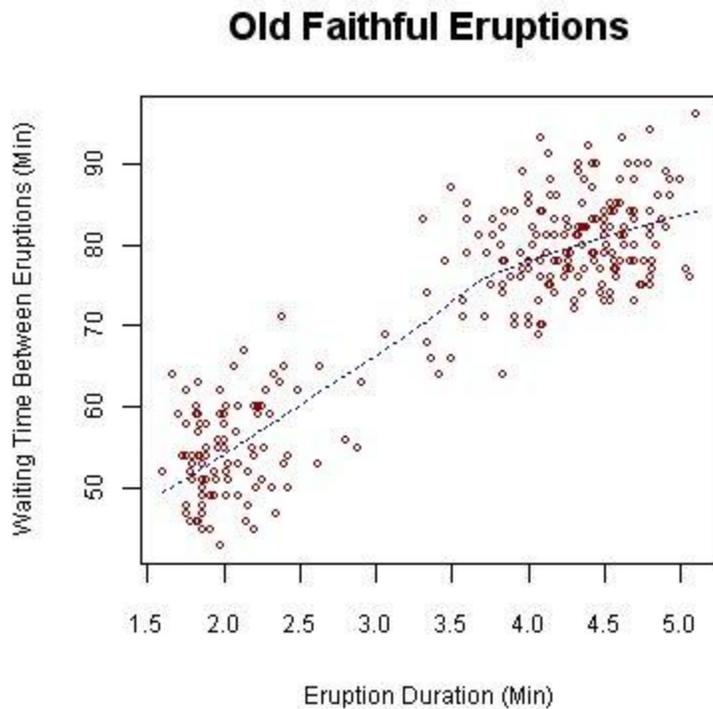
Therefore, it is a good idea to use a software check sheet for information gathering and organizing needs.

One can always use a paper-based check sheet when the information gathered is only used for backup or storing purposes other than further processing.

## 5. Scatter Diagram

When it comes to the values of two variables, scatter diagrams are the best way to present. Scatter diagrams present the relationship between two variables and illustrate the results on a Cartesian plane.

Then, further analysis, such as trend analysis can be performed on the values. In these diagrams, one variable denotes one axis and another variable denotes the other axis.

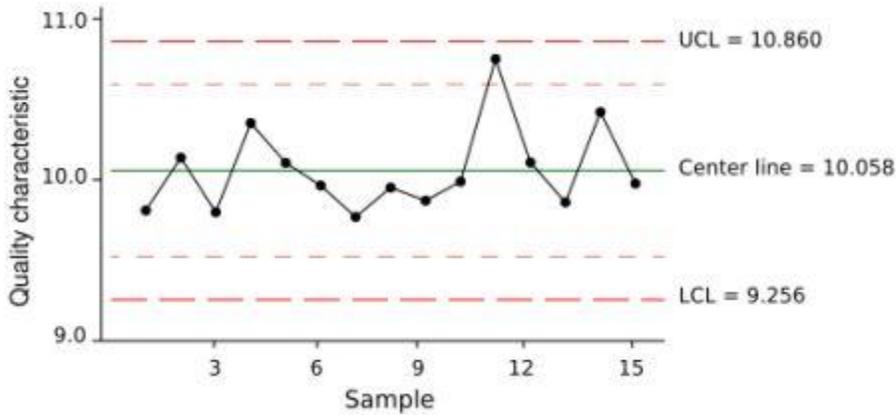


## 6. Control Charts

Control chart is the best tool for monitoring the performance of a process. These types of charts can be used for monitoring any processes related to function of the organization.

These charts allow you to identify the following conditions related to the process that has been monitored.

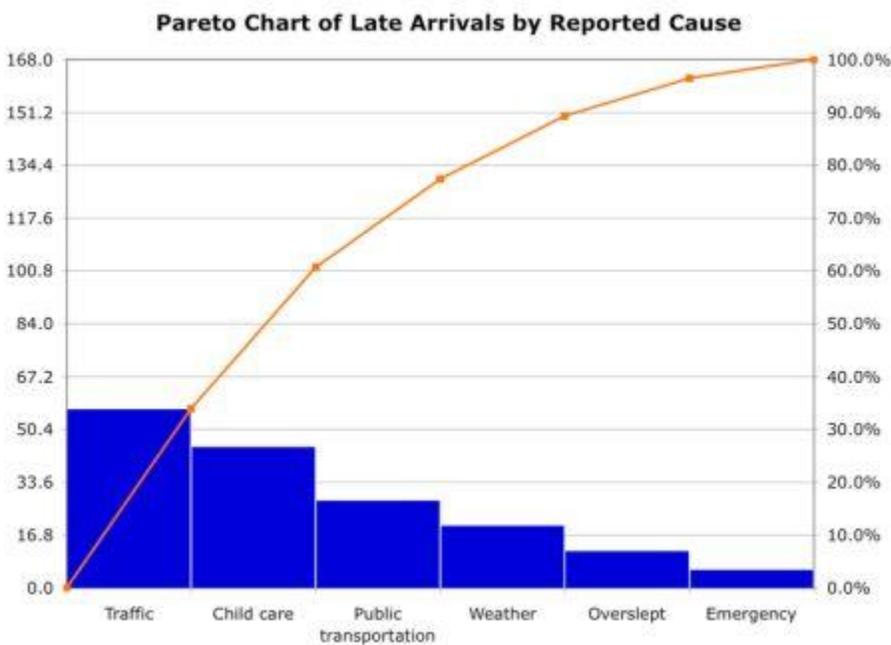
- Stability of the process
- Predictability of the process
- Identification of common cause of variation
- Special conditions where the monitoring party needs to react



## 7. Pareto Charts

Pareto charts are used for identifying a set of priorities. You can chart any number of issues/variables related to a specific concern and record the number of occurrences.

This tool assists in determining the parameters that have the highest impact on the specific concern in order to prioritize issues and work more focused and effectively on controlling the process.



## Conclusion

The seven basic quality tools we reviewed can assist you to address different concerns in your organization. Widespread and standardized use of such tools in improvement activities could enhance the efficiency of quality improvement projects and the organization as a whole

Reference: [http://www.tutorialspoint.com/management\\_concepts/basic\\_quality\\_tools.htm](http://www.tutorialspoint.com/management_concepts/basic_quality_tools.htm) (all except swim lane diagram)

## Appendix J: Organization eCQI Assessment Survey Sample

<b>Date Completed:</b>	
<b>Organization Name:</b>	Organizatio n City:
<b>Organization Type: (Clinic/RHC/FQHC, Hospital/PPS/CAH)</b>	Organizatio n State:

<b>System Assessment</b>	<b>Facility Response</b>
EHR Vendor	
EHR System and Version	
Is this system/version CHPL Certified to 2014 or later standards?	
Is this system hosted or off site? If so by who?	
Finance system and version (if different from EHR)	
Report writing system and version (if different from EHR)	
Do you have onsite EHR technical support? If not who provides this for you?	
Who currently has access to running standard reports (Meaningful use, MIPS, IQR, etc.)?	
Who currently has access to creating and running custom reporting?	
Is your organization comfortable and experienced creating customized reports?	
Additional information/notes/questions	

<b>EHR Use Assessment</b>	<b>Facility Response</b>
Number of locations included in EHR database	
Patient population using EHR (all, main clinic only partial population, ER only, inpatient only)	
What clinical decision support (CDS) rules are currently in place?	
Can you create new or customize existing CDS rules?	
Is patient portal functionality activated?	
Are patients actively using patient portal?	
What information is currently available to patients via the portal?	
Do you use patient level alerts?	
Can you create new or customize existing patient alerts?	
Are reports available that monitor the use/override of CDS alerts?	
Are reports available that identify all CDS rules currently active?	
Are reports available that identify all patient level alerts currently active?	
Do you submit information to any chronic condition registry? If so, which one	
Do you submit immunization or lab information to the state registry?	
Do you electronically submit transition of care documents to other facilities?	
Do you have a meaningful use dashboard?	
Do you have a chronic care management dashboard?	
Additional information/notes/questions	

<b>Quality Reporting Assessment</b>	<b>Facility Response</b>
-------------------------------------	--------------------------

Did you attest MU last year? If so, what stage?	
Are you currently or did you ever report to the EHR Incentive program (MU)?	
Who is currently monitoring your MU performance and in charge of success?	
Did you report PQRS last year? If so, what method (claims, registry, EHR GPRO Web Interface)	
Will you be reporting to MIPS this year?	
If so, what method (claims, registry, EHR, GPRO Web Interface)	
Who is currently monitoring your MIPS Performance and in charge of success?	
What efforts have you taken to validate this quality performance data?	
Please identify any other external initiatives you are participating in: (UDS, PCMH, APM, IQR, DPHHS, QIO etc.), what measures are you tracking for these initiatives?	
Who is currently monitoring performance and in charge of success?	
Please identify any internal QI indicators you are currently monitoring and who they are reported to	
Who is currently monitoring performance and in charge of success?	
What efforts have you taken to validate this quality performance data?	
How many Clinical Quality Measures (CQMs) are you able to track and report on in your EHR?	
Are you able to run quality reports (CQM) on demand?	
Are you able to customize your quality (CQM) reports (fields, date ranges, payer, diagnosis, etc)?	
What other quality reporting options (other than CQMs) or functionality is available in your EHR (dashboards, IQR/PCMH or other quality program tracking)?	
Are you confident in the quality of data in your CQM or other reports?	
Are you confident that the correct workflows are being used to populate the EHR with data needed to populate the quality reports?	
Does your EHR vendor provide documented workflows to support the CQM reports?	
Are you able to export your CQM reports in QRDA type 1 or 3 format?	
Additional information/notes/questions	
<b>QI Culture Assessment</b>	<b>Facility Response</b>
Do you have a QI Committee?	
Do you have a QI Team?	
Do you have a clear process for the flow of data and reporting through your facility to outside entities?	
Do staff/providers receive feedback reports regarding QI initiatives/reporting?	
Is QI performance tracked/graphed regularly and reported to staff or displayed?	
Additional information/notes/questions	
<b>TA Assessment</b>	<b>Facility Response</b>
What type of technical assistance would you like?	
Additional information/notes/questions	

## Appendix K: Certified EHR & EHR Adoption

### 3. Definition of a Certified EHR

#### What does it mean to have a Certified EHR?

The Office of the National Coordinator has established standards and certification criteria by which a vendor (software companies are referred to as “vendors”) can become accredited to indicate their software has met the functional requirements necessary to assist a facility or provider in meeting Meaningful Use. In order to attest to Meaningful Use, providers/organizations must have implemented Certified Electronic Health Record Technology or CEHRT and used this technology to meet the Meaningful Use criteria.

*Certification does not mean standardization of EHR software!*

#### What does it NOT mean to have a Certified EHR?

Certification does not mean standardization. Certification simply indicates that software has met the basic necessary criteria for achieving Meaningful Use. The outcome is that software systems differ greatly in their workflow. This has resulted in some confusion and frustration among providers and organizations.

#### There are some consistent components to an EHR.

EHR's are consistently composed of “like” basic parts –

1) The **Practice Management System (PMS)** is often a separate database from the EHR, but typically includes the following parts:

- ▶ Scheduling and billing module
- ▶ Registration/check in
- ▶ Demographics
- ▶ Claims
- ▶ Business report generation

2) The **Electronic Health Record (EHR)** is the clinical documentation and results system which generally includes:

- ▶ Health information and data
- ▶ Clinical Decision Support (CDS)
- ▶ Computer Provider Order Entry (CPOE) – procedures, tests, med, imaging, etc.
- ▶ Medication management (drug formulary, allergy, reconciliation)
- ▶ eRX – electronic prescribing (usually a 3<sup>rd</sup> party application – integrated with E.M.R – eg. Surescripts)
- ▶ Population Health Management – data collection and transmission tools/interface

*The components of an EHR may be built from different databases, which could impact how your QI data is collected.*

### 4. Achieving widespread use/adoption of the EHR

There is not a “magic bullet” to successfully achieving widespread use, and if you achieve widespread use, this is far different from being successful at widespread user satisfaction. What does exist now that did not 10 years ago is mainstream use that provides us with experience we can use to do a better job at adopting EHRs. Briefly, the factors consistent with the most successful organizations (success meaning, widespread use with general user acceptance):

- ▶ Active leadership involvement at all levels, to include the Board, Executive, Management and Supervisors
- ▶ Active provider and front line staff input in the selection process
- ▶ Utilization of decision making tools (to provide documentation)
- ▶ Narrowing the field early to vendors that make sense for the organization (don't spend time on a vendor you know you can't afford in the end).
- ▶ Due diligence in understanding the contract and maintenance agreements
- ▶ Ongoing communication and discussion after implementation!
- ▶ Dedication to continuing to make improvements for increased user satisfaction and adoption.

*“Go-Live day” is not the end, it is the beginning!*

#### **5. What does achieving widespread use mean for Quality Improvement?**

The basic foundations for quality improvement can be addressed if providers and staff are using the same tool for data collection, ie the EHR. It can allow for more well-defined processes to reduce variation, monitor a process and to collect the data from charting without creating another data collection tool. (Stratis Health, 2009)

## Appendix L: eCQI Project Management Checklist

### eCQI Project Management Checklist

Top Level Tasks	Sub Tasks	Date Complete	Comments
Identify Project Scope			
	Identify outcome measure(s)		
	Establish baseline data/Confirm EHR workflow to support outcome measure		
	Document Project Scope		
Select Project Team			
	Document roles and responsibilities on Project Scope		
Create Change Backlog			
	Brainstorm list of possible changes		
	Review possible EHR functionality and clinical workflow changes		
	Prioritize change backlog		
	Document change backlog on Project Scope Document		
Create Sprint Backlog			
	Identify changes to be included in Sprint		
	Create PDSA document		
Perform PDSA cycle			
	Document PDSA findings (update PDSA document)		
Perform Sprint Review			
	Review and update Change Backlog		
Continue Sprint/PDSA cycle as needed			
	Goals of project are met		
Stabilize/Spread			
	Identify ongoing tracking of improvement		
	Create implementation plan		
	Spread improvement according to plan		
Close Project			
	Document lessons learned and best practices to be used on future eCQI projects		

## Appendix M: Workflow/Process Mapping Info and Template

When to use workflow mapping for an existing process:

- ▶ Process is wasteful
- ▶ RCA/known to be problem/error prone area
- ▶ Bad data or to help validate data in EHR or registry (or other database)
- ▶ To populate data report (eg. the correct data entry to populate a CQM or custom report)
- ▶ New device/product/supply is being added to a current process
- ▶ Significant EHR documentation change
- ▶ Patient/Staff are dissatisfied with current process
- ▶ Examples:
  - Patient scheduling takes too long
  - Increase in Med errors with bedside bar code scanning
  - **Validate/review data entry and collection for CQMs**

When to use workflow mapping for a new process:

- ▶ Significant change in flow of care delivery
- ▶ Significant change in documentation of care delivery
- ▶ Addition of or change in a device or product
- ▶ New regulatory requirements
- ▶ Examples:
  - Moving into a new unit or building – process of the move in addition to utilization of new space
  - Adding bedside bar code scanning
  - Additional documentation required for new sepsis protocol

Layers of workflow:

1. Physical
  - Includes environmental layout of patient room, equipment, devices, supplies, etc
2. Electronic
  - How is the work documented? What screens and fields are used?
3. Data
  - Where does the information documented go?
  - Why does it go there (triggers or reports)?
  - How does it get there (interfaces, uploads, etc)

Steps to workflow mapping:

- ▶ Map the “As is” process
- ▶ Analyze the “As is” process
- ▶ Create the “To Be” process
  - Identify points of change and what the change will look like
- ▶ Map the part of the process that is:
  - Measurable
  - Most directly affects the overall outcome

## Workflow Scope Template

<p><b>1. Process to be analyzed:</b></p> <p>Basic overview/title.</p>	
<p><b>2. Why is this process being chosen to analyze?</b></p> <p>What brought up the desire to map the process?</p>	
<p><b>3. Improvement SMART goal/target:</b></p> <p>(Specific, Measurable, Action oriented, Realistic and Time based)</p>	
<p><b>4. Scope of workflow to be analyzed (clearly define start point and end point):</b></p>	
<p><b>5. EHR/Documentation system, module and / or applications involved:</b></p>	
<p><b>6. Items/equipment/devices involved in process:</b></p>	
<p><b>7. Physical locations involved in process:</b></p>	
<p><b>8. Staff/people involved in process:</b></p>	
<p><b>9. How will the process be mapped (swim lane, basic workflow, etc) using what method (discussion or observation)?</b></p>	
<p><b>10. Who will own the map once completed?</b></p>	

<b>11. Planned start date/target end date (of mapping exercise)</b>	
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Materials Checklist:

- Flipchart
- Marker board
- Erasable markers
- Smart board
- Sticky notes
- Electronic documentation tool – Visio, Excel, Gliffy.com
- Map of workflow project area – blueprints or a simple sketch – several copies or blown up on projector screen, Smart board or marker board.
- EHR access to systems, screens, fields used during workflow
- Printer
- New product, device, equipment or supply item (if applicable)

## Appendix N: References, Resources and Acronyms

### 1. References and Resources

- Ellen Harper DNP, R.-B. M.-B. (2015, February 23). Guiding Principles for Big Data in Nursing.
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- Stratis Health. (2009, April 27). Quality Improvement Basics: From QA to QI.
- Office of National Coordinator Healthit.gov; eCQI: What it is, and it can help you
- Office of National Coordinator, National Learning Consortium (2013, April 30) healthit.gov; Continuous Quality Improvement Strategies to Optimize your Practice
- Institute for Healthcare Improvement: www.ihi.org. How to improve: <http://www.ihi.org/resources/Pages/HowtoImprove/default.aspx>
- Health IT.gov eCQI resources: <https://www.healthit.gov/providers-professionals/planning-and-implementing-improved-care-processes> , <https://ecqi.healthit.gov/>, <https://www.healthit.gov/providers-professionals/measuring-care-processes-and-outcomes>,
- Institute for Healthcare Improvement: Quality Improvement Basics: <http://www.ihi.org/resources/pages/howtoimprove/scienceofimprovementhowtoimprove.aspx>
- Agile/Scrum Methodology: <https://www.cprime.com/resources/what-is-agile-what-is-scrum/>

### 2. Acronyms:

ANA – American Nurses Association

APM – Advanced Alternative Payment Models

CDS – Clinical Decision Support

CMS – Centers for Medicare & Medicaid Services

CPOE - Computer Provider Order Entry

CQM – Clinical Quality Measures

eCQI – Health IT Enabled (or electronic) Clinical Quality Improvement

eCQM – electronically reporting Clinical Quality Measures

EHR – Electronic Health Record

EMR – Electronic Medical Record

eAccess – Electronic access to health records – Patient Portal

EH – Eligible Hospital  
EP – Eligible Provider  
eRX – Electronic prescribing  
HIE – Health Information Exchange  
HIT – Health Information Technology  
LOINC - Logical Observation Identifiers Names & Codes  
MU – Meaningful Use  
MACRA – Medicare Access and CHIP Reauthorization Act  
MIPS – Merit-based Incentive Payment System  
NQF – National Quality Forum  
ONC –The Office of the National Coordinator for Health Information Technology  
PCMH – Patient Centered Medical Home  
PDSA – Plan Do Study Act  
PM – Project Management  
PMS – Practice Management System  
PQRS – Physician Quality Reporting System  
QI – Quality Improvement  
SNOMED CT - Systematized Nomenclature of Medicine -- Clinical Terms  
SRA – Security Risk Assessment  
VDT – View, Download and Transfer