QUALITY MATTERS

Quality Improvement for Health Care Providers in Gastroenterology and Hepatology

Irma Hashmi, MD, Nikita Chadha, DO, Georgia McIntosh, MD and Richard Sterling, MD, MSc, FACG

SUPPLEMENTARY MATERIAL accompanies this paper at http://links.lww.com/AJG/D127

Am J Gastroenterol 2024;119:786–790. https://doi.org/10.14309/ajg.0000000000002609; published online November 17, 2023

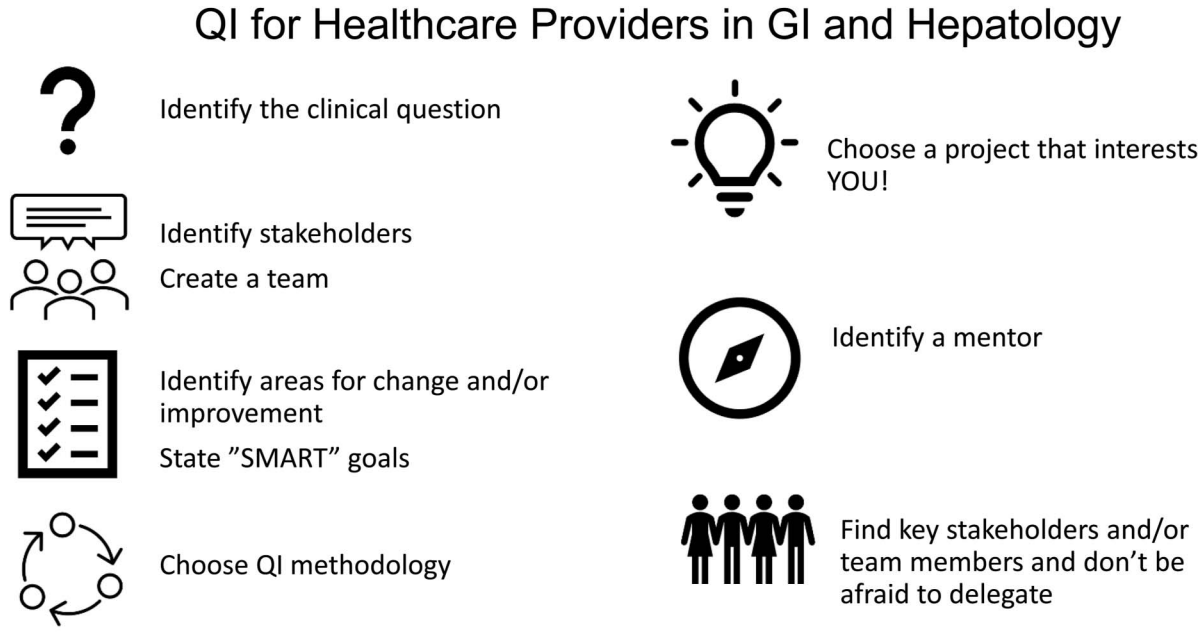
HISTORY AND FOUNDATION OF QUALITY IMPROVEMENT

Quality improvement (QI) uses a standardized model to improve problems in a health care system. The model identifies key stakeholders, creates a framework model, implements changes to test a hypothesis, and evaluates the effect (1). The goal of QI is to bridge the gap between knowledge and practice while making health care safer, more effective, patient-centered, timely, efficient, equitable, and sustainable (2) (see Supplement 1, Supplementary Digital Content, http://links.lww.com/AJG/D127). Health care workers and trainees, who have scientific backgrounds, often lack in their knowledge of QI. To address this, we sought to create a review of what QI is and how to implement it into the health care field of gastroenterology and hepatology to help program directors, trainees, and others bridge this gap.

QI VS RESEARCH

The goal of QI can be further elicited by 1 of the 6 highlighted characteristics: safety, effectiveness, patient-centeredness, timeliness, equity, and efficiency (3) (Figure 1, Table 1). Before initiation of a QI project, however, it is crucial to understand the difference between QI and research (Table 2). Simply put, the purpose of a QI project is to improve on existing systems to increase safety and efficiency of resources. Research, on the contrary, tests a hypothesis to expand on generalizable knowledge. Research uses a single large blind test, while QI is developed and improved on through a series of sequential tests.

Of importance, identification of human and nonhuman subjects is imperative because institutions may require Institutional Review Board approval for the research of human subjects. According to the Health and Human Services policy to protect



Hashmi et al. *Am J Gastroenterol.* 2024. doi:10.14309/ajg.0000000000002609

AJG The American Journal of GASTROENTEROLOGY

Virginia Commonwealth University Health System, Richmond, Virginia, USA. **Correspondence:** Richard Sterling, MD, MSc, FACG. E-mail: richard.sterling@vcuhealth.org.

Received May 23, 2023; accepted November 10, 2023

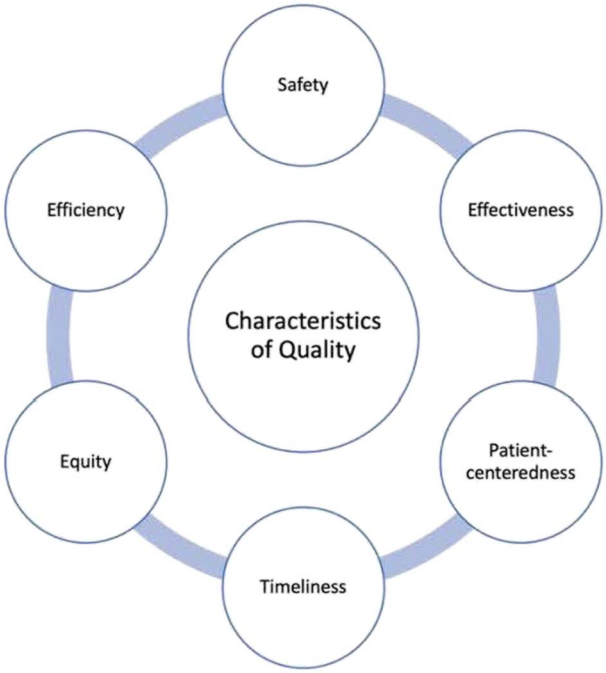


Figure 1. Characteristics of quality improvement.

human subjects in research titled 45 Code of Federal Regulations 46.102, (4) a human subject is any individual about whom information, biospecimens, or identifiable private information is used to promote generalizable knowledge. In other words, participants of a research project represent a subset of the population and have to meet strict inclusion and exclusion criteria with identifiable private information. Nonhuman subjects are exempt from IRB requirements. Subjects of a QI project are included without specific inclusion criteria.

Outcomes in research are analyzed through a scientific process while outcomes in a QI project are compared with established standard of care. Finally, audiences differ between research and QI; the scientific community is the primary audience in research, while local organizations, including institutions, are the primary audience in QI projects (4).

CREATING A QI PROJECT

To create a QI project, we outline 6 steps to creating a successful QI project (Figure 2).

Step 1: understand the problem, stakeholders, and the team

1A. Identify the clinical question. The first step in developing a QI project is to identify the problem or clinical question. This should be a topic that is engaging and meaningful to the trainee. Inspiration can come from colleagues, complaints, significant events or near misses, or recent guidelines. For trainees, whose time at an institution may be limited, Ogurick et al noted that focusing on issues that affect day-to-day care can promote engagement because the improvements will directly affect their career in training and following graduation (5). It is also important to be mindful of the 6 characteristics of QI (Figure 1) and which align most closely with the project (5). Trainees, particularly, are valuable to QI projects because they work closely with all members of the care team and interdisciplinary team, providing insight into system workflow and process, which can contribute to quality and patient safety (6).

Table 1. Definitions of characteristics of quality improvement

Characteristics of quality improvement	Definition	Example
Safety	Avoiding injuries to patients from the care that is intended to help them	Wrong laterality for a surgery Medication errors
Effectiveness	Providing services based on scientific knowledge to all who could benefit, and refraining from providing services to those not likely to benefit (avoiding underuse and overuse, respectively)	Antibiotic stewardship Deep venous thrombosis prophylaxis
Patient-centeredness	Providing care that is respectful of and responsive to individual patient preferences, needs, and values, and ensuring that patient values guide all clinical decisions	Jehovah's witness and blood products Practices Islam and avoiding porcine-derived medications
Timeliness	Reducing waits and sometimes harmful delays for both those who receive and those who give care	Wait times in the emergency department Delay in recognizing critical illness and appropriate management of such
Equity	Providing care that does not vary in quality because of personal characteristics such as gender, ethnicity, geographic location, and socioeconomic status	Variable care based on gender, ethnicity, etc.
Efficiency	Avoiding waste, including waste of equipment, supplies, ideas, and energy	Lack of geographical admissions

Adapted from ref. (3).

Table 2. Difference between quality improvement and research

	Research	Quality improvement
Purpose	Develop or contribute to generalizable knowledge	Apply research in practice; to improve internal processes and practice
Method	One large blind test	Many sequential, observable tests
Risk	May place subjects at risk	Does not increase risk to patients (except possible privacy/confidentiality)
Protocol	Formal and rigid protocol with tight controls; unchanged throughout research	Adaptive, iterative design
Measurement	Complete, accurate, controlled	Gather just enough data to learn and complete another cycle of improvement
Primary audience	Scientific community	Local organization

1B. Identify the stakeholders. Next, it is imperative to identify the stakeholders. Stakeholders are anybody who has interest in the project and has influence over its success or failure. One approach to identifying stakeholders is to identify a list of people and then categorize them into groups. Another strategy is to assess them based on their interest and power and creating a 2 × 2 table to organize this (Figure 3). Stratifying stakeholders by interest and power can help clearly delineate their roles and identify to which degree of involvement each stakeholder may have.

1C. Create a team. QI teams should include a team leader or champion who is responsible for the day-to-day management of the QI project. The system leader determines how the change will affect others in the health care system and is knowledgeable about how systems affect each other. An improvement advisor with expertise in QI methodology will ensure project success. It is also important to have an executive sponsor from the health system administration who will ensure that change can be implemented based on the results of the QI project. Finally, a process owner should be identified for sustaining the process once the project has been completed.

Step 2: identify areas for change and/or improvement

Once a clinical problem has been identified, one can design a project to bridge the gap between knowledge and practice. Herein lies the essence of a QI project; to act as a vehicle of change for the betterment of the patient.

Step 3: explicitly state your goals using the SMART method

Following identification of a clinical question or problem, create a mission statement. The SMART method allows for a clear delineation of goals and achievable time line. A SMART aim states a *specific* process to improve upon; describes how a metric will be *measured*;

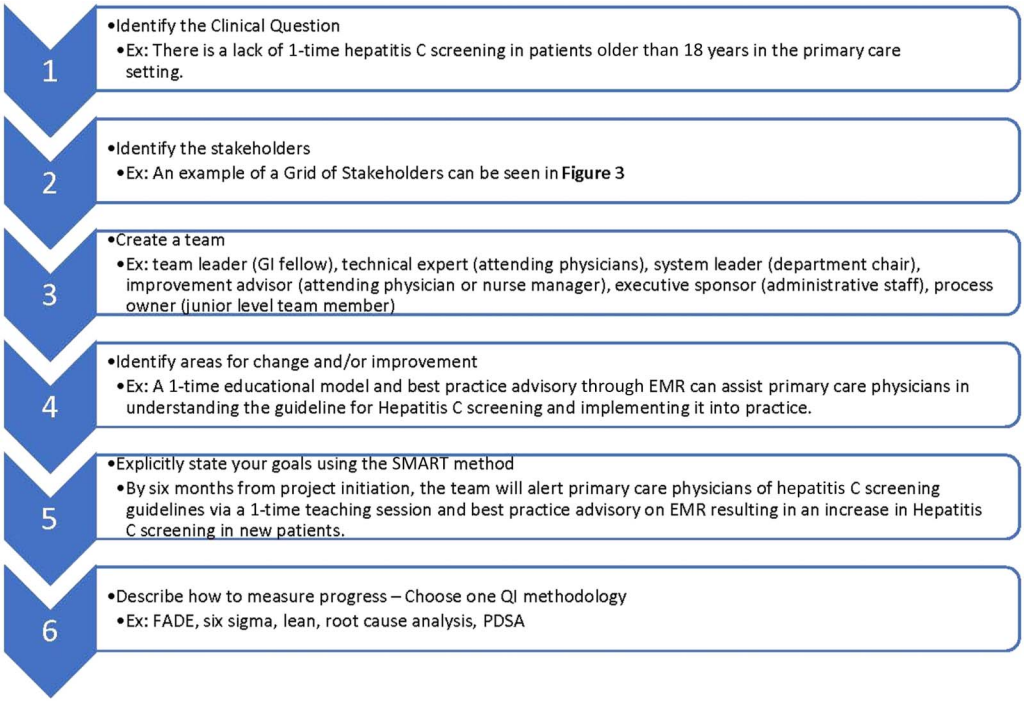


Figure 2. Steps to create a successful quality improvement project. PDSA, plan-do-study-act.

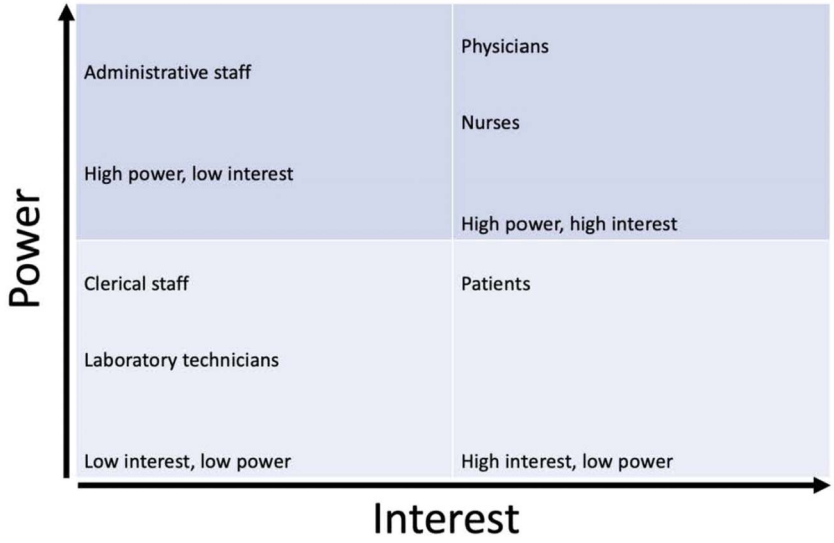


Figure 3. Identifying and categorizing stakeholders.

states the time frame the project will be *achieved*; presents why the project is *relevant*; and creates a *time line* for completion.

Step 4: describe how to measure progress—choose 1 QI methodology

Several methodologies exist in QI that can be used to measure progress following an intervention. Models include the FADE (Focus, Analyze, Develop, Execute), 6 sigma, lean, root cause analysis, and plan-do-study-act (PDSA). PDSA is most often used due to its simplicity (Figure 4). Common themes among the methodologies are leadership, measurement, and staff involvement in a team-based, patient-focused approach. We highlight the PDSA model in this study with an example (Figure 4).

Following completion of 1 PDSA cycle, sustained success can be achieved with continuation of the project. For instance, the process owner of the team, such as the intern, may want to propel the project the following year with another intervention that addresses a subsequent problem. The goal is to attain the most ideal system with each passing PDSA cycle (Figure 4).

Summary of PDSA cycle

We have summarized the 6 steps to a QI project with a detailed example relevant to the gastrointestinal and hepatology provider. Following identification of a gap in knowledge, building a multidisciplinary team is important with the involvement of nurses, medical leadership, and junior members to ensure buy-in, completion, and sustainability. Thereafter, completion of 1 PDSA cycle can be used to propel another related cycle in an effort to achieve an ideal future.

Limitations to QI

While straightforward in practice, QI has limitations. First, interventions can be limited by lack of buy-in from stakeholders such as hospital leadership. As noted by Hughes, "even the best intended projects are at great risk of not being successful" without QI champions among leadership (7). Second, complex multicomponent interventions may limit reproducibility within an organization. Third, cost of care may not be evaluated prohibiting understanding of net benefit in system-wide economic models. Small sample size of QI projects precludes from any generalizability. Also contributing to this is processes, which vary between institutions and different advisory or review boards.

OVERCOMING OBSTACLES IN QI PROJECTS

In addition to limitations, we have identified obstacles that can make involvement challenging. These include identifying a project, persuading colleagues that this is a problem of which an intervention can improve, identifying stakeholders, and trainee involvement (8). To help mitigate some of these barriers, we first find it necessary to identify a mentor who is knowledgeable in QI. Mentors can help with development of project and identifying stakeholders and persuading involvement of colleagues. Second, it is important to pursue project ideas initiated by trainees. Third, because QI projects include multiple iterations of testing and implementation, it is important for trainees to identify key team members with appropriate delegation of tasks. This will help ensure the projects move forward through multiple PDSA cycles.

FINAL RECOMMENDATIONS FOR TRAINEES

1. Understand that QI differs from research and can take multiple iterations to implement change.
2. Choose a project that piques your interest; this can be from your day-to-day life as a trainee. As such, a project on this scale can lead to change implemented during a trainee's tenure.
3. Identify a mentor familiar with QI to help with project implementation and team member identification.

CONFLICTS OF INTEREST

Guarantor of the article: Richard Sterling, MD, MSc, FACG.
Specific author contributions: I.H.: manuscript drafting, revisions, and approval of submitted version of the manuscript. N.C.: manuscript drafting, revisions, and approval of submitted version of the manuscript. G.M.: conceived manuscript design, manuscript revisions, and approval of submitted version of the manuscript. R.S.: principal investigator who conceived, supervised, reviewed, and approved final manuscript.
Financial support: None to report.
Potential competing interests: None to report.

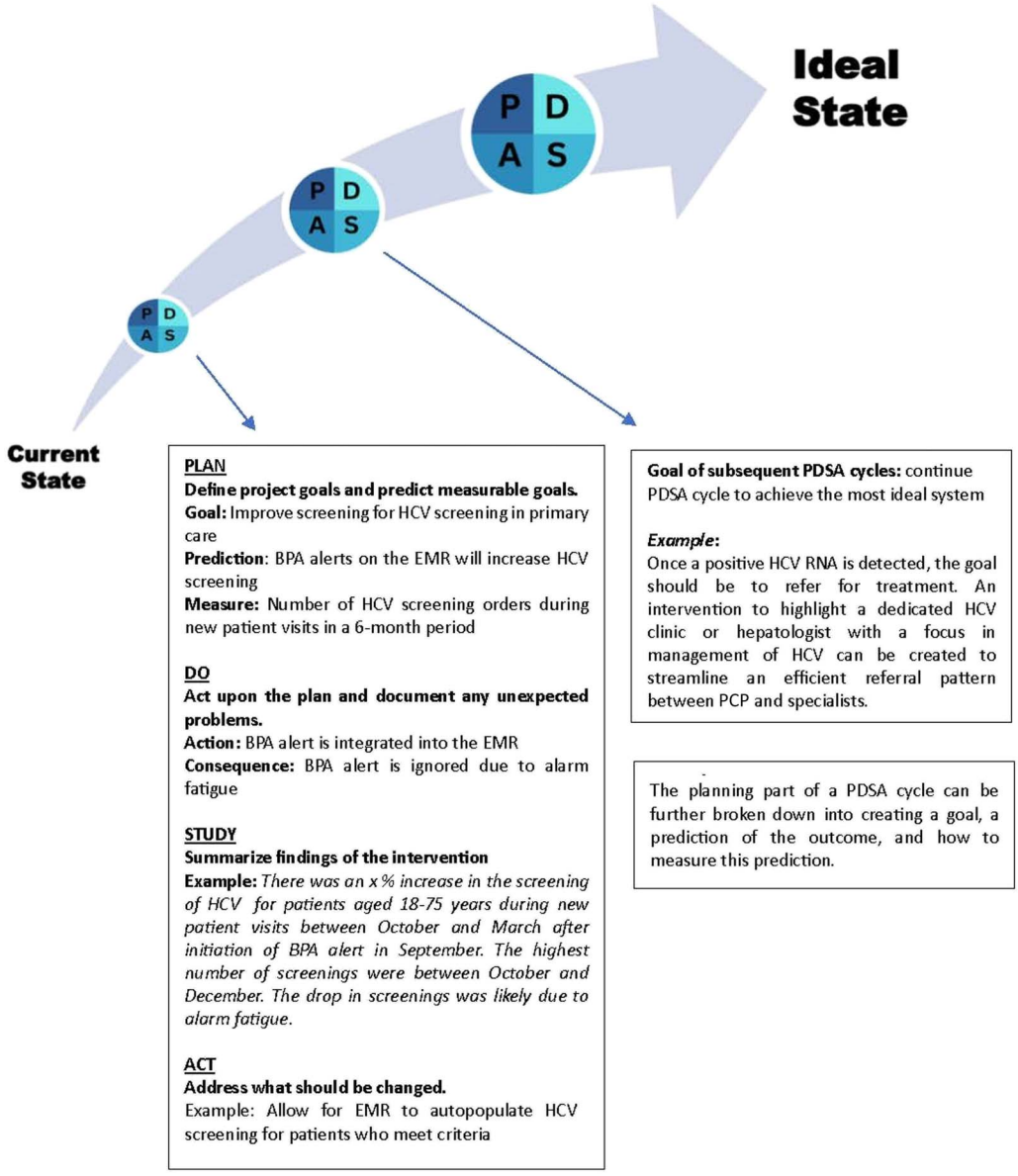


Figure 4. PDSA model. BPA, best practice advisory; EMR, electronic medical record; HCV, hepatitis C virus; PDSA, plan-do-study-act.

REFERENCES

1. Silver SA, Harel Z, McQuillan R, et al. How to begin a quality improvement project. Clin J Am Soc Nephrol 2016;11(5):893–900.
2. Corrigan J. Crossing the quality chasm. In: Building a Better Delivery System: A New Engineering/Health Care Partnership. National Academies Press (US), 2005 (https://www.ncbi.nlm.nih.gov/books/NBK22857/). Accessed May 17, 2023.
3. Baily MA, Bottrell M, Lynn J, et al. The ethics of using QI methods to improve health care quality and safety. Hastings Cent Rep 2006;36(4): 1–40.
4. Bass PF III, Maloy JW. How to determine if a project is human subjects research, a quality improvement project, or both. Ochsner J 2020;20(1): 56–61.
5. Ogurick AG, Magier SJ, Hughes ML. Quality improvement during gastroenterology fellowship: The experience of improving inpatient post-endoscopy communication. Dig Dis Sci 2022;67(6):1932–6.
6. Siddique SM, Ketwaroo G, Newberry C, et al. How to incorporate quality improvement and patient safety projects in your training. Gastroenterology 2018;154(6):1564–8.
7. Hughes RG. Tools and strategies for quality improvement and patient safety. In: Hughes RG (ed). Patient Safety and Quality: An Evidence-Based Handbook for Nurses. Advances in Patient Safety. Agency for Healthcare Research and Quality (US), 2008 (http://www.ncbi.nlm.nih.gov/books/NBK2682/). Accessed September 1 2023.
8. Jones B, Vaux E, Olsson-Brown A. How to get started in quality improvement. BMJ 2019;364:k5408.