



UNIVERSITY OF CALGARY
CUMMING SCHOOL OF MEDICINE
Department of Family Medicine

FAMILY MEDICINE RESIDENCY PROGRAM

QI HANDBOOK

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Introduction

This handbook provides you with information on the resident quality improvement (QI) project and provides you with many links to resources on QI. In addition to this document, you have access to a resident research training coordinator (RRTC) who is capable of fielding any of your QI-related questions.

Projects: As an R1, you must complete a small QI project with a clinical team and, when you progress to R2, you can choose to pursue a larger QI project, a research project, or a systematic review project. Since QI and research are different activities, their handbooks are separate documents. For information on projects in the research stream, consult the Resident Research Handbook (<https://goo.gl/mja88d>).

What is Quality Improvement?

QI is a systematic approach to improving processes or systems. QI is versatile and is applicable to a variety of settings:

- In industry, some processes are manufacturing, testing products for defects, finding ways for minimizing waste, ensuring customer feedback is communicated to product designers, and promoting workplace safety.
- In healthcare, examples of such processes include taking vitals as soon as a patient enters the exam room, ensuring that documents and information is in the right place, finding ways for minimizing patients' wait times from Emergency intake to admission, and optimizing clinical behaviour to improve clinical efficiencies and patient satisfaction.

Although there are many models for pursuing QI in healthcare¹² they all contain step-wise approaches which include:

- Examining your practice
- Identifying a problem in need of change
- Collecting a baseline measure
- Testing a change
- Monitoring for improvement by comparing the baseline measure to the intervention measure
- Deciding if a change was successful and whether it should be implemented or not.

¹ For a detailed overview of the many approaches to quality improvement, see: Hughes, R. G. (2008). Tools and strategies for quality improvement and patient safety.

² The Institute for Healthcare Improvement is also an excellent resource: <http://www.ihi.org/Pages/default.aspx>

Why is QI important to Family Medicine?

QI is important to family medicine because it gives you a methodology for improving the care of patients and clinical processes. By incorporating QI into your daily practice, you can promote a safer, more satisfying clinical experience for patients and the people you work with. QI allows you to reflect on the decisions you make in clinic and adjust them so they are evidence-based, economical, and appropriate for the system you are working in. Among other things, QI can be used to improve:

- Patient wait times
- Patients' knowledge of a particular diagnosis and the steps involved in managing it
- Updating patients' medical lists
- Clinical guidelines:
 - e.g., proportion of DM patients with HbA1C Q6M
 - e.g., proportion of patients who are screened for disease per guidelines
- Proportion of charts that contain crucial information on patients' health status.
 - e.g., proportion of charts with a recorded smoking status?
- Time from Emergency visit to inpatient admission
- Consult times

Key Principles of QI

There are some key principles you should keep in mind as you embark on your resident QI projects.

- A. **Teams:** QI involves **teamwork**. In the context of healthcare, teams may include physicians, nurses, medical office assistants, EMR experts, and patients.
 - i. For your QI project, you will work on a clinical team and there should be consensus among the team that the process needs improvement through QI; residents do not constitute a full team.
- B. **Small scale:** Change is tested on a small scale
- C. **Rapid tests:** Change is tested rapidly, with a short turn-around time. For example, a QI project could involve reviewing the next 10 patients, everyone seen on a single day, or a week's worth of data.
 - i. You do not need a lot of data to determine if a change is needed or if you are moving towards improvement.
- D. **Simplicity:** Measures and interventions are simple: they involve minimal steps and are easy to understand. As well, there is a direct relationship between a project's aim statement and measures.
- E. **Persistence:** If a change does not lead to the desired results, the team moves on to another test of change; if a change is successful, it is implemented more formally/broadly.
- F. **Systems thinking:** QI views clinics as **systems** with many moving, interdependent parts.
 - i. Systems thinking was presented to you at the "Introduction to QI" lecture.
 - ii. For more information on systems thinking: National Health Service in the UK (<http://goo.gl/NhqI06>); article (<http://bit.ly/28WljQG>)

QI and Research

It is important to understand that QI is NOT research. QI and research are different because they involve different agendas, scopes, assumptions, and require different mindsets from practitioners.

- While QI is focused on understanding site-specific processes and making small, quick tests of change, research aims to generate generalizable knowledge (Table 1).
- QI is based on the existing knowledge of team members who are involved in the process. It does not involve an exhaustive review of literature.

Element	Quality Improvement	Research
Goal	<p>Improve an aspect of a clinic; the knowledge and improvements gained from this activity stays with the clinic.</p> <p>Continuous improvement</p>	<p>Create generalizable knowledge and fill a gap in research. This knowledge can be taken from one place and applied to another.</p> <p>Answer research question</p>
Individuals or teams?	Team-based activity	Individual or team-based activity
Method	PDSA cycles	Various: quantitative, qualitative, mixed methods, etc.
Intervention	Specific to the clinic and derived from analysis of baseline measurement – can change from PDSA cycle to PDSA cycle	If there is an intervention, it is established from the design stage of the project. This is done to minimize biases and to ensure that the intervention gets tested.
Statistics	Basic – just simple percentages, no tests of significance or correlation	Advanced or basic depending on research question
Ethics Review	<p>In Alberta, you run your QI project through Alberta Innovate’s “ARECCI Screening Tool” prior to starting: https://goo.gl/KdU4yw</p>	Performed by a Research Ethics Board prior to data collection, if human subjects are involved

Table 1: QI vs Research

The Model for Improvement

We teach the Institute for Healthcare Improvement (IHI) “Model for Improvement” (MFI) because of its widespread use among healthcare practitioners and easy deployment in clinics. Furthermore, the MFI contains all of the principles and characteristics of QI mentioned above. By reading this handbook and completing the required QI project deliverables, you will work through the MFI and see how easy it is to use.

The Model for Improvement (Appendix, Figure 1) contains two parts:

- The *planning part*, where you ask three questions:
 - “What are we trying to accomplish?”
 - “How will we know that a change is an improvement?”
 - “What changes can we make that will result in an improvement?”
- The *doing part*, where you run cycles to test and implement changes in real work settings

For a deeper description of the Model for Improvement, check out:

<http://www.ihl.org/resources/Pages/HowtoImprove/default.aspx>

The IHI Model for Improvement uses Plan Do Study Act (PDSA) cycles as its method for change.

PDSA Cycles

A PDSA cycle involves measuring what you want to improve, designing and implementing a change, and measuring to see if the change makes a difference. Each PDSA cycle should move you closer to achieving your aim statement. This section describes each phase of a PDSA cycle, techniques for employing it in your Resident project, and tactics for ensuring your project is on track.

PLAN

The first thing to do is to hold a meeting with the key people in your clinic, so you can work together to figure out what the clinic needs improving. Then, as a team, write an Aim Statement:

- What are we trying to accomplish; what outcomes are we trying to change?
- The Aim Statement must include 5 elements:
 - A timeframe for completing the improvement
 - What you plan to improve
 - The goal for the improvement expressed as a percentage. This value has a direct relationship with your baseline measure, which is frequently calculated by taking the number of observations and divide it by the number of eligible patients to get X%
 - The location (the clinic’s/setting’s name)
 - The population/scope of the improvement

Topic	Proper aim statement
Updating patient smoking status	<i>“By December 5th, 20XX, 95% of adolescent and adult patients who visit Pinkacre Clinic will be asked about their smoking status and their smoking status will be expressed in the patients’ charts.”</i>
Location	Pinkacre Clinic
Timeframe	By December 5 th , 20XX
Area of improvement	Smoking statuses in EMR
	What gets counted: smoking statuses in the EMR
Goal for improvement	95% of eligible patients will have their smoking status expressed in the clinic’s EMR
Population/scope of improvement	Adolescent and adult patients
Opioid contracts	<i>“By December 5th, 20XX, 95% of patients seeking opioids for chronic pain at the Topolino Clinic will have a current opioid contract on record.”</i>
Location	Topolino Clinic
Timeframe	By December 5 th , 20XX
Area of improvement	Opioid contracts
	What gets counted: Opioid contracts in the EMR
Goal for improvement	95% of eligible patients will have a current opioid contract
Population/scope of improvement	Patients with chronic pain

Table 2: Proper Aim Statements

PLAN - Define measure(s)

- What measure(s) will your team use? How will you be able to show that change is an improvement?
- There are three types of measures: process, outcome, and balancing. **For your R1 project, focus on collecting process measures and consider the other measures in the write-up of your final report.**
 - **Process measures** serve to quantify steps and actions that constitute clinical behaviour and the processes in a clinic. Examples of process measures are the percentage of patients being referred, how often patients are asked about a health issue, and how often an illness is correctly labeled in the EMR.
 - **Outcome measures** quantify clinical or financial outcomes such as lab results, mortality rates, adverse drug events, and financial costs.
 - **Balancing measures** capture the implications of making change in one part of a system on another part of the system. For example, if a physician updates each of her patients' medical lists at each patient encounter, does this increase wait times for other patients?
- Ensure that your measures actually measure the outcome you plan to improve. This seems self-evident, but experience has shown us that many QI Teams miss this critical link. Do not assume measures will satisfy your aim statement; if you are improving X, measure X.
- Keep your measure(s) **simple**.
- Examples of appropriate measures:
 - If you are improving the frequency of taking patient vitals, count how often vitals are taken and divide it by the total number of patients who visited during your established time frame.
 - If you are improving how often a form is correctly filled out, get an example of a good, complete form and see how often clinical staff correctly complete the form.

PLAN - Collect baseline measure(s)

- PRIOR to any test of change, collect baseline data on your selected measure(s).
 - **Baseline measures are important:** Your baseline measure tells you if there was a problem to begin with and, once your intervention is in play, whether you've made a change.
 - Your baseline measure is frequently calculated by taking the number of observations and dividing it by the number of eligible patients to get X%
 - For example: $(\# \text{ of opioid contracts} / \# \text{ patients who qualify for opioid contracts}) * 100 = X\%$
 - Again, make sure you are measuring the thing you are trying to improve; double-check to confirm your baseline satisfies your aim statement.
- Now that you have taken your baseline, does your baseline measure substantiate the need for improvement?
 - Do not assume that there is a problem in your clinic – use your baseline measurement to validate your assumption.
 - If your baseline measure surprises you by being close to the goal in your stated Aim, you will need to identify another area for improvement and redefine your Aim Statement.

DO - Conduct a test of change

- This step may contain multiple sub-steps, e.g.:
 - Consider HOW you might improve your selected measure(s):
 - Consider your stated outcome as the result of a PROCESS or SYSTEM.
 - What are the STEPS in the process? Write these down with your Team. Ensure you agree on what are the steps in the process.
 - You may learn more about “process mapping” by visiting <http://bit.ly/28Ti61n> or <http://bit.ly/1SYcNMo>, but a simple list of steps will suffice for your QI Project.
 - You can also consider using a cause and effect diagram (also known as a Ishikawa or “fishbone” diagram) to help pinpoint your intervention. For examples of these diagrams, go to: <http://bit.ly/29PiChL>
 - As part of a Cause and Effect analysis, you can ask the “5 Whys” to zero in on the causes of problems. Here is IHI’s page on the 5 Whys: <http://bit.ly/29Piqmr>
 - Where could your Team introduce a change that might influence the outcome?
- Generally, your QI Team will identify multiple strategies to improve the outcome. **SELECT ONE intervention for your R1 Project** – for examples, see Table 3.
- Test a change to one element of the process. **(If you complete a QI Project in R2, you will need to select and test more than one change)**

Scenario	Intervention
The clinic wants to ensure that patients' smoking statuses are recorded in the electronic medical record (EMR).	<ul style="list-style-type: none"> - For two weeks in July, every patient aged 15 years and above will be asked about their smoking status and their smoking status will be recorded in the EMR. - Change will be measured by comparing the number of smoking statuses to the number of qualifying patients.
The clinic wants blood pressures taken for every visit.	<ul style="list-style-type: none"> - For two weeks in September, each patient who visits the clinic will have his/her blood pressure taken. - Change will be measured by comparing the number of blood pressures listed in the EMR to the number of patients who visit during those two weeks.

Table 3: Scenarios and Possible Interventions

STUDY - Measure the outcome of the change

1. Collect new (post change) data on your selected measure.
2. Did your change result in improvement?

ACT - Decide on next steps

- For your **First QI Project**, remember that you only have to complete one PDSA cycle, so you are not required to act upon the results of your single test for change.
- As part of a reflective exercise, the QI Worksheet asks you questions about a hypothetical continuation of your project.
 - Your QI Team has 2 choices after any test of change:
 - The change was successful and resulted in achieving the Aim Statement. Implement the change.
 - The change was not successful or was only somewhat successful, but improvement is still possible. Modify the change slightly and re-test – or - conduct a completely new test of change.

What are the requirements for the QI project(s) in the Residency Program?

First QI Project

- In R1, all Residents must complete a small QI Project.
- The requirements of the First QI Project are provided in the QI Worksheet, which is available at the DFM Resident Research Webpage. The essential elements are:
 - o Complete 1 test of change (“PDSA cycle”) in your clinic (following the steps of a PDSA cycle outlined above), and submit a final report outlining your QI project.
 - o Your PDSA cycle must include a baseline measure, an intervention, and an intervention measure.

Scholarship Project

- All Residents must complete a scholarship project.
- The scholarship project may be one of the following:
 1. A second QI project: A multi-PDSA QI Project (either a new topic, or an expansion of your R1 QI Project)
 - Follow the steps of the PDSA cycle listed above, but complete the cycle multiple times and work to achieve your aim statement. Your project will comprise of at least two PDSA cycles, but may require more, since your goal is to **achieve your aim statement**. The expectation is that you will run as many PDSA cycles as necessary to achieve your aim statement.
 - This project will be much larger than your R1 QI project and the expectations for the second QI project are much higher. You must start early and work closely with clinic staff to make sure your project is an ongoing concern.
 - The components³ of the second QI project are:
 - i. Letter of Intent and Clinic Approval
 - ii. Team Charter
 - iii. Proposal
 - iv. Formal Progress Report and frequent email status updates sent to RRTC
 - v. Final Report
 - vi. Presentation at Resident Scholarship Day
 2. A Research Project (see Research Handbook for details)

Project Supervisors

- All Family Medicine residents are must identify a faculty member or clinical preceptor who agrees to supervise all of their scholarly work.
 - o Have your preceptor sign the resident-preceptor agreement
 - This agreement is available on the DFM Resident Research Webpage.

Role of Supervisors

Supervisors mentor and support to residents in the following areas:

- Identifying research topics relevant to Family Medicine
- Helping to design projects
- Providing input on outlines, proposals, progress reports, presentations, and final reports.

³ Instructions for each component can be found on the DFM Research Webpage

Resident Deadlines

- Deadlines for the first and second QI project can be found on the DFM Research Webpage
- **For your Scholarship Project, be sure to check the DFM Research Webpage in July of next year for a new set of deadlines when you transition from R1 to R2.**

Resident Scholarship Day

- As a program requirement, you must present your scholarship project at Resident Scholarship Day (RSD)
 - Residents are assigned a presentation type: Poster or Oral Presentation
 - If you cannot present at RSD and have an program-approved absence, you will present at another time and work with the Residency Program to schedule this presentation

Resources

The University of Calgary's Department of Family Medicine Research Website:

http://www.calgaryfamilymedicine.ca/Research/index.php?option=com_content&view=article&id=1800

AHS AIW: <http://goo.gl/j2Gqdy>

ARECCI <http://www.aihealthsolutions.ca/initiatives-partnerships/arecci-a-project-ethics-community-consensus-initiative/>

ARECCI screening tool: <http://goo.gl/lgLQyc>

Dr. Mike Evan's "Quality Improvement in Healthcare" (YouTube video): <https://youtu.be/jq52ZjMzqyl>

Health Quality Ontario's Quality Improvement Guide covers everything contained in this handbook (PDF): <http://goo.gl/7OFV7z>

The Institute for Health Improvement: <http://www.ihl.org/resources/Pages/default.aspx>

IHI Model for Improvement: <http://www.ihl.org/resources/Pages/HowtoImprove/default.aspx>

IHI Cause and Effect Diagrams: <http://bit.ly/29PiChL>

IHI Five Whys: <http://bit.ly/29Piqmr>

NHS Institute for Innovation and Improvement. "Working in systems: Process and systems thinking" (PDF): <https://is.gd/phmDvr>

West of England Academic Health Science Network. "What is systems thinking?": <http://goo.gl/NhqI06>

NHS Institute for Innovation and Improvement. "Process mapping – An overview": <https://is.gd/ylzT09>

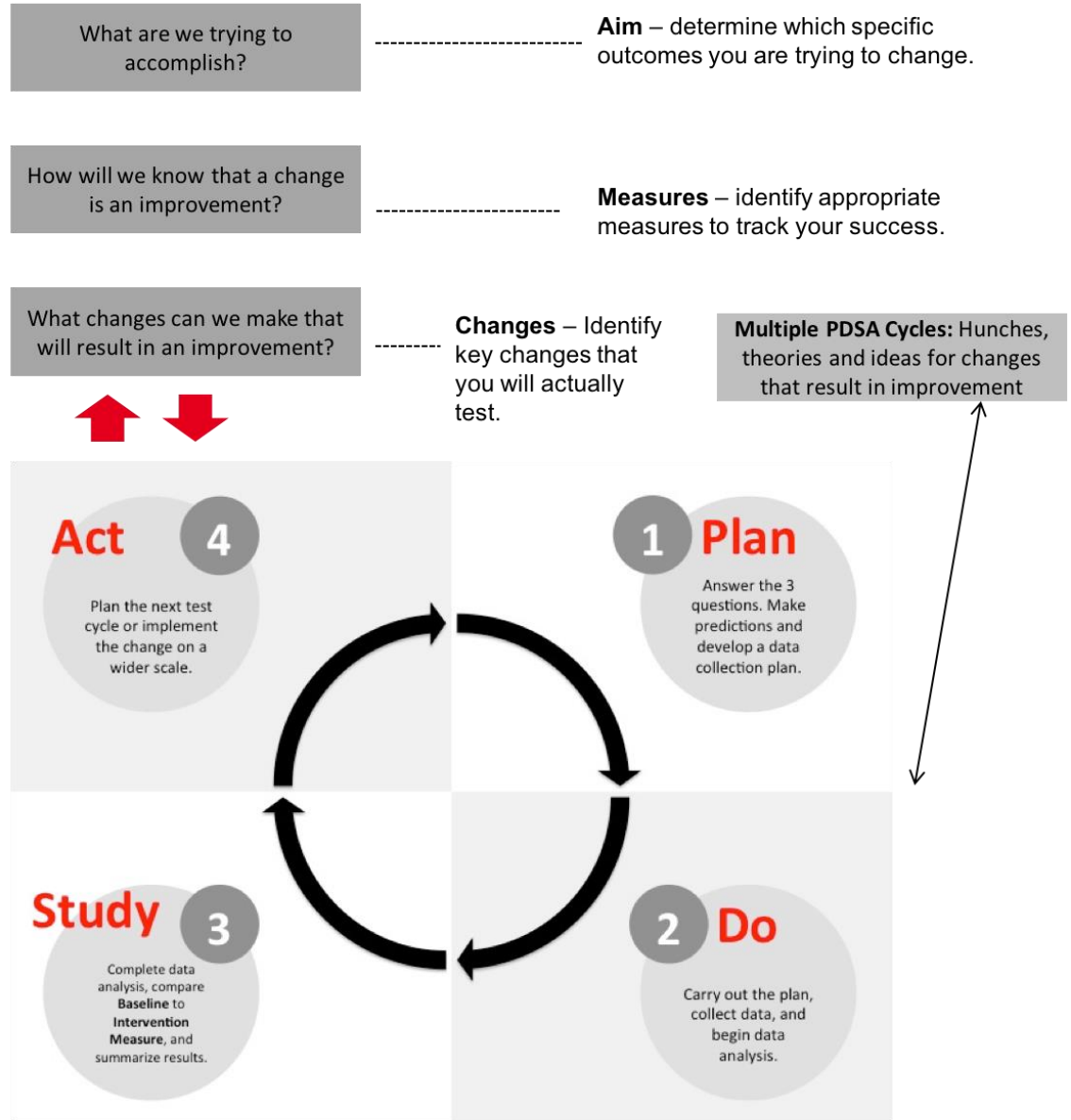
NHS Institute for Innovation and Improvement. "Process mapping, analysis, and redesign" (PDF): <https://is.gd/aSQIMz>

QI is not Research: <https://irb.research.chop.edu/quality-improvement-vs-research>

UCSF Department of Medicine's Quality & Safety Reading List: <https://medicine.ucsf.edu/safety/resources/>

Appendix

The Model for Improvement – PDSA Cycles



Source: Langley, G.L., Nolan, K.M., Nolan, T.W., et al. (1996). The improvement guide: a practical approach to enhancing organizational performance. San Francisco: Jossey-Bass.

Figure 1: The Model for Improvement