Guide to Quality Improvement (QI) Projects

The Outline

Icon Guide

🔎 Advanced Topic in QI – Talk to your mentor to better understand these topics and choose what works best for your project

💡 Pro Tip – Useful tips to consider during your QI journey

Step 1: Understanding QI

What is QI?

Quality improvement is a process that makes your job better, safer, faster, more efficient, etc. It all started in manufacturing – reducing waste and increasing production – but its concepts work well in all fields, including healthcare.

Why should I do a QI project?

Simply put, QI gives you the power to improve the system. By improving the system in which you work, you can improve your job and the care you provide your patients. You can even do QI projects to improve personal aspect of your life (weight, exercise, cooking dinner, etc.).

Step 2: Pick a Project

How do I start?

First, decide if you want to do your own project with co-resident(s) or join a senior resident / attending's project.

- If you choose to join someone else's project, follow along below with that project idea or think of another idea and follow the process.
- Who do you need to help you?
    - Team should have 5-8 members
    - Consider including a QI expert, a content expert, some front-line workers (RNs, 2-3 residents, RTs, etc.), and possibly family/patients

You've decided to create a project, but how do you decide on a topic?

- **Think about the following in the hospital or at clinic:**
    - What makes you mad? Frustrated?
    - What's something we could do better?
    - What do patients complain about?
    - What have you seen at other hospitals/clinics that we don't do well here?
    - Does someone else have a project that speaks to you?
    - What are some AAP recommendations that we don't follow?
- **Now, brainstorm/discuss ideas with a diverse group of people!**

    Pro Tip: if you plan to go into fellowship, consider doing a project in that field

Resident Project Examples:

- Reduce unnecessary blood draws (NICU)
- Improve dental health (JAXHATS)
- Develop order sets for CNS disorders (inpatient)
- Increase Vitamin D supplement in eligible infants (outpatient)
- Improve Tdap vaccination rates (outpatient)
- Improve NAS family teaching and managing expectations (NICU)

Step 3: Determine Your Project's Aim

Writing your aim:

- What to do you want to improve and by how much?
- **SMART AIM:**
  - **S**PECIFIC
  - **M**EASURABLE
  - **A**TTAINABLE
  - **R**ELEVANT
  - **T**IME BOUND
- **Example**: I want to increase the percentage of patients receiving the hepatitis B vaccine in the newborn nursery to 99% within 3 months.

Step 4: What You Will Measure

How will you know the improvement works?

- What will you measure?
- Are these data already collected or will you have to collect them yourself?
- What does this project need in terms of hospital approval (IRB/QIPR – see Step 6)?
- **Outcome measures** – the final impact of the intervention (meaningful to patients, decrease death/disability/time in hospital/costs)
- **Process measures** – process steps that lead to the outcome (e.g. order set use)
- **Balancing measures** – negative unintended consequences of this project (if avoiding CT for minor head trauma, did we miss a bleed?)
- DATA – you need just enough data to know you're improving. Collect as few data as possible, this is not research!! Know how you will use all data you collect.
- Sampling is often appropriate but must be thoughtful (are days the same as nights? Weekdays the same as weekends?)

Step 5: Interventions

Define the system

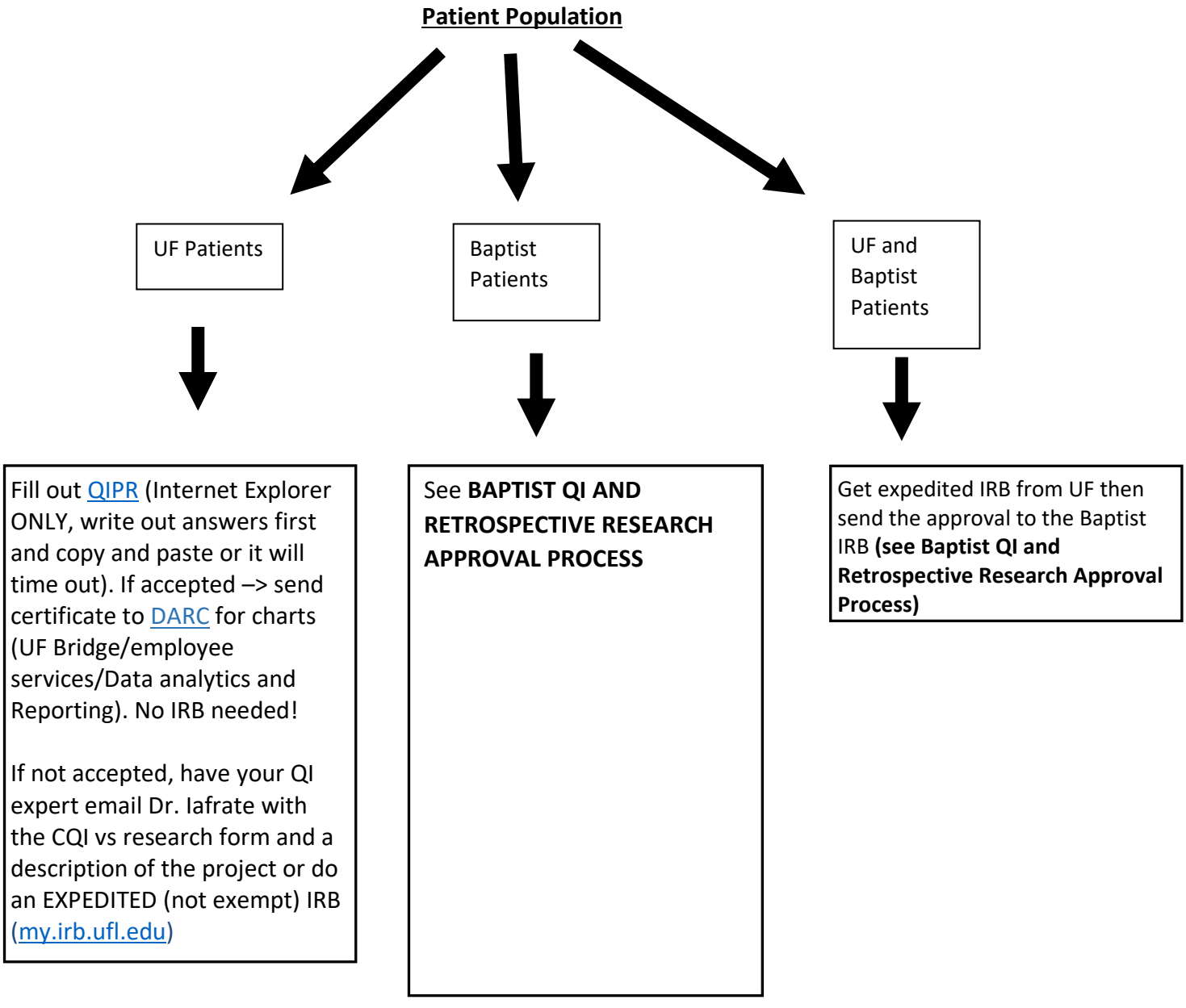
- Identify primary and secondary drivers
- What change are you going to make?
- Consider using the following methods to determine change: 🔍 key driver diagram, brainstorming, fishbone, looking at change concept lists, social theories of change
- How can you create reliable changes (🔍 forcing functions, automation, standardization)?
- Do you need to educate personnel that could be impacted?
- How will you educate (Flyers, meetings, posters, etc.)?
- Do the personnel agree with the change? Are they willing to cooperate?
- What intervention can you do that will be least impactful to workflow yet effective in obtaining your measures?

Step 6: Submitting for Hospital Approval/Requesting Charts

How will I know if my project should be sent to the QI Project Registry (QIPR) or IRB?

- If this is a UF Health Project with only UF patients / locations: If you can (honestly) answer the questions in the link the way they are bolded, QIPR is the fastest way to get project approval
- You get in the QIPR fast lane IF:
  - No randomization
  - No strict protocol
  - Project ends when quality goal is reached
- If your project doesn't qualify for QIPR, then you will likely need IRB approval

Where to Submit for Approval by Patient Population:



Pro Tip: If you are still confused or not sure whether you need IRB review. Call the UF IRB office at (904) 244-9746 or (904) 244-9427

Step 7: Start the Project

This is where we start to use those PDSA Cycles:

→ PLAN → DO → STUDY → ACT →

- **Baseline data:**
  - Do you need a cycle to collect baseline data without intervening?
  - Baseline data will help show you where to put your efforts
- **Create a PLAN:**
  - Pick 1 change at a time (biggest offender, if known)
  - List what you will measure
  - Who is going to help you with this cycle?
  - How exactly are you going to make these changes?
  - Assign team roles

Further Reference Links:

- **Detailed Instructions and Examples of PDSA Cycles**
- **Blank PDSA Worksheet for YOUR project**

Step 8: DO the intervention

DO the Intervention

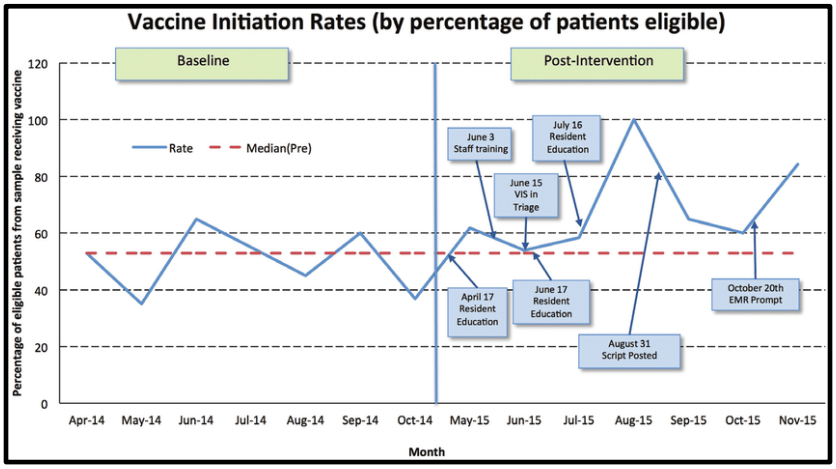
- Remember to start small – 1 change, 1 patient, 1 day
- Track your measures
- Get feedback from participants

Step 9: Plot your Measures - Run Chart/Control Chart

Create Your Run Chart: You can make a run chart on a piece of paper

- **Develop your horizontal scale (X axis)**
  - Label your axis
    - Usually this is time (days, weeks, months, etc.)
    - Cycle length is determined by number of patients and average compliance – ASK A MENTOR
- **Develop the vertical scale (Y axis)**
  - Label your axis
    - Be sure the number range you choose is logical for your data
    - Leave room for future data that might be outside of current range
- **Create a useful title for your chart**
- **Plot your data points**
  - A run chart becomes more powerful as you add more data points because there will be more opportunities to identify patterns.
  - Usually you need at least 10–12 data points to see signs of improvement
- **With 10+ data points, calculate the median of the data and place as a line on the chart**
  - Median = number in the middle of the data set when ordered highest to lowest
  - Note: If you have enough **baseline data** (i.e., data collected before the improvement effort), you can calculate and plot a median of that data and use it as a basis for comparison against future results.

- **Annotate the chart**
  - Include annotations for important events that may impact your results
- **Annotated Run Chart Example:**



Creating a Run Chart in Microsoft Excel

- **Run Charts:**
  - If you want to do your own run chart digitally:
    - Create 3 columns
      - Time (x)
      - Data points (y)
      - Median of baseline data
        - In the first cell, say it's C2, enter "=MEDIAN(your data range)"
        - Then in C3 type "=C2" and then drag the bottom right corner down to copy the remaining cells to match remaining data
    - Highlight the area of the 3 data columns you entered including column headers and click Insert -> Chart -> Line (pick the first 2-D line chart)

- **Reading a run chart**
  - Significant results include
    - A shift of 5 or more points trending up or down
    - 6 or more points above and below the line are

    💡 **See IHI's Run Chart Reference Sheet for examples and explanations**

- 🔎 **Control Charts**
  - Control chart are generally better than run charts if you have enough data
  - Use a Control chart when measuring proportions
  - Control charts include 3 sigma upper and lower control limits and more rules to detect change
  - Creating a Control Chart in Excel
    - Create 3 columns
      - Time
      - Numerator (patients meeting metric)
      - Denominator (all patients in cycle)
  - Dr. Garber can help create your control charts but you need to provide excel sheets with raw data as above (do NOT compute percentages and means)

Step 10: STUDY the Results

STUDY your results

- Were results as expected?
- Anything surprising in your tracking?
- Was there anything you found that you should track that you didn't?
- What should you change immediately?

Step 11: ACT - Use the Results & Repeat the PDSA Cycle

Decide to continue, adapt, or abandon intervention based on findings

- If improvement → test again, expand the number of participants!
- If no improvement → why?
  - What else can you change?
  - Discuss with those who took part in the first cycle
- Do another PDSA cycle on a somewhat bigger scale
- Analyze
- Repeat until rolled out and results are met!

Watch this video for a simple IHI QI Project summary

💡 Don't forget to check out the rest of our PedsJAX website for helpful resources and residency expectations

Now, time to go through the above guideline with YOUR project!

My QI Project Worksheet

Use this sheet to keep track of your project so when you aren't able to think about it for a couple months, you can come back and pick up right where you left off!

Problem:

Project SMART aim:

Team Members:

Mentor:

Our first change:

What we will Measure:

Outcome measure:

Process measures

Balancing measures:

How will we collect our baseline and project data?

Assign Team Role Specifics

- Mentor:
- Team Member 1
- Team Member 2
- Team Member 3
- Team Member 4

What's the plan?

Start Date:

Tracking Progress (use when starting a busy rotation, for example)

Date: ____

What was our team's last step?

What is our next step so I can pick back up where we left off?

Project example

- **Problem:** Only 92% of our newborns are receiving the hepatitis B vaccine prior to discharge from our newborn nursery

- **AIM:** We want to increase the percentage of patients receiving the hepatitis B vaccine in the newborn nursery to 99% within 3 months.

- **Team Members:**
    - Nursery Attending A will be our mentor
    - Residents B & C to engage the residents in our project
    - Nursery charge nurse as this will affect nursing staff
    - Medical Student D as she has a research month and can help us with our data

- **What are we going to change?**
    - Our first change – Based on our driver diagram, we think a large reason for decline the vaccine is fear that it causes harm.
    - For families that decline the vaccine, we will give them the printout on Hepatitis B vaccine from healthychildren.org and return in the afternoon to discuss again and attempt to gain consent

- **What will we measure?**
    - **Outcome measure** - % of total infants receiving the hepatitis B vaccine
    - **Process measure** – number of patient families that initially decline the vaccine, number of patients who agree to the vaccine after initial decline, number of patients receiving the printout, number of patients re-counseled
    - **Balancing measure** – tracking patient satisfaction rates in those who initially decline the vaccine, time spent by nursery team on additional counseling to families regarding vaccinations

- **Assign team roles – who will do what**
    - Dr. A will let the division know of our project once we start collecting data and will provide the handout to the attending rotating on nursery starting next month. Dr. A will also help us analyze the data.
    - The resident team includes Resident B & C.
        - Resident B is going to meet with the nursery team during implementation and explain the handout and answer questions. He will let the team know the expectations. He will help analyze data.
        - Resident C is going to guide the medical student and help on the day 1 of data collection. She will help analyze data.
    - Medical Student D will help us collect data
        - As we don't have baseline data on time for vaccine consent / refusal, MS-D is going to be available the next 2 weeks to observe and time the portion of rounds spent consenting & counseling for Hepatitis B vaccine so we have some baseline data.

        - Once we implement, the MS-D will also time the portion of rounds spent consenting and counseling hepatitis b vaccine. She will also track the how many patients receive the handout and track and time afternoon counseling.
        - She will also solicit feedback from the patients' nurses and medical nursery team after implementation
        - She will help us analyze data
    - The nursing charge will help provide recommendations for rollout and with soliciting feedback regarding the process with nursing. She will help us create nurse advocates for this change.

- **How will be implement this exactly?**
    - We are going to start providing the printout next month with the first patient who declines the vaccine.
    - The nursery senior will provide the handout the family and discuss the handout with the nurse.
    - The senior and intern will return in the afternoon with a member from our team and find out from the nurse if the family had any questions, and discuss the form with the family.
    - We will then obtain feedback from the family about the form, from the nurse about the process, from the nursery team about their experience and decide if any changes need to be made immediately

- **Do the intervention!**
    - The team had someone refuse the Hepatitis B vaccine on day 1
    - What went well: The team gave the handout, the nurse was able to follow-up mid-day and ask the family if they had questions, the family said the handout was easy to read and made sense, the medical student was able to come and track the time
    - What went poorly: the residents found it hard to go back in the afternoon due to clinic schedules and the attending had to go alone, the patients still refused the vaccine, the nurse had some questions from the family she couldn't answer