

Chapter 9

Implementing Quality Improvement at Your Institution



Michael Ghio, Danuel Laan, and Shauna Levy

Chapter Objectives

- To describe how to align key stakeholders to implement quality improvement locally
- To discuss clinical areas which might benefit from organized quality improvement initiatives

Introduction

In the last several decades there has been a paradigm shift toward improving quality within healthcare that is at least in part motivated by the growing relationship between reimbursement and patient outcomes. Quality improvement (QI) and patient safety are rightfully gaining momentum as healthcare professionals across the country strive to be leaders in improving and innovating care in their respective fields.

M. Ghio · D. Laan · S. Levy (✉)

Tulane University School of Medicine & Tulane Medical Center,
New Orleans, LA, USA

e-mail: mghio@tulane.edu; dlaan@tulane.edu; slevy10@tulane.edu

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Broadly, QI is a thoughtful, deliberate process designed to improve patient outcomes on the whole, whether they be process or outcome measurements. QI includes identification of factors that impact patient outcomes either positively or negatively, with the objective being to minimize elements of care that lead to poor results and implementing or maximizing processes that lead to improved patient care. Once these components are identified, a team is mobilized to form a plan of action for improving outcomes. Implementation of the plan is followed by monitoring and evaluation of the strategies that were executed to improve patient care.

While institutions and quality improvement teams in different fields may share similar goals and methods of deploying strategies, many specifics of QI are site and field dependent. No two hospital sites or healthcare networks are the same, so tailoring of care and quality improvement, which are dependent on such characteristics as patient population, facilities and equipment, variability in surgical procedures, and composition of staff, is individualized at each site. There are, however, many lessons that can be learned from both the successful and unsuccessful practices implemented by different disciplines and institutions. We hope to help the reader understand the fundamental components of basic quality improvement and provide insight into how the respective parts can be tailored to individual institutions.

In this chapter, we will take a look at the history of QI and discuss implementation of QI programs with emphasis on the important role of institutional stakeholders. We will describe why stakeholders are important, how to identify stakeholders, and share strategies for utilizing their skillsets and interests to maximize success. A review of the ways in which successful and unsuccessful QI attempts can benefit institutions and ultimately patient care will follow. We will end with an examination of clinical areas that are likely to benefit from QI and consideration of patient safety in the new era of COVID-19.

History of Quality Improvement Implementation

One of the first impetuses for quality improvement began in 1998 with the *President's Advisory Commission on Consumer Protection and Quality in the Health Care Industry* [1]. The Commission was created by President Bill Clinton in March 1997 with a goal to “advise the President on changes occurring in the health care system and recommend measures as may be necessary to promote and assure health care quality and value and protect consumers and workers in the health care system.” [1] This report provided a clear set of goals, including [1]:

1. Reducing the underlying causes of illness, injury, and disability
2. Expanding research on new treatments and evidence on effectiveness
3. Assuring appropriate use
4. Reducing healthcare errors
5. Addressing oversupply and undersupply of healthcare resources
6. Increasing patients' participation in their care

The Commission not only directed that these goals be implemented, but it had the foresight to stipulate that measurable objectives (such as consumer satisfaction, clinical quality performance, service performance measures like waiting time), which were later recognized as a hallmark of quality improvement, be used to evaluate each of these aims [1]. Another influential part of this report was its recommendation to organizations that they structure their systems to include clear leaders and stakeholders with varying levels of motivation. The report released by the *President's Advisory Commission on Consumer Protection and Quality in Health Care Industry* set the foundation for future efforts in QI.

In response to the initial report by President Clinton, in 1999, the Institute of Medicine (IOM) published its popular, landmark publication, *To Err Is Human: Building a Safer Health System*, which showed that close to 100,000 people in the United States were dying each year due to medical errors [2]. This astounding number was more than car crashes (43,458), breast cancer (42,297), and AIDS (16,516) [2]. The initial report also demanded a 50% reduction in medical errors over the next 5 years [2]. There was widespread attention from both the public media and the healthcare sector. Notably, the federal government set aside 50 million dollars annually for patient safety efforts [3]. The IOM continued its investigation of these concerning statistics, in 2001, publishing *Crossing the Quality Chasm: Health System for the twenty-first Century*, which identified six aims that laid the foundation for improving quality improvement [4]. These six aims were [4]:

1. Safe: not doing harm
2. Effective: using proven therapies to treat, not experimental or personal experiences
3. Patient centered: understanding the individual needs of your patient
4. Timely: trying to reduce wait or delays to care
5. Efficient: reducing unnecessary use of resources
6. Equitable: care that does not vary due to gender, ethnicity, location, or socioeconomic status

Subsequent to the release of *Crossing the Quality Chasm: Health System for the twenty-first Century*, the United States saw an increase in the number of grants to study QI, an increase in publications related to patient safety, and a reduction in medical errors [5]. These six pillars remain the guiding force of healthcare QI in the United States and provide a benchmark to focus for the provision of care in the modern era.

Other initiatives designed to continue improving patient safety arose at about this same time, including the development of “serious reportable events” in 2002 by the National

Quality Forum (NQF) [6]. These broadly fell into the following categories, as determined by the NQF [6]:

1. Surgical or Invasive Procedure Events: such as wrong site surgery
2. Product or Device Events: such as a contaminated device resulting in a death/serious injury
3. Patient Protection Events: such as patient suicide while inpatient
4. Care Management Events: such as a serious event/death due to medication error
5. Environmental Events: injury such as electrical shock or burn while in the hospital or injury secondary to use of physical restraints
6. Radiologic Events: such as death or injury of patient or staff associated with introducing a metallic object in MRI field
7. Potential Criminal Events: such as impersonation of healthcare member, abduction of a patient

In 2004, the Joint Commission published its national patient safety goals, and in December of that same year, in response to the Joint Commission's goals, the Institute of Healthcare Improvement (IHI) launched its "100,000 Lives Campaign" with the intent to improve safety and outcomes. In their initial campaign in 2006, the IHI cited statistics showing that about 100,000 people die annually due to medical injuries and high rates of hospital-acquired infection [7]. Per the Institute's initial report, specific aims were defined, including:

1. Deploy rapid response teams that include a physician, nurse, and a respiratory therapist that respond prior to a code event [7].
2. Deliver reliable, evidence-based care for acute myocardial infarction (AMI). This was based on the worrisome fact that every year, 350,000 out of a total 900,000 patients die of AMI in the acute period [8].

3. Prevent adverse drug events that result in over 7000 deaths annually [2].
4. Prevent central line infections by examining five components of care aimed at reducing risk: handwashing, barrier precautions, use of chlorohexidine, site choice, and daily evaluation of need, or the removal of a line no longer indicated [7].
5. Prevent surgical site infections by using preoperative antibiotics when indicated, appropriate hair removal, glucose control, and perioperative normothermia [7].
6. Prevent ventilator-associated pneumonia by elevating the head of bed between 30° and 45°, sedation vacations with daily evaluations for extubation, peptic ulcer prophylaxis, and deep venous thrombosis prophylaxis [7, 9, 10].

IHI's campaign was successful, enrolling about 3100 hospitals (75% of all hospitals in the United States at that time) [11]. Over the following 18 months, IHI's efforts were estimated to result in 122,000 fewer deaths [11]. This effort yielded a number of other spin-off projects across the world and encouraged efforts by individual systems.

The development of checklists accelerated as checklists became a well-known means to improve quality of care in various settings. Notably, in 2007, Dr. Peter Pronovost's use of checklists in the intensive care unit was lauded for its prevention of catheter-associated infections [12]. Similarly, Dr. Atul Gawande expanded the use of surgical checklists in 2008; using Dr. Gawande's checklists, the rate of death significantly declined (from 1.5% to 0.8%), and inpatient complications similarly decreased from 11.0% to 7.0% (both statistically significant) [13]. At about the same time, the World Health Organization developed a Surgical Safety Checklist and conducted a global study that was published in the *New England Journal of Medicine* in 2009 showing that use of checklists is associated with both decreased complications and decreased mortality [13].

In 2010, the Health Information Technology for Economic and Clinical Health (HITECH) Act was passed that provided

30 billion dollars to healthcare systems to incentivize hospitals to use electronic health records. In 2011, the NQF again published an update expanding its list of serious events to be aware of while simultaneously reiterating demand for accountability from healthcare organizations [14]. In this report, the NQF recommended healthcare systems search for gaps in their care and encourage frequent and high-quality reviews specific to departments and categories of patient interventions, followed by incorporation of findings to improve care delivered [14]. In 2015, the Department of Health and Human Services announced a change in Medicare's payment policies, such that payments would be based on quality, instead of purely volume, thus representing a further shift in the paradigm.

While the above examples are not an exhaustive list of all the safety and patient-quality care measures taken in the last several decades, they do illustrate the growing importance placed on QI by governing officials, hospitals, and healthcare systems. Although these government agencies, professional organizations, and leaders in the field make the case for QI and provide guidance, frameworks, and insight, it is most often left to individual healthcare networks and hospitals to implement QI.

Identification of Key Stakeholders

At an institutional level, the first step in QI is identifying an area in which a hospital or department can improve on. This can be done through a variety of methods including observation of trends such as a higher than nationally reported infection rate associated with a procedure, use of the American College of Surgeons National Surgical Quality Improvement Program (NSQIP) data, or by having townhall-style sessions to identify deficiencies seen by frontline workers.

Quality can broadly be measured in terms of the following four aspects [15, 16]:

1. Structure: Easily measurable components of a hospital, such as volume (of hospital, individual surgeons), not as readily amenable to quality improvement processes.
2. Process: The individual steps of a patient's care that lead to outcomes. This can be preoperative, intraoperative, or postoperative. Common postoperative process measures include cessation of prophylactic antibiotics within 24 h, removal of urinary catheters, and ambulation within 6 h of surgery.
3. Outcome: Broadly speaking, morbidity and mortality associated with surgery. Frequently seen as the most important to patients and surgeons, given the severity.
4. Composite: Multiple of the above.

Once an area requiring improvement has been identified, a fundamental first step is the identification of key stakeholders. A stakeholder is any individual who is impacted by a project and/or has an ability to influence its success and failure. Stakeholders are important because they provide a variety of lenses through which to identify and view problems along with a diverse group of approaches to addressing needs or shortcomings. Additionally, either directly or indirectly, stakeholders increase awareness of problems, promote transparency during periods of change, and increase the likelihood of commitment to QI through their participation [17].

It is important to think about the range of departments and individuals who play a role related to the area of need and, with that in mind, identify as many stakeholders as possible, from administrators, to pharmacists, nurses, physicians, housekeeping, basically every level of staff at an institution. It is useful to then sort stakeholders through use of a continuum in regard to their power (ability to contribute) and interest level (Fig. 9.1). Each stakeholder is motivated differently: whether by improvement in patient care, recognition for success, financial success if incentives are involved, or efficiency resulting in increased time to use for other activities.

While there is a tendency to invite staff, who are receptive and have readily apparent motivations for participating, it is important to also include staff who may seem resistant to

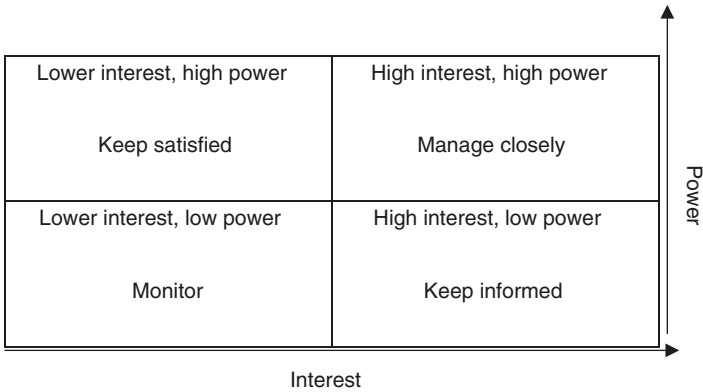


FIGURE 9.1 Relationship between interest, power, and involvement in quality improvement

change. Missing a stakeholder or failing to identify stakeholders who may resist change can result in inefficient implementation and immediate or delayed failure of a QI project. By targeting naysayers for inclusion on the stakeholder team, their objections can be identified early and ideally be addressed in components of the plan proactively. As a brief example, when thinking about implementing a time out quality improvement project, it is essential to involve all parties in this project. From surgeons, to anesthesiologists, to circulators and scrub techs, each one will have a different opinion on the project's usefulness and the time required for its successful implementation. Failure to engage one of these parties can result in frustration or missing a crucial part of the process.

Analysis of the various stakeholders should be a multidisciplinary effort to ensure every area of the institution that impacts or is impacted by a particular patient outcome is represented. An effective way to approach this is to create a process map – this is a way to identify each action required to complete a task from beginning to completion [18]. A process map should be created for every project and can be accurately created by walking through the desired action, speaking with various staff members, or looking at required

documentation [18]. In doing so, one can accurately identify every stakeholder. This is particularly important as the literature has showed the number of steps involved in a surgery or procedure is directly correlated with the numbers of errors and can guide decision-making in a quality improvement project [18].

The identification of each stakeholder is important in and of itself, but each will have a different perspective on the problem and project, and this should be a component of analysis. Stakeholders will often only buy into the quality improvement project if the expected outcome is identifiable or there is some benefit to their particular department or area of responsibility – whether it be financial, improved patient care, or saved time, to name a few. Once a stakeholder's motivation has been identified, evidence must be presented as to how the project will make their specific job more streamlined or meaningful. While not every QI project will make someone's job easier per se, if it improves patient outcomes or makes a seemingly meaningless action more meaningful and purpose driven, its likelihood of being successful is greater. While the inclusion of a diverse group of stakeholders encourages a view of the problem and possible responses, it is natural that the broader the list of stakeholders, the greater the risk for potential conflict as systems are potentially redesigned [17, 19]. Not all stakeholders are flexible or readily adaptable to change. This is where transparency is essential, with a clear focus of the project with an identifiable, visible deficiency that the team is attempting to correct. Examples may include data showing a higher-than expected rate of infections, patient feedback noting an area of deficiency, or reports showing rates of “never events” at your hospital.

Once stakeholders have been identified, the leadership team should be assembled. In our experience, this should include the following members [20]:

1. **Project Leader:** This individual is primarily in charge of organizing the daily activities and has a vested interest in its success. Ideally, one person takes the lead on an activity.
2. **Subject Leaders:** These members of the team are those that have leadership roles in the area that you are attempting to improve. For example, if attempting to improve hand hygiene on a surgical floor, this would include the nursing leaders on that floor and the housekeeping leader, in addition to a surgical leader. It is important to identify every level of leadership within a system of change. There will be several people who compose this facet of the team.
3. **Project Mentor:** Ideally, a QI director or someone else at the institution with experience in implementing projects.
4. **Project Mentees:** Every project should involve learners (residents, medical students, nursing students, etc.) with an interest in QI who can get involved and learn side by side with the team.
5. **Support Members:** This can include other physicians, pharmacists, students, or any member who has the time and ability to help with implementation and studying the effects of the project.
6. **Patients:** Including patients in the team incorporates a perspective often forgotten about, that of likely the biggest stakeholder. Ultimately, these changes should benefit their care, and understanding their perspective is important and educational.

The designation of a leadership team and delineation of responsibilities among members gives the group structure and increases efficiency and opportunity for success [17]. However, for the team to accomplish its goals, there must be a sense of camaraderie with little emphasis on hierarchy. Excitement about the prospect of identifying a common goal to address the problem or area of need is essential, and a thirst for achieving this outcome is important. It is also important the team be receptive to feedback and motivated.

Following selection of the team, the team must articulate what it is trying to accomplish in measurable terms, develop a method for measuring the aim, and articulate how it will evaluate outcomes and project overall. There is excellent support for this “model for improvement” which asks three fundamental questions [21]:

1. What are we trying to accomplish?
2. How will we know a change is an improvement?
3. What change can we make that will result in improvement?

Once the team has established what it is trying to accomplish and how they will measure it, they can develop an initial “PDSA” cycle – standing for “plan, do, study, act.” During the plan portion, the team attempts to set a specific goal with a focus on details. For example, returning to our hand hygiene case, the team would need to identify a specific goal (i.e., the percentage, or number of people, etc.) instead of just saying “We will improve handwashing rates.” Another part of setting the goal is the need to set a goal timeframe, such as “in 2 weeks.” The next step is to then study improvement and act on its changes. These can be either positive or negative results, and it is important to recognize that many quality improvement and patient safety projects can be implemented in a several-week timeframe, not necessarily months to years. The IHI has a project charter sheet that we recommend using for organizing QI plans [22]. When thinking about outcomes, these are broadly classified into three types [20]:

1. Outcome Measures: These are the primary outcomes, e.g., the number of people washing their hands or the number of catheter-associated urinary tract infections, to name a few. These are the outcomes relevant to the patients.
2. Process Measures: These involve looking at the individual steps of the QI project and how they are being implemented, e.g., how many people are being audited for handwashing.

3. **Balancing Measures:** These refer to an unintentional consequence that the QI project had, e.g., studying if while improving ambulation, the number of patient falls during the study period increased.

The “RE-AIM” method (reach, effectiveness, adoption, implementation, maintenance), which was originally introduced in 1999, is an effective tool to implement a project while ensuring to assess the project’s more long-term implementation into the culture of an institution as opposed to a temporary change [23, 24]. One can assess outcome, process, and balancing measures during the implementation phase and use them to guide the team’s reaction and/or maintenance phase of the project.

The most important takeaway is that a team’s PDSA cycle must be quick to adapt and use lessons learned from prior cycles. If the first implementation cycle of a QI project does not result in improvement of outcome or process measures, or if the balancing measures are too great, the team should not abandon the project but should analyze the process to identify reasons why success was not attained and then develop and implement a second plan. Several cycles of planning and implementation may be necessary to achieve desired outcomes or minimize balancing measures. Rapid cycle methodology requires the use of run charts, which can be used to identify certain trends and guide the next potential change required [19, 25].

We will share a project we are implementing at Tulane Medical Center that we will use moving forward as an example. We recognized that the rate of ambulation was extremely low in our surgical patient population: a dismal 10% were ambulating at least daily. We set a goal of improving the ambulation rate by 25% over 2 weeks by using text message reminders as an inpatient. Our team was led by a resident leader, with general surgery staff surgeons, nursing leadership, and patients also involved. We tested our change by sending two text messages a day to these patients and saw a

greater than 50% improvement in ambulation rates among our patients. Our balancing measure was the number of falls in the unit; there was no increase in rate of falls in our population. Because of its simplicity, ease of implementation, and success, this has now evolved into a hospital-wide program aimed at using text messaging to improve various aspects of patient care.

How to Prevent Quality Improvement Fatigue

Frequently in quality improvement and patient safety areas, there is either initial success or failure that is then met with inconsistent follow-up on the project, sometimes with a decline in implementation. It is important that projects are not seen as temporary measures or as isolated projects but as the new norm and standard of care at a hospital. The project's success is frequently determined by its resource requirement, i.e., can it be implemented without constant oversight, a significant monetary inflow, or other factors that may be difficult to maintain longitudinally?

The strongest projects are those that create a culture of change, require few new resources, and have proven, transparent results. On a basic level, the importance of constantly reassessing the PDSA cannot be overstated – quality improvement is defined by the ability to constantly reassess QI measures, from every day to week to month, and redesign the PDSA cycle [22]. True QI can be evaluated on a weekly basis to see if improvements happen then less frequently but still regularly.

It is estimated that up to 70% of change through QI is not sustained, and efforts seen in the United Kingdom showed that 33% of QI projects were not continued 1 year after completion [26, 27]. The National Health Service in the United Kingdom identified ten factors related to process implementation that if scored could predict sustainability [27]. These factors include [27]:

1. Are there benefits beyond helping patients (are jobs easier)?
2. Is there credibility of the benefits? Does evidence support the change and are the benefits visible?
3. Is there adaptability of the improved process? Does the change rely on a specific individual or group?
4. Is there effectiveness of the system to monitor progress? Are there monitoring systems in place?
5. Is staff involved in the change and was new staff hired?
6. Are staff encouraged to express ideas?
7. Is senior leadership engaged and supportive?
8. Is clinical leadership engagement and support?
9. Is there alignment with strategic aim and culture?
10. Is there space and equipment to support change/is infrastructure in place?

We agree that these factors are all important in preventing quality improvement fatigue and should be examined prior to implementation. A project is only as useful as its ability to be continued after initial success, so remaining cognizant of these factors when designing a patient safety project may lead to improved implementation.

Once a QI project has proven successful and implemented as the new norm, it is important to identify new leaders who will continue to assess the outcomes and ensure it is being implemented properly. Oftentimes, this involves inviting mentees with an interest in QI to take on a more substantial role and tasking them with evaluating the project quarterly or at some regular interval. Engaging residents and students is crucial in learning how to develop collaborative initiatives with nursing. Helping mentees understand the goal of quality improvement projects, the fundamental components of designing a project, how their role as a resident is valuable, and the time commitment have all been shown to improve resident involvement [28]. IHI modules provide an introduction to the fundamental topics of quality improvement and patient safety

and are a good stepping stone to helping students and residents understand the basics of designing a project. There is a great focus on QI education of residents by the American College of Surgeons through their development of the Quality In-Training Initiative (QITI) that aims to create a culture of change and prioritization of patient safety [25].

Collaboration and networking between hospitals are another strategy to minimizing QI fatigue. Hearing from colleagues at other hospitals about how they created a culture change, implemented projects, and sought to identify stakeholders can ignite passion for QI while providing ideas for further innovation. It also is advantageous for young surgeons and learners as a way to network with experts in the field.

Clinical Areas That Have Established Quality Improvement

Every single surgical field can benefit from QI. Within each surgical department, there are limitless opportunities – from preoperative interventions, intraoperative, postoperative, it is crucial to think about every step of day activity when considering and evaluating areas that would benefit from QI. These exist on a local and national level and require collaboration among providers, whether residents, nurses, attendings, or others. There are certain QI programs that we want to highlight that track patient safety information.

First, the American College of Surgery National Surgical Quality Improvement Program (NSQIP) is a nationally validated, risk-adjusted program that allows hospitals to compare themselves with one another in regard to their complications and is an effective way to gather valuable information about hospital performance. The NSQIP generates semiannual reports showing hospitals' risk-adjusted

30-day morbidity and mortality outcomes along with an odds ratio (1.0 is as expected, >1.0 worse than expected, <1.0 better than expected). This information can provide real-time feedback to hospitals and help identify specific areas for improvement. NSQIP has helped improve the risk-adjusted mortality and risk-adjusted complication rates, preventing between 250 and 500 complications per year [29].

There are a number of quality improvement programs that are specialty specific: Transplant Quality Institute through United Network for Organ Sharing, Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP), Trauma Quality Improvement Program (TQIP), Vascular Quality Initiative (VQI), NSQIP Pediatric, and others that we encourage involvement in as these provide useful ways to compare efforts to others.

Within a hospital or healthcare system, frequent review of outcomes in regard to particular departments is a great first step to identifying areas for improvement as is being aware of outcomes achieved at other institutions. In these discussions, it is worthwhile to involve every level of provider and staff to help identify deficiencies. Polling frontline workers about potentially weak sections of their departments as they impact patient outcomes can help delineate areas that need improvement and may identify key stakeholders for a QI project. Institutional administrators and financial directors can help discover financially beneficial projects that will provide additional funding to leverage toward other components of patient care. Whatever the goal may be, a multidisciplinary committee is essential to making meaningful change. Networking between hospitals can provide additional resources for identifying areas to monitor and types of improvement to strive for. Openly and candidly discussing results in regard to individual departments opens the door for dialogue and identification of either deficiencies or areas of success that others would benefit from learning from.

COVID and Quality Improvement: Synchrony in a Dyssynchronous Medical System

In this new COVID-19 world, the importance of QI has intensified. Finding ways to deliver high-quality care is even more important than ever so that repetitive exposure to potentially positive or confirmed positive COVID patients is avoided. There has been an explosion of quality improvement efforts, with high-functioning institutions understanding that efforts must be amplified. Meetings among QI groups should focus on educating frontline workers with useful skills and expertise needed to improve the care they are providing, whether COVID-related or not, to minimize exposure to any patient or to staff. A focus on designing COVID response teams, to manage airway, personal protective equipment, and medications is especially important [30].

There is a growing need for QI and patient safety in the COVID-19 era, with the Federal Communications Commission (FCC) recognizing that telehealth programs, some of which are QI in nature, are essential. In April of 2020, the FCC released a 200-million-dollar budget dedicated to promoting telehealth programs that would provide care for people while reducing exposure of providers to patients [31]. This was an extremely valuable resource that a number of providers took advantage of across the country.

In this environment, it is important to have frequent virtual meetings, leverage support staff, and attempt to maximize the value of in-person interaction with patients when they do take place. We should be careful not to have frivolous interactions that put patients, coworkers, family members, and staff at risk for exposure.

Conclusion

In conclusion, we have stressed the importance of identifying stakeholders and have provided a guide for implementing a QI program. The first step is to draw up a comprehensive list

of stakeholders, focusing on how the project will impact stakeholder jobs on a day-to-day basis (i.e., will it eliminate or add new responsibilities) and how the project will ultimately benefit them (whether financially, improved patient outcomes, or other motivation). After bringing the team together, make sure to identify and involve future QI leaders (residents, nursing, medical students, and others) and implement the plan-do-study-act cycle. Of critical importance is the need to respond to both failures and successes – in the case of failures, it is important to attempt to identify what went wrong and implement an updated PDSA cycle that addresses this failure. If a plan resulted in success, the team can move forward with planning for how implementation will continue with less oversight. Awareness and prevention of QI fatigue are essential to sustain long-term results.

Prior to COVID-19, there was a thirst for quality improvement and patient safety projects – now, more so than ever, there is a need for creative methods to impact meaningful patient care given the limitations of current patient care given the ongoing pandemic. Developing projects that improve patient outcomes and motivate them to be active participants in their care is crucial.

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