IHI Open School Quality Improvement Practicum Handbook

Contents

Introduction 2

General Requirements for the Quality Improvement Practicum 2

Overview of Forms 3

Practicum Checklist 4

Teacher-Learner Agreement 5

Standard Format and Definitions for a Charter 6

Charter Form 7

Charter Assessment 8

Cause and Effect Diagram Instructions 9

Cause and Effect Diagram Form 10

PDSA Basics 11

Plan Do Study Act (PDSA) Form 12

Displaying Data 15

Run Chart Template 16

Practicum Summary Report 17

INTRODUCTION

QI 201: Guide to the IHI Open School Practicum will walk you through the process of conducting a quality improvement project in a clinical setting. It will pull knowledge and learning from many other IHI Open School courses – particularly QI 101: Fundamentals of Improvement; QI 102: The Model for Improvement: Your Engine for Change; and QI 103: Measuring for Improvement, which are all prerequisites – and help learners apply quality improvement skills in a real-world setting.

Unlike other courses in the IHI Open School, you will submit documents after five of the Lessons. Upon successful completion of the course, you will be prepared to plan and carry out a basic quality improvement project in your own health care setting. You will also receive the IHI Open School Practicum Certificate, showing employers and colleagues that you have the skills, knowledge, and desire to improve care processes.

GENERAL REQUIREMENTS FOR THE QUALITY IMPROVEMENT PRACTICUM:

- Learners need to complete three IHI Open School courses: QI 101: Fundamentals of Improvement; QI 102: The Model for Improvement: Your Engine for Change; and QI 103: Measuring for Improvement. Each course teaches an important piece of the quality improvement process, and learners will be using that knowledge in planning and carrying out your project.
- Quality improvement projects need to be in a clinical setting that involves or affects patient care. (Personal or non-health improvement projects may be useful exercises, but will not qualify as a Practicum.)
- Project teams should include learners from different backgrounds (e.g., nursing, medicine, public health, etc.), but this is not required.
- Learners are expected to identify a faculty and health care system sponsor. In some cases, this may be the same person. The faculty sponsor's primary role will be to guide the learners in identifying a potential project and coaching the learners on the use of improvement methodologies. The health system sponsor's role will be to orient the learners to the health care setting and manage relationships within the health care setting.
- A project should take anywhere from 4 weeks to 6 months, depending on the complexity and other time commitments. Projects can go on for longer, but should be scoped accordingly.
- Learners will hand in a teacher-learner agreement, a charter, a cause and effect diagram, two PDSA cycles, at least one run chart, and one summary report.

Overview of Forms

Teacher-Learner Agreement: This will ensure that expectations – and potential time commitments – are clear for the learner and the faculty before the project begins.

Charter: This is the basic description of your project. What is your aim? What are you trying to accomplish? Do you need to narrow your scope? Who do you need on your project team? Your charter should not be a thesis; it should be a one-page document.

Charter Assessment: Now that you've created your charter, what's next? Give your faculty sponsor your charter along with the charter assessment form. The charter assessment is a tool to help your faculty review your project and give you feedback. They should use both the scoring system and the comment boxes to give you feedback. When you receive the feedback assessment form, revise your charter in response to their feedback. They may encourage you to narrow your scope, include more details, or provide more clarity. (Note: You are not required to turn in this form.)

Cause and Effect Diagram: Also known as an Ishikawa (after its developer) or "fishbone" (after its shape) diagram, this is a graphic tool used to explore and display the possible causes of a certain effect. It will help you to identify potential changes to test for your quality improvement project.

Plan-Do-Study-Act (PDSA) Form: Use this form to carry out your tests. The PDSA forms – you'll submit at least two – should be submitted for the specific small tests of change you do (as opposed to the overall project level).

Run Chart: In order to know if your interventions have led to an improvement, you need to have a family of measures that you follow over time. Run charts let you follow them. They tell the story of your QI project, allowing you to see which tests of change successfully lead to an improvement and which ones do not. You'll submit at least one run chart at the end of the project. (If you are up for the challenge, you can submit a statistical/Shewhart process control chart, but this is not required.)

Summary Report: This form will serve as a summary of your project and encourage you to reflect on the process. What was successful? What wasn't? What did you learn? With your permission, the IHI Open School will share your project publicly. We want to openly share successful projects to demonstrate how learners can help improve care for patients.

PRACTICUM CHECKLIST

- ☐ Complete IHI Open School courses QI 101, QI 102, and QI 103.
- ☐ Identify a project.
- ☐ Identify a faculty advisor.
- ☐ Identify a health system sponsor (in some cases, this may be the same as the faculty advisor).
- ☐ Sign and submit teacher-learner agreement after completing Lesson 1 of QI 201: Guide to the IHI Open School Practicum.
- ☐ Turn in the first draft of your charter to your faculty advisor.
- ☐ Meet with your faculty advisor to get feedback.
- ☐ Finalize your charter.
- ☐ Submit your charter after completing Lesson 2 of QI 201: Guide to the IHI Open School Practicum and get feedback from IHI.
- ☐ Submit your cause and effect diagram after completing Lesson 3 of QI 201: Guide to the IHI Open School Practicum.
- ☐ Submit PDSA cycles and run charts after completing Lesson 5 of QI 201: Guide to the IHI Open School Practicum.
- ☐ Send your final summary report after completing Lesson 6 of QI 201: Guide to the IHI Open School Practicum.
- ☐ Receive the IHI Open School Practicum Certificate after your project is accepted by the IHI Open School team.
- ☐ Provide permission (if possible) for your project to be featured on the IHI Open School Practicum website.

TEACHER-LEARNER AGREEMENT

Purpose: To make sure the project expectations – and potential time commitments – are clear to all parties at the start, we ask you and your faculty member to sign this teacher-learner agreement.

General ground-rules

1. Open communication
2. Regular meetings
3. Constructive feedback
4. Respectful interactions
5. Focus on improving care
6. Confidentiality

Learner Benefits	Learner Responsibilities
– Gain practical experience in quality improvement, which is valued by educational systems and future employers – Work closely with faculty member with quality improvement knowledge and skills – Become familiar with health system sponsor – Improve care in an area of interest – Earn the IHI Open School Practicum Certificate – Have practicum project published on IHI Open School website (optional)	– Complete IHI Open School Courses QI 101, QI 102, QI 103, and QI 201 – Commit to completing Practicum work within 6 months – Complete and submit Practicum forms • Project charter • Cause and effect diagram • Two PDSA forms • Run chart(s) • Summary report – Seek feedback from faculty on a regular basis
Faculty Benefits	**Faculty Responsibilities**
– Gain practical experience mentoring learners in quality improvement, which is valued by educational systems and employers – Work closely with learner mentee interested in quality improvement – Develop relationship with health system sponsor – Improve care in an area of interest	– Review Practicum Faculty Handbook – Be familiar with IHI Open School's online course content in quality improvement – Commit to mentoring/advising learner • Set aside time to meet regularly, review Practicum forms, and provide ongoing feedback/guidance – Support the learner by identifying available resources, including forms, data analysis, and tools – Advocate for project within health system

TEACHER

Signature (electronic is acceptable):

_____

Printed Name: _____

Title/Position: _____

Date: _____

LEARNER

Signature (electronic is acceptable):

_____

Printed Name: _____

Title/Position: _____

Date: _____

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STANDARD FORMAT AND DEFINITIONS FOR A CHARTER

What are we trying to accomplish?

Aim statement

- ✓ Please provide the aim of the project that answers the following questions:
  - How good?
  - For whom?
  - By when?

Problem to be addressed (briefly and broadly defines WHAT)

- ✓ What existing problem is to be addressed?
- ✓ What aspect of care will be improved?
- ✓ What subsystems will be affected? (e.g., medication delivery, trauma care in the emergency department)

Reason for the effort (defines WHY)

- ✓ Why is the effort important?
- ✓ How will this improvement benefit patients?
- ✓ What is the potential downside of this effort for patients?
- ✓ What background information (data/analysis/literature review) supports the choice of this effort?

Expected outcomes (defines WHAT specifically, still not HOW)

- ✓ Specific objectives to be accomplished.
- ✓ Specific, numerical goals to be attained.
- ✓ Time frame: Expected dates for key milestones and completion date.
- ✓ Anticipated products, tools, and deliverables (e.g., checklists) as part of a process.

How do we know that a change is an improvement?

Define the measures that will be used to monitor the impact of this improvement effort:

- ✓ Identify outcome measures (minimum of 1), process measures (minimum of 2), and balancing measures (minimum of 1) for the project. This is your family of measures.
- ✓ Connect measures to the goals and outcomes of the charter (Tip: Consider qualitative feedback as well as quantitative measures.)

What changes can we make that will lead to improvement?

- ✓ *Initial changes planned:* What changes will you make to accomplish your stated aim?
  - What factors led your group to conclude the change selected is likely to be successful?
- ✓ *Barriers:* What are the perceived barriers for your planned changes to be effective?
  - Is there IT support? Is changing provider behavior an issue? Is it cost prohibitive? How will these be addressed?
- ✓ *Key stakeholders:* Who are the key stakeholders in the planned changes?
  - Explain how you are going to ensure interprofessional/multidisciplinary input on your project as needed.

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CHARTER FORM

Name: _____

Team Members: _____

Project Title: _____

University/Organization Name: _____

Health System Sponsor Name: _____

What are we trying to accomplish?

Aim statement (How good? For whom? By when? 1-2 sentences):

Problem to be addressed (Defines WHAT broadly; 2-3 sentences)

Reason for the effort (Defines WHY; 4-5 sentences)

Expected outcomes/benefits (Defines WHAT specifically, still not HOW; 3-4 sentences)

How do we know that a change is an improvement?

(Identify outcome, process, and balancing measures; 4-5 sentences)

What changes can we make that will lead to improvement?

(Initial changes, barriers, key stakeholders; 4-5 sentences)

Read the following statement and check the box below before submitting this charter to the IHI Open School.

☐ *I certify that my faculty advisor has reviewed and approved this charter.*

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CHARTER ASSESSMENT

All items must be satisfied in each domain at a rating of "2" or higher in order to submit. Feedback should be provided for all items with a score of "1" and charter should be revised until expectations are met.

What are we trying to accomplish?	**Needs Improvement 1**	**Meets Expectations 2**	**Exceeds Expectations 3**
Aim statement is clear and answers how good, for whom, and by when.	☐	☐	☐
Problem to be addressed clearly justifies need for improvement.	☐	☐	☐
Identifies aspect of care that will be improved and subsystems that will be affected.	☐	☐	☐
The impact (positive *and* negative) on patients is clear.	☐	☐	☐
Supportive background information is provided.	☐	☐	☐
Specific objectives and numerical goals are clearly defined.	☐	☐	☐
Project can be completed within time frame.	☐	☐	☐
Addresses anticipated products, tools, and deliverables that will be used in process.	☐	☐	☐
Feedback:			

How do we know that a change is an improvement?	**Needs Improvement 1**	**Meets Expectations 2**	**Exceeds Expectations 3**
An appropriate family of measures is identified (minimum of 1 outcome measure, minimum of 2 process measures, and minimum of 1 balancing measure).	☐	☐	☐
Measures identified are directly related to the project description, objectives, and goals.	☐	☐	☐
Each measure is operationally defined in an appropriate way.	☐	☐	☐
Data collection on metrics is reasonable and practical given scope of QI project.	☐	☐	☐
Feedback:			

What changes can we make that will lead to improvement?	**Needs Improvement 1**	**Meets Expectations 2**	**Exceeds Expectations 3**
Initial changes to be tested are clear and well defined.	☐	☐	☐
Specific strategy/methodology used in selecting change is identified and explained.	☐	☐	☐
Project constraints/barriers are defined, including how both will be addressed.	☐	☐	☐
Identifies key stakeholders and explains their role in the process.	☐	☐	☐
Feedback:			

CAUSE AND EFFECT DIAGRAM INSTRUCTIONS

What is a cause and effect diagram? A cause and effect diagram, also known as an Ishikawa (after its developer) or "fishbone" (after its shape) diagram, is a graphic tool used to explore and display the possible causes of a certain effect. It will help you to identify potential changes to test for your quality improvement project.

Why is it such a valuable tool to you and your team?

1. It helps teams understand that there are many causes that contribute to an effect.
2. It graphically displays the relationship of the causes to the effect and to each other.
3. It helps identify areas for improvement within your project.

What is a cause? Causes are parts of a system and forces outside a system that directly influence the outcome, or aim, of your project. For example, one cause of a low hand hygiene compliance rate is provider behavior. In other words, getting providers to change their behavior (and wash their hands) directly influences the compliance level within the unit or hospital.

There are lots of causes that contribute to a certain effect. Take poor hand hygiene, for example. What are the contributing factors? Sometimes clinicians are too busy. Sometimes they wash their hands, but they don't use proper hand washing technique. Sometimes the gel dispenser is broken. Sometimes the gel dispenser is working, but it's empty.

Consider these six categories of causes:

- Materials: Supply, design, availability, and maintenance
- Methods and Process: Steps in care process and steps in supply chain
- Environment: Staffing levels and skills, workload and shift patterns, administrative and managerial support, and physical plant, policies, and regulations
- Equipment: Any equipment/tools needed to get the job done
- People: Staff knowledge and skills/training, competence, patient behavior, and supervision
- Measurement: Data collection, definition of measures, and sampling issues

What are the steps required to construct a cause and effect diagram?

1. Write the effect (in other words, the thing you're trying to change) in a box on the right-hand side of the page.
2. Draw a long horizontal line to the left of the effect.
3. Decide on the categories of causes for the effect. As mentioned above, useful categories of causes in a classic fishbone diagram include Materials, Methods and Process, Environment, Equipment, People, and Measurement. Another way to think of categories is in terms of causes at each major step in the process. (Note: These categories can vary depending on your project. Manufacturing sometimes follows the "5 M's": man, machines, materials, methods, and measurement. Nonmanufacturing systems sometimes use the "5 P's": patrons, people, provisions, places, and procedures. Just make sure the categories you choose fit your project.)
4. Draw diagonal lines above and below the horizontal line (these are the "fishbones"), and label with the categories you have chosen.
5. Brainstorm and collect a list of causes for each category. (We'll discuss this step in further detail on the next page.)
6. List the causes on each fishbone. If a cause has a secondary cause (for example, under "pagers," you could list "hard to use" and "inadequate training"), draw a branch bone to show relationships among the causes.
7. Develop the causes by asking, "Why?" until you have reached a useful level of detail — that is, when the cause is specific enough to be able to test a change and measure its effects.

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CAUSE AND EFFECT DIAGRAM FORM

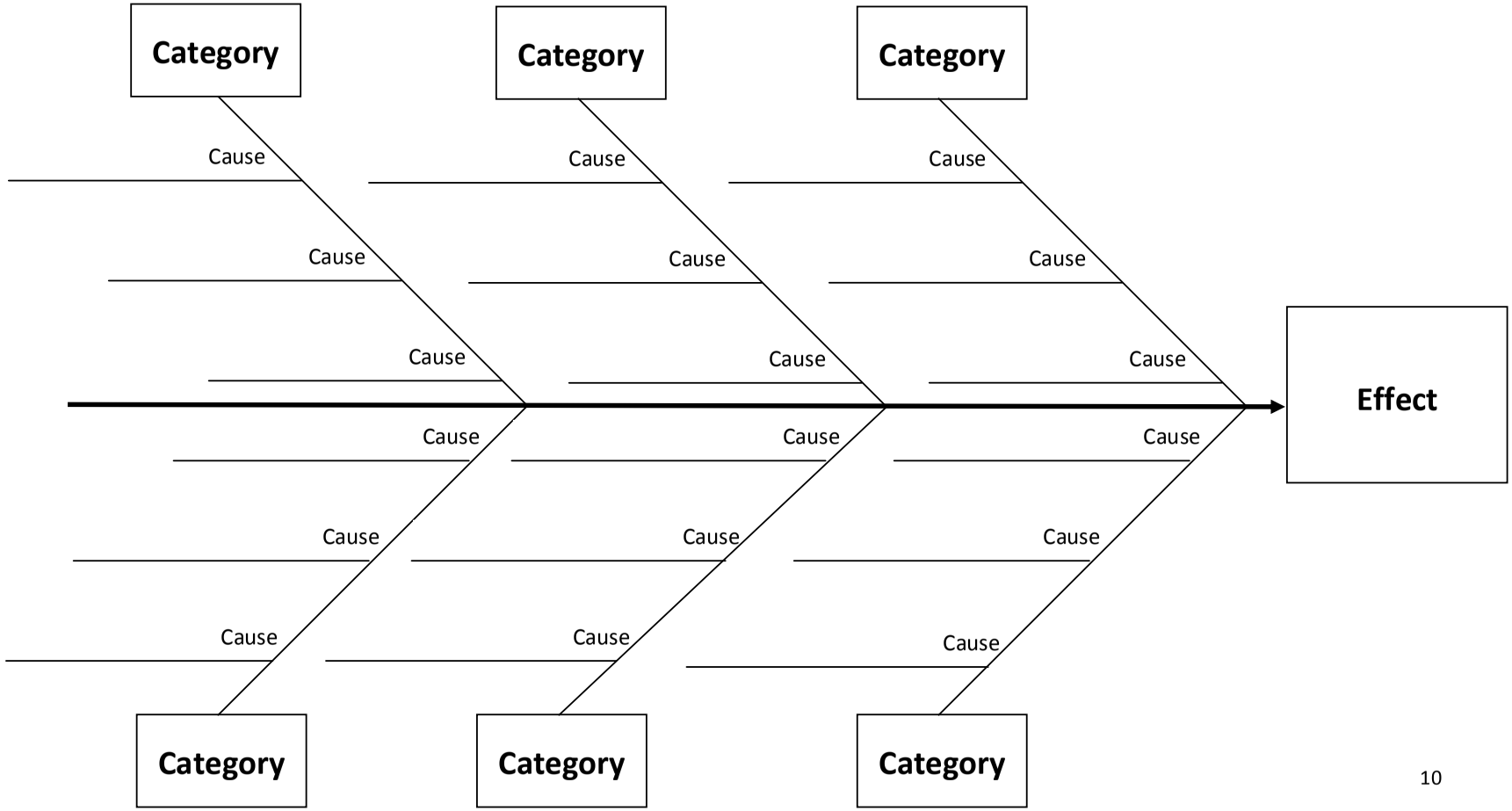
Name: _____

Project Title: _____

University/Organization Name: _____

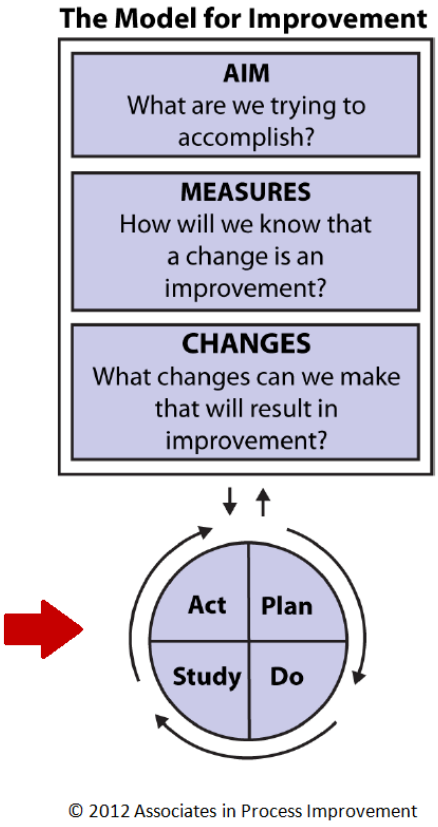
Health System Sponsor Name: _____

Team Members: _____



PDSA Basics

Plan. Do. Study. Act. These four words will guide you as you carry out your tests of change and, hopefully, find ways to improve patient care at your organization.



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In four simple steps:

1. Plan: Plan the test or observation, including a plan for collecting data.

- State the objective of the test.
- State the questions you want to answer and make predictions about what will happen and why.
- Develop a plan to test the change. (Who? What? When? Where? What data need to be collected?)

2. Do: Try out the test on a small scale.

- Carry out the test.
- Document problems and unexpected observations.
- Begin analysis of the data.

3. Study: Set aside time to analyze the data and study the results.

- Complete the analysis of the data.
- Compare the data to your predictions.
- Summarize and reflect on what was learned.

4. Act: Refine the change, based on what was learned from the test.

- Determine what modifications should be made.
- Prepare a plan for the next PDSA.

PLAN DO STUDY ACT (PDSA) FORM

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Cycle #:

Start Date: **End Date:**

Project Title:

University/Organization Name:

Health System Sponsor Name:

Objectives of this Cycle:

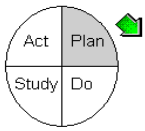
☐ Test a Change

☐ Implement a Change

☐ Spread a Change

Short objective of cycle:

PLAN



Test/Implementation Plan:

What change will be tested or implemented?

How will the change be tested or implementation be conducted (consider small scale early)?

Who will run the test or implementation?

Where will the test or implementation take place?

When will the test or implementation take place?

Predictions:

1.

2.

3.

4.

Data Collection Plan:

What information is important to collect?

Why is it important?

Who will collect the data?

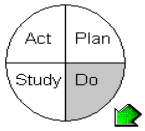
Who will analyze the data prior to Study?

Where will data be collected?

When will the collection of data take place?

How will the data (measures or observations) be collected?

DO



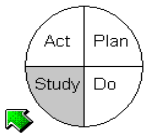
Observations:

Record observations not part of the plan:

Did you need to tweak the original Plan?

Begin analysis of data (graph of the data, picture):

STUDY



Questions: Copy and paste Questions and Predictions from Plan above and evaluate learning. Complete analysis of the data. Insert graphic analysis whenever possible.

1. **Prediction:**

   Learning (Comparison of questions, predictions, and analysis of data):

2. **Prediction:**

   Learning (Comparison of questions, predictions, and analysis of data):

3. **Prediction:**

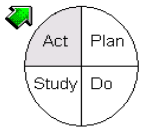
   Learning (Comparison of questions, predictions, and analysis of data):

4. **Prediction:**

   Learning (Comparison of questions, predictions, and analysis of data):

Summary (Look at your data. Did the change lead to improvement? Why or why not?):

ACT



Describe next PDSA Cycle: Based on the learning in "Study," what is your next test?

DISPLAYING DATA

Plotting data over time is a simple and effective way to determine whether the changes you are making are leading to improvement – that is, to answer the second question in the Model for Improvement: *How will we know that a change is an improvement?*

Because improvement happens over time, a run chart is a great tool for displaying and learning from improvement data.

Using run charts has a variety of benefits:

- They help improvement teams formulate aims by depicting how well (or poorly) a process is performing.
- They help in determining when changes are truly improvements by displaying a pattern of data that you can observe as you make changes.
- They give direction as you work on improvement and information about the value of particular changes.

Here's how you make a run chart:

1. Plot time along the X axis. Choose the appropriate time increment based on your improvement project—minutes, hours, days, weeks, months, etc. Note that individual patients could also be the unit plotted on the X axis.

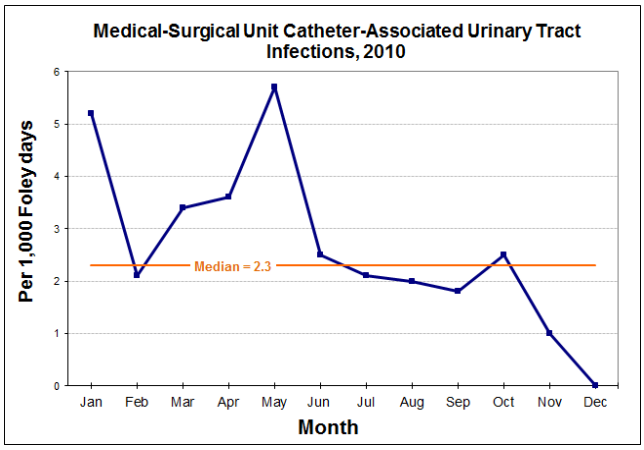
2. Plot the variable you're measuring along the Y axis. A good scale is one that is easy to plot, easy to read, and leaves enough room for future data that might be larger or smaller than the values in your initial run chart. In a good scale, most of the data will lie near the middle half of the graph.

3. Label both the X and Y axes, and give the graph a useful title. For Alan's team's project on hand hygiene compliance, your run chart for your outcome measure might be called "Percentage of Clinicians Complying with Hand Hygiene Guidelines."

4. Calculate and place a median of the data on the run chart. The median is the number in the middle of the data set when the data are ordered from the highest to the lowest. The median comes in very handy when you're interpreting the chart. The median is also the position of the fiftieth percentile.

5. Add other information as needed. Add a goal or target line, if appropriate. Annotate unusual events, changes tested, or other pertinent information.

Here's an example of a completed run chart:



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RUN CHART TEMPLATE

***Please Note: This is an example. Use the Excel document that is linked in the course to do your run charts.*

Graph Label	Graph Title
Y Axis Label	Y Axis Label
X Axis Label	X Axis Label

Enter dates or observation numbers into the green cells at right. (clear the sample data before you begin)

Enter your data values into the blue cells. Goal values are optional.

Don't leave any blank cells in the Date/Observation column.

Enter an 'X' into the End Median column to mark the last row to be included in the median

Enter your graph title, x axis, and y axis label into the cells provided.

Use regular Excel commands to configure the graph.

See sheet 'Rules for Interpreting Charts' for information about interpreting charts

Date / Observation	Value	Median	Goal	End Median

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PRACTICUM SUMMARY REPORT

Name: _____

Team Members: _____

Project Title: _____

University/Organization Name: _____

Health System Sponsor Name: _____

Aim of project (1-2 sentences)

Planned changes tested (2-3 sentences)

Predictions (2-3 sentences)

Results
Present your results with a graph(s).

Summary of results (3-4 sentences):

Learning (4-5 sentences)
Comparison of questions, predictions, and analysis of data:

Impact on systems (3-4 sentences)
Discuss the project's significance on the local system and any findings that may be generalizable to other systems:

Conclusions (3-5 sentences)
Summarize the outcome of the project. Is this project sustainable? What are the requirements for sustainability?

Reflections/Discussions (5-7 sentences)
Discuss the factors that promoted the success of the project and that were barriers to success. What did you learn from doing this project? What are your reflections on the role of the team?

By signing this document (electronic signature is acceptable), I attest that the information provided by the learners in this project is accurate.

LEARNER(S):

Signature: _____ Signature: _____
Printed Name: _____ Printed Name: _____
Area of Study: _____ Area of Study: _____

Signature: _____ Signature: _____
Printed Name: _____ Printed Name: _____
Area of Study: _____ Area of Study: _____

Signature: _____ Signature: _____
Printed Name: _____ Printed Name: _____
Area of Study: _____ Area of Study: _____

FACULTY SPONSOR:

Signature: _____
Printed Name: _____
Institution: _____

HEALTH SYSTEM SPONSOR (if different from faculty sponsor):

Signature: _____
Printed Name: _____
Institution: _____

AUTHORIZATION
Do the learners, faculty sponsor, and health system sponsor authorize this project for publication at www.ihi.org?

☐ Yes ☐ No