Quality Improvement Essentials

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“Undoubtedly, the most important single requisite is a commitment to quality: an unequivocal desire and determination to dedicate oneself to the best one is capable of, despite every obstacle.”

—Donabedian, 2003, p. xxix

Upon completion of this chapter, the reader should be able to:

1. Define quality improvement (QI).
 2. Describe the historical evolution of QI.
 3. Explain QI in nursing practice
 4. Compare and contrast QI, evidence-based practice, and research.
 5. Differentiate between QI models and methodologies, including Plan-Do-Study-Act (PDSA), Lean, and Six Sigma.
 6. Describe reactive and proactive approaches to QI problems.
 7. Explore the role of the nurse in QI projects.
 8. Discuss the impact organizational leadership has on QI activities.
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CROSSWALK

This chapter addresses the following:

QSEN Competency: Quality Improvement

The American Association of Colleges of Nursing. (2021). *The essentials: Core competencies for professional nursing education*.

Domain 5: Quality and Safety

OPENING SCENARIO

A home care nurse is admitting a new patient. While conducting the medication reconciliation based on the nursing admission policy, the patient hands the nurse a bottle of erythromycin he has been taking for 3 days. However, there is no electronic medical record (EMR) indication that this patient was prescribed erythromycin or any medical history or recent provider notation prescribing erythromycin. The nurse is clearly performing an important assessment and has several questions about the medication. The first question the nurse asks is, “Who prescribed erythromycin for you?” The patient responds that he had a cold and decided to go to urgent care rather than try to see his provider. The provider at urgent care prescribed erythromycin for bronchitis. As the patient explains the situation, the nurse recognizes that the EMR cannot reflect any out of network information.

1. From an interprofessional perspective, who would the nurse initially contact based on this observation?
2. What regulation(s) is the nursing admission assessment policy that stipulates medication reconciliation be conducted on every home visit based on?
3. Is there opportunity to consider a quality improvement activity based on this scenario?

INTRODUCTION

Staff nurses who provide direct patient care are best positioned to participate and lead quality improvement (QI) activities, thus affecting the quality of care patients receive. In such manner, it is important that nurses become familiar with the essentials of QI. The purpose of this chapter is to explore QI processes as they promote patient safety and the achievement of the best patient outcomes. QI will be defined and key concepts pertaining to the history of QI will be presented to showcase its interdisciplinary nature. Research and evidence-based practice (EBP) will be differentiated from the process of QI. The Donabedian model for change and Deming’s Plan-Do-Study-Act (PDSA) process will be introduced as models commonly used in QI activities. Improvement methodologies such as Six Sigma and Lean will be explored. A proactive tool, namely the Healthcare Failure Mode and Effect Analysis (HFMEA), is presented. Reactive tools such as the root cause analysis (RCA) process are discussed as evaluation tools used to determine the root cause of a significant near miss, an error, or sentinel event. Implementing and sustaining a culture of safety through the delivery of evidence-based high-quality healthcare using an interdisciplinary approach supported by leadership are key to continuous QI.

DEFINING QUALITY IMPROVEMENT

Quality improvement (QI) is defined the same for both prelicensure and graduate nursing education by the Quality and Safety Education for Nurses (QSEN) competency as “Use data to monitor the outcomes of care processes and use improvement methods to design and test changes to continuously improve the quality and safety of healthcare systems” (QSEN Institute, n.d.-a, n.d.-b). The knowledge, skills, and attitudes (KSAs) differ, however, in that the prelicensure expectations focus on preparing the new nurse to participate in or lead small-scale QI activities while graduate students are expected to take a greater role and facilitate QI activities across the organization. QI is the process of collecting and analyzing data to determine the extent to which quality healthcare is being delivered

according to established standards. Standards may be internal, such as those created by the organization, or external, such as those created by regulatory bodies. QI can be considered as both an art and a science (McLaughlin et al., 2012). Indeed, the art of QI involves asking questions and coming up with creative ideas and visionary innovations of how to approach and consider improvement interventions. The science of QI, presented in Chapter 12, involves the ongoing process of testing improvement interventions, to measure if improvements lead to the intended outcomes, and to sustain intended outcomes.

Triggers that may initiate a QI activity may include inconsistent patient outcomes, poor patient outcomes, patient outcomes that do not meet expectations related to evidence-based practice (EBP) or to standards, or patient/family complaints. Such outcomes may be specific to a patient (e.g., a medication error), groups of patients (e.g., hospital-acquired pressure injury rates), or may identify a process that needs improving (e.g., transition from acute care to home care). QI is a continuous process that includes elements of prevention (risk reduction), recognition, and alleviation of harm as well as the ongoing search for performance excellence.

QI is a structured series of events that involves planning, implementing, and evaluating healthcare outcomes (Hughes, 2008b). In addition, the National Academy of Medicine, formerly the Institute of Medicine (IOM, 2001), identified six aims for care delivery: that care delivery is safe, effective, patient-centered, efficient, equitable, and timely. Each aim provides an avenue for data collection and analysis that may trigger evidence that improvement is required or desired.

There are several key steps to formal QI projects, including assembling a team, understanding the organization as a complex system, accessing and interpreting data, implementing interventions to improve outcomes, and sustaining actions when improvement goals are met. Certainly, it is safe to say QI focuses on improving processes and outcomes, including those that result from practice decisions, and measuring or evaluating such outcomes compared to an established, evidence-based standard, goal, or industry benchmark. Many organizations exist to provide QI resources and expertise to individuals, teams, and organizations working to improve. Examples of such organizations are listed in Box 11.1. It is also well recognized that there are cultural factors of the organization that influence

BOX 11.1 Examples of Organizations Associated With Healthcare Quality

Organization and Web Address

Agency for Healthcare Research and Quality (AHRQ) <http://ahrq.gov>

American Society for Quality (ASQ) <http://asq.org>

Centers for Medicare and Medicaid Services (CMS) <http://cms.hhs.gov>

Hospital Compare <http://medicare.gov/hospitalcompare/search.html>

Institute for Healthcare Improvement (IHI) <http://ihi.org/Pages/default.aspx>

Institute for Safe Medication Practice (ISMP) www.ismp.org

The Joint Commission (TJC) <http://jointcommission.org>

The Leapfrog Group www.leapfroggroup.org

National Database of Nursing Quality Indicators <http://public.qualityforum.org/actionregistry/Lists/List%20of%20Actions/Attachments/141/NDNQIBrochure.pdf>

National Association for Healthcare Quality (NAHQ) www.nahq.org

National Quality Forum www.qualityforum.org/Home.aspx

Quality and Safety Education for Nurses (QSEN) <http://qsen.org>

improvement activities such as engaged and supportive senior leadership, interdisciplinary teams, staff buy-in, technology support, and direct supervisory commitment for time to work on improvements (Mitchell et al., 2015). The existence of a just culture, or a culture where reporting errors or risks is welcome because such reporting leads to improvements, is another cultural factor that distinguishes organizations that strive and meet performance excellence.

As nurses care for patients or communities, it is their professional responsibility to obtain and apply the KSAs of QI to daily practice. The American Nurses Association (ANA) Code of Ethics, specifically Provision 3, speaks to nurses as patient advocates, protecting patient rights and safety (ANA, 2015). This provides an ethical basis for nurses taking part in QI activities. Organizations do not only hold nurses accountable to recognize and mitigate risk, but also to analyze patient outcomes to determine if improvement is warranted. In addition, nurses must have skills to evaluate organizational processes and report those processes that impede care delivery. Analyzing patient outcomes and evaluating complex processes requires the QI KSAs outlined by QSEN. These QI actions should sound familiar as they mimic the nursing process. It is truly an exciting time to be a nurse! Nurses are not only responsible for impacting the well-being of patients, groups, and communities, but are charged with ethical accountability to pursue continual improvement toward zero harm. It is no wonder why the public consistently ranks nurses as the most trusted, ethical, and honest profession 18 out of the last 19 Gallup polls (Gaines, 2021). Sometimes, the most challenging aspect of QI activities is getting started. The Real World Interview on page 365 describes a newly graduated nurse's experience with her first QI project.

Getting started also includes establishing a project team, gathering support or buy-in for a project, and setting aside time to complete the project. Buy-in and team success can be challenging, as seen in the Developing Clinical Judgment (Box 11.2) scenario.

BOX 11.2 Developing Clinical Judgment

You are the nurse representative on a QI project team that plans to reduce the use of mental health restraints. The project has been going on for 3 months, yet the expectation was it would be completed within weeks. The project meetings are typically attended by half of the participants. The leadership project sponsor, who was away when the project started, has assigned the project lead to a psychiatrist who has delegated the lead role to one of the mental health administrative support staff and does not attend the scheduled meetings. Although the organization's patient safety officer has created a project charter, the psychiatrist also does not think there is a problem that needs improvement. As a project team member, you are frustrated and think the team needs motivation.

1. What CUES for the causes of the project delay could you provide to the leadership project sponsor?
2. What HYPOTHESIS can you consider?
3. What ACTION (plan and implement) would be the most effective in this situation?
4. What OUTCOMES would you consider evaluating?

Real World Interview

When I graduated, I attended a year-long Transition to Practice Residency that included numerous classes and clinical experiences as well as the requirement to complete a QI project. My goal was to do a project where I would eventually practice, the optometry and ophthalmology services, or eye clinic. As a novice nurse, my initial project ideas tended to be grandiose. I wanted to make a significant impact on the patient experience. However, I knew I had to scale back my idea and focus on one part of patient care. As I considered my project idea, two separate events with suboptimal patient outcomes occurred within 1 week.

The first event happened when a veteran called their primary provider complaining of “change in vision.” A referral was placed for a “routine” eye examination, typically scheduled within 30 days. The veteran was scheduled nearly 30 days from his complaint. His symptoms persisted, so he contacted the eye clinic directly. He was seen quickly and diagnosed with a retinal detachment requiring surgery. Unfortunately, some permanent visual impairment resulted.

As that was unfolding, a veteran called the Telephone Assistance Program (TAP) complaining of a headache and blurry vision. The TAP operator encouraged the veteran to go to the emergency department. The veteran, however, declined as he was concerned about long wait times. A note was entered into his chart for the primary care staff. Because this occurred during the weekend, the primary care staff did not read the note for 2 days. Sadly, we later learned that this veteran suffered a stroke. Although everyone involved followed procedures, we understood an eye examination may have detected an impending stroke.

These two events highlighted an opportunity for improvement. Could a nurse-led initiative to ensure timely assessment with the goal to minimize these types of outcomes work?

For eye or vision complaints, primary care (or other services) and electronic or telephone referral to the eye clinic occurred, where a nonclinical staff member scheduled the appointment. Because the staff are nonclinical, no triage occurred to determine urgency. Knowing this, I wondered if I could create a way for a healthcare provider to refer a patient to the eye clinic as a way to determine urgency of needed care. Could this be my project?! There’s a clear problem, a goal, and potential intervention.

The goal, to improve consultations for appropriate and timely triage of veterans needing eye clinic expertise, was agreed on by leadership. With access being key, the logical intervention was to collaborate with telecommunications to develop a “triage line.” This direct triage line would include both clinic nurse phones and the attending/technician workstations ensuring only clinical staff would be responding. In addition, to ensure timely access, the intervention included no voice mailbox. Telecommunications installed the line and we were set to study the outcome. To support the intervention, I developed a flyer about the new resource, including instructions. This informative flyer was sent to all healthcare providers in the organization, emphasizing the use of this line.

By the end of the first month we had 15 calls, all of which resulted in same day appointments. Three of those patients (20%) required close follow-up. Within 2 months, two veterans with retinal tears were triaged, received immediate intervention, and had outcomes of preserved vision. One veteran already had longstanding visual impairment in one eye; thus, preservation of the vision in the other eye was especially critical. It was clear that this new process improved care outcomes for patients.

Financial costs for this project were minimal: only activation of a new direct line and the paper/time to develop and distribute the informational flyers. It is clear this new process has improved care outcomes for veterans while increasing efficiencies for healthcare providers. The improvement skills I gained from the residency project have professional

impact because as nurses, we need to not only have improvement skills, we need to employ them throughout our professional careers.

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HISTORY AND EVOLUTION OF QUALITY IMPROVEMENT IN HEALTHCARE

Prior to the 20th century, there was no such thing as a standard of care for physicians or hospitals, let alone nursing care standards of practice. Patient outcomes were not tracked or reported. With little to no emphasis on measuring patient care outcomes, it is not surprising that improvement or quality was not a consideration.

The establishment of the American Medical Association (AMA) started in the early 20th century from the efforts of Dr. Ernest Codman. The AMA set out to create standards of care and expectations for physicians, improve medical education, and improve public health. Dr. Codman began encouraging patient case review and the tracking of patients posthospitalization to ensure the care they received was effective. It was through Codman's efforts to track patient outcomes, morbidity, and mortality following hospital stays and surgical procedures that the American College of Surgeons (ACS) was born. The primary responsibility of the ACS was to act as an oversight organization to physicians and hospitals. In the early 20th century, the ACS developed five minimum standards for hospital care. To be certified by the ACS, a hospital had to:

1. Organize the physicians practicing at the hospital into a medical staff.
2. Limit staff membership to well-educated, competent, licensed physicians and surgeons.
3. Have rules and regulations governing regular staff meetings and clinical review.
4. Keep medical records that included the history, physical examination, and results of diagnostic testing.
5. Supervise diagnostic and treatment facilities such as laboratory and radiology departments (Luce et al., 1994).

For the next 40 years, meeting minimum standards for hospital care was considered a satisfactory means to demonstrate quality care. By the 1960s there was a shift from meeting the minimum standards to identifying outcomes outside those that were expected, often referred to as outliers. Identifying and improving physician outliers became the impetus to achieving quality care. To identify physician outliers, a peer review of patient charts was instituted. Individual physician care data were collected from patient charts and analyzed. Patient care characteristics such as readmission rates, transfers to the ICU, needs for transfusion, and antibiotic use were reviewed to identify poorly performing physicians. Efforts could then be made to educate and support QI in physician practice through mentoring. The results of this peer-review process were eventually used by hospitals in credentialing physicians. Physicians not performing up to standards or failing to correct practice deficiencies could potentially lose their privileges to practice at that institution.

As physicians were being peer reviewed, there remained little to no attention to the quality of nursing care. However, that was not the case in the manufacturing sector. The work of many experts including Deming and the Plan-Do-Study-Act (PDSA) model became intriguing to businesses that could demonstrate improved production by employing principles of continuous improvement. As part of this revolution, industrial leaders

began welcoming frontline staff participation and evaluation of processes since they were involved with the day-to-day operations. Frontline staff welcomed the opportunity and could easily and often quickly identify opportunities for improvement that could impact production. This belief and even the PDSA, described later in this chapter, eventually influenced healthcare quality methodologies.

There were numerous historical events that have brought light to healthcare quality. For the purpose of this chapter, several will be highlighted including Title XVIII of the Social Security Act that signed Medicare into law; regulatory oversight of healthcare, such as TJC; and several IOM publications.

In 1966, Medicare was signed into law providing healthcare for Americans 65 years and older, followed by Medicaid that provided healthcare resources to low-income Americans. Today, both programs are combined into the Centers for Medicare and Medicaid Services (CMS). These programs have gone through revisions over the years including identifying quality indicators. For example, the Experimental Medical Care Review Organizations were established in 1972 to review quality and appropriateness of care delivered (Owens & Koch, 2015). In 2001, CMS instituted the Hospital Quality Initiative, making aggregated healthcare quality data publicly accessible. The National Quality Foundation identified “never events” in 2001 as sentinel events or preventable errors that should never occur. In 2007, the CMS restructured reimbursement of never events, holding organizations more financially accountable for the cost associated with never events. The **Hospital Value-Based Purchasing** (HVBP) Program introduced by CMS in 2011 is a payment model with roots in the Affordable Care Act (ACA). Traditionally, reimbursement for healthcare has mainly been and remains a fee-for-service model where the patient or the patient’s insurer, if an insurer exists, is billed directly. The HVBP model shifts payment from fee-for-service to value based. This shift equates to insurers such as Medicare to reward or penalize hospitals based on patient care and process outcomes. The HVBP recognizes providers who deliver better outcomes at lower costs (Aroh et al., 2015; Figueroa et al., 2016; Haley et al., 2017). With HVBP, hospital performance is based on four quality domains: Person and Community Engagement (25%), Clinical Care (25%), Safety (25%), and Efficiency and Cost Reduction (25%; CMS, 2018a). Because reimbursement is tied to meeting established outcomes, the belief is that HVBP would result in cost containment. There are organizations who maintain high performance, those who improve performance, and others who decline in performance, which impact their reimbursement (Carroll & Clement, 2020).

The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) was founded in 1951 through the collaborative efforts of the American College of Physicians, the American Hospital Association, the AMA, and the Canadian Medical Association. JCAHO was initially charged with regulatory oversight of hospital quality (TJC, n.d.-b). JCAHO, currently called TJC, also assumed regulatory oversight of nursing homes and laboratory facilities, among other duties. TJC sets forth a set of widely recognized standards of performance and quality measure sets that healthcare organizations must achieve for accreditation. One example of a TJC requirement, specifically one of the TJC National Patient Safety Goals (NPSG), is to maintain and communicate accurate patient medication information (TJC, n.d.-c) that was discussed in the chapter opening scenario.

In the 1970s and 1980s, the focus on quality care transitioned from a peer review of patient charts to identify “problem physicians” to improving the performance of a group of physicians and hospitals through implementing practice guidelines. The goal of practice guidelines was to standardize care decision-making. Practice guidelines would apply up-to-date evidence that would inform clinical decision-making, resulting in improved patient outcomes and a reduction in morbidity and mortality.

As TJC matured, the focus moved from quality of care being a physician responsibility to an interprofessional responsibility. All healthcare workers were now responsible and accountable to ensure quality and safety within their practice. The scope of responsibility

not only included patients, but staff and visitors who were also in the healthcare environment and could be subject to safety risks. The environment of care, for example, has many TJC requirements to protect patients, visitors, and employees. A simple spill of ice chips on a floor can lead to falls for anyone in that area, not just patients.

In 2002, TJC initiated the requirement that all hospitals seeking their accreditation begin reporting their performance on core patient quality measures. These core patient quality measures are a listing of standardized evidence-based care that should be delivered to certain patient groups, for example, all patients with pneumonia should receive an antibiotic before they leave the emergency department (ED) or all patients with a myocardial infarction should be prescribed a beta-blocker. Since hospital payers (e.g., insurance companies, CMS) often require proof of accreditation before they will reimburse health services, hospitals became motivated to participate in improving their performance given the financial implications. TJC patient quality measures change based on evidence or outcome trends. To learn more about TJC quality measures, visit www.jointcommission.org/measurement/measures.

TJC also changed its approach to how it assessed an organization's compliance to their published standards by shifting from a scheduled to an unannounced site visit. In addition, TJC implemented the **tracer methodology** that traces an individual patient through their transitions of care across the organization, and included "system tracers," such as medication management and infection control, tracing those complex processes across the entire organization. Consider a patient with congestive heart failure (CHF) on an acute care medical unit who has had multiple admissions for CHF. This patient is improving but, on arrival to the ED, was intubated and admitted to the medical ICU (MICU).

When TJC surveyor is ready to conduct a tracer activity, the surveyor will request a complex patient, such as the patient with CHF, who has been admitted across several care settings during one hospital stay. The surveyor will request to meet with the interprofessional team starting with the current team on the medical unit, and then traces the care delivery backward to previous settings, including meeting with those team members. All staff involved in the care of the selected patient, including the nurse caring for the patient while on that unit, are asked to meet with the surveyor. The surveyor asks the team about their care delivery to determine if the team is following their policies and procedures, which are often created based on TJC regulatory requirements. The surveyor may also request to speak to the patient and the family to assess if patient education occurred and if they are satisfied with the care and services they have received. Once the surveyor has completed the discussions, which may take hours, the surveyor traces care and services backwards to meet with the previous care team(s). In this example, the surveyor begins in the MICU followed by the ED team. The surveyor interviews the staff regarding the specific care and services the patient received while under their care. The patient's electronic medical record (EMR) is reviewed, and team documentation and any other aspects of care and services that the surveyor chooses are evaluated. Because the patient experienced multiple levels of care, the surveyor asks about communication that occurred during transfer between transitions as communication failures may result in risks or errors that can impact patient outcomes.

During the team discussions, the surveyor takes notes, such as policy questions to look up after the discussion, and visits other departments involved in the care delivery for this patient. Since the patient was previously intubated, respiratory care services and the radiology department both receive visits from this surveyor. The intent of tracers is to determine if staff followed their policies and procedures based on TJC requirements for accreditation. This level of review adds value to the accreditation and ultimately to patient care because it goes beyond compliance (yes–no type questions) to a process approach ("talk to me about your admission assessment"). For nurses, a tracer is nothing more than explaining what was done for the patient and/or family based on the scope of nursing practice.

The surveyor asks questions about nursing care processes related to medication administration, assessment/reassessment, documentation, patient education, discharge planning, and care coordination across settings. Also appreciate that TJC surveyors are well versed

in all TJC requirements. Although they may be on the unit conducting a tracer, they will be assessing the environment, looking in storage areas, and watching staff in action, for example, regarding hand hygiene (HH) compliance. To learn more about tracers, TJC

Real World Interview

*Despite my high level of experience and confidence as a homecare nurse, I always feel anxious if I am the nurse involved with a TJC tracer. I think no matter how well prepared, there is always the worry that they will find something, and it will be your fault. I do feel the best way to prepare is to try and do the right thing every day and then you are always ready. During my visit, the patient had a free-standing oxygen tank for supplemental oxygen. Because I immediately saw it and knowing home oxygen is a safety risk, I quickly placed the tank into a storage cylinder where it belonged and re-educated the patient that oxygen tanks cannot be left freestanding, which pleased the surveyor. The patient also had an over-the-counter medication that was not on his medication list. I was able to address that as part of the routine medication reconciliation and ensured it was documented. Home care nurses are well informed that handwashing will be closely watched by the surveyor and should not cause anxiety. Because we know errors can happen, especially when being watched, we make sure our techniques are correct. The process of preparing for a survey or tracer is challenging because one never really knows what they will ask. As a new nurse I was anxious. Experience helps me **do my job to the best of my ability, to adjust along the way, and to follow the procedures.** This makes talking with a surveyor less stressful. I also have found if I do not know an answer, the surveyor helps to coach me and will share best practices the surveyor may have seen at other organizations that can help. All in all, it can be stressful but also educational.*

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offers a brief video overview of the tracer process at www.jointcommission.org/resources/news-and-multimedia/video-resources/mock-tracer-therapeutic-school.

A greater emphasis on risk reduction can be seen in TJC standards and process. In 2017, TJC changed their approach to how deficiencies are identified and scored during surveys. Deficiencies are reported based on risk of harm and scope of the deficiency. This change allows the organization to mitigate or take corrective action on the highest risk deficiencies first by prioritizing them for immediate action (TJC 2016). With TJC's scoring methodology called Survey Analysis For Evaluating Risk (SAFER) Matrix, deficiencies are categorized by the likelihood of harm and the scope of the deficiency. This approach allows the surveyor who identified the deficiency to analyze the deficiency based on the likelihood of harm (high, moderate, and low) as well as the scope of the deficiency (widespread, pattern, and limited). The deficiency is evaluated and inserted into the matrix based on the surveyor's analysis. This provides the organization with a comprehensive visual, risk-based prioritized list of deficiencies to correct. Regardless of risk (except for identification of immediate risk to life or safety), the organization will have 60 days for corrective action. However, for those high-risk deficiencies, TJC will request additional information and evidence of corrective actions and sustainment (TJC, n.d.-a). Visit www.jointcommission.org/accreditation-and-certification/become-accredited/what-is-accreditation/safer-matrix-resources to learn more about and to visualize the SAFER Matrix.

Several publications by the IOM highlighted the continued quality challenges facing the healthcare system. *To Err Is Human: Building a Safer Health System* (2000) recognized the grim reality of patient deaths associated with medical errors. The publication *Crossing the Quality Chasm: A New Health System for the 21st Century* (2001) focused on healthcare system failures, emphasizing it was not the fault of the employees but poor care

delivery processes, or systems, that needed improvement. In response, many organizations have taken improvement actions to address these issues utilizing the QI tools discussed later in this chapter.

As the public became better informed about the mounting problems within the health-care industry, the staggering cost of healthcare continued and continues to rise today at alarming rates. In fact, the U.S. health expenditure is expected to increase by 5.5% annually between 2018 and 2027, with growth of spending expected to be faster than that expected in Gross Domestic Product (GDP) by 0.8% (CMS, 2018b). These predictions indicate the health share of GDP will increase from 17.9% (2017) to 19.4% by 2026 (CMS, 2018b). Despite significant funding, continued evidence of less than optimal healthcare outcomes are realized. Patients complain of long wait times for appointments and access to care challenges. Care coordination and communication gaps exist as do healthcare disparities with the focus on episodic care rather than preventive care (Salmond & Echevarria, 2017). There are many examples that contribute to increased healthcare costs, such as the demand for greater, sophisticated technology, prescription medications (Squires & Anderson, 2015), waste, excessive administrative costs, unnecessary services, and preventive failures (Berwick & Hackbarth, 2012).

With increased healthcare costs, many Americans find healthcare unaffordable. For years, consumers of healthcare have asked for healthcare reform to include affordable healthcare coverage. In response, the ACA was passed by Congress in 2010. At that time, approximately 46.5 million Americans were uninsured (Tolbert et al., 2019). That number decreased because of the ACA to 27.9 in 2018. However, there has been a steady increase in uninsured Americans since 2016 (Tolbert et al., 2019). These authors noted in 2018, 45% of the uninsured Americans reported the cost of insurance being prohibitive to purchase (Tolbert et al., 2019). The ACA went beyond healthcare coverage; it supported many programs and reimbursement models aimed at “fixing” the healthcare system. An example is the Patient-Centered Medical Home program to provide a team-based approach to primary care in the patient’s home. Patients with chronic disease are prime candidates for the Medical Home program because the focus is to improve the patient’s self-management of their chronic conditions while providing care coordination and evidence-based care.

QUALITY IMPROVEMENT IN NURSING

Traditionally, the practice of nursing has been perceived as a valued, trusted contribution to patient care. Because nurses are members of teams and often carry out interventions identified by other team members, consider the complexity of identifying unique indicators of nursing practice that are specific to nursing. There are many questions as to how the unique practice of nursing equates to quality care outcome measures. How does nursing judgment impact patient outcomes? How is efficiency of nursing practice measured? As these and many other questions have been raised regarding nursing and patient outcomes, the IOM, QSEN, ANA, and others have acted. The IOM has called for a stronger body of EBP for all healthcare disciplines to create a greater empirical evidence-based care delivery by each discipline. Through the KSAs of the QSEN competencies, nurses are being better prepared to question practice, evaluate the literature, and take active roles in QI.

The ANA funded the development of nurse-sensitive quality indicators in 1998 to provide data on specific acute-care outcomes that could directly indicate the quality of nursing care delivery. Participating organizations could submit their outcomes for trending and comparison purposes. Results could be useful to compare nursing care outcomes with like-sized organizations with either evidence that expectations are being met or indications that improvement is warranted. These data in the National Database of Nursing Quality Indicators (NDNQI), now managed by Press Ganey (accessible at www.pressganey.com/resources/program-summary/ndnqi-solution-summary), continue to evolve and are likely

to change as new empirical evidence substantiates new, specific, nurse-sensitive indicators. Other organizations have created nurse-sensitive indicators, such as the National Quality Forum (NQF), that include many of the NDNQI indicators (accessible at www.qualityforum.org/Publications/2004/10/National_Voluntary_Consensus_Standards_for_Nursing-Sensitive_Care__An_Initial_Performance_Measure_Set.aspx). In reality, capturing nurse-sensitive indicators that effectively and accurately capture nursing care is challenging. Other sources have identified indicators that are used and are useful but further research is needed that demonstrates unique, empirical relationships between such indicators to specific patient outcomes. In addition, indicators for all practice settings are needed as most of the current nurse-sensitive measures focus on acute care settings.

Today's healthcare organizations are highly complex systems that are often multi-site and provide various levels of care. Perhaps one of the most important aspects of QI is the organization's culture and expectations regarding quality care delivery and outcomes. To create and sustain a culture of continual improvement, leadership must foster innovative systems thinking of all staff and serve as role models by participating with staff in QI activities. Leadership support includes educating employees on QI methods, providing time for QI activities, recognizing staff for identifying opportunities for improvement, ensuring that patients' and families' feedback is used toward improvement, and sustaining those QI outcomes that have met the improvement aim(s).

IS QUALITY IMPROVEMENT EVIDENCE-BASED PRACTICE OR RESEARCH?

It is important to be able to differentiate QI from EBP and research. QI incorporates a data-driven systematic process in which individuals collaborate to improve specific internal processes within a care delivery area or an organization. One key aim of QI is the analysis of data into decision-making information to determine if improvement is warranted. The aim is different from EBP and research.

EBP does not analyze information, data, or seek to problem-solve, but rather it critically appraises all relevant evidence to answer a clinical, educational, or administrative question. The aim of EBP is to determine if evidence supports clinical, educational, or administrative practice. If evidence exists, it validates practice. If evidence does not exist, the need for research to provide new evidence may be supported. One similarity between QI and EBP involves a review of literature. Reviewing the literature is a basic aspect of EBP but there is merit in assessing the literature when conducting QI. The literature may provide relevant interventions that a team may wish to employ. As nurses, QI and EBP are both fundamental expectations of practice. It is important to apply basic QI principles for continued improvement and question practice to determine if practice is based on sound evidence.

Research is a scientific process of generating new knowledge. The aim of research is to test hypotheses that may be generalizable beyond the research setting. Reducing bias is crucial to generalize research outcomes. Quantitative research often includes an intervention group (those who received the study intervention) and a control group (those not receiving the intervention), allowing to test for statistical differences between groups. Conducting research is neither a basic skill nor an expectation of nursing practice. Advanced degrees are necessary for nurses who may wish to become researchers. When conducting research, ethical consideration for approval and oversight by an institutional review board (IRB) is required to ensure the safety of human subjects who will be participating in the research study. Although the aims of research and QI are different, these differences can be vague, especially if patients are included in a QI project.

The scope of QI activities can be a simple, individual act such as reorganizing a utility room, making it easier and quicker to find supplies, to a unit-based team working

to improve unit outcomes, to a system-wide initiative that includes professionals from different disciplines, all involved in the process that needs improvement. With QI, there are two distinct types of data. There are **baseline data**, or the data that support the need for improvement, and **postintervention data**, or the data generated after the QI intervention was implemented. Comparing baseline to postintervention data allows for the determination if the QI goal(s) were accomplished. **Outcome data**, often referred to as accountability data or performance measure outcomes, represent the outcomes of health-care delivery processes. These outcomes are inherent to practice and systems. For example, patient falls can be measured as one outcome indicator of nursing care. The total time it takes from a CT scan order, to scan, to read, and to communicate results, is a process that can be measured. Patient or process outcomes relate to accountability of employees and the organization. These outcomes are frequently public and reported to regulatory bodies as an indication of organizational performance. Analysis of outcome data can be used as baseline data for decision-making, regarding whether improvement is warranted or not. For example, if an indicator such as hand hygiene was measured on a nursing unit for 1 month and was found to be 70% compliant with the Centers for Disease Control and Prevention (CDC) requirements, 70% represents an outcome measure and would serve as the baseline if a project was planned to improve hand hygiene compliance. Analysis of this outcome, including unit trends of hand hygiene compliance over time, is necessary to determine if improvement is warranted. If improvement of hand hygiene compliance is deemed necessary, a QI activity could occur. The QI activity would involve implementing an intervention to improve the baseline outcome measure of 70%. The measurement obtained to evaluate the effect of the intervention is the postintervention measure. In this example, if an intervention was introduced resulting in 88% hand hygiene compliance, the 88% represents the postintervention measure, which is an improvement from the baseline measure of 70%. If an intervention to improve hand hygiene was introduced but the goal was not obtained, an additional intervention may be needed. If the intervention had no effect, the team would need to identify a new intervention or consider reevaluating how the original intervention was implemented, which may be the contributing factor to not meeting the goal.

So far, EBP, research, and QI seem to be very distinct approaches to measurement. As patient care and process outcomes have greater influence on reimbursement, the need for measurement and sophisticated QI interventions will become more important. In addition, the study of QI interventions has become a relevant area of research. In fact, the literature has numerous examples of QI research where the focus of the research hypothesis is on the intervention itself and how the intervention was deployed. Confusing, right? But consider a QI project with the aim to reduce falls on a nursing unit. The intervention consists of one group of patients assessed with Fall Risk Scale A, another group with Fall Risk Scale B, and a third group who did not have a risk assessment performed. Although there would be unit-level baseline outcome data on falls and the scope of the project is within one unit with no intent to generalize outcomes, the fact is patients are being randomized. Randomization is a research methodology; thus, this QI project is now moving into a QI research realm. As described in the example, the QI activity is now QI research because patients were randomized with a control group. If the project aim had been to reduce falls by trialing one fall risk assessment that all patients received, without randomizing patients, there would be no research methodologies underway. Casarett et al. (2000) propose differentiating QI from research can be challenging in that rigorous research guidelines exist while such rigor is currently absent with QI.

Traditionally, there was confidence employees could easily differentiate between “QI,” “research,” and “data.” That confidence may be risky. Understanding the difference among QI Nonresearch, QI Research, and Accountability data that represent patient/ process outcome can increase confidence that staff nurses can take improvement actions appropriately

and safely and are not including research methodologies as a member of a QI team. The distinction among QI Nonresearch, QI Research, and Accountability data, as they relate to performance measurement, is important because each has a different value, aim, and specific processes associated with it. O'Rourke and Fraser (2016) differentiate QI as both a research and practice activity. Lloyd (2010) identified three faces of performance measurements. Table 11.1 is useful in differentiating the characteristics of all three measurement approaches. Notice the aim statements clearly provide key differences as they relate

TABLE 11.1 THREE APPROACHES TO PERFORMANCE MEASUREMENT

PERFORMANCE MEASUREMENT APPROACH			
ELEMENTS OF EACH APPROACH	QI - NONRESEARCH	QI - RESEARCH	ACCOUNTABILITY-PATIENT/PROCESS OUTCOME DATA
Aim	Improve patient care within a local context	New knowledge as to why and how QI interventions work in different contexts	Benchmark Evidence of meeting or not meeting a measurable expectation Provides opportunities for improvement
Intervention	Identified, applied, revised based on local context	Tested, explored, often a control group to compare impact of intervention(s)	No intervention, evaluate current performance
Project Lead	Expert in local context	Expert in research methods	No project
Bias	Accept bias	Designed to eliminate bias for greater generalizability	Measure and adjust to reduce bias
Sample Size	Small sample is usually adequate	Statistically calculated	Utilize 100% of available data
Flexibility of Hypothesis	Hypothesis is flexible to allow for changes during intervention	Fixed, unchangeable	No hypothesis
Testing & Time Frame	Sequential tests with goal to complete quickly; rapid cycles	One large test that is time intensive	No testing, technological systems are frequently instituted for review of aggregate data analysis and decision-making
Project Approval	IRB not required	IRB required	Not a project
Determining if Outcome Is an Improvement	Commonly run or control charts	Hypothesis statistical testing	No testing
Confidentiality of Data	Data used only by QI intervention team	Participant data is protected	Data available to stakeholders and usually public

IRB, institutional review board; QI, quality improvement.

Source: Adapted from Lloyd, R. C. (2010). Navigating in the turbulent sea of data: The quality measurement journey. *Clinics in Perinatology*, 37, 101-122. <https://doi.org/10.1016/j.clp.2010.01.006>; O'Rourke, H. M., & Fraser, K. D. (2016). How quality improvement practice evidence can advance the knowledge base. *Journal for Healthcare Quality*, 38(5), 264-274. <https://doi.org/10.1097/JHQ.0000000000000067>

to context. In summary, the aim of a QI research project is to understand why and how improvement interventions work in different contexts to determine if they are generalizable. The focus of QI Research is therefore to study and understand the intervention itself. The aim of QI-Nonresearch is to improve processes and outcomes within a local context, not to imply the outcome has implications across settings, although that may well be the case when sharing/standardizing successful projects. Patient and process outcomes are not a project at all, but the measures from care and service delivery that can serve as baseline data for QI decision-making.

QUALITY IMPROVEMENT MODELS AND METHODOLOGIES

There are various QI models that provide a comprehensive framework for evaluating healthcare quality. Some of the most common are Donabedian's Structure, Process, Outcomes Model, and methodologies such as Deming's PDSA, Six Sigma, and Lean. It is important for nurses to familiarize themselves with the types and workings of the models. Regardless of the QI method applied, ultimately QI should improve outcomes. Improved outcomes, however, does not guarantee staff will adopt new practice changes. One factor that influences adaptation, that may be minimized by QI teams, is applying principles of change theory throughout their project. There are a variety of change theories to consider that are beyond the scope of this chapter. Small et al. (2016) described their QI journey in adopting a handoff process that failed until the team applied principles of change theory to the project. After studying various change theories, the team selected a simple but effective theory commonly used in business, Kotter's Change Model, that incorporates eight steps:

1. Create a sense of urgency.
2. Form a guiding coalition.
3. Create a vision.
4. Communicate the vision.
5. Empower others to act.
6. Create quick wins.
7. Build on the change.
8. Institutionalize the change.

Staff's willingness to change practice based on QI outcomes is influenced by how well the QI team applies principles of change theory.

DONABEDIAN'S MODEL

Over 50 years ago, Avedis Donabedian proposed a model of quality assurance that is still used today: structure, process, and outcomes of care (Donabedian, 2003). **Structure** refers to "the conditions under which care is provided" such as nursing staff ratios or supplies available to provide patient care (Donabedian, 2003, p. 46). **Process** refers to "the activities that constitute healthcare" such as healthcare policies and standards of care (Donabedian, 2003, p. 46). **Outcomes** refer to the "changes (desirable or undesirable) in individuals and populations that can be attributed to healthcare" (Donabedian, 2003, p. 46). Outcomes may be clinical (urinary tract infections), functional (mobility), patient safety (medication errors), or patient/family satisfaction measures. It is important to understand that structure, process, and outcomes are not isolated. In fact, structures, processes, and outcomes are interdependent, meaning "specific attributes of one influence another according to the strength of the relationship" (Hughes, 2008a, p. 5). When evaluating outcomes, it is important to consider both the structural and process impacts on the

TABLE 11.2 EXAMPLES OF STRUCTURES, PROCESSES, AND OUTCOMES

STRUCTURE	PROCESS	OUTCOMES
Staffing (nurses, physicians, nursing assistants, advanced practice nurses) Infection control Skill mix Education level of staff Resources (e.g., computers, library databases, etc.) Supplies Technology Budget Leadership commitment/engagement	Evidence-based guidelines Nursing process Standards of care Pathways Policies Motivated, engaged Staff Core measures Care routines (e.g., hourly rounding)	Hospital-acquired infections (e.g., Catheter-associated urinary tract infections, Central line associated blood stream infections, ventilator-associated pneumonia) Hospital-acquired pressure ulcers Fall rates Patient satisfaction Medication errors Infection rates Sentinel events/Never events

outcomes. Chapter 12's content explains that outcome data are used to determine if outcomes meet, exceed, or fail to meet expectations. When outcome data do not meet expectations, improvement interventions may be warranted. The structural and process elements associated with the outcome provide ideal opportunities for improvement interventions.

Donabedian's model was applied by the ANA's development of the NDNQI. The ANA's aim was to identify nurse-sensitive measures that could demonstrate the impact of nursing care on patient outcomes (Jones, 2016). Table 11.2 provides structure, process, and

CASE STUDY

QI teams often use Dr. W. Edwards Deming's **Plan-Do-Study-Act (PDSA)** model to implement QI projects. Deming incorporated knowledge of engineering, operations, and management with the goal of improving accuracy, reducing costs, and increasing efficiency and safety, all leading to satisfied customers. Deming described his philosophy as "a system of profound knowledge" composed of four parts: (a) appreciation for a system, (b) understanding process variation, (c) applying theory of knowledge, and (d) using psychology (Evans, 2008). The PDSA model and the actions within each step can be seen in Figure 11.1. Although some refer to the cycle as Plan-Do-Check-Act (PDCA), as originally developed by Walter Shewhart, Deming had strong beliefs that the terminology, PDCA, and PDSA, were very different and he only used the "PDSA cycle" to describe process improvement (Moen & Norman, 2009). Deming argued that "study" implied more of a rigorous scientific approach to QI measurement and outcomes analysis where "check" did not have the same connotation.

The advantage of using the PDSA cycle is that it is easy to understand, can be used cyclically on a smaller scale to perform small tests of change, or can be used when implementing large, system-wide improvements. The following questions can be used during the PDSA process (Langley et al., 2009):

1. *What is the goal of the project?*
2. *How can it be determined that the goal of the project was reached?*
3. *What needs to be done in order to reach the goal?*

FIGURE 11.1 Plan-Do-Study-Act Model.

outcomes examples that support the delivery of patient care. This table will serve as a resource to use while working through the corresponding Case Study.

In the “Plan” stage, a plan to improve quality is developed. In this beginning project stage, planning includes a problem statement, evidence of the problem (baseline data), and a clear aim or specified goal used to evaluate the outcomes of the QI project. In addition, the Plan will include what the intervention will consist of and how it will be introduced. The “Do” stage is the actual implementation of the improvement intervention. No change can occur without taking some action. It is important to understand that one intervention is to be introduced within the PDSA cycle. The outcome of one intervention allows for the testing of that single intervention’s ability to meet the goal. If multiple interventions are introduced simultaneously, it will be unclear which intervention is making the impact, or which one did not impact. After the intervention has been introduced over a period of time, evaluation of the impact the intervention had toward meeting the QI goal can now be determined or studied. The “Study” stage focuses on measurement by comparing the baseline to postintervention data to determine the intervention’s impact toward the goal. Based on analysis, the QI team can now “Act.” If the goal was met, the question becomes how to best sustain the improved outcome. If the goal was not met, the team needs to decide what the next intervention, or cycle, will consist of toward reaching the goal.

Because processes are complex, it may take multiple PDSA cycles to accomplish the goal, with each cycle introducing a new intervention, as seen in Figure 11.2. This also occurs if the intervention selected did not have the intended impact. When additional PDSA cycles are needed, the team creates a new PDSA. The PDSA cycles continue until a solution is reached and implemented (Langley et al., 2009). Silver, McQuillan, et al. (2016) discuss how one of the greatest challenges of QI is in sustaining the improved change over time. Silver, Harel, et. all. (2016) offer QI teams ways to sustain their efforts because approximately 70% of QI outcomes are not sustained. Considering the time, effort, and work QI teams incur, lack of sustainment may impact patient safety and cost to the organization. This unfortunate reality may result in reduced leadership support in conducting QI.

Box 11.3 provides an example of how the PDSA model works in an organization. Nurses have an advantage in applying the PDSA model because the PDSA model is closely replicated in the nursing process of assessment (plan), diagnosis (plan), planning (plan), implementation (do), and evaluation (study and act).

FIGURE 11.2 Multiple PDSA Cycles.

PDSA, Plan-Do-Study-Act.

Source: Courtesy of Christopher Roser at AllAboutLean.com.

BOX 11.3 Example of PDSA

Problem: Patients do not appear to understand health education provided in the hospital as evidenced by high rates of readmissions for the same diagnosis, patients not understanding medications and not taking them as directed, and missing appointments with the physician after discharge.

Solution: Assess the patient's understanding of health information by performing the health literacy assessment using the REALM short-form tool.

Plan

We plan to

- Train nurses to use the REALM health literacy assessment tool to identify those patients with low health literacy. Patients identified as having low health literacy will have education provided at an easier-to-understand level.
- Implement the REALM tool for 1 week on one unit for all patient admissions to assess health literacy.
- Create an area in the computerized charting system to document the results.

Do

We found that:

- Not all patients are directly admitted to the unit; therefore, they did not have a health literacy assessment.
- Completing the REALM tool was time-consuming until the nurses became used to the tool.
- The findings from the use of the REALM tool were not used to individualize health education materials.

(continued)

BOX 11.3 Example of PDSA (*continued*)

Study

We learned that:

- The tool accurately identified those patients with a low health literacy level.
- We need to create a way to use the REALM tool findings to individualize health education materials.

Act

We concluded that:

- The REALM tool does identify those patients with low health literacy.
- We need to look at what we do with the information from the REALM health literacy assessment.
- We need to look at ways to meet the patient's individual health education needs by creating an online repository of health education materials designed for low health literacy education.

PDSA, Plan-Do-Study-Act; REALM, Rapid Estimate of Adult Literacy in Medicine.

As mentioned earlier in this chapter, there are many factors that may reduce QI sustainment, such as not considering factors that influence change. Marshall et al. (2016) spoke about their experience conducting an improvement and identified six risks to be aware of that may contribute to QI process failures:

1. The problem may be defined too vaguely or lack clarity.
2. There may be a lack of a clearly defined methodology, such as PDSA.
3. Interventions involve people who function in a social context. Social context may not be considered in the identification or deployment of the intervention.
4. What the intervention is, how it is deployed, and the organizational context are interdependent.
5. Evaluation and actions based on evaluation may occur too rapidly.
6. QI teams may lack a necessary level of expertise. Service users, improvement specialists, clinicians, and potentially academic partners can all contribute.

Also consider that although interprofessional staff are expected to participate in QI activities, not all will bring the QI QSEN KSAs to the project. There are many resources to assist healthcare professionals who may need orientation to QI methods. The IHI Model for Improvement, accessible at www.ihimodel.org, is an excellent resource.

LEAN

The principles of **Lean** thinking strive to eliminate forms of waste within a process to increase efficiency while enhancing effectiveness (Hallam & Contreras, 2018). According to Shrank et al. (2019), waste accounts for approximately 25% of healthcare spending. Healthcare organizations are applying Lean methodologies to QI projects to increase efficiency and to reduce waste. There are eight identified sources of waste in organizations: unnecessary services/overproduction, mistakes/defects, delays in waiting, unnecessary motion, over processing, excessive inventory, excessive transport, and unused human

CASE STUDY

You are a nurse manager of a long-term care unit. Due to the Coronavirus pandemic, the facility leadership is requiring every unit to develop creative methods that may reduce the risk of transmission or isolation, or improve staff ability to provide palliative care when appropriate among this vulnerable population. Regardless of treatment or vaccination for Coronavirus, leadership is using the pandemic to improve weaknesses the pandemic identified. Leadership has scheduled a poster session where each unit will showcase and disseminate their QI outcomes that must conform to the Institute for Healthcare Improvement's (IHI) Model of Improvement. The units were divided, and your unit was one of three units assigned palliative care. Your staff is not trained on QI models but has received specific training on Coronavirus.

1. *As a nurse manager, what administrative judgments can you make based on the cues in this scenario?*
2. *What actions to improve knowledge on the Model for Improvement should you take? Go to IHI.org. In the search box, type in "Model for Improvement." Review the two brief videos:*

Model for Improvement (Part 1) www.ihl.org/education/IHIOpenSchool/resources/Pages/AudioandVideo/Whiteboard3.aspx

Model for Improvement (Part 2) www.ihl.org/education/IHIOpenSchool/resources/Pages/AudioandVideo/Whiteboard4.aspx

3. *After viewing the two videos, you decide to use them for staff training. What actions would be most effective in creating unit-based training?*
4. *To evaluate the effectiveness of the training, you establish a set of standardized questions you will ask participants after the videos are shown. To prepare, you must first answer the questions yourself:*
 - a. *What is the first question asked in the Model for Improvement?*
 - b. *What is the second question asked in the Model for Improvement?*
 - c. *What is the third question asked in the Model for Improvement?*
 - d. *How does the Model for Improvement get activated?*
 - e. *How would implementing multiple cycles of a PDSA impact the Model for Improvement?*
5. *Once training is completed, you begin to consider who will lead the QI project. You have several ideas. What position would be most effective in leading a QI team on palliative care?*

potential/overburden (Hallam & Contreras, 2018). When these sources of waste occur, employees may figure out work-arounds rather than considering new processes to improve efficiency. A work-around is a deviation from an approved process or procedure often done to increase efficiency or to create a "short-cut" that is perceived to be "more" efficient. There are risks associated with not following approved processes or procedures. For example, the nursing assistant is tasked with changing bed linens for each patient every day. To make the process quicker, the midnight shift nursing assistant collects the linens and places them in each patient's room. This action saves the day shift nursing assistant

time in having to gather linens. Although a seemingly innocent and kind gesture, a problem arises when the original patient is discharged before the linens are used. The linens are then sent back to laundry for cleaning, causing an increase in workload for the laundry workers. Even worse, the linens might be used for the newly admitted patient.

The danger of a work-around is the error that may result from creating and applying nonapproved processes. Lean interventions center on improving efficiency, reducing waste, and streamlining processes that are patient and employee centered. Lean thinking builds on the belief that it is the sum or cumulative effect of many small improvements that creates the greatest impact in performance (Evans, 2008). Small, low-cost, and low-risk improvements are easily implemented with the goal to keep the project simple over a short duration of time. Lean addresses visible problems. For example, a nurse can see that items in a clean utility room are orderly or in disarray. Color-coding shelves to hold specific types of equipment or supplies helps to quickly identify an item. Placing items together that are typically needed at the same time such as an indwelling urinary catheter kit next to a clean specimen collection kit is an example of Lean. A nurse searching for supplies is wasted time that can be much better spent. Simple Lean tools, such as the 5S process, can be quickly and easily applied to ensure the work environment is clean and organized, which will reduce nonvalue-added activity that wastes the nurse's time. Lean is easily taught, intuitive, and easy to apply in practice. The improvement process of 5S also impacts patient safety by standardizing the environment, allowing staff to consistently locate the products used to deliver patient care. The 5S process includes the following:

1. Sorting the necessary from the unnecessary; discard unnecessary items.
2. Set items in order; everything has a place and keep everything where it belongs.
3. Shine; keep the area clean, neat, and organized.
4. Standardize the area.
5. Sustain the first four Ss (Hadfield et al., 2009).

Although reducing healthcare waste seems logical, Cohen (2018) provides an excellent overview of Lean in healthcare but identifies that some healthcare organizations may object to Lean principles because Lean was founded in manufacturing. Objection may result in perceptions that patients are not automobiles or healthcare organizations are not assembly lines. Cohen (2018) argues that healthcare and manufacturing do have similarities. Both are in business to produce high-quality products, have limited resources, require complex processes with numerous inputs and outputs to each process, and must meet or surpass customer satisfaction. Applying Lean principles in healthcare to reduce unnecessary waste has a profound impact on patients. For example, patients want efficient and timely care, simplified and timely access, streamlined procedures, continuity of their healthcare management, and coordinated care. These few examples and many more can be improved by applying Lean principles.

SIX SIGMA AND DEFINE, MEASURE, ANALYZE, IMPROVE, AND CONTROL

Six Sigma, one of the more advanced methodologies adopted from the business sector, encompasses interventions with the goal to reduce variation in existing processes. In doing so, it often leads to new process design or redesign. When a process is carried out inconsistently, the outcomes of that process vary over time, leading to process variation. The goal is to reduce variation by standardizing the process so that the process's outcomes are consistent over time. Consider a nurse working on a surgical unit with a common nursing intervention of pain reassessment after providing pain medication. Because the

TABLE 11.3 DEFINE, MEASURE, ANALYZE, IMPROVE, AND CONTROL (DMAIC)

Define	Identifies the QI focus. Defines the team, operational definition of the variable, baseline data and improvement aim or expected level of performance when variability is reduced, and the project timeline. Tools such as fishbone diagrams and process maps are used to define the problem.
Measure	Includes identifying the current process, validating the variable to measure, assessing baseline performance, and selecting who will conduct measurement procedures. Tools such as Pareto charts and process control charts are often useful in this step (see Chapter 12).
Analyze	Rigorous analysis to understand top causes of why errors are occurring. Tools such as statistical measurements, control charts, fishbone diagrams, and hypothesis testing are often useful in this step (see Chapter 12 and the fishbone diagram in this chapter).
Improve	Brainstorming what solutions may be useful in reducing variation and conducting small-scale trials of possible solutions.
Control	Methods to sustain improvements, such as employee education, and the process for ongoing measurement to ensure the new and improved processes are sustained over time.

QI, quality improvement.

pain reassessment policy would stipulate the reassessment and documentation requirement post-medication administration, a nurse can measure how consistently that is being accomplished. If the policy stipulates 30 minutes as the time frame from administration to reassessment, outcomes hovering around that 30-minute time frame would demonstrate a stable process. If the average time were found to be 45 minutes with a range of 33 to 48 minutes, the process demonstrates variation. Not only does this example show if staff are following the policy, it also speaks to the risk that patients may continue to experience pain because they are not consistently being reassessed.

Six Sigma incorporates several problem-solving steps to reduce variation in a healthcare process (Evans, 2008). The steps are known as define, measure, analyze, improve, and control, or DMAIC, as defined in Table 11.3.

Although similar, there are appreciable differences between Lean and Six Sigma. Lean focuses on reducing waste while Six Sigma is more focused on variation in performance and requires specialized skills and statistical tools, making it a more sophisticated improvement approach. There are QI professionals who believe it is first necessary to make a process more efficient before attempting to reduce variation, thus combining the two methodologies within QI activities.

APPROACHES TO QUALITY IMPROVEMENT PROBLEMS

The QI process is often a critical response to an adverse event, near miss, or sentinel event. To identify the actual cause of a problem and implement improvement strategies, it is important to know how the problems are identified and resulting specific actions by a QI team. Uncovering the problem can be more difficult than one might expect. Reactive strategies are those actions that occur after an event has taken place, such as peer review (discussed earlier in the chapter) and root cause analysis (RCA). Healthcare Failure Mode and Effect Analysis (HFMEA) is a proactive method to identify risks before they result in errors, allowing the team to prevent problems in high-risk processes before a near miss or adverse event occurs.

RETROACTIVE APPROACH: ROOT CAUSE ANALYSIS

A **root cause analysis** (RCA) is an investigation of what caused a problem and why the problem occurred. Haxby and Shulldham (2018) outline three stages of the RCA process:

1. Identifying the fundamental issues and contributing factors that resulted in an incident.
2. Asking crucial questions of what, how, and why the incident happened.
3. Recommending opportunities for improvement, to mitigate similar future risks.

The most frequent root causes of sentinel events reported to TJC between 2005 to 2018 can be viewed at www.jointcommission.org/resources/patient-safety-topics/sentinel-event/sentinel-event-data---event-type-by-year. Unfortunately, these reports reveal consistent sentinel events to include unintended retention of foreign object, wrong-patient, wrong-site, wrong-procedure, and falls despite efforts to mitigate them.

The RCA process is also a valuable tool that can be used in any instance where the need to know the underlying root cause of a problem exists. RCAs are formal and often interprofessional. Nurses are often invited to participate on RCA teams because nurses are integral and participate in most care delivery as the ones who bring clinical knowledge and skill in identifying the root cause and potential corrective action. Completing the Developing Clinical Judgment box will reinforce the role of the nurse in RCAs.

RCAs are conducted when an actual error has occurred and require **corrective action**, the action taken to eliminate the cause(s) of an error with the goal to prevent recurrence (International Organization for Standardization, 2015b). For example, a patient with insulin-dependent diabetes is given the wrong dose of insulin. Although the patient did not experience any detrimental effects, the medication error is considered an adverse event. The staff determined that an RCA can help determine the contributing factors to the medication error and how to prevent similar errors from occurring. An interprofessional team consisting of nurses, physicians, nursing assistants, quality department representative, central supply representative, and clinical educator is gathered to investigate the problem. To conduct an RCA, the following steps occur:

1. Identify what happened.
2. Review what should have happened.
3. Determine causes.
4. Develop causal statements.
5. Generate a list of recommended changes.
6. Share findings with those who affect or are affected by the outcome.
7. Ensure actions are taken and sustained to prevent or reduce the risk of future recurrence.

The first step, identify what happened, occurs through a dialogue among all team members. The team starts with the statement that a medication error occurred, resulting in 10 times the ordered dose of insulin given to the patient. The clear statement brings all team members to the same starting point to examine the problem.

To understand what happened, the team develops a flow chart (Figure 11.3) of the insulin preparation process. Team members use the flow chart to identify and examine factors in the process that may have contributed to the near miss or sentinel event. The process is mapped out to show each of the steps involved with the insulin preparation process.

Those team members directly involved with the medication error provide information about steps that can highlight process problems. It is important to note here that the RCA looks at process breakdowns rather than the individual person's error. In this scenario, the

CASE STUDY

You are a member of your organization's CPR Committee. One committee responsibility is to review all rapid response team (RRT) documents to determine if the RRT was an appropriate action and what follow-up steps are necessary. The first review is an 80-year-old patient admitted for abdominal pain found to have ulcerative colitis. The patient had a bowel resection with an uneventful postoperative recovery period. On the second postoperative day, however, an RRT was called based on assessment findings of a pulse of 130, blood pressure (BP) 70/30, and PulseOx 87%. The patient had been completely oriented but is now disoriented to place and time. During the RRT, the patient was given a liter of normal saline and transferred to the ICU. The patient's condition worsened in the ICU, leading to intubation. The CPR Committee has asked you as the nurse committee member to present this case to the Committee. In preparation, you begin by reviewing medication administration records in the EMR. Although antibiotics were ordered, three postop doses were not documented as given. Morphine Sulfate was ordered and given consistently every 6 hours for postoperative pain as prescribed. Because of time, your initial preparation ends.

1. *To continue preparation for your presentation to the Committee, what additional clinical information would you evaluate before the Committee meeting to effectively present this case?*
2. *In addition to clinical data, what nonclinical other data would you need to evaluate to determine appropriateness of the RRT?*
3. *After your overview, which includes the nurse who called the RRT and did follow the RRT procedure, the chair of the Committee asks for your judgment and recommendations:*
 - a. *What recommendation would you, the nurse, make regarding appropriateness of the RRT based on the RRT procedure?*
 - b. *While reviewing the case, what cues did you identify as potential root causes that may have precipitated this outcome? Identify four potential root causes from the scenario.*
 - c. *Would you recommend this Committee should refer this case for an official RCA to be conducted?*

FIGURE 11.3 Flowchart of Insulin Preparation

FIGURE 11.4 Fishbone Diagram.

nurse is not viewed as causing the error; rather, a breakdown in the process allowed the error to occur. This encourages all participants to fully engage in identifying contributing factors.

The next step is to determine causes. A cause-effect diagram, or fishbone diagram, helps participants understand the contributing factors to the medication error. The “bones” of the fish, as seen in Figure 11.4, represent the common areas that might contribute to the problem. Common categories seen on cause-effect diagrams are methods or task factors, people or patient/staff characteristics, work environment, and equipment (Institute for Healthcare Improvement, 2017). It is important to note that the categories, or bones of the fish, may have different labels depending on what template is used.

Each area is discussed by team members and examined in terms of what happened during the near miss or sentinel event that contributed to the outcome. During this process, an effective method to get at the core causes of the problem is to ask “Why/” five times. Asking “Wh?” five times helps the team dig deeper into the actual process issues that caused the problem. For example, a problem could be finding time to study for an examination. Asking “Why?” helps clarify what the core of the problem is. By the time the fifth “Why?” is asked, the core root of the problem should become evident.

During the creation of the flowchart, the team identified that the nurse reached for a syringe from a drawer labeled “insulin syringes,” but instead the drawer was stocked with tuberculin syringes. This resulted in the nurse giving 10 times the ordered dose of insulin. Another misstep occurred when the nurse asked another nurse to double-check the dose of insulin. The second nurse glanced at the syringe and agreed the dose was correct.

Based on findings from the flowchart and the cause-effect diagram, a list of causal statements and recommended changes is created, as depicted in Table 11.4. RCAs are intended to focus on system problems rather than placing individual blame for any problems or sentinel events.

The goal of the team is to improve the safety of known, complex, high-risk healthcare processes before they result in adverse events by identifying, minimizing, or eliminating high-risk aspects and other vulnerabilities of the process. Therefore, the **Healthcare Failure Mode and Effect Analysis (HFMEA)** promotes risk mitigation or **risk-based-thinking** to eliminate the cause(s) of a known or potential risk before an error occurs. Risk-based thinking enhances patient safety efforts and should be a fundamental nursing skill to identify practice risks and mitigate them before errors occur. Risk-based thinking requires accurate nursing judgment, ethical decision-making to act, and follow through to ensure appropriate actions are implemented timely.

TABLE 11.4 CAUSAL STATEMENTS AND RECOMMENDED CHANGES

CAUSAL STATEMENTS	RECOMMENDED CHANGES
Tuberculin syringes were inappropriately stocked in the insulin syringe drawer.	Move tuberculin syringes to a different location.
Tuberculin and insulin syringes both have orange caps and black markings on the syringe.	Check with other vendors about the availability of different colored syringes.
Verifying the insulin dose with another nurse did not catch the medication error.	Double-checks with another nurse need to include specific steps such as looking at the type of syringe, the amount of medication in the syringe, and the dose ordered.

CASE STUDY

Because healthcare processes are complex and often people-dependent, **risks** or deviation from what the process is expected to accomplish may result (International Organization for Standardization, 2015a). HFMEA is a prospective risk analysis system to identify, assess, and address vulnerabilities in high-risk processes. Failure Mode and Effect Analysis (FMEA) has its roots in the U.S. military, engineering, and aerospace industries, where steps are taken to minimize or eliminate the risk that an accident or failure will occur. In 2001, the U.S. Department of Veterans Affairs, National Center for Patient Safety, developed a hybrid model specific to, and ideal for, the healthcare environment (DeRosier et al., 2002). At the same time, TJC introduced a new leadership standard, still in effect today, that speaks to healthcare leaders ensuring a proactive risk assessment be conducted for identified high-risk processes (TJC, 2020b). Three basic questions are the focus of any proactive failure mode/risk analysis:

1. *What could go wrong?*
2. *Why would the failures occur?*
3. *What would be the consequences of each failure?*

Many errors can be prevented by informal or formal risk mitigation. Many organizations offer HFMEA resources but, in general, flow mapping and fishbone diagrams are commonly used tools by HFMEA teams. For example, the administration of a heparin infusion, a high-risk medication, involves many complex steps including calculating the patient's weight in kilograms, ensuring the correct amount of heparin is in the solution, changing doses, and administering boluses based on laboratory studies. The role of the provider who must order the heparin correctly, the pharmacist who may prepare or deliver the heparin, and the nurse who must administer the heparin are all involved in a process with risk for error. HFMEA allows the team to assess potential risks of each step. Teams prioritize actions based on a severity of risk rating scale. The VA National Center for Patient Safety (accessible at www.patientsafety.va.gov/professionals/onthethejob/hfmea.asp) identifies five steps to be completed during a HFMEA:

1. Define the HFMEA topic.
2. Assemble the team.
3. Graphically describe the process.

4. Conduct a hazard analysis.
5. Perform actions and outcome measures.

HFMEA improvement strategies commonly involve redesigning processes to minimize or eliminate identified risks. Of consideration, nurses should maintain an ongoing awareness of those high-risk processes that may serve well for an HFMEA. Nurses are encouraged to participate or lead teams, as many high-risk processes involve nursing judgment and oversight, and will therefore benefit from that nursing expertise. Teams conducting an HFMEA will identify many actions believed to reduce the risk of error from occurring. The team must also prioritize actions based on a risk assessment.

The added value of nurses participating in QI activities is more evident once the basics of QI are learned, including models and improvement methods. Nurses collaborating to improve patient care is an expectation of practice and of your employer. While working toward improvement is rewarding and necessary, challenges may occur. Work through the corresponding Case Study.

CASE STUDY

Each QI methodology discussed in this chapter has value and application depending on the situation. QI tools, mainly discussed in Chapter 12, are often shared within QI methodologies. For example, flow mapping can be used in any QI activity to better understand the process under investigation. Read the corresponding Current Literature feature that demonstrates how one improvement activity utilized many of the methodologies and tools discussed in this chapter.

CURRENT LITERATURE

CITATION

Wilson, J., Swee, M., Mosher, H., Scott-Cawiezell, J., Levins, L., Fort, K., & Kumar, B. (2020). Using lean six sigma to improve pneumococcal vaccination rates in a veterans affairs rheumatology clinic. *Journal for Healthcare Quality*, 42(3), 166–174.

DISCUSSION

The authors clearly make a case for improved vaccination rates against pneumococcal disease. Vulnerable populations, such as immunocompromised patients are at greater risk for pneumococcal disease. A VA Rheumatology Clinic audit result demonstrated a <3% vaccination rate, a definite opportunity for improvement. Rather than one improvement approach, the authors apply multiple improvement methodologies to meet their goal of 70%. The interprofessional QI team describe their use of applying multiple QI methods. A **preintervention process mapping** (flow map) that was used to identify barriers to the time required for vaccination administration. The **Define-Measure-Analyze-Improve-Control** (DMAIC) is presented to outline the QI process. To test interventions, three **PDSA cycles** were conducted where Cycle-1 was provider education, Cycle-2 reinforcement of provider education and voice of the customer, and Cycle-3 Workflow improvements. Pre-intervention (current state) and post-intervention (future state) **process maps** were created. A **control chart** (discussed in Chapter 12) was used to track vaccination rates during the PDSA

cycles. **Voice of the Customer** was also used to better understand veteran perceptions of vaccinations, provider awareness, those involved with the actual administration of the vaccination, and medical assistants/schedulers regarding timeliness. Despite these efforts, the authors reported an increase from 3% to 23% vaccinations, well short of the 70% goal. The authors provide rational why the goal was not met and determined 70% was too ambitious when starting at 3%. Educational interventions were not sustained. The QI methods used in the project allowed the interprofessional team a better understand how complex meeting vaccination guidelines can be and how more PDSA cycles will be needed.

IMPLICATIONS FOR PRACTICE

There are several implications. First, establishing realistic goals is necessary in QI. Second, there are valuable lessons learned from QI not meeting goals. In this citation, educational interventions were not sustained. That said, educational interventions may be successful in a different situation or setting. The authors successfully demonstrated how multiple QI methods can be applied within one project. This is important because health care is complex. Flow mapping a process can illustrate where interventions may be used to reduce process steps that may increase outcomes. Studying the process map alone may identify numerous interventions, each serving as a new PDSA cycle toward meeting the goals. Consider various QI methods when you are a member of a QI team and do not be afraid of not meeting goals. Rather, consider that more opportunities for improvement. QI teams should celebrate outcomes even when not meeting goals because of lessons learned and that the team is working to continuously improve. Also note that when conducting QI, voice of the customer does may not only mean patients. Staff involved in the process serve as customers and their voice matters. Staff in the process often have ideas how to improve the process.

CASE STUDY

As important as team members are in QI activities, appreciate that not every improvement requires a formal, full team to be successful. A new nurse brings a great advantage to the work area because they will see opportunities for small-scale changes and daily improvements that other staff may not recognize. Every organization has problems big and small and every process has at least some irritant. It is the staff doing the work every day that is most knowledgeable about what those irritants are, how they affect the workflow, and what the best possible fixes may be. When every staff member makes “seemingly small” improvements every day, a fully engaged workforce emerges that is committed to improvement. Together, over time, that can add up to significant organizational improvements in patient care and outcomes. By encouraging those daily improvements, leaders demonstrate support by recognizing staff knowledge, skills, and commitment toward improving quality and patient safety. Staff is empowered and sees the value of doing “what is possible today.” New staff that are sometimes overwhelmed by the complexity, length, and breadth of large formal QI projects that can go on for months or more can appreciate and enjoy the small successes that come from small tests of change. Those successes can then be the impetus for involvement in larger scale QI projects.

THE ROLE OF THE NURSE IN QUALITY IMPROVEMENT

As described earlier in this chapter, the nursing process mimics QI. Nurses collect patient data, analyze the data, plan and implement nursing interventions, and evaluate patient outcomes for decision-making. This foundation in preparing nurses for practice also prepares nurses to participate and lead QI activities.

Nurses can assume a variety of roles when conducting QI activities. Novice nurses committed to improving care can help collect data or assist with literature reviews for more complex improvement interventions; therefore, it is important to know what sources of data and information are available, how to access them, and who the QI resources are. When processes involve multiple disciplines, representatives from each discipline should be included on the QI team. To better understand the importance of selecting QI team members, complete the corresponding Case Study.

In addition to participating or leading QI is the expectation of disseminating QI outcomes. There are many venues to disseminate what was done and improvements from the QI project. Feedback and dissemination of the results of QI projects are essential for improvement. Healthcare and professional organizations offer a variety of mechanisms including newsletters, presentations, posters, new employee orientation, email communication, staff training, staff meetings, and unit-based communication boards. One method of sharing QI data is to use scorecards or dashboards that use a quick-look approach to show where the current standing is on a quality issue in relation to benchmarks. QI outcomes can stimulate other professionals to assess their area of care delivery or processes to determine if improvement is warranted or not. QI outcomes can also identify potential interventions that others can consider and apply when successful or possibly avoid if unsuccessful. The various lessons learned when conducting QI also have value and could help other nurses be more efficient in their efforts. Academic education also utilizes QI, particularly when assessing curriculum to determine if improvement is needed. Read the corresponding Current Literature feature that describes how academic QI utilizes guidelines to standardize dissemination of academic improvements and will introduce another example of an improvement methodology.

CURRENT LITERATURE

CITATION

Ogrinc, G., Armstrong, G. E., Dolansky, M. A., Singh, M. K., & Davies, L. (2019). SQUIRE-EDU (Standards for Quality Improvement Reporting Excellence in Education): Publication guidelines for educational improvement. *Academic Medicine*, 94(10), 1461–1470.

DISCUSSION

Not every change is based on QI, but every successful QI outcome should result in some change. For change to occur, improvement outcomes need disseminated or reported. There are many venues such as speaking at conferences, presenting posters, sharing at staff meetings, etc. In this chapter, many improvement methods have been described. PDSA for example is one model that can easily be used for disseminating QI outcomes. The SQUIRE Guidelines (Standards for QUality Improvement Reporting Excellence) is another, more scholarly example of a standardized means of reporting health care improvements. Standardizing dissemination increases the reader or participant ability to better understand the details of the QI and its potential

application to their work. In the citation, the authors nicely outline the SQUIRE Guidelines. As you review the guidelines, you will see how the guidelines include many PDSA concepts but add additional detail. For example, in PDSA, a description of the intervention occurs at step 2, or within the DO of the Plan-Do-Study-Act. For the SQUIRE guidelines, the intervention is also outlined but adds more specifics such as commenting on ethical considerations addressed or mitigated specific to how the QI intervention was implemented. Because academics is also working to continuously improve, the same reporting principles apply to reporting academic QI. The authors describe how the SQUIRE Guidelines can be modified to report on educational QI for standardization of educational QI among health professions (SQUIRE-EDU). For example, the SQUIRE guideline for ethical considerations mentioned above has an educational ethical QI component. For example, did the educational QI intervention consider vulnerable learners, such as learners with English as a second language and if so, how did that impact the intervention.

IMPLICATIONS FOR PRACTICE

Conducting QI without disseminating outcomes, even those unsuccessful outcomes, is necessary for professional growth and to promote patient safety. Just as our colleagues in practice need to hear, read, and share QI outcomes, academic QI is also working to improve and needs to disseminate educational QI outcomes. Standardizing how these outcomes are reported has value for those reading or listening to better analyze, synthesize, and determine applicability of outcomes to their practice or curriculum. Journals, such as the *Journal of Nursing Education*, is one example where curricular innovations and improvements are published.

Nurses are expected to have the KSAs to assess, analyze, intervene, and evaluate not just patient outcomes, but outcomes that reflect individual and interdisciplinary practice. Salmond and Echevarria (2017) offer some advice. Nurses will need to shift their focus from episodic care to care across the continuum, partner with patients and families, and consider the social context to include resources that support wellness and independence. Assessing care across the continuum to include social context requires a skill set, such as auditing.

AUDITING

The International Organization for Standardization defines **audit** as a documented, systematic process to obtain objective evidence of conformity or nonconformity to established procedures or requirements (International Organization for Standardization, 2015a). In healthcare, determining conformity or nonconformity occurs in several ways. An external audit, such as TJC, is an independent organization that establishes evidence-based criteria, then audits to that criteria to determine if the organization is conforming to the criteria. External audits provide some form of certification or accreditation and often are required for reimbursement. External auditors have no vested interest in the organization they are auditing.

External accreditation not only impacts reimbursement but also implies the organization successfully met the requirements that were surveyed. Confirming requirements are met is important to the organization's patients, families, and staff because it demonstrates a level of reliability. Because accreditation is important, the organization's ability to determine **survey readiness**, or ensuring all staff know and follow regulatory requirements and

that established processes to meet requirements are followed, is a priority. Survey readiness speaks to how assured the organization is should an external auditor or surveyor, such as TJC, arrive to inspect the organization. One method an organization may employ to determine their survey readiness is to create a formal Internal Audit Program.

One aim of an internal audit is to self-identify errors or risks and mitigate them before external surveys occur. Internal auditors, or select employees who work for the organization, are trained to audit their own organization's processes to determine conformity to regulatory requirements. The added value of internal audits is to self-identify process errors or risks for potential error and take action to mitigate them. Establishing formal internal audits and teams to conduct them is common practice. For example, many health-care organizations employ Environment of Care internal audits to assess environmental requirements, such as verifying that no used reusable medical equipment is found in a clean utility room. Earlier in this chapter, TJC tracer methodology was introduced. Conducting internal audits closely replicates tracer methodologies as both assess complex or high-risk processes. Audit teams are typically interprofessional and include subject matter experts. For example, if a mock survey of a complex process such as medication administration was being performed, the audit team should minimally include representatives from pharmacy, nursing, and medicine as these services are all involved in medication administration. Nurses are excellent candidates and are often requested to serve on internal audit teams because nurses are involved in many care delivery processes. For this reason, Review Activity #5 at the end of Chapter 11 was created to further explore principles of auditing. The act of auditing is only one aspect of survey readiness. Internal auditing serves no purpose if results are not mitigated prior to an external audit. More importantly, audit results identify what the organization needs to focus on to improve, which has direct impact on patient safety outcomes.

LEADERSHIP SUPPORT

There are many factors that contribute to successful QI initiatives, including engaged leadership (Kampstra et al., 2018). A supportive and empowering organizational culture and leadership commitment is necessary for optimal QI. Given the ramifications of quality outcome performance for organizational reimbursement, there are financial implications that impact leadership's full support for improving hospital processes. This includes clinical and administrative processes, as well as processes managed by support services. Leaders are the catalyst of change (Sandberg, 2018). Leaders must demonstrate their commitment. For example, visibility by rounding on patient care units and directly talking with staff could lead to identifying quality and safety concerns. Having access to leadership empowers staff to voice strengths and challenges. Effective leaders partner with their employees by empowering them to ask questions, seek new ways of doing business, remove fear of failure and reporting it, and provide the resources needed to try new ideas that may improve organizational performance. Lindberg and Kimberlain (2008) note that if the intent of every healthcare worker is to provide quality care, then the responsibility of executives is to create a culture for that to occur.

Organizational leaders support QI activities by providing a set of clear expectations, providing ongoing and meaningful feedback, ensuring staff are educated on QI methodologies, and providing time away from duties to devote to improvement. When an organization's leadership participates in QI projects, it sends the message that quality is a shared team responsibility. By the same token, nurses, physicians, and the entire interdisciplinary healthcare team must actively engage in QI efforts by bringing issues to leadership's attention from the ground up. If this can occur, improvements are more likely to be meaningful and sustained. Nurse managers and leaders must use caution, however, on the amount of

raw data and information shared. Large quantities of unanalyzed data and information can become difficult to understand, overwhelming, and less meaningful for staff. It is best to share concise analyses that highlight how a process was improved or how a quality benchmark was met (Lindberg & Kimberlain, 2008). It is leadership's responsibility to balance QI activities, practice, and dissemination of outcomes.

OVERCOMING QUALITY IMPROVEMENT BARRIERS

In today's complex healthcare organizations, it is the responsibility of both novice and expert nurses to improve quality. It is intuitive to nurses to want to improve and focus on enhanced patient outcomes (Berwick, 2011). In fact, the optimal goal of nursing care is to improve health, improve the processes and systems that contribute to positive outcomes, and reduce harm. Despite everyone's responsibility, limitations or barriers toward nurse's involvement in QI exist. Dunagan (2017) created and tested a nurse QI attitude survey and found nurses were unclear as to their role in QI and not feeling safe in reporting safety risks. Although a small survey sample size, fear of reporting risks must be mitigated to truly create a culture of continual improvement. Risks must be listened to, evaluated, and serve as opportunities for improvement when substantiated. Rather than fear, leadership and the culture must celebrate identified risks. Only then can a just culture and high reliability be realized.

Although it is the goal of many healthcare organizations to engage the healthcare team in QI initiatives, a significant barrier is adequate time for healthcare workers and support staff to participate in improvement projects. Additionally, nurses may want to, or feel obligated to, participate in QI initiatives, but they may lack the knowledge and skills necessary to comfortably and actively participate. Moreover, many of these challenges can be overcome with a style of leadership called shared governance.

Shared governance is a professional practice model founded on the principles of partnership, equity, accountability, and ownership that form a culturally sensitive and empowering framework, enabling sustainable and accountability-based decisions to support an interdisciplinary design for excellent patient care (Cox-Sullivan et al., 2017). It is the shared control over nursing practice and clinical decision-making that empowers staff nurses and managers to work together for successful QI projects. When frontline staff nurses actively participate in QI and take control over their practice, the expected result is a better work environment, better staff satisfaction, improved staff retention, and better patient outcomes, all of which impact the patient's healthcare experience.

Internal auditing may be a potential QI barrier. Auditors who are subjective or unfamiliar with the criteria they are auditing to can miss nonconformities. Auditors may not know how to identify evidence that confirms conformity when assessing complex processes across the organization. They must have interview skills when obtaining information from staff or patients and consider the social context to responses. These examples of auditor barriers indicate training and competency is required that may not be provided. It may also be wrongfully assumed experience equates to auditor skills. In addition, for successful survey readiness, audit results need analyzed, corrective actions implemented when appropriate, and potentially QI activities conducted using the various methods described in this chapter. Without a clear process for reporting audit results to process owners who mitigate them and follow up to ensure mitigated actions have been sustained, survey readiness may not occur. The barriers associated with internal audits and auditors can be overcome with leadership oversight, creating a comprehensive internal audit program, training and assessing auditor competency, and mitigating internal audit findings.

Academic barriers exist in preparing students to apply QI methodologies and in developing student interest and motivation to value their role in QI as professional nurses. A

small study conducted by Peterson-Graziose and Bryer (2017) supports the existence of this academic-practice gap regarding QI. The researchers asked 73 undergraduate nursing students their perceptions to the extent they acquired the KSA of the six QSEN competencies. Regarding QI, students reported that QI content was taught the least in the curriculum, was the lowest skill set they felt prepared for, and rated QI the least important of all six QSEN competencies. Organizations desperately seek nurses with the QI KSAs to recognize processes needing improvement, to act, implement improvement interventions, evaluate the outcomes of actions, and determine whether or not the outcome meets the expectation. Faculty can promote the QSEN QI KSAs by creating partnerships. Partnerships with clinical sites can offer students access to real-time QI activities and experienced staff who can mentor on QI methodologies, and potentially create opportunities for students to participate in active projects. Partnerships can shift QI KSAs from being largely theoretical to being more foundational to nursing practice. There is truly a sense of accomplishment, of victory when a problem, outcome, or process is improved. If students can experience victory as students, their interest and ability to continue QI as professional nurses may increase. Learning principles of QI in a classroom is necessary but applying principles of QI in clinical settings may be a barrier for students to appreciate the value and their role in QI.

It is truly an exciting time for nurses and those participating in and leading QI activities. Empowering and preparing nurses to be active participants in QI activities encourages them to make decisions that impact the quality and safety of their patient's care. This chapter highlighted QI methodologies and other essential QI concepts that increase QSEN QI knowledge, skills and attitudes. The essentials are important, but to successfully contribute to QI activities, nurses must be able to understand and utilize a broad array of QI tools that are presented in Chapter 12. Identifying new, improved ways to provide care and services is only one part of the QI equation. Disseminating outcomes from QI projects to other colleagues helps others to improve their own practices. Once the QI KSAs are obtained, the ability to improve patient outcomes and organizational processes is limitless.

END-OF-CHAPTER RESOURCES

KEY CONCEPTS

1. Quality improvement (QI) is defined as to “use data to monitor the outcomes of care processes and use improvement methods to design and test changes to continuously improve the quality and safety of health care systems” (QSEN Institute, n.d.-a, n.d.-b).
2. QI began with the work of the American Medical Association in the early 1900s. Over time, QI changed from standardizing care to include measurements of the process of care and healthcare outcomes in response to accreditation standards of The Joint Commission (TJC). The current focus of QI continues to evolve in response to the Centers for Medicare and Medicaid (CMS) programs such as Value-Based Purchasing.
3. QI is the incorporation of existing information and data into QI activities. EBP focuses on translating evidence into clinical, educational, or administrative practice. The aim of research is to generate new knowledge by testing theories or interventions.
4. Donabedian’s Model looks at three areas for QI: structure, process, and outcomes. Deming’s model prescribes how QI takes place in a cyclical manner using Plan-Do-Study-Act (PDSA). Six Sigma prescribes five steps for QI to reduce variation in performance: define, measure, analyze, improve, and control (DMAIC). Lean interventions focus on improving efficiency, reducing waste, and streamlining processes through the cumulative effect of small improvements.
5. Patient satisfaction data is collected and reported to the CMS. CMS makes the patient satisfaction data publicly available on their website. The data allows consumers to make an informed decision about where to seek healthcare.
6. A root cause analysis (RCA) is conducted after a near miss or sentinel event has occurred. An RCA is an investigation of what caused a problem and why the problem occurred. Corrective action is expected. TJC requires that an RCA take place whenever a sentinel event occurs.
7. Examine how the RCA process helps understand near miss events or sentinel events.
8. Healthcare Failure Mode and Effect Analysis (HFMEA) is a QI tool that looks at a healthcare process to determine the potential for risk. The goal of a HFMEA is preventative, or to improve the safety of a complex, high-risk healthcare process before an adverse event occurs by identifying and eliminating high-risk aspects of the process.
9. Nurses, both experienced and novice, are expected to have the knowledge, skills, and attitudes (KSA) to assess, analyze, intervene, and evaluate not just patient outcomes, but outcomes that reflect individual and interdisciplinary practice. Nurses approach the processes and systems of care they use every day as variables that constantly need evaluation, recognizing processes that may enhance care or lead to errors and recognizing how such processes can be improved to promote patient safety and performance excellence.
10. Organizational leadership must support staff to conduct QI efforts to enhance patient safety and to support the organization’s high-reliability journey. Although QI barriers exist, they can be overcome with leadership support and ensuring staff are educated on QI methodologies and tools.

KEY TERMS

- > Audit
- > Baseline data
- > Corrective action
- > Healthcare Failure Mode and Effect Analysis (HFMEA)
- > Hospital Value-Based Purchasing
- > Improvement sustainability
- > Lean
- > Malcolm Baldrige Performance Excellence Framework
- > Outcome data
- > Outcomes
- > Plan-Do-Study-Act (PDSA)
- > Postintervention data
- > Preventive action
- > Process
- > Quality improvement (QI)
- > Risk
- > Risk-based-thinking
- > Root cause analysis (RCA)
- > Six Sigma
- > Structure
- > Survey readiness
- > Tracer methodology

REVIEW QUESTIONS

Answers to Review Questions appear in the Instructor's Manual. Qualified instructors should request the Instructor's Manual from textbook@springerpub.com.

1. You are a staff nurse caring for a patient that TJC surveyor has selected for a tracer. This is the first day you are caring for this patient. Because you are not familiar with this patient, which of the following actions would be best for you and the organization?
 - A. Explain to the surveyor that this is your first day caring for the patient.
 - B. Request another patient.
 - C. Review the EMR to ensure all provider documentation is up-to-date.
 - D. Transfer the patient to another unit.
 - E. Request the nurse from the previous shift stay to talk with TJC surveyor.
2. What is the *primary* goal of quality improvement?
 - A. Improve patient outcomes
 - B. Create evidence of a high-reliability organization
 - C. Improve cost-effectiveness of care delivery
 - D. Identify potential opportunities to reduce waste

3. The emphasis on risk reduction using preventive actions is similar to what improvement methodology?
- A. Lean/Six Sigma
 - B. HFMEA
 - C. RCA
 - D. All of the answers are correct.
4. A group of nurses on a medical-surgical unit noted their readmission rates were higher than those of other units. With further investigation, the nurses identify that patients were readmitted to the hospital based on a lack of understanding of discharge instructions. As a team, the nurses decide to look at how they could assess every patient's health literacy level (understanding of health information) because health literacy was identified as a contributing factor to increased readmissions. The team identifies three tools commonly found in the literature. They decide on one tool that is appropriate for their medical-surgical population of patients. To implement the tool, they teach the staff how to use it, document the patient's literacy level score in the EMR, and brief the rest of the patient's care team on use of that health literacy information during interactions with the patient. Readmissions are reduced from 15% to 8% at the end of a 4-month trial period. Is this considered research, quality improvement, or evidence-based practice?
- A. It is research since the nurses research each tool to find evidence.
 - B. It is quality improvement since the nurses used data and identified an intervention to improve their readmission outcome.
 - C. It is evidence-based practice since the nurses evaluated three tools and selected the most appropriate tool for their patient population.
 - D. None of these answers are correct; the nurses only wanted to find out the patient's literacy level.
5. Which of the following processes using Deming's Plan-Do-Study-Act method for quality improvement is correct?
- A. Collect baseline data, evaluate the improvement, measure outcomes, and redesign the plan.
 - B. Collect baseline data, use small-scale trials for change, collect data and compare against desired outcomes, and adjust the plan.
 - C. Implement small-scale change, collect data, disseminate the data, and sustain the improvement.
 - D. Implement changes, evaluate effects from change, identify data, and readjust the plan.
 - E. None of these answers are correct.
6. Many organizations are combining Lean and Six Sigma concepts within their quality improvement efforts. Which of the following options best explains why this combination may be successful?
- A. Lean focuses on optimizing existing processes (e.g., removing non-value-added activities) for cost reduction and efficiency while Six Sigma focuses on minimizing variability to eliminate defects.
 - B. Lean focuses on variability reduction over time while Six Sigma focuses on efficiency in the current existing process.
 - C. Lean, emphasizing efficiency, and Six Sigma, emphasizing increasing variability, are seldom combined as they both focus on separate improvement methods.
 - D. Lean focuses on eliminating existing processes to reduce costs while Six Sigma focuses on eliminating defects to increase variability over time.

7. Which of the following options is true about a fishbone diagram?
- A. It is a useful data analysis tool in determining variability over time.
 - B. It visually represents a process, from beginning to end.
 - C. It is commonly used to determine definitive cause-and-effect relationships.
 - D. It is a quality improvement tool to identify relationships among possible factors.
 - E. None of these answers are correct.
8. Healthcare Failure Mode and Effect Analysis (HFMEA) is different from a root cause analysis (RCA) because of which of the following?
- A. HFMEA is a proactive process to assess, eliminate, or reduce the risks related to complex, high-risk processes before they result in adverse events. RCA is a retrospective analysis of an event that has already occurred.
 - B. HFMEA is a proactive process of an event that has already occurred. RCA is a retrospective process to identify the most appropriate intervention when developing a PDSA.
 - C. HFMEA is an adverse event documentation system commonly employed by organizations to track sentinel events. RCA is an improvement tool that must be done annually on one significant event that occurred within the organization.
 - D. HFMEA is one single process used to enhance the quality culture within the organization. RCA is a part of every PDSA and is documented as part of the D (“Do”) phase.
9. Which of the following types of problems would likely prompt the initiation of a root cause analysis? *Select all that apply.*
- A. A suicidal patient signs out against medical advice (AMA) in the emergency department.
 - B. An adult dose of heparin is given to an infant.
 - C. Surgery was performed on the wrong leg.
 - D. A staff member fails to resuscitate a patient after an inadvertent morphine overdose in the hospital.
 - E. Two different hemostats, one reusable, one disposable, are stocked in the clean utility room within the same bin.
10. As you are walking down the hall of your unit, you hear a patient you have cared for all shift call out for help. When you arrive to the room, the patient is on the floor. After you call for help you see the patient is awake and alert and says they needed to go to the bathroom and “slipped.” A physician quickly arrives. After physical assessment and x-rays, the patient is diagnosed with a fractured hip needing surgical intervention. Your manager calls you to their office to complete an incident report. Of the following actions, what initial action would you document on the incident report as your next step?
- A. Conduct an interdisciplinary QI project regarding reducing falls.
 - B. Conduct a HFMEA™ to prevent future falls.
 - C. Analyze the unit’s fall data to determine if falls are a problem.
 - D. Revise the fall risk checklist, an approved procedure.

REVIEW ACTIVITIES

1. Go to the Institute for Healthcare Improvement (IHI) website at www.ihi.org.
 - Select EDUCATION.
 - Select IHI Open School.

- Select Take a Course.
 - Select course number **PS 201** (Root Cause Analyses and Actions) and complete the course.
2. Consider the following situation: The headline of your school's daily newspaper reads, "Food Services to Increase Prices." The article explains revenue from sales has decreased by 20%, leaving no other option but to increase prices. Now, go to the Institute for Healthcare Improvement (IHI) website at <http://ihi.org>. Enter PDSA worksheet in the search box. You will find the PDSA worksheet is available in PDF. (Note: You will have to register with IHI to open the PDF document.) Divide into groups of four to five students. Use the PDSA worksheet to develop a small scale of change that could prevent cost increases incurred by students and faculty. Create an AIM and PLAN. Identify an intervention you would DO. Create a measurement plan to STUDY. Whether or not your intervention was successful, describe how you would next ACT. Compare student group ideas for improvement.
 3. Go to the Baldrige Performance Excellence Program www.nist.gov/baldrige. Select Award Recipients. Select 2011 as your year option, and in the Search section, select 2011 as the year and Health Care for the Sector. Three healthcare award recipients will be available. Select the Award Application Summary for Henry Ford Health System (HFHS).
 - a. Identify examples of innovations that demonstrate performance excellence.
 - b. Would you want to be employed by this organization? Why or why not?
 - c. View the YouTube video from HFHS: www.youtube.com/watch?v=rw380n-6JhW4
How does this performance by senior leadership speak to performance excellence?
 - d. Is there evidence of Lean/Six Sigma and preventive actions in the HFHS Application Summary?
 4. Access the American Society for Quality website at <http://asq.org>.
 - a. Select Learn About Quality. Many quality topics are listed that were discussed in this chapter. As you learned, preventive actions are taken when a risk for error is identified but has not occurred.
 - b. From the Quality Topics A to Z list, select Mistake-proofing. Read through this brief explanation including the accompanying flowchart.
 - c. Can you apply the restaurant example to an outpatient clinic? What questions could be asked?
 - d. Can you think of an operating room procedure that was created using mistake-proofing principles?
 5. Audits or inspections are common in healthcare settings. An audit examines if a process follows requirements, such as TJC requirements. External audits occur when auditors come from outside the organization. Internal audits occur from staff within the organization, which supports survey readiness. It is common for nurses to serve as auditors on an internal audit team at their organization. Access the American Society for Quality website at <http://asq.org>. Select Learn About Quality. From the Quality Topics A to Z list, select Auditing.

- a. View the brief video. What are a few benefits of auditing identified by the speaker?
- b. Select the three different types of auditing. Scroll down to Performance Audits vs. Compliance and Conformance Audits. What is the major difference between performance and compliance audits?
- c. When TJC conducts an audit, would that audit be defined as a first-, second-, or third-party audit?
- d. You are a nurse on an internal audit team auditing the environment of care to determine if the environment meets TJC requirements. The Quality Management department has provided the audit team with a checklist of key JC environmental requirements as a reference that must be turned in to verify the audit was conducted. During the audit, you ask a nurse who works in the environment being audited to explain how IV pumps are managed. Is there evidence of compliance, process, or both audit methods in this scenario?
- e. Is auditing an essential element of QI?

A robust set of instructor resources designed to supplement this text is located at <http://connect.springerpub.com/content/book/978-0-8261-6145-1>. Qualifying instructors may request access by emailing textbook@springerpub.com.

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