New York State
Partnership
for Patients

Unit-Based Patient Safety and Quality Improvement Toolkit

A partnership of the Healthcare Association of New York State
and the Greater New York Hospital Association.

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Introduction

The Centers for Medicare & Medicaid Services' (CMS) Partnership for Patients' goals under the Hospital Improvement and Innovation Network (HIIN) program are to reduce avoidable hospital-acquired conditions (HACs) and readmissions. The New York State Partnership for Patients (NYSPFP), a partnership of the Greater New York Hospital Association (GNYHA) and the Healthcare Association of New York State (HANYS) in collaboration with IPRO, the State's Quality Improvement Organization (QIO), has been working with hospitals since 2012 to achieve these goals by implementing evidence-based best practices to reduce HACs and readmissions using a multifaceted approach to quality improvement. Key to the success of these efforts is leveraging the knowledge of unit-level frontline staff to inform change at the unit level.

Frontline care givers often have the most knowledge about patient safety hazards and the ability to decrease the occurrence of HACs and readmissions. By engaging frontline staff in quality improvement (QI) efforts, hospital leaders can leverage their knowledge to develop sustainable change and ensure desired harm prevention strategies are performed for every patient every time.

The following section describes NYSPFP's suggested strategies to engage frontline staff in QI efforts and develop a culture of safety through a Unit-Based Safety Approach.

NYSPFP Unit-Based Safety Approach

The Unit-Based Safety Approach is a process for interactive learning and bringing care improvement to the bedside and is characterized by:

- Awareness and involvement of staff in improvement processes
- Identification and implementation of standardized care processes to ensure reliable adherence to best practices (e.g., bedside and leadership rounds or patient safety checklists)
- Education and development to ensure staff have up-to-date knowledge on evidence-based interventions and the principles of the science of safety
- An organizational structure that supports the transition to a unit-level safety culture where staff seek to improve patient care and the work environment, readily and transparently share feedback, and are engaged in improvement activity to achieve unit-based excellence

Applying the Unit-Based Safety Approach, NYSPFP supports hospitals' efforts to:

- Convene unit-based teams to collaboratively solve problems, improve performance, and enhance the quality of measurable results[1]

1 P. Cohen, Ptaskiewicz M., and Mipos, D. "The Case for Unit-Based Teams: A Model for Front-line Engagement and Performance Improvement." *The Permanente Journal* vol. 14, no. 2 (Summer 2010); 70–75.

- Support unit-level leaders to coach team members to perform to the best of their abilities[2]
- Create dynamic leadership-staff partnerships to promote collaboration, shared decision-making, and accountability for improving the quality of care, patient safety, and enhancing staff satisfaction[3]

To support QI at the unit level, a broad range of tools are included in this document. Each tool is intended to complement existing unit-level resources, education, and information-sharing strategies to address harm reduction through:

- Generating awareness
- Identifying and addressing staff education needs
- Applying QI strategies
- Implementing best practices to achieve excellence

How to Use the Toolkit

This toolkit is designed to help hospitals plan, implement, and sustain interventions to reduce HACs and readmissions at the unit level. Each chapter contains various tools that can be adapted and used by frontline staff to address any HAC.

The toolkit supplements resources that hospitals may already have in place. With internal quality improvement department and NYSPFP project manager support, frontline hospital staff can opt to use all the tools in sequence or select and modify specific tools that meet unit-level QI needs.

Who should use the toolkit?

The toolkit is a resource to support unit-level frontline and managerial-level staff who are leading a QI initiative.

What is in the Toolkit?

Introduction
Describes NYSPFP's Unit-Based Safety Approach and how to use the toolkit

Chapter 1: Getting Started: How to Improve
Contains tools describing the overarching quality improvement philosophy behind the toolkit and helps teams select project goals.

Chapter 2: Planning and Implementing your QI Project
Contains tools to use in planning and implementing your chosen improvement project and tracking progress to maintain desired changes

Chapter 3: Maintaining Momentum and Sustaining Change: Keeping your QI Project Alive
Contains tools to sustain progress and spread improvements for enduring change

Chapter 4: Beyond the Basics
Contains a set of QI tools for use by frontline staff with support from the hospital's internal QI staff, as well as suggested tools for when the team is seeking innovative approaches to improving results

2 R. Sherman "5 Strategies to More Effectively Coach Nursing Staff," *Emerging RN Leader* (May 2013).
3 M. Anthony, "Shared Governance Models: The Theory, Practice, and Evidence." *Online Journal of Issues in Nursing* vol. 9, no. 1, (January 31, 2004), manuscript 4.

Chapter 1. Getting Started: How to Improve

NYSPFP suggests that hospital teams use the "Model for Improvement" to guide their work as recommended by the Institute for Healthcare Improvement (IHI). This toolkit closely follows the model's Plan-Do-Study-Act (PDSA) cycle. Additional tools, resources, and considerations from outside of the IHI QI essentials toolkit[4] are also included in the NYSPFP toolkit and are clearly noted in the description of each tool.

Hospital teams should review the Model for Improvement and the tools in the following chapters and select those that best suit their needs.

The following tool summarizes the Model for Improvement.

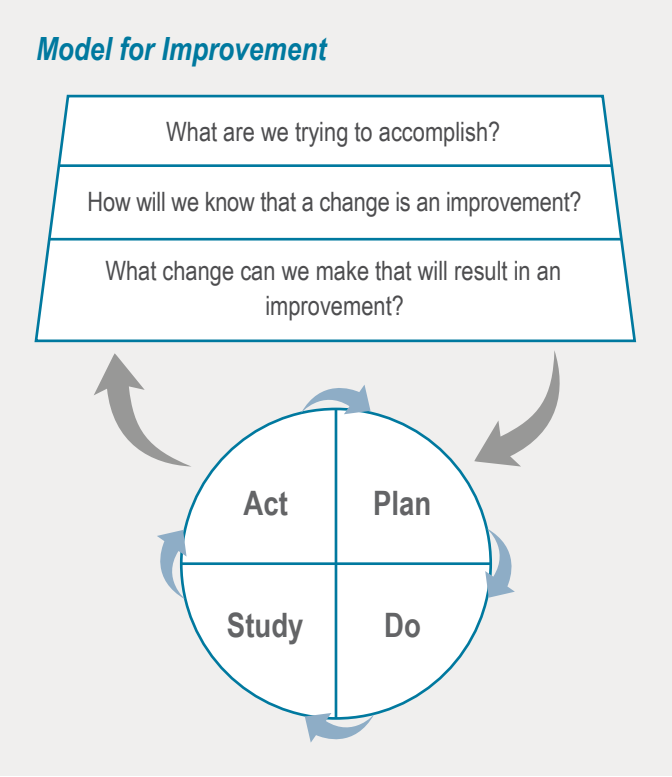
1.1 Model for Improvement

What is the tool?

Developed by the Associates in Process Improvement, the Model for Improvement is the framework used by the IHI for accelerating process change. A simple but transformative model, it is not intended to replace existing change models adopted by organizations.[5]

The model has two parts:

- Three fundamental questions, which set the overall plan for the improvements
- PDSA cycle, which could be used to test changes selected by the team



When should the tool be used?

The Model for Improvement tool can be used by the team when it is charged with improving a process. The model provides direction on how the team should set the project aim, select measures and changes, and test, implement, and spread. Using the model will lead the

4 Institute for Healthcare Improvement. "Quality Improvement Essentials Toolkit." (2017). **http://www.ihi.org/resources/Pages/Tools/Quality-Improvement-Essentials-Toolkit.aspx** (accessed on November 8, 2017).

5 Institute for Healthcare Improvement. "How to Improve."(2017). **http://www.ihi.org/resources/Pages/HowtoImprove/default.aspx** (accessed on November 8, 2017).

team through the steps required to achieve improvement results. It will guide teams to answer the following questions:

What are we trying to accomplish?

This is the improvement's aim. It should be specific, measurable, assignable, realistic, and time-based.

How will we know if a change is an improvement?

When answering this question, the team will identify the measures to be used to track the improvements.

What change can we make that may result in improvement?

This question will lead to the specific process changes that the team plans to test.

What are the Instructions for the Tool?

The Model for Improvement is available on the IHI website.

How to Improve

http://www.ihi.org/resources/Pages/HowtoImprove/default.aspx

Chapter 2. Planning and Implementing Your QI Project

This chapter contains tools to use in planning and implementing an improvement project and tracking progress to maintain desired changes.

The tools are organized to correspond with different stages of the start of a QI project. Unit-based teams can use all of the tools or select the specific tools that best match their needs.

Suggested Tools for Each Planning and Implementation Phase of a QI Project

Selecting an effective team prior to starting the QI initiative

2.1 Selecting your Team

Gathering ideas for intervention/change and identifying opportunities for improvement

2.2 Brainstorming
2.3 Obtain and Use Frontline Knowledge
2.4 Engage Patients and Family Caregivers in your QI Project
2.5 Flowcharting

Planning and preparing for challenges to the success of your QI project

2.6 Organizational Readiness Tool
2.5 Flowcharting
2.7 Developing Measures

Tools to plan and roll out your QI project

2.8 Action Planning Tool
2.9 PDSA

Tools to track the success of the project

2.10 Displaying and Sharing your QI data
2.11 Holding an Effective HAC Team/QI Meeting

2.1 Selecting your Team

What is the tool?

Each quality initiative should have a dedicated team of individuals with defined roles who are responsible for planning, implementing, and measuring results. This tool is a guide for identifying and selecting core team members and assigning appropriate roles.

The team should be comprised of individuals interested in the improvement subject who will function well together and have some subject-specific expertise to contribute to the initiative. Team members' roles should include but not be limited to the following:

- Executive sponsors
- Day-to-day leaders
- Technical experts
- Clinical leaders
- Unit-based champions

When should the tool be used?

It should be used at the beginning of the initiative to create a cohesive team. Quality improvement at the unit level benefits from input from individuals who work with the processes every day. Participation by various stakeholders will ensure that consideration is given from many viewpoints and that new ideas are available for the team to consider.

Tips and considerations for using the tool:

In addition to the types of members included in unit-based teams, the teams should consider the following:

- Teams should be limited in size, with five to eight members ideal
- Each team member should be supported by their supervisor in terms of commitment to the time required
- Diversity of team members (i.e., including members from multiple disciplines, including those without "direct patient care" responsibilities such as environmental services and transport) will benefit the group's work
- Team members should receive quality improvement training when needed
- Team members should understand and periodically discuss their roles to serve colleagues not represented on the team, and inform all stakeholders of the team's work
- Each team member should report on their own progress as a standing agenda item during routine meetings
- Team members should endeavor to attend all meetings and should not send a representative in their stead unless the team has preapproved. Substituting team members will slow the team's work.

What are the Instructions for the Tool?

The specific instructions on how to select team members are available on the IHI website.

Science of Improvement: Forming the Team
http://www.ihi.org/resources/Pages/Howto-Improve/ScienceofImprovementFormingtheTeam.aspx

Appoint a Safety Champion for Every Unit
http://www.ihi.org/resources/Pages/Changes/AppointaSafetyChampionforEveryUnit.aspx

Additional Resources

Module 14: Creating Quality Improvement Teams and QI Plans (Agency for Healthcare Research and Quality [AHRQ])
https://www.ahrq.gov/professionals/prevention-chronic-care/improve/system/pfhandbook/mod14.html

Improvement Teams (HRSA)
https://www.hrsa.gov/sites/default/files/quality/toolbox/508pdfs/improvementteams.pdf

2.2 Brainstorming

What is the tool?

Brainstorming is an idea-generation tool designed to produce large numbers of ideas through the interaction of members of a group.[6] Brainstorming establishes a framework and ground rules to facilitate the generation of a high volume of ideas by creating an atmosphere free of criticism and judgement.

When should the tool be used?

Brainstorming should be used whenever the team is attempting to identify new approaches or concepts. When a team is stuck in the "same old way" of thinking, for ex-

What are the Instructions for the Tool?

The specific steps for the tool are available on the IHI website.

Brainstorming Tool
http://www.ihi.org/resources/Pages/Tools/BrainstormingAffinityGroupingandMultivoting.aspx

6 Institute for Healthcare Improvement. "Idea Generation Tools: Brainstorming, Affinity Grouping and Multivoting." (2004). **http://www.ihi.org/resources/Pages/Tools/BrainstormingAffinityGroupingandMultivoting.aspx** (accessed on November 8, 2017).

7 M. Brassard and Ritter, D. *The Memory Jogger II: Health Care Edition: A Pocket Guide of Tools for Continuous Improvement and Effective Planning* (GOAL/QPC, 2016), 19.

ample, brainstorming can help motivate team members, generate enthusiasm, get input from each team member, and build on one another's creativity.[7] The team can brainstorm when it is ready to identify potential process changes or ways to spread improvements.

Tips and considerations for using the tool:

Remember to include feedback and ideas from team members from all shifts (night shift, day shift, weekend staff).

2.3 Using Frontline Knowledge

What is the tool?

Frontline staff knowledge integrates staff experiences into the implementation of quality improvement interventions to promote buy-in, ensure sustainability of changes, and contribute to culture change. This tool provides a structured, standardized approach to generating feedback by providing the team with sample questions to use to gather information from frontline staff.

When should the tool be used?

This tool should be used when staff ideas and feedback are needed on how processes can be improved as the desired intervention is implemented. By gathering information in a consistent, structured manner, the team can analyze feedback to adapt the implementation plan to adjust for barriers and opportunities identified.

The tool should be used to seek staff input on existing processes to inform quality improvement work. It includes questions to learn the following:

- Staff perceptions of leadership interest and commitment to the initiative
- Staff perceptions about the frequency of the event, and previous attempts to address the HAC targeted by the current initiative
- Staff perceptions on potential solutions to the HAC addressed by the initiative
- Staff perceptions on a specific, undesirable event

What are the instructions for using the tool?

Prior to using the tool with staff:

- Select a sample of frontline staff (four to eight people) from a selected unit
- Select a leadership/quality improvement leader for the unit
- Select a location to conduct the small group conversations. The location should be chosen to minimize interruptions and offer some privacy to encourage the open sharing of feedback

For ease of use, questions are organized by the different stages of maturity of your QI initiative.

- Select questions that will be used from the sample questions in the tool and create a customized list of standardized questions for the initiative
- Add any additional questions to the standardized list of questions that all staff groups selected for this exercise will be asked
- Gather staff in the small groups at the selected location to ask selected questions from the standardized list
- Ask open-ended questions with words such as what, how, and why to encourage dialogue and keep the questions on point.

Sample Questions to Ask at the Beginning of the Initiative

Assessing awareness of HAC and leadership support:

- When was the last [insert targeted HAC]?
- What do you think caused the [insert targeted HAC]?
- Does your unit currently have a team focused on [insert initiative name here, e.g., reducing falls]?
- Do you currently collect data on [insert targeted HAC]?
- What methods are used to share data with

the team on the unit?
- What methods to address [insert targeted HAC] have been successful to date?
- Were there previous efforts to address [insert targeted HAC]? If yes, what aspects of that initiative were successful, what didn't work, and why?
- How do you think leadership can help ensure that this initiative is successful?
- Please describe what you think can be done to prevent or minimize the harm from [insert targeted HAC]?

Assessing awareness of the initiative and perceived leadership support:
- Does your unit currently have a team focused on [insert initiative name here, e.g., reducing falls]?
- Do you know who the initiative champions are on your unit?
- Do you know who is leading the project?
- Who would you say is involved in the project and how are they helping the team be successful?
- How can leadership better support the initiative?
- What data has been shared with unit staff on [insert targeted HAC] rates?
- Are you aware of the [insert targeted HAC] rates on this unit?
- What methods have been used to share data?
- Do you know how you can provide ideas and feedback on the initiative outside of this conversation?

Assessing success and identifying opportunities for improvement:
- What are the greatest successes you have encountered related to the initiative?
- What are the greatest challenges you have encountered related to the initiative?
- Please describe what you think can be done to prevent or minimize the harm from [insert targeted HAC]

Additional Resource
Learn from Defects (AHRQ)
https://www.ahrq.gov/professionals/education/curriculum-tools/cusptoolkit/toolkit/learndefects.html

2.4 Patient and Care Partner* Engagement in your QI Work

What is the tool?

This tool is a guide for strategies to engage patients and care partners in the QI process that can be adapted for unit-based teams. AHRQ defines patient, family, and care partner engagement as "a set of behaviors by patients, family members, and health professionals and a set of organizational policies and procedures that foster both the inclusion of patients and family members as active members of the health care team and collaborative partnerships with providers and provider organizations.[8]"

Examples of such strategies include:

- Helping design and test new strategies, processes, or protocols to reduce HACs and readmissions

* NYSPFP uses the "care partner" term intentionally to highlight a family member, friend, or caregiver as an extension of the health care team; this also is promoted by the Institute for Patient and Family-Centered Care, Planetree, and CMS. The term can be used interchangeably with "caregiver."

8 Agency for Healthcare Research and Quality. "Guide to Patient and Family Engagement in Hospital Quality and Safety." (June 2013). **http://www.ahrq.gov/professionals/systems/hospital/engagingfamilies/index.html** (accessed on November 8, 2017).

- Including patient-centered concepts and strategies to meaningfully engage patients and care partners in education for physicians-in-training and staff orientation curriculum
- Incorporating patient-centered care practices for preventing HACs and readmissions

When should the tool be used?

This tool should be used in the planning phase of every initiative to incorporate the perspectives of the patient and care partner into the improvement plan. Teams should refer to the tool to identify opportunities to engage patients, families, and caregivers in designing the intervention, gathering ideas for opportunities for improvement, and in assessing the progress of the initiative. Once identified, these opportunities can then be added to the initiative's action plan.

What are the Instructions for the Tool?

Specific instructions and considerations for engaging patients and families, and for the tool are available on the NYSPFP website.

Patient and Family Engagement Resource Guide
https://www.nyspfp.org/Materials/NYSPFP_PFE_Guide_2014.pdf

Additional Resources

Guide to Patient and Family Engagement in Hospital Quality and Safety (AHRQ)
http://www.ahrq.gov/professionals/systems/hospital/engagingfamilies/index.html

Hospital Engagement Network Guide to Working Effectively with Patient and Family Advocates (The Healthcare and Patient Partnership Institute)
http://h2pi.org/

2.5 Flowchart

What is the tool?

Flowcharts are used to visually convey the steps in a process.[9] This tool is a guide to identify process steps and create a visual representation of the process(es) to be modified as part of a QI project, with suggestions for involving key stakeholders.

When should the tool be used?

Flowcharts and the tools to guide flowchart creation can help teams closely examine and demonstrate current processes to create a shared understanding, and identify activities that can impact process performance. Flowcharts can be particularly helpful to compare and contrast the actual versus the ideal flow of a process to identify improvement opportunities.[10]

What are the Instructions for the Tool?

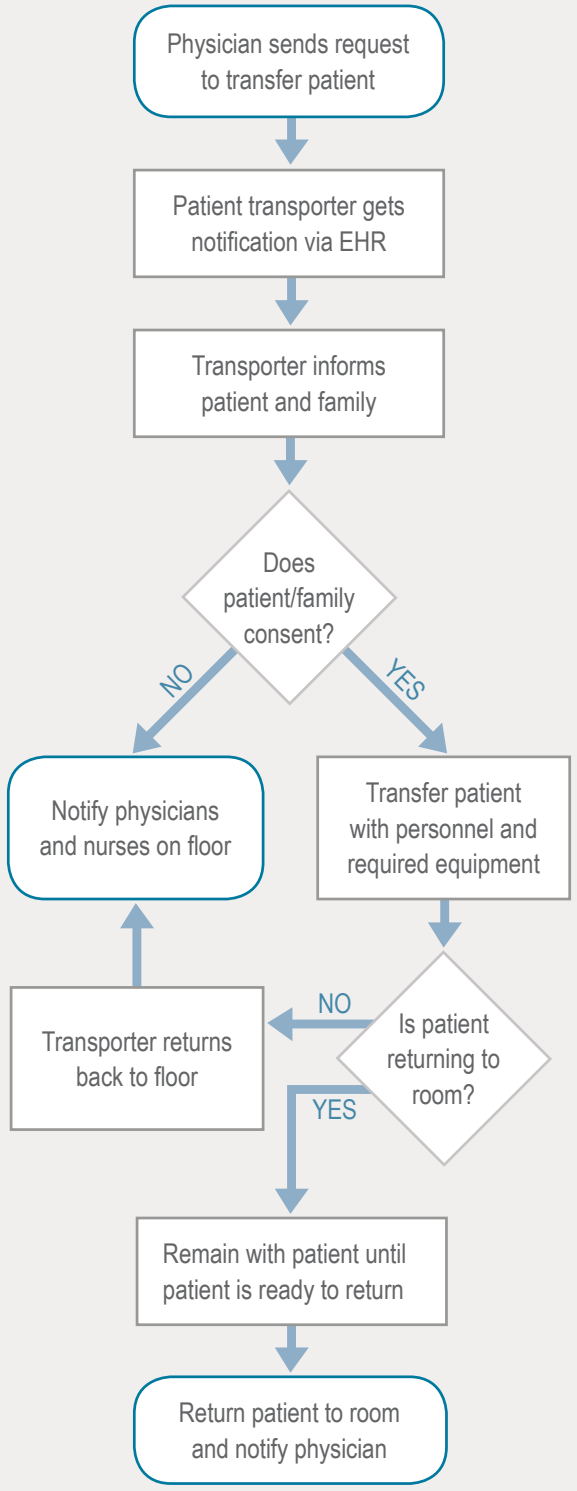
The specific steps to create a flowchart are available on the AHRQ website:

Flowchart Tool
https://healthit.ahrq.gov/health-it-tools-and-resources/evaluation-resources/workflow-assessment-health-it-toolkit/all-workflow-tools/flowchart

9 Agency for Healthcare Research and Quality. "Health Information Technology Flowchart." **https://healthit.ahrq.gov/health-it-tools-and-resources/evaluation-resources/workflow-assessment-health-it-toolkit/all-workflow-tools/flowchart** (accessed on November 8, 2017).

10 M. Brassard and Ritter, D. *The Memory Jogger II: Health Care Edition: A Pocket Guide of Tools for Continuous Improvement and Effective Planning* (GOAL/QPC, 2016), 56.

Process Map Example



Additional Resources

Many types of flowcharts and more sophisticated visual representations of processes can be helpful to teams. Other visual representations that can be used include but are not limited to value stream mapping, value-added analysis, and workflow diagrams.

Process Mapping (AHRQ)
https://healthit.ahrq.gov/health-it-tools-and-resources/evaluation-resources/workflow-assessment-health-it-toolkit/all-workflow-tools/process-0

Process Mapping (IHI)
http://www.ihi.org/communities/blogs/_layouts/15/ihi/community/blog/ItemView.aspx?List=7d1126ec%2D-8f63%2D4a3b%2D9926%2Dc44ea3036813&ID=166&Web=1e880535%2Dd855%2D4727%-2Da8c1%2D27ee672f115d

2.6 Organizational Readiness Assessment

What is the tool?

Organizational readiness is a change management concept that refers to staff and patient receptiveness to accept change and the organization's capacity to implement change, which may be key to determining an intervention's long-term success.[11] The following tool contains a set of key questions to assist staff in assessing potential challenges that may arise when implementing the new process or intervention(s).

When should the tool be used?

Though the potential benefits of implementing an intervention may be obvious, an organization or unit may not be ready or have processes in place to optimize the success and hardwiring of innovative practices. The

11 Agency for Healthcare Research and Quality. "Module III: Can We Do It Here?" **https://innovations.ahrq.gov/guide/guide3** (accessed on November 8, 2017).

readiness assessment helps staff to identify and plan for potential barriers to the initiative's success by exploring key stakeholders' concerns, leadership support for intervention, and other structural or process changes that may be needed but may not be immediately obvious without performing an assessment.

Tips and considerations for using the tool:

As part of the readiness assessment, frontline staff may be consulted for their input on potential approaches to implementing the intervention. Some staff may be concerned about how a change could affect them, so teams should prepare for some potential questions.

A list of potential questions can be found in the chapter on workplace change in the *High Performance Toolkit,* developed by Industrial Relations Victoria, which oversees industrial relations policy for the Government of Victoria, Australia: **http://www.business.vic.gov.au/hiring-and-managing-staff/staff-management/change-management-procedures-and-role-change**.

What are the Instructions for the Tool?

Sample organizational readiness assessment tools with full instructions are available on the AHRQ and HRSA websites.

Module III: Can We Do It Here? (AHRQ)
https://innovations.ahrq.gov/guide/guide3

Readiness Assessment & Developing Project Aims (HRSA)
https://www.hrsa.gov/sites/default/files/quality/toolbox/508pdfs/readinessassessment.pdf

2.7 Selecting QI Measures

What is the tool?

Measures allow a QI team to understand whether an intervention of interest will result in the desired changes to drive improvement.[12] This tool is a guide to selecting measures, using simple questions to help teams identity what should be measured.

When should the tool be used?

Measures should be selected at the beginning of any QI initiative to help teams determine the initiative's progress and success over time, or anytime teams identify an issue affecting the success of the initiative that needs to be monitored.

Measures can help teams to:

- Assess whether the interventions implemented are having the desired impact
- Make adjustments to increase adherence to and the success of implemented interventions, and see how the adjustments impact the desired outcomes
- Monitor and document successful performance and sustainability of interventions implemented[13]

Tips and Considerations for Using the Tool

Types of measures to select

When selecting measures, teams should remember that it may be helpful to include different types of measures in your QI plan.[14] The following are the most important measure types for a unit-based QI team:

- Process Measures: Are the parts/steps in the system performing as planned? Are our efforts to improve the system on track?[14]

12 Institute for Healthcare Improvement. "Science of Improvement: Establishing Measures." *Institute for Healthcare Improvement,* **http://www.ihi.org/resources/Pages/HowtoImprove/ScienceofImprovementEstablishingMeasures.aspx** (accessed on November 8, 2017).

13 Health Resources and Services Administration. "Developing and Implementing a QI plan," US Department of Health and Human Services. (2011). **https://www.hrsa.gov/sites/default/files/quality/toolbox/508pdfs/developingqiplan.pdf** (accessed on November 8, 2017).

14 M. Brassard and Ritter, D. *The Memory Jogger II: Health Care Edition: A Pocket Guide of Tools for Continuous Improvement and Effective Planning* (GOAL/QPC, 2016), 56.

- Outcome Measures: How does the system impact the values of patients, their health, and wellbeing? What are the impacts on other stakeholders such as payers, employees, or the community?[14]
- Balancing Measures: (looking at a system from different directions/dimensions) Are changes to improve one part of the system causing new problems elsewhere in the system (i.e., creating unintended consequences)?[14]

Measurement for Research vs. for QI

When selecting measures for your QI project, it may be helpful to note that measures for a research project can differ greatly from those selected for a QI project. The differences are summarized in the tool instructions.

Standardizing the Process

A well-documented, standardized data collection plan is essential to the successful start of a QI project.[15] At a minimum, teams should establish who will collect the data for the measures, what methodology will be used to collect the data (so that others can reliably reproduce the data), and when the data should be collected. Documenting the data collection procedure for each measure ensures reliable and reproducible data over time to better assess "real" changes in performance rather than changes due to inter-collector variability.

Displaying your Measures/Data

Once the measures have been selected, the frequency of data collection and how the team will monitor the data from the measures collected and how often will need to be decided. Teams may also wish to think about how to display the data in a run chart or table and how to disseminate the results to staff. For more on displaying and sharing QI data, please see tool 2.10, Displaying and Sharing your QI Data.

What are the Instructions for the Tool?

Specific considerations teams may want to consider when selecting measures for the QI project are available on the IHI website.

Science of Improvement: Establishing Measures
http://www.ihi.org/resources/Pages/HowtoImprove/ScienceofImprovementEstablishingMeasures.aspx

Science of Improvement: Tips for Effective Measures
http://www.ihi.org/resources/Pages/HowtoImprove/ScienceofImprovementTipsforEffectiveMeasures.aspx

2.8 Action Planning Tool

What is the tool?

An action plan is a statement of steps needed to achieve a particular goal or objective.[16] The action planning tool provides project teams with systematic guidance to develop, implement, and track plans targeted at specific tasks that need to be completed, and determine which resources are needed to reach the goals.

When should the tool be used?

This tool is used when the team has identified specific changes to be tested, and potential challenges and opportunities to increase chances of sustaining the proposed changes. The team can use the action planning tool to identify the specific actions to be accomplished, the timeline for completion, and the individuals responsible for each action.

15 Health Resources and Services Administration. "Managing Data for Performance Improvement." US Department of Health and Human Services. (April 2011). **https://www.hrsa.gov/sites/default/files/quality/toolbox/508pdfs/managingdataperformanceimprovement.pdf** (accessed on November 8, 2017).

16 L. A. Hill, "Evaluating an Action Plan," *Harvard Business Review,* (January 1994).

Tips and considerations for using the tool:

The NYSPFP Action Plan is usually completed after completing a condition-specific NYSPFP Gap Analysis, which can be found on the NYSPFP website.

Please review the instructions below to complete the blank action planning tool on page 14.

Detailed instructions:

The following are steps to complete an action plan.

- Identify leaders and stakeholders of the change process
- Develop an aim statement (refer to the IHI Model for Improvement tool in Section 1.1 for more details)
- Identify individual team members involved in frontline patient care and in developing and approving internal policy and protocol to participate in this activity using your aim statement
- Identify process changes and key strategies and steps (tasks) required to accomplish them
- Identify the resources and team members needed to complete steps
- Include completion date by which changes/best practices will be implemented
- Identify measures to track the impact of changes on achieving the aim
- Identify target audience

Once the above has been identified, teams can start to fill in the information in the tool.

Action Planning Tool Information

1	2	3	4	5	6
Process Change/ Key Strategy	List Next Steps (How will you implement process change/key strategy?)	Resources/ Stakeholders Available/ Needed? (Which departments and staff will be involved?)	Owner(s)	Completion Date (If not in place)	Measurement Strategy (What data will be used to monitor progress/track the impact of changes?)

Column 1: Record changes and strategies focused on best practices the team intends to initiate
Column 2: List components/steps associated with the best practice process
Column 3: Outline people and resources needed to accomplish changes (consider using a “fishbone” diagram to detail this step)
Column 4: Identify those responsible for facilitating/leading the change process(es)
Column 5: Select a date to complete the change or process supporting achievement of the hospital goal/aim
Column 6: Consider how you will measure the progress and success of implementing the selected changes/strategies (i.e., select process and outcome measures). Enter the selected measurement strategy identified by the group, including how and what data will be fed to the team to monitor progress

Action Planning Tool

Initiative: _____

Hospital: _____

Administrative Champion: _____ Team Lead: _____

Lead Physician: _____ Nurse Lead: _____

Data Lead: _____ Other Team Member(s): _____

AIM STATEMENT: _____

Consider each process change or key strategy below and complete the worksheet components for implementing them. Add other strategies as appropriate for your hospital.

Process Change/Key Strategy	**List Next Steps** (How will you implement process change/key strategy?)	**Resources/Stakeholders Available/Needed?** (Which departments and staff will be involved?)	**Owner(s)**	**Completion Date** (If not in place)	**Measurement Strategy** (What data will be used to monitor progress/track impact of changes?)

2.9 Plan-Do Study-Act Cycles

What is the tool?

The PDSA cycle refers to the process of competing multiple, small tests of change. The cycle consists of four parts:

- Plan: Develop a plan to test the change
- Do: Carry out the test
- Study: Observe and learn from the results
- Act: Identify modifications to the test[17]

The tool is a PDSA worksheet designed to help document tests of change and to guide teams in performing their own PDSA cycles.

When should the tool be used?

After the action plan is created and the changes to be tested and implemented have been determined, teams can use the PDSA worksheet to start planning for small tests of change.

Tips and considerations for using the tool:

When testing new interventions, the IHI recommends that teams start to analyze the process with one patient or event, including how the intervention impacted workflow. Teams can then continue testing and refining changes in a continuous process before expanding to include more patients/events/staff.[18]

Following a PDSA cycle, remember to provide regular feedback to process participants, the rest of the QI team, and executive sponsors. When you are confident that the change is producing the desired effects, begin planning to make the change a permanent part of staff workflow, then spread the change to all staff on the unit and beyond.

> ***What are the Instructions for the Tool?***
> The specific instructions to prepare and run a PDSA cycle can be found in the IHI's PDSA worksheet.
>
> PDSA Worksheet
> **http://www.ihi.org/resources/Pages/Tools/PlanDoStudyActWorksheet.aspx**

2.10 Displaying and Sharing Quality Improvement Data

What is the tool?

The QI data is the quantified result of the measures that the team decided to collect. This tool is a guide on how to track quality improvement data and share it in a format that allows a quick overview of the team's progress from baseline to goal.

When should the tool be used?

Once the measures to track and collect data have been decided, the team will need to choose a standardized format to display and share the data to identify trends and assess performance. The tool can help teams to determine the data display format best suited to their initiative.

Tips and considerations for using the tool:

Data can be presented in many formats, each of which has advantages and disadvantages. Regardless of format, the presentation should:

- Be easy to understand
- Be concise. Choose the best way to summarize the data.

17 Institute for Healthcare Improvement "Plan-Do-Study-Act (PDSA) Worksheet." (2017). **http://www.ihi.org/resources/Pages/Tools/PlanDoStudyActWorksheet.aspx** (accessed on November 8, 2017).

18 Institute for Healthcare Improvement. "Improvement Project Roadmap." (2017). **http://www.ihi.org/resources/Pages/Tools/ImprovementProjectRoadmap.aspx** (access on November 8, 2017).

Sample Run Chart

- Be tailored to the needs of the audience
- Tell a story. What does the data say?
- Emphasize comparisons, changes, and patterns. What story is being conveyed? Can the data be used to motivate others?

The Run Chart is the most common method of displaying quality performance data over time.

What are the Instructions for the Tool?

Specific instructions for using the tool are included in the tool, developed by HRSA.

Managing Data for Performance Improvement
https://www.hrsa.gov/sites/default/files/quality/toolbox/508pdfs/managingdataperformanceimprovement.pdf

Additional Resources

For the most common method to display data:
Run Charts (IHI)
http://www.ihi.org/resources/Pages/Tools/RunChart.aspx

For different methods of displaying data:
The 7 Basic Quality Tools for Process Improvement (ASQ)
http://asq.org/learn-about-quality/seven-basic-quality-tools/overview/overview.html

To help choose between different data displays:
Which chart or graph is right for you? (Tableau)
http://www.tableau.com/sites/default/files/media/which_chart_v6_final_0.pdf

Considerations for displaying data:
Improving the Visual Display of Data (IHI)
http://www.ihi.org/resources/Pages/ImprovementStories/ImprovingthevisualdisplayofdataStories.aspx

2.11 Holding an Effective QI Team Meeting

What is the tool?

The QI team meeting is an opportunity to plan the initiative, allow each team member to report on their role-specific activities, and review the progress of the initiative.

This tool is a guide for creating a productive team and includes:

- Strategies for establishing an effective team meeting process
- A blank meeting agenda template with considerations to guide teams in creating effective agendas for team meetings
- A blank meeting record template to help teams hold members accountable by documenting items discussed and next steps decided upon during the team meeting

When should the tool be used?

The tool should be used at every team meeting.

> ***What are the Instructions for the Tool?***
> Specific instructions for using the tool are available on the HRSA website.
>
> Improvement Teams; Pages 9-13
> **https://www.hrsa.gov/sites/default/files/quality/toolbox/508pdfs/improvementteams.pdf**

Chapter 3. Maintaining Momentum and Sustaining Change

This chapter contains tools to maintain the QI project's momentum, ensuring that the implemented interventions are hardwired into practice on the unit. It also includes guidance on spreading improvements that worked well on one unit to other units at the organizational level.

3.1 Sustainability Checklist

What is the tool?

Sustainability refers to locking in progress that has been made and continually building upon it.[19] This tool is a checklist of items to help teams ensure their interventions are sustained. The checklist includes items to prompt teams to:

- Identify a process owner
- Establish key leadership for support and buy-in, tool assessment and development
- Monitor results
- Identify and communicate project milestones to celebrate the teams' successes

When should the tool be used?

Teams should complete the sustainability checklist before implementing a new intervention and review it periodically or during each new PDSA cycle. The checklist can also be used once the interventions have been successfully trialed and teams are hardwiring them into daily workflow.

What are the instructions for using the tool?

This template sustainability checklist helps QI teams identify and take steps to lock in gains already made. Use the checklist to consider ideas that address particular factors, then plan next steps for the team to achieve sustainability. Efforts to achieve sustainability will be more successful if many ideas are implemented. Use the checklist to build on prior success by evaluating ongoing improvement and seeking opportunities for continued improvement and innovation.

Suggested Tools for Each Planning and Implementation Phase of a QI Project

Launch of project

3.1 Sustainability Checklist

Changes/interventions have been trialed successfully by staff in several PDSA cycles on the unit—spread the intervention to other units

3.2 Spreading Improvement

Changes/interventions have been successfully trialed and need to be hardwired

3.1 Sustainability Checklist

The Sustainability Checklist (page 19) is Adapted from the Following Materials

Sustainability Checklist (Center for Public Health Quality)

http://www.astho.org/Quality-Improvement/Toolkit/Quality-Improvement-Project-Sustainability-Checklist/

Sustainability Planning Guide & Sustainability Planning Workbook (IPRO)

http://atlanticquality.org/download/hospital-safety-ny/508_IPRO-Sustainability-Planning-Guide-and-Workbook_Web-Version_20170217.pdf

19 Institute for Healthcare Improvement. How-to Guide: Sustainability and Spread." **http://www.ihi.org/resources/Pages/Tools/HowtoGuideSustainabilitySpread.aspx** (accessed on November 8, 2017).

Sustainability Checklist

What will be Sustained

Who is the QI process owner?

Do you have a nurse champion?

☐ Yes ☐ No

Do you have a physician champion?

☐ Yes ☐ No

What are you planning to sustain?

How will you hardwire changes?

Do you have the necessary resources?

☐ Yes ☐ No

Leadership Engagement

What information is needed to keep leadership informed about this project?

How frequently will leadership be updated and how?

Does leadership review the provided information consistently? Describe.

Are there periodically scheduled meetings with leadership for adjustments/feedback purposes?

☐ Yes ☐ No

Frontline Staff and Ongoing Support Involvement

Does the frontline staff have the skills and confidence to implement changes?

☐ Yes ☐ No

What training is needed? Describe.

_____

_____

Is a consistent, established communication system with staff in place?

☐ Yes ☐ No

Does the frontline staff actively participate in the problem solving/issue detection process?

☐ Yes ☐ No

Does the frontline staff consistently use the available tools?

☐ Yes ☐ No

Are new tools needed?

☐ Yes ☐ No

Are existing tools regularly updated as part of a standardized tool review process?

☐ Yes ☐ No

Feedback and Monitoring

What are the vital measures to track?

_____

_____

Do we have an established measurement mechanism?

☐ Yes ☐ No

How frequently will the measurement be conducted?

_____

_____

Is there a mechanism to share the data collected to help track progress?

☐ Yes ☐ No ☐ N/A

How will the results/reports be communicated?

Do the data reports influence your PDSA rapid cycles?

☐ Yes ☐ No

Hardwiring the Changes

Are the staff roles and responsibilities updated accordingly?

☐ Yes ☐ No

Have the existing policies and procedures been adjusted to reflect the new processes?

☐ Yes ☐ No

Is leadership playing an active role in reinforcing the implementation of the changes?

☐ Yes ☐ No

Celebrate Success

What are good milestones to celebrate success? (e.g., reaching or surpassing goals, or six-month or one-year anniversaries.)

How will successes be celebrated?

3.2 Spreading Improvements

What is the tool?

Spread refers to the process of "actively disseminating best practice and knowledge about every intervention and implementing each intervention in every available care setting."[20] This tool is a guide to considerations a team should address when they start spreading the successful intervention. Spreading innovations and best practices maximizes the initial team's investment and provides the benefit of improved care to a broader group of patients.

When should the tool be used?

Once the team has tested the change/intervention on a single unit and has established that it affects the

20 "How to Guide: Sustainability and Spread," *Institute for Healthcare Improvement*, **http://www.ihi.org/resources/Pages/Tools/HowtoGuideSustainabilitySpread.aspx**

outcome in the desired direction, the intervention can spread to other relevant parts of the hospital.

Tips and considerations for using the tool:

As teams prepare to spread the intervention they have successfully trialed, at a minimum it is important to plan ahead and:

- Prepare for spread
- Establish an aim for spread
- Develop, execute, and refine a spread plan

In addition, unit-based teams should consider adopting improvements successfully trialed on other units; improvements or processes that could be successfully adapted and adopted or spread from other units.

What are the Instructions for the Tool?

Specific instructions within the tool can be found on the IHI website.

How-to Guide: Sustainability and Spread
http://www.ihi.org/resources/Pages/Tools/HowtoGuideSustainabilitySpread.aspx

Additional Resources

A Framework for Spread: From Local Improvement to System-Wide Change (IHI)
http://www.ihi.org/resources/Pages/IHIWhitePapers/AFrameworkforSpreadWhitePaper.aspx

The Seven Spreadly Sins (IHI)
http://www.ihi.org/resources/Pages/Tools/IHISevenSpreadlySins.aspx

Chapter 4. Beyond the Basics

This chapter contains a set of tools for use by frontline staff with support from staff trained in the principles of QI. In addition, tools are suggested for consideration when the team is looking for innovative approaches to improving results.

Consider using the tools in this chapter when a QI approach to HACs, and other clinical or operational challenges, has been applied and the team is striving to make further reductions/improvements to meet desired outcomes. Some scenarios to which these tools can be applied include:

- When interventions have been implemented but the project's data is still moving in an undesirable direction
- When it is unclear if changes are resulting in an improvement and more sophisticated ways to analyze and display data are being sought
- When significant improvement has been achieved but the goal is to reach the "100th percentile"
- When outcomes exceeded the goal but a new decline in performance is realized

Suggested Tools for Each Planning and Implementation Phase of a QI Project

Intervention implemented but HAC rates are moving in an undesirable direction and the team needs further help to examine barriers to success

4.1 Improvement Capability Self-Assessment Tool
4.2 Cause and Effect Diagram
4.3 Driver Diagram
4.4 Failure Modes and Effects Analysis
4.5 Root Cause Analysis
4.6 Pareto Chart
4.7 Value Stream Mapping

More sophisticated methods sought to display data

4.8 Control Charts
4.9 Histogram
4.10 Scatter diagram

Significant improvement in the HAC rate achieved, but goal is to reach the"100th percentile"

Epilogue

When outcomes have been competitive but a recent setback occurs

4.3 FMEA
4.4 Root Cause Analysis

4.1 Improvement Capability Self-Assessment

What is the tool?

This tool is an assessment developed by the IHI for organizations to assess their improvement capability in six key areas and determine where they would like to be in a specified period of time.[21]

21 Institute for Healthcare Improvement. "IHI Improvement Capability Self-Assessment Tool." **http://www.ihi.org/resources/Pages/Tools/IHIImprovementCapabilitySelfAssessmentTool.aspx** (accessed on November 8, 2017).

When should the tool be used?

The Self-Assessment Tool can be used periodically by an organization to determine its progress in the improvement journey. This tool is helpful to organizations interested in:

- Stimulating discussion about their strengths and areas for improvement
- Understanding their organization's improvement capability
- Reflecting on and evaluating specific improvement projects

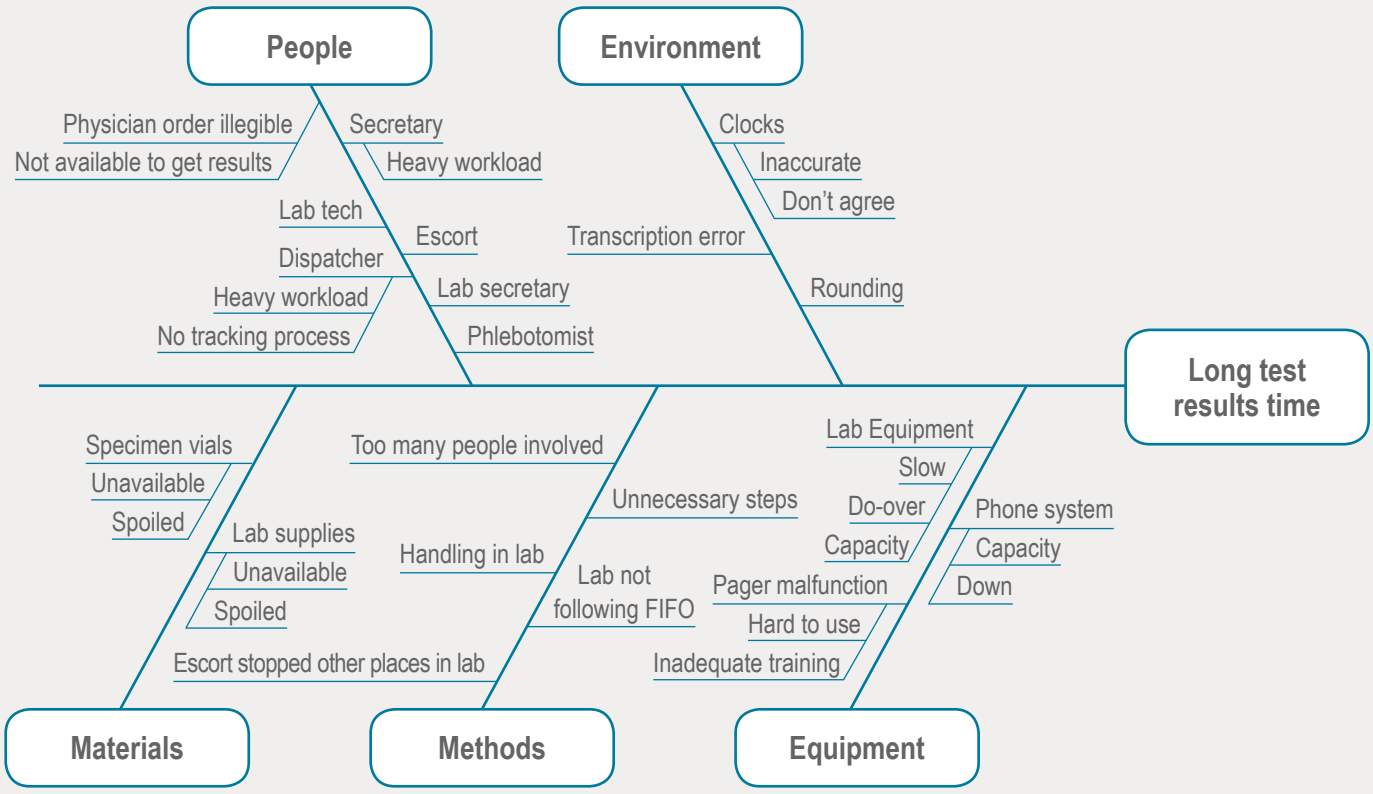
> ***What are the Instructions for the Tool?***
>
> The specific instructions for using the tool are available in the guide on the IHI website.
>
> Improvement Capability Self-Assessment Tool
> **http://www.ihi.org/resources/Pages/Tools/IHI-ImprovementCapabilitySelfAssessmentTool.aspx**

4.2 Cause and Effect Diagram

What is the tool?

It is a graphic tool used to explore and display the causes of a certain effect. It is also known as an Ishikawa or "fishbone" diagram.[22] This tool is a detailed guide with instructions for the team on how to create a cause and effect diagram. The tool also contains

Sample Cause and Effect Diagram



22 Institute for Healthcare Improvement. "QI Essentials Toolkit: Cause and Effect Diagram." **http://www.ihi.org/resources/Pages/Tools/CauseandEffectDiagram.aspx** (accessed on November 8, 2017).

sample diagrams and a blank template that the team can fill in.

When should the tool be used?

Teams should use this tool to explore the multiple causes contributing to a particular outcome. The diagram can help identify previously undiscovered areas for improvement.

Tips and considerations for using the tool:

The Cause and Effect Diagram should be constructed by a team comprised of stakeholders who are familiar with the process that produces the effect. It is a qualitative tool and any causes selected for further action should be validated first before moving forward with improvement efforts. The tool should be used in the planning phase, when the team is determining what changes should be tested.

What are the Instructions for the Tool?

Specific instructions are contained within the tool available on the IHI website.

QI Essentials Toolkit: Cause and Effect Diagram
http://www.ihi.org/resources/Pages/Tools/CauseandEffectDiagram.aspx

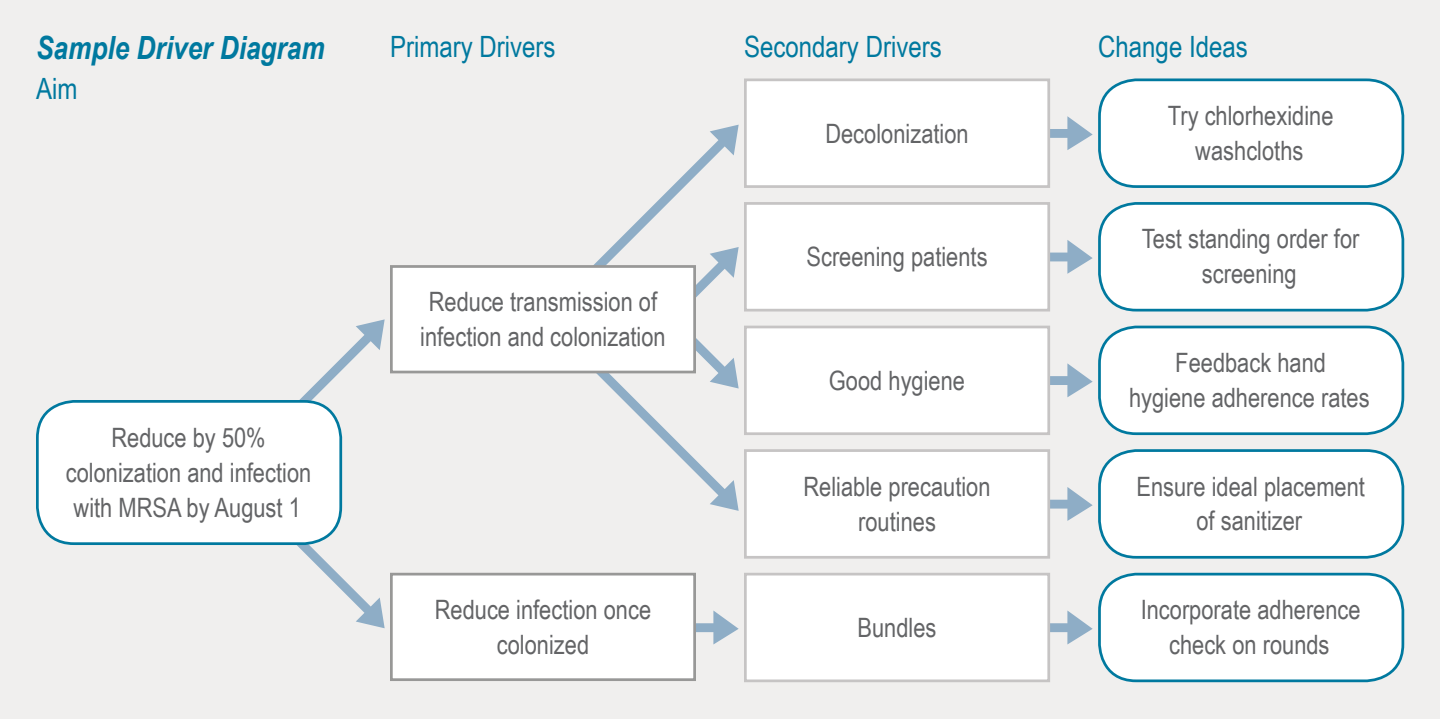
Alternative Tools

Cause and Effect Diagram (AHRQ)
https://healthit.ahrq.gov/health-it-tools-and-resources/evaluation-resources/workflow-assessment-health-it-toolkit/all-workflow-tools/cause-and-effect-diagram

4.3 Driver Diagram

What is the tool?

Driver diagrams are visual displays of what "drives" or contributes to the achievement of a project aim.[23] The tool includes a step-by-step guide to creating a driver diagram, with sample driver diagrams and blank diagram templates.



23 Institute for Healthcare Improvement. "QI Essentials Toolkit: Driver Diagram." **http://www.ihi.org/resources/Pages/Tools/Driver-Diagram.aspx** (accessed on November 8, 2017).

When should the tool be used?

The driver diagram can be used to help a team identify priority actions to be taken to achieve a specified aim. It is particularly helpful in the beginning or planning phases of an initiative to help determine priority issues that need to be addressed.

It can also help to link the specific project activities and changes to key components in the system and define how project progress and results should be measured and monitored.

Tips and considerations for using the tool:

When creating a driver diagram, it is important to enlist the help of key stakeholders from multiple disciplines who are familiar with different aspects of the system under review. This helps to identify all the drivers for the process of interest, as it's unlikely a single person has a clear view of the whole system.

What are the Instructions for the Tool?

Specific instructions on how to create a driver diagram are included in the tool available on the IHI website.

QI Essentials Toolkit: Driver Diagram
http://www.ihi.org/resources/Pages/Tools/Driver-Diagram.aspx

Additional Resource

Defining and Using Aims and Drivers for Improvement: A How-to Guide (CMS)
https://innovation.cms.gov/Files/x/HCIAT-woAimsDrvrs.pdf

4.4 Failure Modes and Effect Analysis (FMEA)

What is the tool?

FMEA is a method that attempts to identify all possible failures that can occur within a system and identifies the potential effects of the failures/errors.[24]

This tool is a step-by-step guide to help teams conduct an FMEA with assistance from their internal quality team.

When should the tool be used?

FMEA can be used during an improvement project's planning phase to help identify and prioritize areas for improvements based on risk level. In addition, it can be used for periodic evaluation of the process or to examine specific errors. FMEA is a proactive technique to prevent errors before they occur.

Tips and considerations for using the tool:

When completing an FMEA, it is important to recruit a multidisciplinary team and include staff who are involved at any point in the process. The FMEA process typically requires the group to meet multiple times, so the team

What are the Instructions for the Tool?

The specific instructions for using the tool are available on AHRQ's website.

Failure Mode Effects Analysis (AHRQ)
https://healthit.ahrq.gov/health-it-tools-and-resources/evaluation-resources/workflow-assessment-health-it-toolkit/all-workflow-tools/fmea-analysis

Additional Resources

Failure Mode Effects Analysis (IHI)
http://www.ihi.org/resources/Pages/Tools/FailureModesandEffectsAnalysisTool.aspx

Failure Mode Effects Analysis (ASQ)
http://asq.org/learn-about-quality/process-analysis-tools/overview/fmea.html

24 The Agency for Healthcare Research and Quality. "Failure Mode Effects Analysis" **https://healthit.ahrq.gov/health-it-tools-and-resources/evaluation-resources/workflow-assessment-health-it-toolkit/all-workflow-tools/fmea-analysis** (accessed on November 8, 2017).

should take steps to avoid burnout and loss of momentum. Teams should carefully define the FMEA's scope to avoid being unable to conclude the exercise in a timely manner.

Sample FMEA

Steps in the process	Failure Mode	Failure Causes	Failure Effects	Likelihood of Occurrence (1-10)	Likelihood of Detection (1-10)	Severity (1-10)	Risk Profile Number (RPN)	Actions to Reduce Occurrence of Failure
Orders are written for new medication	The first dose may be given prior to pharmacist review of the orders	Medication ordered may be available and easily accessed in the dispensing machine	Patient may receive incorrect medication, incorrect dose, or a dose via incorrect route	6	5	1	30	Assign clinical pharmacists to patient care units so that all medication orders can be reviewed as they occur
Orders are written to discontinue a medication or change the existing order	Orders are written to discontinue a medication or change the existing order	All doses needed for a 24-hour period are delivered to the drawer. Drawer is not changed until next routine delivery 24- hour supply of refrigerated medications is delivered Multi-dose vials may be kept in the patient-specific drawer. Medications are available in dispensing machine.	Patients may receive medications that have been discontinued or the incorrect dose of a medication that has been changed	10	5	5	250	Schedule pick-ups of discontinued medications, including refrigerated medications, twice per day Use dispensing machine screen to verify all information regarding current and discontinued medications prior to each administration
Orders are written for a non-standard dose of a medication	Nursing staff may prepare an incorrect dose when manipulating the medication	Staff prepare the dose using medications from the dispensing machine and manipulate them to get the dose ordered	Patient may receive an incorrect dose	3	5	4	60	Prepare all non-standard doses in the pharmacy and dispense each as a patient-specific unit dose

Source: Institute for Healthcare Improvement

4.5 Root Cause Analysis

What is the tool?

Root cause analysis (RCA) is a process for identifying the fundamental causal factor(s) underlying variations in performance. It can include the occurrence or possible occurrence of an event that could lead to patient harm (commonly referred to as a "near miss"). It is most commonly used after an error has occurred.[25]

The tool includes a step-by-step guide for teams to use with their quality team to conduct an RCA.

When should the tool be used?

Following the occurrence of, or near occurrence of, an undesirable event that could have resulted in patient harm, RCA can be used to uncover contributing factors and to help organizations identify opportunities for improvement to deliver safer care.

RCA can be a useful QI tool, as gaps it identifies can help teams turn an adverse event into a learning opportunity to prevent future occurrences. RCA efficacy lies not only in how the RCA is performed, but how the knowledge or data gained from an RCA is used to inform improvement processes.

What are the Instructions for the Tool?

The specific instructions on how to conduct an RCA are contained within The Joint Commission's guide.

Root Cause Analysis in Health Care: Tools and Techniques
https://www.jcrinc.com/assets/1/14/EBRCA15Sample.pdf

Additional Resources

Root Cause Analysis (AHRQ)
https://healthit.ahrq.gov/health-it-tools-and-resources/evaluation-resources/workflow-assessment-health-it-toolkit/all-workflow-tools/root-cause-analysis#h=Root Cause Analysis

What is Root Cause Analysis? (ASQ)
http://asq.org/learn-about-quality/root-cause-analysis/overview/overview.html

RCA2: Improving Root Cause Analyses and Actions to Prevent Harm (National Patient Safety Foundation)
http://www.npsf.org/?page=RCA2

4.6 Pareto Chart

What is the tool?

A Pareto chart is a type of bar chart in which factors that contribute to an overall effect are arranged based on the size of their contribution, from largest to smallest.[26] The tool includes a step-by-step guide to creating and using a Pareto chart, as well as Pareto chart examples and templates to help teams create a Pareto chart.

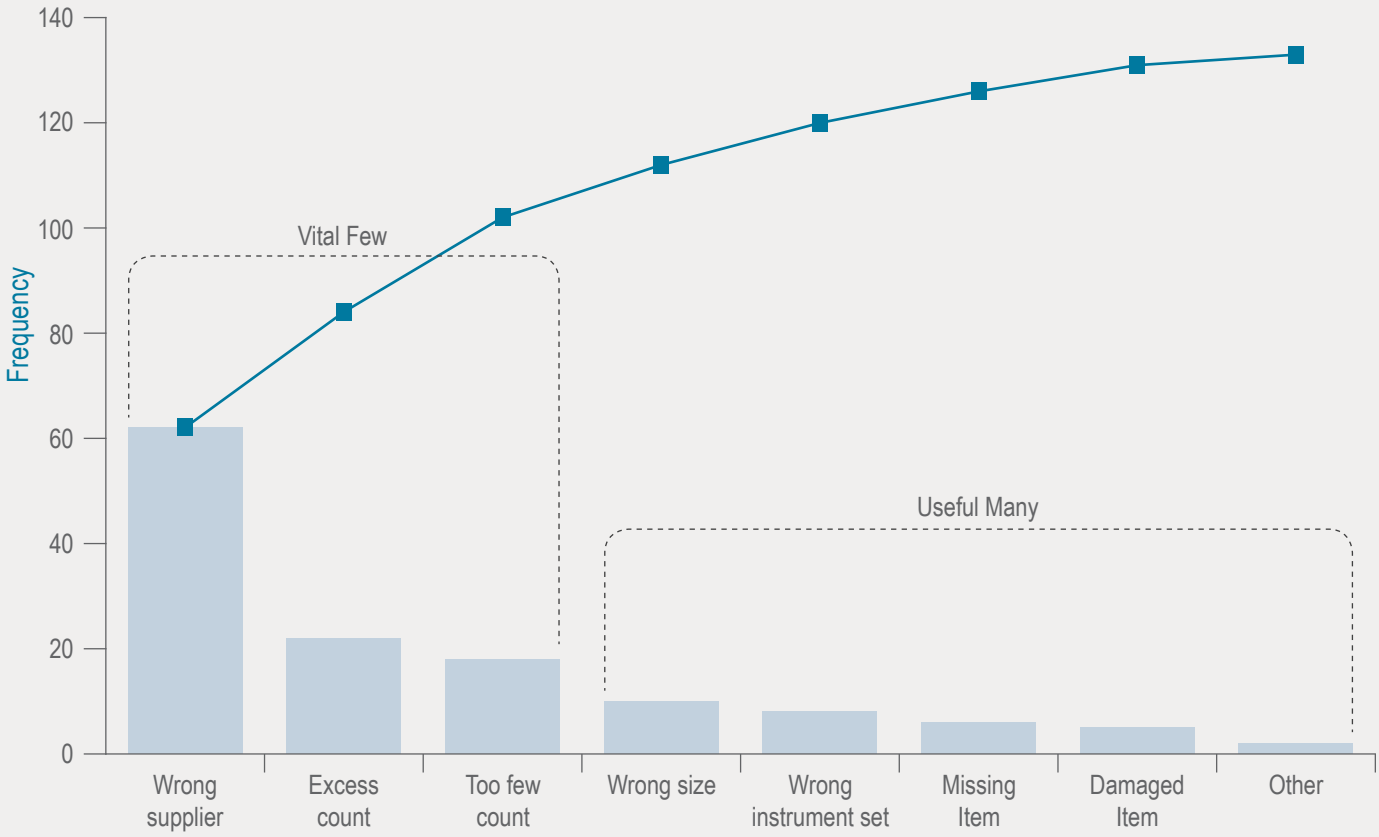
When should the tool be used?

At the beginning of an initiative, it can help teams concentrate their improvement efforts on the factors that have the greatest impact. Once the selected causes are resolved, teams should consider creating a new chart to identify new priorities.

25 J.Parker, King, L., Fry, H.M., Harris, J., Hinkley, C.C. "Root Cause Analysis in Health Care: Tools and Techniques. Fifth Edition." The Joint Commission (2015); **https://www.jcrinc.com/assets/1/14/EBRCA15Sample.pdf** (accessed on November 8, 2017).

26 Institute for Healthcare Improvement. "QI Essentials Toolkit: Pareto Chart." **http://www.ihi.org/resources/Pages/Tools/IHIImprovementCapabilitySelfAssessmentTool.aspx** (accessed on November 8, 2017).

Sample Pareto Chart



Source: Institute for Healthcare Improvement

What are the Instructions for the Tool?

The specific instructions to create and use a Pareto chart are included in the tool, available on the IHI website.

QI Essentials Toolkit: Pareto Chart
http://www.ihi.org/resources/Pages/Tools/IHIImprovementCapabilitySelfAssessmentTool.aspx

Additional Resources

Pareto Chart (AHRQ)
https://healthit.ahrq.gov/health-it-tools-and-resources/evaluation-resources/workflow-assessment-health-it-toolkit/all-workflow-tools/pareto-chart#h=Pareto

4.7 Value Stream Mapping

What is the tool?

Value Stream Mapping (VSM) is a Lean* tool that allows an entire process to be visualized. VSM differs from a flowchart in that it represents the flow of both materials and information in an attempt to improve a process by identifying sources of waste that cause inefficiency or

* Lean refers to a system of techniques and activities that help create maximum value for patients by reducing waste and waits. Based on the Toyota model, it focuses on how efficiently resources are being used. More information on Lean is available in the epilogue.

the potential for error.[27] This tool includes an introduction to VSM, with examples of value stream maps and guidance on how to create a VSM.

When should it be used?

VSM can be helpful to a team when it is ready to make changes to a process and wants to ensure it is considering the changes' impact on all participants in the process.

Tips and considerations when using the tool:

While multidisciplinary teams are essential to create an effective VSM, teams should be aware of the team's size and how it can affect decision-making and action.

What are the Instructions for the Tool?

Unit-based safety teams should work with their internal QI staff to leverage their expertise in Lean and VSM; some expertise in Lean and VSM is required to develop an effective value stream map.

Specific instructions for creating a VSM are included in the tool available on the ASQ website.

Value Stream Mapping—An Introduction
http://www.asqled.org/uploads/3/1/2/5/31251163/2006-06_value-stream-mapping-an-introduction_manos.pdf

4.8 Control Charts

What is the tool?

A control chart is similar to a run chart in that it shows how data changes over time, but it also includes statistically calculated upper and lower control limits to help teams distinguish between common and special causes of variation within a process.[28] This tool includes a step-by-step guide to creating run charts and control charts, sample control charts, and blank control chart templates.

When should the tool be used?

Control charts should be used when there is more than 15 data points[28] and more insight into the data is needed. Control charts identify special cause variation to help staff to track progress and monitor a process to ensure sustained performance from a quality improvement effort.

What are the Instructions for the Tool?

The specific instructions for using the tool are available on the IHI website.

QI Essentials Toolkit: Run Chart & Control Chart
http://www.ihi.org/resources/Pages/Tools/RunChart.aspx

Additional Resources

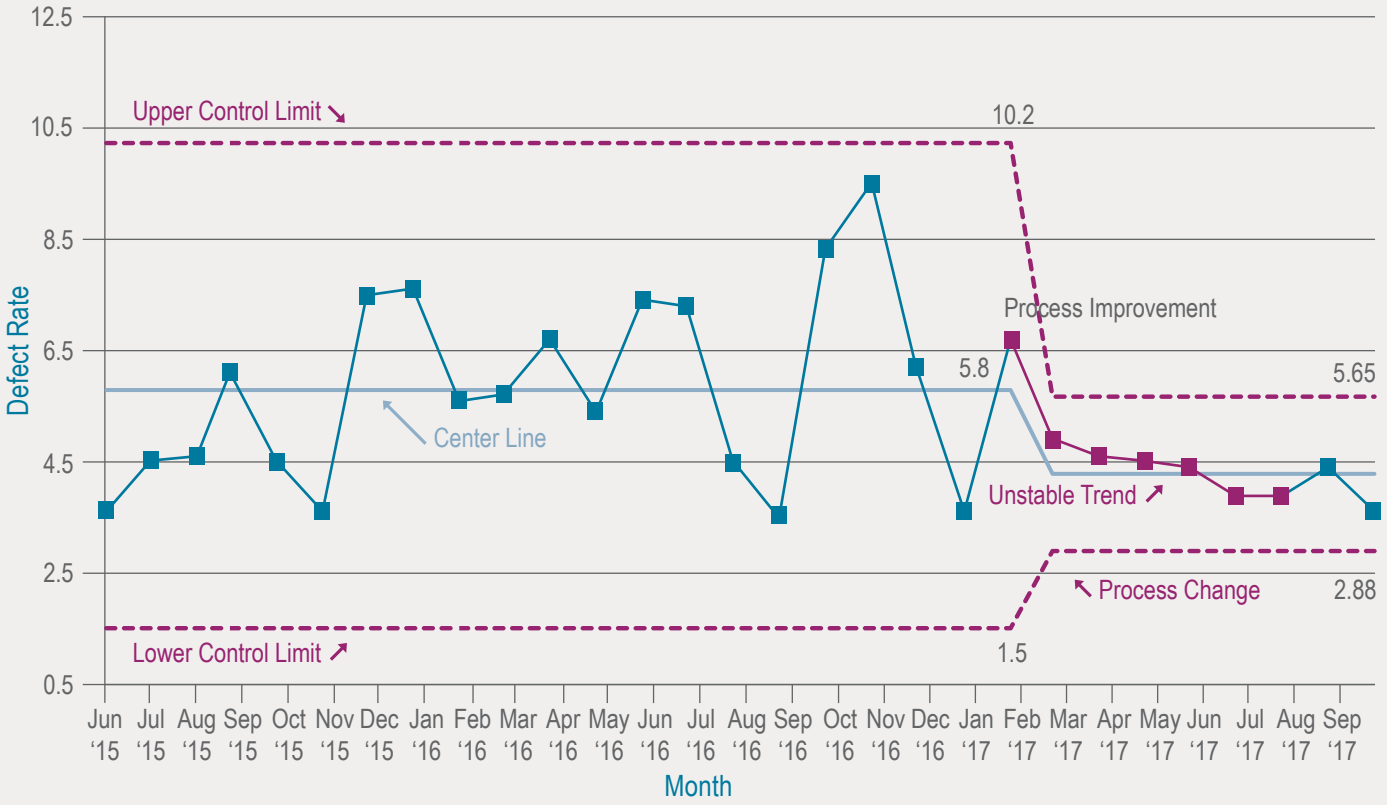
Control Chart (ASQ)
http://asq.org/learn-about-quality/data-collection-analysis-tools/overview/control-chart.html

Statistical Process Control (AHRQ)
https://healthit.ahrq.gov/health-it-tools-and-resources/evaluation-resources/workflow-assessment-health-it-toolkit/all-workflow-tools/statistical-process-control#h=Control Chart

27 Agency for Healthcare Research and Quality. "Value Stream Mapping. **https://healthit.ahrq.gov/health-it-tools-and-resources/evaluation-resources/workflow-assessment-health-it-toolkit/all-workflow-tools/value-stream-mapping** (accessed on November 8, 2017).

28 Institute for Healthcare Improvement. "QI Essentials Toolkit: Run Chart & Control Chart," **http://www.ihi.org/resources/Pages/Tools/RunChart.aspx** (accessed on November 8, 2017).

Anatomy of a Control Chart



Source: QIMacros

4.9 Histogram

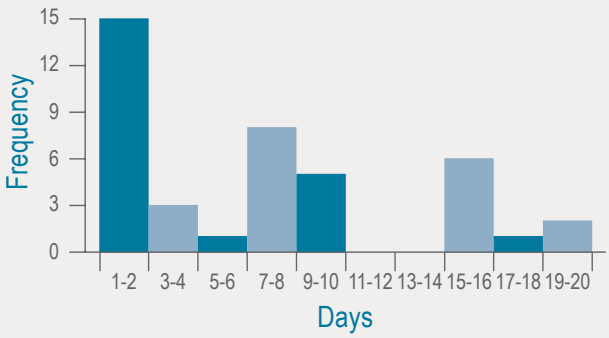
What is the tool?

A histogram is a type of bar chart that groups data into ranges, and is used to display variation in continuous data such as time, weight, or size.[29] The tool includes a step-by-step guide for creating a histogram and data table templates to help teams create their own histogram.

When should the tool be used?

A histogram can help a team see a pattern in data that may not be visible in other formats. The team can more easily compare time periods, averages, and medians, and see changes over time.

Sample Histogram: EKG Turnaround Times



Source: Institute for Healthcare Improvement

29 Institute for Healthcare Improvement. "QI Essentials Toolkit: Histogram. **http://www.ihi.org/resources/Pages/Tools/Histogram.aspx** (accessed on November 8, 2017).

What are the Instructions for the Tool?

Specific instructions for creating and using histograms are included in the tool available on the IHI website.

QI Essentials Toolkit: Histogram
http://www.ihi.org/resources/Pages/Tools/Histogram.aspx

Additional Resources

Histogram (AHRQ)
https://healthit.ahrq.gov/health-it-tools-and-resources/evaluation-resources/workflow-assessment-health-it-toolkit/all-workflow-tools/histogram

Histogram (ASQ)
http://asq.org/learn-about-quality/data-collection-analysis-tools/overview/histogram.html

4.10 Scatter Diagram

What is the tool?

A scatter diagram, or scatter plot, is a graph that shows the relationship between two variables. One variable is displayed on an x-axis, the other on a y-axis.[30] This tool includes a step-by-step guide to creating and using a scatter diagram, with sample scatter diagrams and guidance on how to spot trends in a scatter diagram. Template data collection sheets and diagrams are also included.

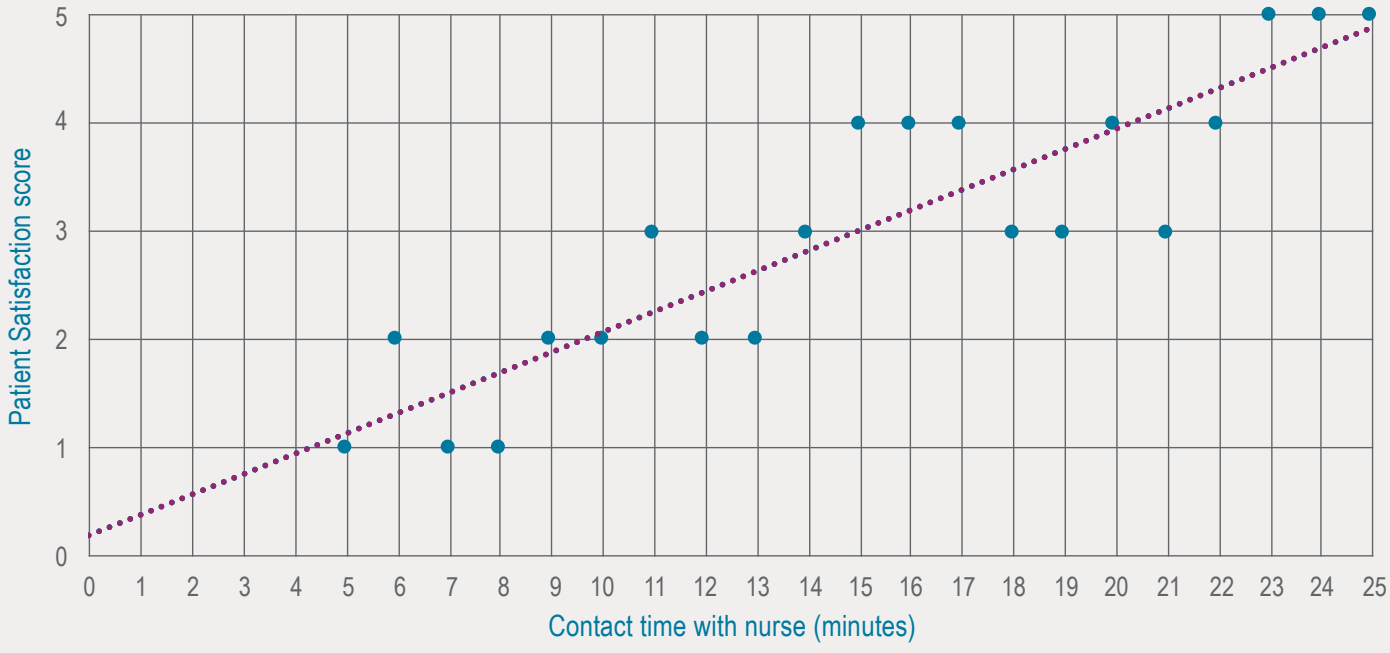
When should the tool be used?

The scatter diagram is used to determine whether a cause-and-effect relationship exists between two variables. It can also be used to illustrate the impact changing one variable has on a related variable.

Tips and considerations for using the tool:

Scatter diagrams can be effective in measuring the

Sample Scatter Diagram: Relationship between contact time and patient satisfaction score



30 Institute for Healthcare Improvement. "QI Essentials: Scatter Diagram." **http://www.ihi.org/resources/Pages/Tools/ScatterDiagram.aspx** (accessed on November 8, 2017).

strength of relationships identified in a cause-and-effect diagram (for more detail on a cause-and-effect diagram, please refer to tool 4.2).

It is important to note that scatter diagrams can show correlations between two variables from which causation may only be inferred and not attributed.

What are the Instructions for the Tool?

The specific instructions for constructing and interpreting a scatter diagram are available on the IHI website.

QI Essentials: Scatter Diagram
http://www.ihi.org/resources/Pages/Tools/ScatterDiagram.aspx

Additional Resources

Scatter Diagram (AHRQ)
https://healthit.ahrq.gov/health-it-tools-and-resources/evaluation-resources/workflow-assessment-health-it-toolkit/all-workflow-tools/scatter-diagram#h=scatter diagram

Scatter Diagram (ASQ)
http://asq.org/learn-about-quality/cause-analysis-tools/overview/scatter.html

Epilogue

This toolkit was developed to help staff implement a QI project at the unit level. Unit-level improvements have been successful in hospitals across the country. When a plateau in performance is reached, numerous strategies can be considered to engage the entire hospital in QI and align with the organization's strategic goals. The following sections contain overview descriptions of a few of the more well-known approaches that some hospitals have adopted in their quest to deliver safe patient care. All these approaches were designed to be implemented across the entire organization, and thus require leadership support and significant resources for effective implementation. The following approaches are **not** designed to be undertaken by the unit-based team alone.

Lean Management

Lean management principles, which began as Toyota's Production System model, have been successfully applied to health care delivery. Lean philosophy aims to reduce waste so that all work addresses value and serves the patient's needs.[31] One important tool in Lean is the VSM (see tool 4.10).

For Lean principles to take root, leaders must create an organizational culture receptive to Lean thinking, starting at the top of the organization. All staff (especially frontline staff) should be involved in helping redesign processes to improve flow and reduce waste.[31] Lean management requires extensive education and fundamental changes to how an organization operates.

Lean experts note that the only sustainable process is the one in which the participants believe. The best way to create belief in a process is for all participants to contribute their experiences and be able to see the process in its entirety. To create this shared understanding, make available a four- to five-day intensive session focused on analyzing current processes and identifying opportunities for improvement; this is known as a Kaizen event.

Kaizen is the Japanese term for continuous improvement and is a key concept in Lean management. Lean organizations can conduct thousands of Kaizen events to ensure continuous improvement and ensure that staff understand that they are expected to participate.

High Reliability Organizations

The concept of high reliability—or concepts for consistent performance at high levels of safety over long periods of time—originated in high-risk industries such as the nuclear and aviation industries.[32] These concepts have been applied to health care to create an organization that proactively identifies risks and implements practices to reduce harm. A goal of "zero harm" is often a component of high reliability implementation.

31 Institute for Healthcare Improvement. "Going Lean in Health Care." (2005). **http://www.ihi.org/resources/Pages/IHIWhitePapers/GoingLeaninHealthCare.aspx** (accessed November 8, 2017).

32 M.R. Chassin, Loeb J.M. "The Ongoing Quality Improvement Journey: Next Stop, High Reliability." *Health Affairs* vol. 30, no. 4 (April 2011).

To be effective, high reliability organizations implementation requires organizational commitment at all levels. Extensive training is required, as are changes across the organization, including leadership practices, organizational priorities, and culture.[33]

Tracer Methodology

The Joint Commission (TJC) includes tracer methodology as a component of its on-site survey process. A tracer is designed to use information from the hospital to follow the experience of care or treatment for numerous patients through the organization's health care delivery process.[34] Three types of tracers are used by TJC:

- Individual Tracers focus on a select number of patients
- System Tracers examine systems of care based on reviews of individual tracers. Systems evaluated include data management, infection control, and medication management
- Accreditation-Specific Tracers evaluate risk points and safety concerns within different types and levels of care

The tracer methodology can be adapted and used to continuously examine a hospital's care processes, and is not limited to use within TJC's survey process. The results of tracers may help to identify priority areas for improvement activities.

33 M.R. Chassin, Loeb J.M. "The Ongoing Quality Improvement Journey: Next Stop, High Reliability." *Health Affairs* vol. 30, no. 4 (April 2011).

34 The Joint Commission. "Facts about the Tracer Methodology." (February 2017). **https://www.jointcommission.org/facts_about_the_tracer_methodology/** (accessed on November 8, 2017).

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