Chapter 18
Quality Improvement Projects and Indicators

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Introduction

A gap currently exists between the care provided to patients and the care recommended for patients. Quality improvement (QI) methodology strives to close this gap. Additionally, many quality metrics are now being monitored by different groups, such as Centers for Medicare & Medicaid Services and insurance companies. Residents need to be knowledgeable of quality improvement metrics and methodologies and should be engaged in quality improvement projects within an academic medical practice.

Learning Objectives

1. Describe types of quality indicators and patient satisfaction tools used in primary care.
2. Identify how to engage residents in quality improvement.
3. Name components of the Clinical Learning Environment Review (CLER) program.

Outline

- Quality Improvement Background
  - *Crossing the Quality Chasm aims for healthcare*
  - Triple Aim framework

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- Primary Care Quality Indicators

  – Measurement in Quality Improvement
  – Structure/Process/Outcome/Balancing Measures
  – Implementation of Quality Indicators
  – Medicare Access and CHIP Reauthorization Act (MACRA) and Merit-Based Incentive Payment System (MIPS)

- Patient Engagement
- Engaging Residents in Quality Improvement

  – Resident Clinic QI Projects
  – Clinical Learning Environment Review (CLER)

Quality Improvement Background

In 2001, the Institute of Medicine (IOM) published a groundbreaking report, *Crossing the Quality Chasm*, which stated that the US healthcare delivery system does not provide consistent, high-quality medical care to all people [1]. Patients do not always receive the necessary components of care, yet often receive care that is unnecessary. The IOM proposed six aims for healthcare:

1. **Safe**: avoiding injuries to patients from the care that is intended to help them. Examples include preventing healthcare-associated infections or making medication errors.
2. **Effective**: providing services based on scientific knowledge to all who could benefit and refraining from providing services to those not likely to benefit. Examples include screening patients with diabetes for retinopathy or not performing PSA screening on men with a limited life expectancy.
3. **Patient-centered**: providing care that is respectful of and responsive to individual patient preferences, needs, and values and ensuring that patient values guide all clinical decisions. Examples include discussing benefits and risks of anticoagulation medications for a patient with atrial fibrillation or discussing goals of care for terminally ill patients.
4. **Timely**: reducing waits and sometimes harmful delays for those who receive and those who give care. Examples include reducing the time for patients to establish care with a primary care physician (PCP) or being able to see PCP quickly for urgent conditions.
5. **Efficient**: avoiding waste, including waste of equipment, supplies, ideas, human potential, and energy. Examples of efficient care include having patients go to a PCP rather than the emergency room for care of chronic medical conditions or streamlining forms to reduce paperwork.

6. **Equitable**: providing care that does not vary in quality because of personal characteristics such as gender, ethnicity, geographic location, and socioeconomic status. Examples include eliminating racial disparities for cancer screening or reducing variance in care based on geography.

Since the publishing of *Crossing the Quality Chasm*, improvements have been made within the US healthcare system; yet significant gaps still remain. For example, the percentage of women ages 50–74 who reported they had a mammogram within the past 2 years has decreased overall from 77.2% in 2000 to 72.4% in 2010 [2]. Despite spending more on healthcare than other countries, the United States has worse health outcomes than international peers and has higher rates of chronic disease [3]. Nearly half of Americans have at least one chronic healthcare condition, and 86% of all healthcare spending was for people with one or more chronic condition [4, 5].

In 2007, the Institute for Healthcare Improvement (IHI) developed the Triple Aim framework which refers to the simultaneous pursuit of three goals (Fig. 1) [6]. The Triple Aim is composed of three components necessary to optimize a health system performance:

1. Improving the patient experience of care, including quality of care, access, and reliability
2. Improving the health of the population
3. Reducing the per capita cost of healthcare

This framework allows health systems to focus on projects that address all three components of the Triple Aim, such as coordination of care to prevent readmissions or reducing unnecessary testing for patients [7]. Additionally, healthcare systems need to change healthcare delivery from episodic fragmented care for individuals to optimizing health both at the individual and population level.

Primary care has been an area of focus within healthcare redesign, given that the primary care physician's (PCP's) office is often the first point of contact for patients in the healthcare system. For individual practices, understanding the concepts and

Fig. 1 The IHI Triple Aim

Population health

Experience of care

Per capita cost
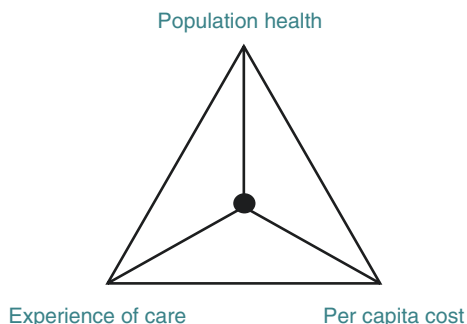
components of quality improvement is important in order to improve efficiency, optimize clinical outcomes, and reduce costs. Physicians and practices must start focusing on the overall health of the population of patients they serve, in addition to the patient sitting in the exam room [8].

A recent review article discussed the essential elements of primary care in the context of providing high-quality care [9]:

1. *Accessible first-contact care*: services available and easily accessible to patients with new medical needs or ongoing health concerns, including shorter waiting times for urgent needs, enhanced in-person hours, around-the-clock telephone or electronic access to a member of the care team who has access to the patient's medical record, and alternative methods of communication including patient portals.
2. *Continuous care*: primary care clinicians have a personal and uninterrupted caring relationship with their patients, with continuous exchange of relevant information about healthcare and health needs.
3. *Comprehensiveness of care*: primary care clinicians, working with the interprofessional primary care team, meet the large majority of each patient's physical and mental healthcare needs, including prevention and wellness, acute care, chronic and comorbid care, and discussing end-of-life care.
4. *Coordinated care*: care is coordinated across all elements of the broader healthcare system, including specialty care, hospitals, home healthcare, and community services and support.
5. *Accountable whole-person care*: primary care clinician/team is knowledgeable about and oriented toward the whole person, understanding and respecting each patient's unique needs, culture, values, and preferences in the context of their family and community.

Primary Care Quality Indicators

Measurement is key to knowing if a change has led to an improvement. Healthcare measurement is founded on Donabedian's framework using structure, process, and outcome measures (Table 1) [10]. Balancing measures assess if any part of the system is being harmed due to other changes. Metrics can be obtained through multiple sources such as claims data, patient surveys, clinician surveys, practice surveys, electronic health record (EHR) reports, or chart audits. Practices are facing increased pressure to provide quality metrics for the insurance companies, the government, and the public. Collecting and analyzing these metrics can place a large administrative burden on practices.

Table 1 Types of measurements to assess quality

Types	General description	Healthcare description	Clinical example
Structure measures	Quantify available resources	Quantify available resources of providers and healthcare systems	Number of diabetes educators in a primary care clinic
Process measures	Quantify the process steps necessary to achieve the desired outcome	Quantify the diagnostic and therapeutic processes used in caring for patients	Number of diabetic patients with a HbA1c checked every 3 months
Outcome measures	Quantify the degree to which consumer specifications are met	Quantify the health status of patients	Number of diabetic patients with a HbA1c less than 7
Balancing measures	Quantify if changes to one process worsens other processes	Changes in baseline health characteristics aside from the primary outcome	Number of diabetic patients who develop hypoglycemia

Adapted from the Institute of Healthcare Improvement, Science of Improvement: Establishing Measures. http://www.ihi.org/resources/Pages/HowtoImprove/ScienceofImprovementEstablishing Measures.aspx

Implementation of Quality Indicators

Adopting and implementing quality indicators can be a struggle. Physicians are committed to providing high-quality care to patients but can easily feel over-whelmed with the requirements to meet quality metrics and may perceive a loss of autonomy [8, 11]. Quality indicator characteristics that facilitate adoption of met-rics include having well-recognized and clear definitions, being evidence based, covering important areas, reflecting current knowledge based on reliable and com-plete data, and representing an "open" rather than "hidden" agenda [12]. Barriers for implementation include a lack of precision of the measure; viewing indicators as a threat to autonomy, as not credible, and as a tool to penalize bad performance; or having financial penalties based on performance areas beyond the scope of profes-sional control. Challenges that physicians may perceive with interpreting and believing the quality data include when the data is not timely, such as being 6 or 12 months old, if there is no accurate physician attribution for the data or there is no adjustment for confounding patient factors such as comorbid conditions or sociode-mographic characteristics [8]. Financial incentives or penalties are one approach used by healthcare organizations to improve quality. A Cochrane Review found that there is insufficient evidence to support or not support the use of financial incentives to improve quality of primary healthcare [13]. Most of the studies about financial incentives tend to focus on one aspect of care, such as diabetes, which may lead to the PCP being able to spend less time on other important aspects of care.

MACRA and MIPS

The Medicare Access and CHIP Reauthorization Act of 2015 (MACRA) is a Quality Payment Program developed by CMS for Medicare providers which repeals the Sustainable Growth Rate (SGR). Ideally, these quality payment programs lead to better patient outcomes, decrease provider burnout, align incentives across healthcare stakeholders through the Alternative Payment Models (APMs), and continue to advance healthcare delivery system reform [14].

There are two tracks available for providers through the Quality Payment Program:

- Advanced Alternative Payment Models (APMs)
- Merit-based Incentive Payment System (MIPS)

MIPS is composed of four categories with each being responsible for a different percentage of the total score (Table 2) and combines existing CMS quality programs into one comprehensive program [15]. The goal of MIPS is to move away from fee-for-service toward paying for value and better care. The current criteria for inclusion are providers (physicians, physician assistants, nurse practitioners, clinical nurse specialists, and certified registered nurse anesthetists) who bill Medicare more than $30,000 per year or provide care for at least 100 Medicare patients. Providers may see positive, neutral, or negative adjustments in their payments. The 2017 data will be used to determine the 2019 payments. In order to succeed, data for these quality metrics needs to be documented in a way that is captured through the EHR. The data can either be reported as an individual under a single National Provider Identifier (NPI) tied to a single Tax Identification Number or as a group who shares a common Tax Identifier Number, regardless of the specialty or practice site.

APMs are a payment approach that gives added incentive payments to provide high-quality and cost-efficient care. APMs often apply to a specific clinical condition, care episode, or population. Advanced APMs are a subset of APMs that allow practices to earn more rewards in exchange for taking on risk related to patient outcomes. Participation in advanced APMs allows physicians to earn a 5% incentive payment each year and avoid MIPS reporting requirements and payment adjustments. Examples of advanced APMs include comprehensive end-stage renal disease care (ESRD), Comprehensive Primary Care Plus, and Comprehensive Care for Joint Replacement Payment Model.

HEDIS Measures

The Healthcare Effectiveness Data and Information Set (HEDIS) is a set of healthcare performance metrics used in the United States by many health plans to measure performance [16]. HEDIS allows for comparison of health plans and to benchmark plan performance. The HEDIS data can be used by employers, consultants, and consumers to select the best health plan for their needs.

Table 2 Components of MIPS

Category	Previous quality program	Components	2017 category weight
Quality	Replaces Physician Quality Reporting System (PQRS)	Most participants: report up to six quality measures	60%
		Groups using web interface: report 15 quality measures for a full year	
		Groups in APMs qualifying for special scoring: report quality measures through APM	
Improvement activities	New category	Most participants: attest completion of four improvement activities	15%
		Groups with fewer than 15 participants or in a rural/health professional shortage area: attest completion of two activities	
		Participants in certified patient-centered medical homes, comparable specialty practices or APM designated as a medical home model: automatically earn full credit	
		Groups in APMs qualifying for special scoring: receive points based on requirements of participating in APM	
		For all current APMs under the APM scoring standard, this assigned score will be full credit. For all future APMs under the APM scoring standard, the assigned score will be at least half credit	
		Participants in other APM: automatically receive half credit and may report additional activities to increase score	
Advancing care information	Meaningful use	Fulfill required measures for a minimum of 90 days: conduct a security risk analysis for protected health information, transmit prescriptions electronically (e-prescribing), provide patient access to electronic health information, electronically create and send summary of care	25%
		Choose to submit up to nine measures for a minimum of 90 days for additional credit	
Cost	Value-based modifier	No data submission required	Counted starting in 2018
		Calculated from adjudicated claims	

Adapted from: Center for Medicare and Medicaid Services Quality Payment Program Fact Sheet, https://qpp.cms.gov/docs/Quality_Payment_Program_Overview_Fact_Sheet.pdf, accessed 4/25/17

The measures are grouped into the following areas [17]:

- Effectiveness of Care

  – Examples include adult BMI assessment, breast cancer screening, care for older adults, comprehensive diabetes care, and use of imaging studies for low back pain.

- Access/Availability of Care

  – Examples include initiation and engagement of alcohol and other drug dependence treatment and call answer timeliness.

- Experience of Care

  – Examples include CAHPS survey.

- Utilization and Risk-Adjusted Utilization

  – Examples include all-cause readmissions, emergency department utilization, and hospitalization for potentially preventable complications.

- Relative Resource Use

  – Examples include relative resource use for people with diabetes or COPD.

- Health Plan Descriptive Information

  – Examples include board certification and total membership.

- Measures Collected Using Electronic Clinical Data Systems

  – Examples include utilization of the PHQ-9 to monitor depression symptoms for adolescents and adults.

Patient Experience

Patient satisfaction and experience with the healthcare system is becoming increasingly recognized. Scores on patient surveys can affect quality scores and reimbursement. Additionally, patients are able to post positive or negative experiences on social media or consumer websites, like Yelp or Facebook.

The Clinician and Group Consumer Assessment of Healthcare Providers and Systems (CG-CAHPS) surveys are designed to collect data from patients regarding their experiences with primary or specialty care [18]. The patients are asked questions about their healthcare provider and the office staff over the last 6 months. Surveys are completed through a third-party vendor and designed to provide a standardized measure of patient experience that can be used between practices.

The adult version contains items in the following core areas:

1. Getting timely appointments, care, and information
2. How well providers communicate with patients
3. Providers' use of information to coordinate patient care
4. Helpful, courteous, and respectful office staff
5. Patients' rating of the provider

The response options are a four-point scale of "never, sometimes, usually, and always," a "yes/no" scale, and a "0–10" scale to rate the provider based upon the question. The CG-CAHPS have adult and child versions, along with versions designed for Primary Care Medical Homes (PCMHs) and Accountable Care Organizations (ACOs). Supplemental items can be added to address specific areas of interest, such as health promotion and education.

Engaging Residents in Quality Improvement

In 2003, the Accreditation Council for Graduate Medical Education (ACGME) added systems-based practice (SBP) and practice-based learning and improvement (PBLI) as part of the six major competencies in medical training [19]. Residents should be engaging in quality improvement (QI) projects and reviewing data related to their patient panel. Residency programs have implemented multiple different models in order to fulfill this requirement (Table 3):

1. Longitudinal quality improvement curriculum—resident(s) are paired with a faculty member to develop and implement a QI project over the course of 1–3 years. The curriculum is paired with didactic learning in QI [20].
2. Shared small group quality improvement projects—multiple residents work together on a project. The work may be handed off between residents based on their residency year and rotations.
3. Single project shared by a residency program—the entire residency program focuses on improving one or two areas, such as the diabetic foot exam. Each resident may be responsible for collecting and analyzing their own data through chart audits [21].
4. Individual chart audits—individual residents can complete performance improvement modules (PIMs) or similar chart audits to learn where they have gaps in their practice and opportunities for improvement. Some programs are able to create dashboards to display quality metrics for a resident's patient panel.

Many clinic quality improvement projects tend to focus on chronic care conditions, such as diabetes mellitus, congestive heart failure, coronary artery disease, or specific time periods, such as transitions of care either between inpatient and outpa-

Table 3 Ambulatory QI models

	Faculty requirements	Resident participation	Sustainability
Longitudinal	Need multiple faculty to supervise a number of projects	Variable; if working in small group, one person may have unfair burden	May not be sustainable after resident(s) leaves; may have multiple different competing projects
Shared small group	Need multiple faculty to supervise a number of projects	Variable; work may not be distributed evenly	May not be sustainable after resident(s) leaves; may have multiple different competing projects
Single shared project	Less faculty to supervise projects, but need someone to coordinate and collect data	All resident engaged, although may not be as rich of a learning experience as designing and implementing a project	More sustainable over time
Individual performance audit	Less faculty to supervise projects, but need someone to coordinate and collect data	All residents engaged, although may not be as rich of a learning experience as designing and implementing a project	May not have large impact on clinical site for overall patient population; may lead to improvements in individual performance

tient or between providers. Challenges to quality improvement work include faculty time, training or funding, multiple competing educational and clinical demands, voluntary participation by a subset of residents, and limitations from the electronic health record in terms of aggregating data and providing performance reports [22]. At our program, Barnes-Jewish Hospital/Washington University School of Medicine, our residents focus on improving diabetes care. Residents receive individualized and clinic metrics for the quality of care for their patients with diabetes pulled from the EHR. Residents then have to complete a chart audit to determine the percent of patients who have a documented diabetic foot exam. This approach has allowed the clinic to focus on one chronic condition and minimized the administrative burden for faculty and staff to distribute and collect data for a large residency program.

Clinical Learning Environment Review (CLER)

In 2012, the ACGME created CLER to explore and understand the clinical learning environment in which trainees learn and practice [23]. The CLER site visit program is part of the Next Accreditation System and distinct from nearly all accreditation activities [24]. Each sponsoring institution is required to undergo a CLER visit about every 18–24 months. The Chief Executive Officer and the Designated Institutional Official (DIO) for the clinical site are required to participate in the visit. The CLER site visits aim to improve how clinical sites engage physician

trainees in learning to provide safe and high-quality patient care [24]. The CLER program addresses the six following areas:

1. Patient safety
2. Healthcare quality
3. Care transitions
4. Supervision
5. Duty hours/fatigue management and mitigation
6. Professionalism

Notably, the healthcare quality area focuses on pathways related to education on QI, resident engagement in QI activities, residents receiving data on quality metrics, resident's engagement in planning for QI, and resident education/engagement to address healthcare disparities.

Initial findings from the CLER visits demonstrated that clinical learning environments vary in [23]:

• The approach and the capacity for addressing patient safety and health quality and the degree to which they engage residents and fellows in these areas.
• Their approach to implementing Graduate Medical Education (GME). In many clinical learning environments, GME is largely developed and implemented independently of the organization's other areas of strategic planning and focus.
• The extent to which they invest in continually educating, training, and integrating faculty members and program directors in the areas of healthcare quality, patient safety, and other systems-based initiatives.
• The degree to which they coordinate and implement educational resources across the healthcare professions.

The CLER program provides a framework for academic medical practices to assess their learning environment and coordinate activities with the GME department. As the CLER findings mention, there is often lack of coordination of PSQI activities across the institution. For example, resident QI projects may not align with the clinical practice site's overall goals. Additionally, different residency programs within one institution may have different PSQI goals, objectives, and curricula for trainees, when there may be potential to collaborate and standardize. The CLER visits and recommendations can provide leverage for academic medical practices to develop PSQI programs that involve the trainees.

Conclusion

Ambulatory practices must engage in quality improvement initiatives to optimize care of their patients, maximize reimbursement, and comply with best practices. Both seasoned physicians and trainees will need support in understanding quality improvement methodologies and indicators, participating in quality improvement initiatives, and complying with metrics. At a minimum, practices should provide

training for staff, identify key areas of improvement and barriers, develop quality goals that are reviewed regularly, develop and monitor quality metrics, and engage patients in quality improvement activities [25]. Using quality improvement methodologies, physicians and practices have the opportunity to enhance the health of patient populations.

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