



A Practical Approach to QI for Fellowship Program Directors

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Learning Objectives

- Define quality improvement in health care
- Describe elements in the IHI Model for Improvement
 - Create a SMART aim statement
 - Define measures
 - Perform cause and effect analysis
 - Test change through PDSA cycles
 - Plot and analyze data in a run chart
- Identify common pitfalls in QI
- Apply QI principles to APEI
- Identify QI resources/toolkits

Why Do Quality Improvement?



American Healthcare System Summary Report:

- Unsafe: <u>To Err is Human</u>: 44,000-98,000 deaths/year due to preventable medical errors
- Unreliable: Defects typically at "parts-per-ten"
- Uncoordinated: Across boundaries in the patients' journeys, especially chronic care
- Inequitable: Race, geography and socioeconomic class strongly predict health status and care, even when controlling for access
- Inefficient: Costs double other nations' that have equal or better care; supply-driven care without value.

Healthcare Spending



Life expectancy vs per-capita healthcare spending.



IOM: Crossing the Quality Chasm



- Healthcare quality: "the degree to which health services ... increase the likelihood of desired health outcomes and are consistent with current professional knowledge."
- Gap between care we are providing and care we are capable of providing.

IOM: Crossing the Quality Chasm



Quality Improvement is a formal approach to the assessment of performance and systematic efforts to improve it.

Quadruple Aim





Image courtesy of:http://www.mihia.org/dashboard/quadrupleaim.html

Research vs. Quality Improvement





Key Features of Quality Improvement:

- Systematic, data-guided activity designed to bring about the immediate improvement.
- Characterized by the prompt feedback of deliberate changes to the care delivery setting that is making the changes.

* Content adapted from: July-August 2006 / Hastings center report, the ethics of using qi methods to improve health care quality and safety

Methodology Alignment



VALIDATE PROBLEM	ASSESS & FOCUS PROBLEM	VERIFY ROOT CAUSES	CHANGE & EVALUATE PROCESS	VERIFY IMPROVEMENT	MAINTAIN PROCESS GAINS
Is there a problem?	What is the extent of the problem?	What is causing the problem?	How can we fix what caused the problem?	How do we know we improved?	How do we keep the problem from happening again?
SIX SIGMA (DM/	AIC)				
Define	Measure	Analyze	Improve		Control
MODEL FOR IMP	ROVEMENT	·····			
Plan: Aim, Measures, Ideas			Do	Study	Act
THE SCIENTIFIC	METHOD	p			
ASK A QUESTION	DO BACKGROUND RESEARCH	CONSTRUCT A HYPOTHESIS	PLAN & DO EXPERIMENT	ANALYZE DATA & DRAW CONCLUSIONS	COMMUNICATE RESULTS

Model for Improvement







Two neonatology fellows have come to your office to brainstorm about QI project topics. Some ideas they have come up with include

- A. Measuring post-op complications in neonates who get routine pre-op labs vs. those who do not.
- B. Improving the healthiness of the lunches served at fellows' conference.
- C. Starting a human milk banking program.
- D. Decreasing time to antibiotics in infants born to mothers with chorioamnionitis.

How should you advise them?





Step 1: Choose an Issue to Tackle



Examples of Quality Gaps

- Unfavorable experiences of care (patients or providers)
- Over or under utilization patterns
- Endorsed national quality measures (e.g. <u>HEDIS</u>)
- Variations in patient flow or access to care
- Gap between actual performance and standard of care/benchmarks





- **S** Specific (clearly stated)
- **M** Measurable (measurable numeric goal)
- A Actionable (within control/influence of team)
- **R** Relevant (aligned with organization's priorities)
- T Time bound (specific time frame)

Improvement aims can NOT be vague!



 Increase health care worker compliance with hand hygiene protocols on unit A from 85% to 95% in 3 months

 Decrease average length of stay for all pediatric asthma admissions from 3.0 days to 2.0 days in 6 months Are your fellows ready to complete a SMART Aim?

No....we don't know what to measure!





Step 2: Measurement



A neurology fellow and a peds resident want to improve the care of patients who present to the emergency department in status epilepticus. The observe the following:

- Many patients who present in status epilepticus are not getting appropriate doses of IV lorazepam for their weight because the ED providers are reluctant to give up to 4 mg.
- Providers sometimes wait longer between doses of lorazepam than is advised in national guidelines.

They want to create a project to address these gaps.

 What should they measure to show that their change is an improvement?



Outcome Measures



- The result of care (patient outcome measure)
- Important to patients







Select the appropriate OUTCOME measure



- A. Time to first dose of lorazepam
- B. Appropriate amount of first dose of lorazepam
- C. Total time in status epilepticus
- D. Percent of patients requiring intubation

Process Measures

- Steps in a process; "proximal" in terms of cause and effect
- Easier to control
- Measure whether action was completed —vaccine administration, writing a prescription, or compliance with a checklist.







Source: National Quality Forum



Select the appropriate PROCESS measure



- A. Percent of patients requiring ICU admission
- B. Appropriate amount of first dose of lorazepam
- C. Total time in status epilepticus
- D. Percent of patients requiring intubation

Balancing Measures



- Evaluate aspects of the system in tension with one another
- Identify unintended and intended consequences
- Examples:
 - Staff satisfaction BALANCES registration time.
 - Readmissions BALANCE shortened length of stay.



Select the appropriate BALANCING measure



- A. Time to first dose of lorazepam
- B. Appropriate amount of first dose of lorazepam
- C. Total time in status epilepticus
- D. Percent of patients requiring intubation

Outcome vs. Process Measures

OUTCOME MEASURES

- Surgical site infections
- CLABSI
- Flu mortality rates
- Infection rates
- Hypoglycemia
- Death from colon cancer
- # of DM foot amputations

PROCESS MEASURES

- OR checklist utilization
- Number of catheter days
- Flu vaccination rates
- Hand washing rates
- Screening for GDM
- Colon cancer screening
- DM foot exams



A neonatology fellow is having the following dilemma:

"I am working to improve the communication between the OB group and the NICU team at deliveries. It is not uncommon for them to not tell us any information when we walk into the delivery room or they frequently forget to tell us important information that we need to know when caring for the newborn. In residency there was this set dialogue that happened between someone from the NICU team and a representative from the OB team in the delivery room. I have talked with one of the MFM fellows and we are working together to get this dialogue happening at Duke. Anyway, I have been struggling to come up with ways of measuring this. I came up with a brief survey to send to my team to ask them how often delivery communication occurs and the quality of the communication."

Avoiding Measurement Pitfalls



- Do not use surveys to measure practice.
 - \checkmark Surveys are good for assessing knowledge and opinions.
- Choose objective measures that can be tracked easily
- Sample size determination:
 - Ideally includes all patients if feasible
 - QI is not research: need enough data to show change results in improvement over time
 - Power calculations are not relevant



Sampling approach: The measurement will consist of 6 weekly data collections of 25 deliveries each. The deliveries can be sampled in several ways:

• 5 deliveries per day for 5 days of the week. The deliveries must be consecutive and at least one day must be a weekend day.

Or

• 25 consecutive deliveries regardless of any specific day, except that it must include some weekend cases.

Or

• If there are fewer than 25 deliveries for a week, the total deliveries for the week should be included in the sample.



Step 3: Set Goal





A PEM fellow and PHO fellow are working on a project to decrease the time to antibiotic delivery in oncology patients who present to the ED with fever and neutropenia.

Reviewed 50 charts from the past 3 years:

• average time to 1st dose of Cefepime: 176 min

How do they determine the goal for their project?



Setting Goals

- Expert opinion
- Peer performance
 - in same organization



- in similar settings (published QI literature)
- External benchmarks
 - e.g. CMS, Specialty organizations, Vizient, etc.
- Multi-institution QI/Safety collaboratives
 - e.g. CLABSI rates

Clinical Scenario



They decide to shoot for <60 minutes based on a published survey from the Children's Oncology Group.

Now that they have measured current performance and identified a goal, what is the SMART aim statement for this project?

We will increase / decrease:

	(outcome)
from:	(baseline %, rate, #, etc)
to:	(future state %, rate, #, etc)
by:	(date, 6-12 month time frame)
in:	(Population impacted)

Clinical Scenario



Who: Pediatric oncology patients w/ F&N Where: Pediatric ED Baseline: Avg. time to antibiotics 176 minutes Goal: <60 minutes

Now write a SMART aim statement for this project

We will increase / decrease:

	(outcome)
from:	(baseline %, rate, #, etc)
to:	(future state %, rate, #, etc)
by:	(date, 6-12 month time frame)
in:	(Population impacted)



Step 4: Understand the problem





A PICU fellow and a peds resident have taken over a QI project that has been unsuccessful in the past. The goal is to improve the use of an asthma severity score when patients with asthma are admitted to the floor and the unit to facilitate communication among providers.

A past fellow found a validated score in the literature, and emailed all RTs and residents announcing implementation of the scoring system. Now it appears that no one is documenting or basing treatment decisions on the score.

What can the new QI team do differently?



- Assuming you <u>know</u> the problem without seeing what is actually happening
- 2. **Assuming** you know how to <u>fix</u> the problem without finding what is causing it
- 3. **Assuming** you know what is <u>causing</u> the problem without confirming it

In other words, not grasping the situation. And where do we grasp the situation?

Grasping the Situation

Examples of how to learn about a process:

- Observations
- Identify stakeholders
- Map the current process
- Identify system failures



- Use a modified Failure Modes and Effects Analysis (FMEA)
- Use a Fishbone diagram

Identify Stakeholders

Interdisciplinary team

-no more than 5-7 -include representatives of everyone involved in the process





-Provide support and guidance -Team reports to this person or group



Leader





Modified FMEA



Logic diagram that displays your theory for improvement

- Left column: Aim statements
- Middle column(s): Drivers (the "what") you need to influence
- Right column: Interventions/change concepts (the "how") that act upon the drivers

<Insert Project Name> Key Key Driver Diagram (KDD)

Project Leader(s):

Revision Date: mm/dd/yyyy (v#)





Step 5: Test, Learn, Implement using PDSA



Plan Do Study Act (PDSA) Cycle





What are Tests?

Putting a change into effect on a **temporary** basis and learning about its potential impact



Interventions



Strong Most Effective

- Forcing functions and constraints
- Automation and computerization
- Standardization and protocols
- Checklists and double-check systems
- Audit and feedback
- Rules and policies
- Education and information
- Exhortation: "Be more careful", "Don't forget to..."



Least Effective





Start testing with:

- one clinic day
- one physician
- one patient...





- Qualitative and/or quantitative learning
- Learn from each PDSA cycle
- Ask yourself each time....

Adapt? Abandon? OR Adopt?





Ramp of PDSA Cycles





- Scenario: PICU fellow wants to use an asthma score in the PICU.
- Use your PDSA Ramp Worksheet to plan the tests.







Measurement: Plot data on a run chart







<u>PDSA</u>

- In each cycle, learn by gathering data (quantitative and/or qualitative)
- Each cycle builds on the next
- Each time ask: "Adapt, adopt, or abandon?"

PDSA **data** are *not* plotted on annotated run chart, but should be documented.

Project

- Recommend collecting minimum 10-20 data points of your project measure monthly
- View the measure continuously over time
- Annotate your chart with what you tested (PDSA ramps)

Plot **measure** on the annotated run or control chart.

Summary of Project Steps





Applying QI Principles to Program Improvement





- NAS places greater emphasis on program improvement
 - annual program evaluation
 - self-study every 10 years
- ABP now offers Part 4 MOC credit for projects that address issues from annual program evaluation or selfstudy.
 - Program directors
 - Faculty
 - Fellows
 - Residents
- APPD advocated for this change.
- Template on ABP website

Template from ABP

- 1. Describe the educational gap or issue addressed by this program improvement project.
- 2. What is/are the root cause(s) of the gap?
- 3. Identify the specific aim of your project.
- 4. What intervention do you plan to make to accomplish your improvement aim?
- 5. What specific measure(s) will you use to determine success of your improvement project?
- 6. What are the results?



Gap: Graduating 3rd year residents indicated on ACGME survey that they did not feel prepared to perform some procedures unsupervised.

Root cause: Decreased opportunities

- Fewer neonatal intubations and umbilical lines
- Splinting and joint reductions done by ortho
- IV team and phlebotomy teams more available

Aim: Increase the proportion of graduating residents who indicate that they are prepared to perform required procedures to >80%



Interventions: Create 1-week procedure block during intern year that can be repeated in 3rd year.

Specific Measure: # of procedures logged during intern ED month with addition of 1-week procedure block.

SMART Aim: increase the number of total procedures logged during the intern ED rotation from a median of 5/month to 20/month by July 2017.

Run Chart





Gap: Demographics of Duke pediatric residency program do not reflect the population we serve.

Population of Durham in 2016



- 1 resident who self-identifies as URM in current program.
- No URMs recruited in 2016.





URMs	2016	2017
Total applicants	12.5% (170)	13.1% (184)
Interviewed	12.1 % (26)	18.2% (40)
Attended 2nd Look	5.9% (1)	22% (8)
Matched	0% (0)	40% (6)





Set 3 goals to implement or enhance quality improvement for your fellowship program.

Pair and Share.



Take Home Messages



- Use QI methodology to determine if changes to your practice or program truly result in improvement
- Avoid common pitfalls to ensure successful projects for your fellowship program.
- Implement tests of change through PDSA cycles to see iterative improvements
- Leverage the MOC part 4 requirement as incentive for faculty and trainees to participate in improvement activities.



- Thank you to many individuals who have contributed or shared their materials
 - ✓ Institute for Healthcare Improvement (IHI)
 - Cincinnati Children's Intermediate Improvement Science Series (I2S2)
 - The Department of Pediatrics Quality Review Board

Resources



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Questions?



