Executive Leadership and Surgical Quality: A Guide for Senior Hospital Leaders

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"Quality is never an accident; it is always the result of high intention, sincere effort, intelligent direction and skillful execution; it represents the wise choice of many alternatives."

—William A. Foster

Introduction

Since the early 1990s when reports of the Veterans Administration collaborative efforts to assess and improve surgical outcomes were published, quality assessment and process improvement initiatives have gained progressive importance in the daily function of the modern department of surgery. In 1994, the National VA Surgical Quality Improvement Program (NSQIP) was established in all 132 VAMC's performing surgery [1]. In 1998, Khuri et al. presented the first national, validated, outcome-based, risk-adjusted report outlining structure, data collection, analysis and reporting of surgical outcomes. Validation of these process improvement efforts more than a decade later suggest that continuous quality assessment in NSQIP, and these programs enhance surgical outcomes [2].

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It is with this background that we examine the role of department and hospital leadership in the development and institution of these quality improvement efforts. Historically, the Institute of Medicine has defined the quality as "the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge." This clearly applies to the field of surgery. In many surgical quality programs, however, indicators were and often continue to comprise the traditional measures—complications and deaths reported in a peer review conference setting—rather than more positive components of quality. In the context of the Affordable Care Act, the modern surgical leadership team must develop a vision consistent with what CMS has defined patient safety efforts as "initiatives that go beyond the current Quality Assessment and Assurance (QAA) provision, and aim to significantly expand the intensity and scope of current activities in order to not only correct quality deficiencies (quality assurance) but also to put practices in place to monitor all services to continuously improve performance" (Section 6102 (c) of the Affordable Care Act).

In this chapter, we will define the role and responsibilities of the surgical quality officer, goals of the program, training and resources necessary to implement a successful value-based quality program, and strategies necessary

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to achieve departmental and institutional goals that are deemed successful. The ultimate goal is to establish a "culture of surgical safety" and "continuous improvement" that systematically ensures in the words of Director Clancy of the Agency for Healthcare Research and Quality—"Getting the right care to the right patient at the right time—every time."

Role and Responsibilities for Successful Oversight

Healthcare and the provision therefore is a remarkable combination of skill, clinical judgment, and teamwork. Those that work within it are indeed privileged to be a part of the profession of treating the ill, reducing suffering, and sometimes, simply supporting the patient and family. However, there are times when our care, despite our best intentions, does not produce the outcomes we had intended and may even cause harm to the patient. More than a decade ago, the Institute of Medicine released its famous report, "To Err Is Human," which set an ambitious agenda for the world to reduce the number of patients harmed by medical errors and preventable adverse events [3].

Who is the Chief Surgical Quality and Patient Safety Officer?

The infamous "call to arms" that started more than a decade ago has included creating a culture of safety and accountability. Changing culture is hard work and it takes more than a checklist to achieve a safe environment for our patients and surgical teams. Creating a culture of safety means ensuring that the highest quality of care is not just a project or flavor of the month, but rather at the core of what we do every day for every patient. Creating this environment for a surgical department should ideally be the primary strategic responsibility of the Chief Surgical Quality Officer (CSQO). While no one person can be responsible for all patients and outcomes, the CSQO has the privilege and responsibility of enthusing and supporting every surgeon, every nurse, every resident and student to ensure the best outcomes. The quality and patient safety field is, out of necessity, developing into a discipline or expertise in how to truly engage with organizational culture and translate quality and patient safety goals and objectives into concrete aims and metrics that can be tracked using disciplined approaches [4].

Traditionally, CSQO's were the chief medical officers in smaller hospitals or the Chair of Surgery in other hospitals with smaller departmental structures; often the role of the CSQO was perceived as something "extra" or as a compliance requirement to supplement the "real work" of patient care. Often, the "safety officer" or "quality assurance person" was little respected nor heeded. In today's healthcare environment, with public reporting of medical errors and support for the concept that most patient injuries are a result of system failures and not bad doctors, the role of the CSQO is critical [5–7]. The CSQO must have the ability to acknowledge these root causes, develop countermeasures, and impact change. Additionally, the CSQO must have essential leadership traits which include the ability to assess clinical practice gaps, understand the science of improvement and reliability, foster transparency, engage other physicians and nurses, and set clear outcomes and measurable metrics [8–11].

Identifying the right CSQO, means finding an individual that embraces change and values continuous performance improvement. The CSQO must be able to lead initiatives, address issues, generate support from other surgeons, and engage the right team. Often, these leaders need training in process improvement and conflict resolution [12]. They need dedicated time to network with others, attend national conferences in Quality and Patient Safety, conduct meaningful rounding, and actively work with other team members on projects and rapid cycle improvement. Experience dealing with administrative issues such as resource allocation, contracting, finance and budgeting, and strategic planning may be very helpful in that these administrative skills may facilitate

goal setting and outcomes measurement. The time must be protected and supported by the Department Chair and hospital administration as truly value added and should therefore be appropriately compensated [13, 14].

Lastly, the ideal CSQO should have clinical experience that has allowed him or her to have achieved a level of clinical expertise that is appreciated and recognized by other surgeons and team members. The CSQO should be at a point in their career whereby they can still maintain their surgical skill with a smaller volume of cases. In academic medical center settings, it is unlikely that a junior assistant professor would have achieved this stature within the first few years after residency. Similarly, a surgeon at the end of their career may not be the ideal candidate. The idea of using quality and patient safety as an "exit strategy" flies in the face of having a CSQO that is current, innovative, and continuously improving [15].

Training and Resources Required for Success

The CSQO must engage with fellow surgeons and develop a team approach to continuous improvement. Additionally, designing reliable processes that mitigate human error involves critical assessment of current processes, careful planning, and the use of the science of reliability. Learning the science of reliability is essential to the CSQO role as well as to fellow team members [16]. Most healthcare leaders and surgeons did not learn the science of reliability; just culture or performance management in their professional training and some may not even know that it exists. The CSQO is responsible for engaging surgeons in improvement initiatives which have historically been a challenge for healthcare organizations because surgeons' primary professional focus is their own practice—the quality of care they personally deliver and the economics associated with that care. In many instances, the priorities of surgeons can seem out of alignment with the quality issues that face the healthcare system as a whole [17]. At best, surgeons have often perceived that they have little time to spare for the departmental or organizational quality agenda. At worst, relationships become strained when there is a tension between the surgeons and the agenda of the department as it works within the healthcare system. This can be affected by the various employment models for surgeons.

Since most surgeons have had little training in just culture development, continuous improvement, high reliability or even quality data collection and analysis, additional and dedicated training is highly advantageous. There are different degrees to which the CSQO and fellow surgeons can be trained and can range from online modules, which take 12 h, to a Master's in Operational Excellence or Business Administration which can take 2 years. Table 15.1 lists a number of potential and graduated training opportunities. At a minimum, training in Six Sigma or Lean concepts is recommended. While there is no "one size that fits all," as training is completed, the CSQO will find that they are better able to address quality issues and are more able to engage surgeons successfully because they understand the failure modes and how to facilitate the solutions [18]. Additionally, this training will allow the CSQO to represent the Department of Surgery more appropriately at the healthcare system level with a very sound understanding of national quality metrics and ranking systems, such as U.S. News and World Report, which are heavily influenced by surgical performance.

Reporting Structure and Administrative Committee Support

Continuously improving our processes to ensure safe and high quality care is not only what the public demands of us; it is now tied to our reimbursement. Authorized by the Affordable Care Act, the Hospital Value-Based Purchasing (VBP) program is the beginning of a historic change in how Medicare pays healthcare providers and facilities—for the first time hospitals across the country will be paid for inpatient acute care services based on care quality, not just the

Table 15.1 Training and professional development

Programs	Details	Link
American Society for Quality Learning Institute	ASQ delivers Lean Sigma training using D-M-A-I-C methodology with integrated Lean tools and techniques	http://asq.org/healthcare-use/training/overview.html
STEEEP Academy (safety, timeliness, efficacy, efficiency, equity, and patient-centeredness)	The STEEEP Academy teaches healthcare leaders the theory and techniques of rapid-cycle quality improvement	http://www.baylorhealth.edu/STEEEPGlobalInstitute/STEEEPAcademy/Pages/default.aspx
National Committee for Quality Assurance	NCQA offers a host of live educational seminars and just-in-time webinars	http://www.ncqa.org/EducationEvents.aspx
Institute for Healthcare Improvement	Conferences, In-Person Training, Web-based Training, Audio and Video Programs, IHI Open School, IHI Fellowship Program	http://www.ihi.org/education/Pages/default.aspx
		http://www.ihi.org/education/IHIOpenSchool/Pages/default.aspx
Emory University	Lean Six Sigma Certificate Program	http://ece.emory.edu/sixsigma/
Health Resources and Services Administration	Quality Improvement & Risk Management Training	http://www.hrsa.gov/publichealth/guidelines/qualityimprovement.html
US Department of Health and Human Services		
TeamSTEPPS	TeamSTEPPS is a teamwork system designed for healthcare professionals	http://teamstepps.ahrq.gov/
AHRQ		
World Health Organization	WHO Patient Safety has developed a range of training materials and tools	http://www.who.int/patientsafety/education/en/
US Cochrane Center	Web course created by the United States Cochrane Center as part of a project undertaken by Consumers United for Evidence-based Healthcare (CUE)	http://us.cochrane.org/understanding-evidence-based-healthcare-foundation-action
Understanding Evidence-Based Healthcare		
• Johns Hopkins Bloomberg School of Public Health		

Johns Hopkins Medicine	*Workshops and e-Learning*	http://www.hopkinsmedicine.org/armstrong_institute/training_services/workshops.html
Armstrong Institute for Patient Safety and Quality	The Armstrong Institute hosts training workshops throughout the year targeted to a wide range of healthcare professionals, from front line staff to executives	
Intermountain Healthcare	The Advanced Training Program (ATP) offers a course for healthcare professionals who need to teach, implement, and investigate quality improvement	http://intermountainhealthcare.org/qualityandresearch/institute/courses/atp/Pages/home.aspx
Duke University	Patient Safety—Quality Improvement	http://patientsafetyed.duhs.duke.edu/
	EBM workshop	http://sites.duke.edu/ebmworkshop/
Six Sigma Green Belt Healthcare	Focuses on Six Sigma Green Belt training on healthcare applications	http://cpd.engin.umich.edu/professional-programs/six-sigma-greenbelt-healthcare/index.htm
University of Michigan		
Masters of Operational Excellence	An 18-month degree focusing on developing leaders leadership in the emerging, rapid and continuous improvement environment found in leading service, healthcare, and manufacturing organizations	http://fisher.osu.edu/mboe/
Fisher College of Business, The Ohio State University		

quantity of the services provided. In order to succeed and sustain gains in reducing care-associated adverse events while continuing to fund our mission to provide high quality care, healthcare institutions must embrace standardized, evidence-based practices as well as purposeful engagement of the entire healthcare team. Human factors and in particular, unanticipated events in the operating room during high acuity surgery are a stark and often unnerving reality [19, 20]. Therefore, we as surgeons, partnering with the CSQO and hospital administration, must be responsible to develop a strong safety culture that demonstrates effective coordination of care, identifies gaps and engages caregivers who proactively and thoughtfully bring solutions forward to provide the highest quality of care for all patients [21].

Every department of surgery and healthcare institution is structured a little differently. Nonetheless, some form of departmental Quality Committee, that is aligned with the healthcare institution is essential. The true north for such a committee should be providing the highest quality of care for all surgical patients, which implies care that is safe, efficient, effective, patient centered, timely, and equitable [22]. It is the responsibility of the CSQO to ensure that all of these Institute of Medicine aims are fulfilled within a department and health system so that the delivery of quality care is given equal attention and prioritization. To that end, the departmental Quality Committee should have a representative from each surgical division within the Department. Meetings are typically monthly and often the timing may need to be creative to accommodate surgical schedules. Additional key members of the committee include representatives from the operating room—particularly nursing, the surgical intensive care unit, the surgical care unit, and pharmacy. Data managers and/or epidemiologists and hospital quality administrative support are essential. Other invited guests should be chosen depending on the topic being discussed. For example, infectious disease representatives and infection control staff would be appropriate when discussing wound infection rates. Residents and medical students should always be encouraged to attend. Risk managers and compliance representatives may be appropriate at times but should not dominate the conversations. Quality managers and data analysts that assist with data collection and process improvement should be considered a part of the committee and not simply facilitators of the process. Table 15.2 considering busy operating schedules, each divisional quality lead should have an alternate and at a minimum, each divisional lead should complete basic Quality and Patient Safety training prior to being nominated to the departmental committee. The reporting of the departmental quality committee should be to the Hospital or System level Quality and Patient Safety Committee, and the CSQO should be an active member of a larger hospital oversight committee. Similarly, the CSQO should identify a Co-chair of the Departmental Quality Committee to attend the system level meeting when he or she is unavailable to ensure a continued presence at the health system level.

Table 15.2 Department of surgery quality committee membership

CSQO
Divisional or departmental representatives (and alternate)
Perioperative nursing
Surgical intensive care nursing
Surgical unit floor nursing
Pharmacy
Epidemiology
Chief residents
Quality managers
Data analysts
Ad Hoc members: risk management, infection control, etc.
Medical students

As each hospital or medical center may be organized differently, the above Quality committee structure should be considered flexible. For example, if a hospital has multiple surgical departments, then a representative of each department should be a member of the committee, rather than divisional members. In addition, at large members are important to help message to the middle part of the organization.

Strategic Alignment and Leadership

Although the CSQO charge may vary from institution to institution, in addition to eliminating adverse events, he or she will often be asked to lead efforts to balance a sometimes conflicting set of responsibilities. This list includes, but is not limited to, educating surgeons and trainees about quality and process improvement, achieving compliance with a growing list of external mandates that may not always seem rational, standardizing and streamlining care pathways, ensuring appropriateness, and making difficult decisions about resources. The CSQO requires a unique skill set, including not only the ability to listen and a willingness to work for consensus, but also the authority and fortitude to make some decisions that may not always be greeted with enthusiasm. Ultimately, the CSQO is responsible for aligning the Department of Surgery with hospital or institutional initiatives. Often, hospital goals or key result areas are significantly impacted by surgical services and outcomes. Having the department understand how their performance impacts the institution as a whole is vital to sustained improvements. Clear definition of the reporting structure and quality oversight is key, and understanding that not only is the reporting fixed, but that the ultimate responsibility of the leadership and board can be leveraged is often very helpful. An example of one is provided in Fig. 15.1. Impacting mortality and reducing sentinel events, including retained foreign bodies and wrong site procedures, the CSQO may serve as the project leader or champion for programs aimed at process improvement [23–25]. Approaches such as team training or Crew Resource Management are really surgically driven programs that have been shown to improve outcomes [26–30]. Without the leadership and direction of the CSQO and key members of surgical departments and divisions, such programs are unlikely to be successful and could serve as a source of frustration for all surgeons involved. The CSQO should be the advocate for the individual surgeon when these initiatives are being rolled out while he or she is leveraging the institutional support to render the initiative successful [31]. Sentinel events often can only be addressed after thorough root cause or common cause analysis. To that end, the CSQO may serve as the lead physician on these workgroups and be responsible for devising and implementing countermeasures to prevent them from happening again. Inherent to this process is the sharing of often sensitive data when a surgeon or surgical team has been involved in a "never event" [32]. By focusing on the systems issues and sharing the fixes, the CSQO can further the culture of safety and continuous improvement, without compromising the integrity of the surgeon. Using the departmental Quality Committee, to share events and patient safety opportunities is an appropriate venue that is safe and productive. Opportunities that have been realized through careful analysis could be shared using standardized storytelling which could be distributed electronically or in poster format in resident rooms or the perioperative surgeon's lounge as seen in Fig. 15.2 [33].

Resources and Relationships Critical to Success

Over the past 25 years, measurement of healthcare processes and outcomes has been evolving and rapidly changing. Initially, the focus was on data collection and reporting. Of late, there is a push from business groups, state and national agencies, and most importantly, patients to ask questions about healthcare outcomes, cost, and patient experience. To address these questions at the surgical divisional or departmental level, there must be good and validated data. According to Provost and Murray, "Data are documented observations or results of performing a measurement process. Data can be obtained by perception or by performing a measurement process." [34]. In order to leverage data and create ultra-safe environments for patients, not only are resources needed, but a relationship between departments, clinical and administrative, must be forged and maintained.

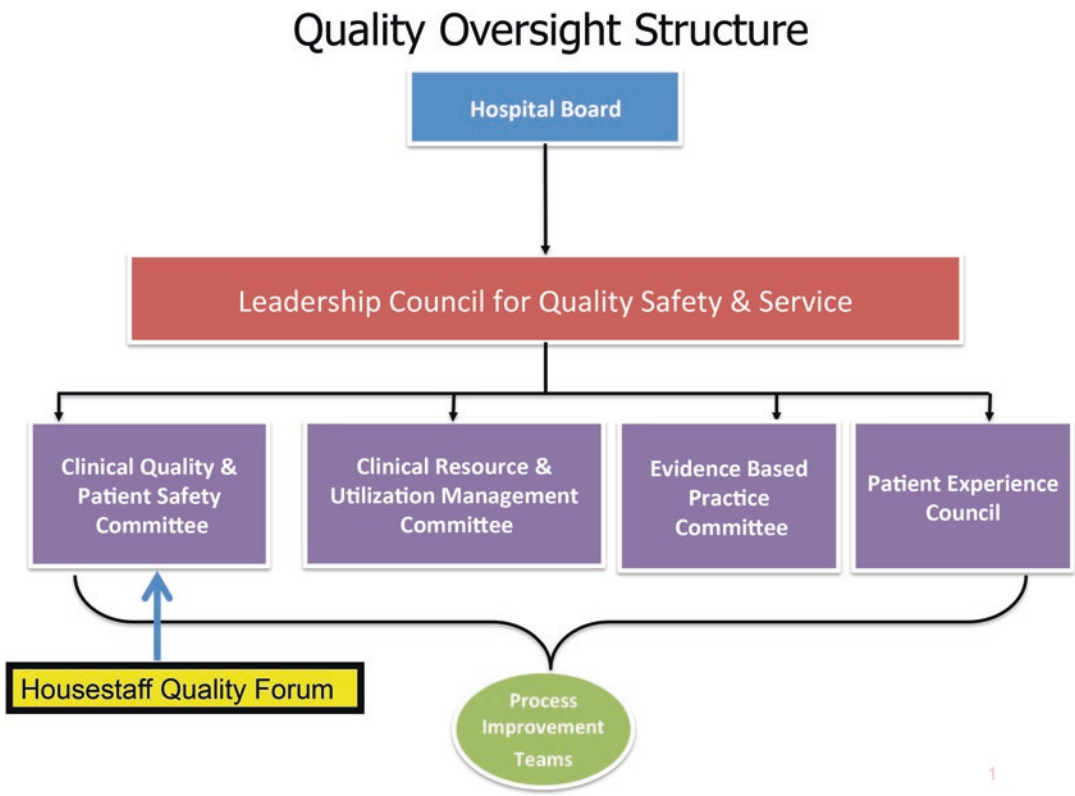


Fig. 15.1 *Quality oversight structure*. An example of a quality oversight structure is provided, whereby the hospital or health system board is ultimately responsible for quality and patient safety. The Leadership Council comprises key clinical and administrative leaders in the organization and to which the subcommittees responsible for quality, resource utilization, evidence-based practice, and patient experience report. The individual department quality committee would report to the Clinical Quality and Patient Safety Committee

Developing a Culture of Safety and High Reliability at All Levels

The root causes for most events that occur among surgical patients include lack of communication, lack of teamwork, lack of patient involvement, lack of reliable processes, lack of organizational emphasis on safety and reliability, and the inability of the department or organization to continuously learn from its mistakes [35]. Understanding that a just culture is one of trust, not only a culture in which people are encouraged to provide essential safety-related information, but also a culture in which it is clear about where the line must be drawn between acceptable and unacceptable behavior as defined by James Reason's five-part algorithm for creating accountability [36].

Despite a dedicated interest at many levels to ensure the highest quality of care for patients, studies have shown that progress in patient safety has been exceedingly slow, secondary to lack of both clarity regarding the definition and standard methodology to assess iatrogenic patient harm [37]. Additionally, some researchers believe that there is a lack of will at the senior leadership level and consequently a lack of resources and focus on the hard work necessary to redesign systems for high reliability performance [10, 38]. There continue to be reports of fear and intimidation that are still uncomfortably widespread in healthcare, and in surgical disciplines in particular, which leads to an overwhelming reluctance of physicians and staff to escalate concerns about safety or reveal their own errors or near-miss events [10, 38, 39].

√ Scenarios

A patient in the OR undergoing a facial fracture repair had surgical lubricant placed on a corneal shield instead of ophthalmic lubricant. The corneal shield was placed in the eye during surgery. Exposure to surgical lubricant led to chemical injury of the cornea. The cornea injury improved and the patient was discharged with required follow-up to determine the long-term impact of the chemical injury.

√ Process Issues

- There was a misconception that surgical lubricant is acceptable for use in the eye and could be placed on a corneal shield.
- Ophthalmic lubricant is used every time a corneal shield is inserted, but was not on surgeon preference cards for procedures.
- Ophthalmic lubricant is only located in the anesthesia carts and was not available to the circulating nurse in the operating room. The item was passed from anesthesia to the surgical resident and did not follow the policy requiring items passed on the surgical field be handled by the circulating nurse.

√ My Role

- **Look Alike Products:** Unfortunately many products look similar, read labels and their contents carefully. Attempt not to locate look alike products together.

Fig. 15.2 *Lessons learned poster*. When serious safety events occur, it is the responsibility of the CSQO to share lessons learned and what process issues were addressed. Posters like this can be used in email alerts or in the surgeons' lounge to reach a broad audience in a productive fashion

Nevertheless, there are several examples of remarkable and measurable advances in patient safety in individual health systems [39, 40]. A number of notable organizations and programs were able to achieve and sustain significant reductions in preventable adverse events and hospital acquired infections with a reduction in sentinel events, reduction in risk-adjusted death rates, improvement in safety attitude/culture throughout the organization, and increased reporting with more effective investigation into patient safety incidents [40, 41]. The common theme among all of these successes is that improved patient safety metrics have translated into improved staff morale and reduced costs resulting from shorter hospital lengths of stay.

The most significant characteristic shared by organizations that have made progress in patient safety and consistently good outcomes has been consistent and genuine engagement by leadership [14, 41]. There is an increasing focus on the importance of leadership, specifically with regard to the education of physicians, reflected in new requirements and guidance of the Accreditation Council for Graduate Medical Education [42]. Nursing leadership has also been highlighted for its critical role establishing a culture of safety and improving clinical outcomes by directly affecting clinical workflow and patient-care processes at the bedside [43]. Effective process redesign focuses on both the reduction of errors and identification of risks to ensure that errors are caught and patients are not harmed.

Much research has been done on what exactly this "culture of patient safety" entails. A robust survey of California hospitals found seven characteris-

tics that were key: (a) commitment to safety at the highest level, (b) necessary resources for safety are provided, (c) safety is the highest priority, (d) all coworkers communicate effectively about safety concerns, (e) hazardous acts are rare, (f) there is transparency in reporting and discussing errors, and (g) safety solutions focus on system improvement, not individual blame [10]. Building and nurturing a culture of patient safety is directly correlated with improved clinical outcomes and reduced errors, such as shorter length of stay, fewer medication errors, lower rate of ventilator-associated pneumonia, lower catheter-related bloodstream infections, and most significantly, a lower risk-adjusted mortality [44].

In order to achieve a culture of safety and these improved outcomes, leaders must demonstrate that they value transparency and encourage disclosure of adverse events [21]. By analyzing these events, organizational learning and system changes are then possible to prevent similar errors from occurring. There are several validated administrative and clinical tools effective in establishing a culture of safety [41]. It is essential to first accurately measure the safety culture. This will provide the organization with baseline data important in assessing the effect of any intervention. The survey most frequently used is the Hospital Survey on Patient Safety Culture that was developed by the federal Agency for Healthcare Research and Quality. This tool has been used extensively to develop patient safety programs in hospitals across the country and AHRQ now publishes comparative data to support continuous improvement and collaboration [45]. Another powerful leadership tool in the hospital setting is Patient Safety Leadership WalkRounds, in which a senior leader undertakes walking rounds to discuss patient safety with staff and patients/families. Safety issues are recorded, prioritized, and addressed with system wide changes at subsequent meetings. This has been an effective tool in demonstrating that senior leadership value patient safety and will address adverse events and vulnerable systems in a nonpunitive manner [40, 46].

The use of Crew Resource Management across entire departments and hospitals has been part of a culture transformation [26–29, 31]. Team training uses crew resource management theory from aviation that has been adapted for healthcare [21, 31, 47, 48]. The Veterans Health Administration (VHA), the largest integrated healthcare system in the United States, implemented a national operating room team training program and studied the outcomes [20]. The investigators found that with every additional 3 months of team training completed, mortality was reduced in all types of surgical patients undergoing a variety of cases of differing levels of complexity. Team training, as it currently exists in our operating rooms, relies heavily on checklists and effective care transition communications. The use of these checklists has been shown to globally reduce morbidity and mortality as made evident by the World Health Organization's Safe Surgery Saves Lives program [22]. Since this seminal publication, the Safe Surgery Checklist, as popularized by Dr. Atul Gawande, has spread from the operating room to every aspect of patient care. Dr. Pronovost's success in reducing central line infections to almost zero in intensive care units using a standardized checklist is another prime example of a hardwired "safety tool" improving care [49]. However, after considering the findings of Hu et al., and Urbach et al., [50], perhaps we have been overly prescriptive in hard wiring processes without prior engagement of surgical teams, and rather than capitalizing on what surgeons are traditionally known for- resilience. The investment in such programs is real, but the results can be impressive [31, 51].

The Lucian Leape Institute at the National Patient Safety Foundation has endorsed five overarching principles for transforming hospitals and clinics into high-reliability organizations. These include transparency in disclosing errors and quality problems, integration of care across teams and disciplines, engaging patients in safety, restoring joy and meaning in work, and reforming medical education to focus on quality and safety [41].

Worker satisfaction is critical to get any buy-in in a patient safety culture. It directly correlates with improved patient satisfaction and outcomes. Transparency is essential to understand the current

state of patient safety and to develop a learning culture in which mistakes inform system-wide change and there are no punitive consequences for disclosing medical errors. This will align with healthcare providers' ethical obligation to disclose medical errors and apologize for patient harm. Patients and their families should be engaged in their clinical care through informed medical decisions and self-management [52–54].

Data Analytics and Validation

There are currently many sources of surgical data and analysis that are required to evaluate the performance of surgeons as well as divisions and departments as a whole. The registries that are currently the most developed and are likely to be found within a surgical department can involve almost any surgical discipline. It is the responsibility of the CSQO to have a sound understanding of the data collection methodology, the analysis and the reporting mechanism associated with the registries the Department of Surgery intends on implementing. A dedicated surgeon champion should be identified for the different registries, separate from the CSQO, and they can assist in the analysis of results and drive change. Table 15.3 is a listing of the most commonly used surgical databases.

Metric Development and Goal Setting

To measure quality, the CSQO and key surgical leaders will need to take several steps. First, the aims must be set, that is, to make the data collection relevant, all measurement should be directly connected to the departments, hospital and health systems goals. Next, priorities for quality and patient safety efforts for the department must be established, such as reducing surgical site infections and these must be in alignment with the institutional priorities and efforts. After selecting the specific measure, there must be consensus on the operational definition so that when the data is finally collected and presented there is no "the data is incorrect" mentality [55, 56]. Developing a data collection plan and the actual acquisition of data will likely require hospital or health system support. The CSQO needs to understand this process well enough to represent the department at health system budget and resource meetings. Lastly, there must be a plan to analyze the data with the appropriate stakeholders and be transparent with sharing the results, good or bad. Taking action to improve outcomes is an interprofessional process that starts with good data, appropriate analysis, and being grounded in the aims and goals of the surgeons, divisions, and department as a whole. Table 15.4 is an example of metrics and goals set at an institution level.

Table 15.3 Surgical quality improvement registries

Specialty	Database	Link
All surgical specialties	National Surgical Quality Improvement Project (NSQIP) (*Essential, small/rural hospital, procedure targeted version or pediatric version*)	http://site.acsnsqip.org/
	Bari NSQIP (Bariatric Surgery)	http://www.mbsaqip.org/
Cardiac and thoracic surgery	Society of Thoracic Surgeons Quality database	www.sts.org
Vascular surgery	Society of Vascular Surgery Quality Improvement program	http://www.vascularqualityinitiative.org/
Trauma surgery	Trauma Quality Improvement program	http://www.facs.org/trauma/ntdb/tqip.html
Transplant surgery	Scientific Registry of Transplant Recipients	http://www.srtr.org/
All surgical specialties	University Health System Consortium (UHC)	https://www.uhc.edu/

Table 15.4 Goals and metrics for success (system level). The goals for quality and patient safety improvement need to be established yearly. The previous year's success and the goals need to be clearly defined. The means by which the data will be collected and validated need to be transparent

Performance incentive metrics	Baseline year ("threshold") FY15	FY16 ("target") goals	Current performance	Description (health system)
CAUTI (per 1000 foley days/Standardized Infection Ratio—SIR)	1.156	0.854	0.75	All patients anywhere in the hospital that develops a UTI with a foley in
CLABSI (per 1000 line days/SIR)	0.577	0.46	0.71	All patients anywhere in the hospital that develops a BSI from a Central Line
cDiff (per 10,000 patient days/SIR)	0.824	0.75	0.74	All patients anywhere in the hospital that develop C diff
SSI Colon Surgery (per 100 procedures/SIR)	0.982	0.751	0.47	Deep infections after any sort of colon surgery
Hand hygiene	90 %	95 %	93 %	Rate from observation program of clean in/clean out
Mortality index	0.64	0.63	0.65	UHC all inpatient mortality index
Sepsis mortality index	0.88	0.89	0.84	UHC mortality index for patients with a sepsis diagnosis code
PSI 90	0.64	0.62	0.66	Composite measure: PSI 03 Pressure Ulcer Rate; PSI 06 Iatrogenic Pneumothorax Rate; PSI 07 Central Venous Catheter-Related Blood Stream Infection Rate; PSI 08 Postoperative Hip Fracture Rate; PSI 09 Perioperative Hemorrhage or Hematoma Rate; PSI 11 Postoperative Respiratory Failure Rate; PSI 12 Perioperative Pulmonary Embolism or Deep Vein Thrombosis Rate; PSI 13 Postoperative Sepsis Rate; PSI 14 Postoperative Wound Dehiscence Rate; PSI 15 Accidental Puncture or Laceration Rate
PSI 12 Post Op PE/DVT rate	9.18	7.87	6.41	Rate per 1000 discharges

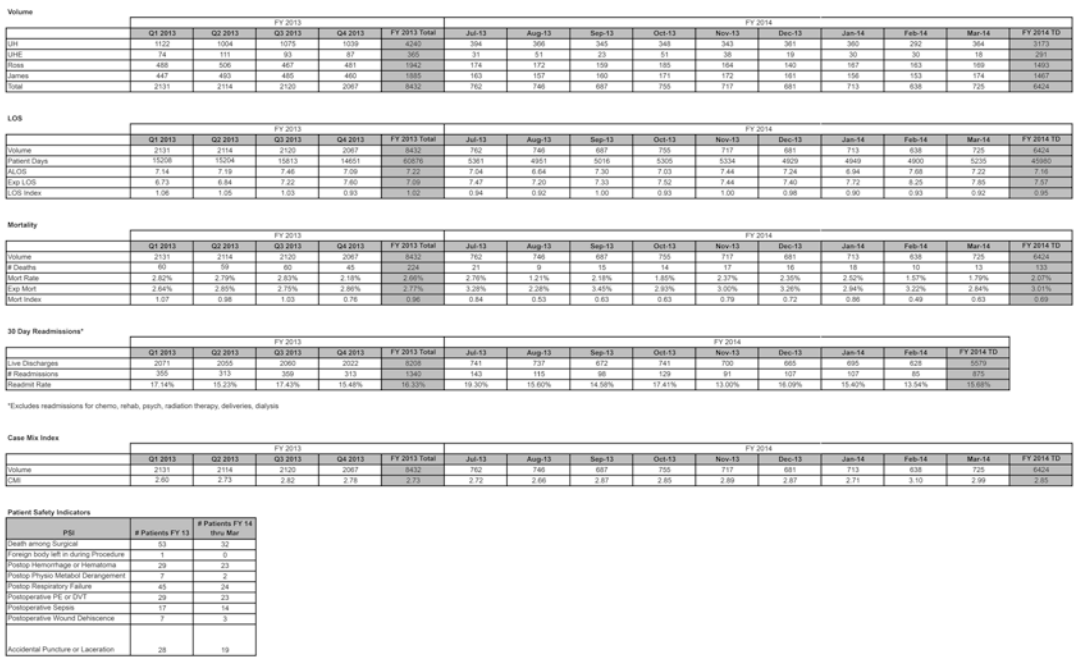
Total falls per 1000 patient days	1.64	1.55	1.44	All falls and benchmarked with NDNQI
Injury falls per 1000 patient days	0.37	0.32	0.35	Falls with injury level 1 or higher benchmarked with NDNQI
Overall 30 days all cause readmission rate	13.20%	11.90%	13.30%	All cause readmissions back to OSUWMC for any reason
HCAHPS overall rating	75.30%	79.40%	78.20%	Percent of those surveyed who gave scores of "9" or "10" if patients would recommend OSUWMC
HCAHPS doctor communication	81.10%	82.80%	82.30%	"How well did the doctors treat with courtesy and respect, listen carefully, explain things"
HCAHPS nurse communication	80.30%	81.00%	81.50%	How well did nurses treat with courtesy and respect, listen carefully, explain things, answer the call button
CGCAHPS	90.80%	96.00%	90.80%	Would you recommend this provider's office (yes-definitely)
CGCAHPS test results	76.90%	94.00%	87.30%	Follow up to give test results (yes)
Medicare spending per beneficiary	0.998	0.98	0.998	Cost for 3 days prior, inpatient stay, and 30 days post

The data collected by the CSQO and shared with divisions and surgeons often rolls up into national rankings and grading systems. Therefore, the CSQO must understand, at a minimum, how the surgical data and indicators affect the Joint Commission accreditation status, the Centers for Medicare and Medicaid Value-Based Purchasing program, and the U.S. News and World Report rankings. To that end, division quality and patient safety cards need to be formulated, reviewed monthly, and be part of the leadership's compensation as to the success or challenges. Figure 15.3 is an example of a General Surgery divisional scorecard that is in alignment with the institutional metrics and goals. Lastly, as each surgeon influences the performance of the department and the institution, individual scorecards are essential (Fig. 15.4). The metrics that formulate these scorecards must be in alignment with the division and the institutional as a whole (Fig. 15.5).

Continuous Improvement Training and Support

Healthcare providers involved in improving our care delivery system must be able to create a just and accountable culture, implement highly reliable systems, and foster transparency. Additionally, designing reliable processes to mitigate human error involves critical assessment of current processes, careful planning, and the use of the science of reliability. Learning the science of reliability is essential as understanding the fundamental cornerstone of all projects is continuous process improvement.

Since most healthcare providers have had little training in just culture development, high reliability or even quality data collection and analysis, additional and dedicated training in process improvement is highly advantageous. There are different degrees to which healthcare team members can be trained, and can range from online modules, which take 12 h to



Volume

	FY 2013					FY 2014									
	Q1 2013	Q2 2013	Q3 2013	Q4 2013	FY 2013 Total	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	FY 2014 TD
UH	1122	1004	1075	1039	4240	394	366	345	348	343	381	360	292	364	3173
UHE	74	111	93	87	365	31	51	23	51	36	19	30	30	16	291
Ross	488	506	467	481	1942	174	172	159	185	164	140	167	163	169	1493
James	447	493	485	460	1885	163	157	160	171	172	161	156	153	174	1467
Total	2131	2114	2120	2067	8432	762	746	687	755	717	681	713	638	725	6424

LOS

	FY 2013					FY 2014									
	Q1 2013	Q2 2013	Q3 2013	Q4 2013	FY 2013 Total	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	FY 2014 TD
Volume	2131	2114	2120	2067	8432	762	746	687	755	717	681	713	638	725	6424
Patient Days	15208	15204	15813	14651	60876	5361	4951	5016	5305	5334	4929	4949	4900	5235	45980
ALOS	7.14	7.19	7.46	7.09	7.22	7.04	6.64	7.30	7.03	7.44	7.24	6.94	7.68	7.22	7.16
Exp LOS	6.73	6.84	7.22	7.60	7.09	7.47	7.20	7.33	7.52	7.44	7.40	7.72	8.25	7.85	7.57
LOS Index	1.06	1.05	1.03	0.93	1.02	0.94	0.92	1.00	0.93	1.00	0.98	0.90	0.93	0.92	0.95

Mortality

	FY 2013					FY 2014									
	Q1 2013	Q2 2013	Q3 2013	Q4 2013	FY 2013 Total	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	FY 2014 TD
Volume	2131	2114	2120	2067	8432	762	746	687	755	717	681	713	638	725	6424
# Deaths	60	59	60	45	224	21	9	15	14	17	16	18	10	13	133
Mort Rate	2.82%	2.79%	2.83%	2.18%	2.66%	2.76%	1.21%	2.18%	1.85%	2.37%	2.35%	2.52%	1.57%	1.79%	2.07%
Exp Mort	2.64%	2.89%	2.75%	2.96%	2.77%	3.28%	2.28%	3.45%	2.93%	3.00%	3.26%	2.94%	3.22%	2.84%	3.01%
Mort Index	1.07	0.98	1.03	0.76	0.96	0.84	0.53	0.63	0.63	0.79	0.72	0.86	0.49	0.63	0.69

30 Day Readmissions*

	FY 2013					FY 2014									
	Q1 2013	Q2 2013	Q3 2013	Q4 2013	FY 2013 Total	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	FY 2014 TD	
Live Discharges	2071	2055	2060	2022	8208	741	737	672	741	700	665	695	628	5579	
# Readmissions	355	313	359	313	1340	143	115	98	129	91	107	107	85	875	
Readmit Rate	17.14%	15.23%	17.43%	15.48%	16.33%	19.30%	15.60%	14.58%	17.41%	13.00%	16.09%	15.40%	13.54%	15.68%	

*Excludes readmissions for chemo, rehab, psych, radiation therapy, deliveries, dialysis

Case Mix Index

	FY 2013					FY 2014									
	Q1 2013	Q2 2013	Q3 2013	Q4 2013	FY 2013 Total	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	FY 2014 TD
Volume	2131	2114	2120	2067	8432	762	746	687	755	717	681	713	638	725	6424
CMI	2.60	2.73	2.82	2.78	2.73	2.72	2.66	2.87	2.85	2.89	2.87	2.71	3.10	2.99	2.85

Patient Safety Indicators

PSI	# Patients FY 13	# Patients FY 14 thru Mar
Death among Surgical	53	32
Foreign body left in during Procedure	1	0
Postop Hemorrhage or Hematoma	29	23
Postop Physio Metabol Derangement	7	2
Postop Respiratory Failure	45	24
Postoperative PE or DVT	29	23
Postoperative Sepsis	17	14
Postoperative Wound Dehiscence	7	3
Accidental Puncture or Laceration	28	19

Fig. 15.3 *Division level scorecards*. Using hospital resources that have access to system level data, scorecards can be generated that focus on efficiency metrics including length of stay and all-cause readmissions as well as quality metrics including mortality. Case mix index can be a surrogate marker for appropriate documentation and clinical documentation programs that may have been instituted

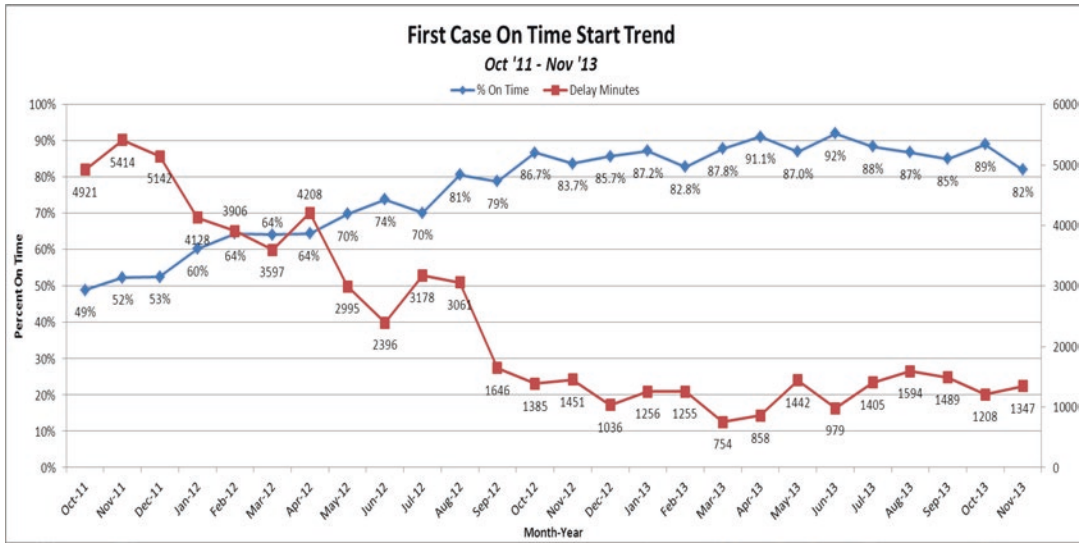


Fig. 15.4 *Surgeon-specific scorecards*. Surgeons should be able to see their own performance on a quarterly to semiannual basis. This can be provided through dedicated, secure web sites or in a written format. The data should include acceptable quality data bases including NSQIP and STS as well as institutional data. Mortality and peer review of clinical care should be included in the scorecard. HCAPS and patient complaints should be shared through this format. There should always be a peer comparison and a trend over time that can be reviewed

Master's in Operational Excellence or Business Administration which can take 2 years as mentioned earlier in the chapter (Table 15.1).

Management techniques from business and industry including Lean, Six Sigma and the Toyota Production System (TPS) have often been studied in relation to healthcare process improvement for many years [7–10, 13, 14, 19]. These techniques share common foundations such as maintaining respect for people and focusing on continuous improvement. But across approaches there also exists a tension between medical and business approaches to process improvement [15, 19, 20]. In practice, Lean and other process improvement methodologies must take into account the context and environments in which they are applied, with long-term success only possible if organizations can change behaviorally and culturally to embrace a focus on continuous improvement [57]. As a performance improvement process, for example, Lean philosophy calls for value creation through elimination of waste. These wastes are common in all industries and perhaps are most evident in healthcare [22, 23].

Innovation in Process Improvement: Engaging the Team

In traditional healthcare organizations, however, responsibility and accountability for patient safety, patient satisfaction, staff satisfaction, and operational efficiency have resided with senior leaders who are not clinically responsible for the patients. What is needed, in most instances, is a more grass roots approach that engages those on the front lines of healthcare to identify challenges, implement solutions, and sustain change in the areas of quality, patient safety, resource utilization, patient experience, and financial responsibility [58]. Really that should be termed continuous improvement rather than process improvement. The traditional model of rapid cycle improvement addresses one issue at a time, but teams outside the clinical area are likely to be less successfully sustained. We proposed a more bottom-up, grass roots approach that engages those on the front lines of healthcare to identify challenges, implement solutions, and sustain change in the areas of quality, patient safety, resource utilization, patient experience, and financial responsibility.

Status	Indicator	Peers Score	Target	SPC Alert	Current Period
A - Volume and Acuity					
▼	Ambulatory Surgery Cases	22	n/a		Q1 2014
▼	CMI	6.25	n/a		Q1 2014
▲	IP Discharges	85	n/a		Q1 2014
✕ ▲	IP LOS Index (Obs_Exp)	0.80	0.95		Q4 2014
▲	IP Procedures	215	n/a		Q1 2014
▼	Observation Cases	20	n/a		Q1 2014
▲	Outpatient Visits	400	n/a		Q1 2014
	Consult Volume	20	n/a		Q1 2014
B - Patient Care					
—	Missed Major Dx on Autopsy	0	n/a		Q1 2014
✕ ▼	IP Mort Index (Obs_Exp)	1.00	0.63		Q1 2014
▼	Mortalities Reviewed	11	n/a		Q1 2014
▲	Mortalities Sent for Peer Review	1.0	0		Q1 2014
▼	Mortality Peer Review #1 Score 4 or 5	0.00	n/a		Q1 2014
▼	Mortality Peer Review #2 Score 4 or 5	0.00	n/a		Q1 2014
	Post Op Mortality in 48 Hrs	0.00	n/a		Q1 2014
▲	Quality Management Events	1.00	n/a		Q1 2014
▼	Quality Management Events - Standard of Care Not Met	0.00	n/a		Q1 2014
✕ ▲	ReAdmit 30 Days (All Cause)	11.3%	10.60%		Q1 2014
▲	PSI 15 Accidental Puncture/Laceration	0.33	5		Q1 2014
—	PSI 6 Iatrogenic Pneumothorax	0.00	n/a		Q1 2014
—	PSI 9 Postop Hemorrhage/Hematoma	1.00	2		Q1 2014
—	STS - Mortality Risk Adjusted Index (ISO AVR)	0.00	n/a		Q1 2014
—	STS - Mortality Expected Rate (ISO AVR)	0.0%	n/a		Q1 2014
★ —	STS - Mortality (ISO AVR)	0.0%	1.7%		Q1 2014
✕ ▲	STS - Complication Stroke Permanent (ISO AVR)	2.3%	1.3%		Q1 2014
★ —	STS - Deep Sternal Infection (ISO AVR)	0.0%	0.3%		Q1 2014
★ —	STS - PostOp Renal Failure (ISO AVR)	0.0%	1.6%		Q1 2014
★ —	STS - ReOp for Graft Occlusion (ISO AVR)	0.0%	0.1%		Q1 2014
★ —	STS - Tamponade Requiring ReOp (ISO AVR)	0.0%	2.6%		Q1 2014

Status	Indicator	Peers Score	Target	SPC Alert	Current Period
▲	STS - Mortality Risk Adjusted Index (ISO CAB)	0.73	n/a		Q1 2014
▲	STS - Mortality Expected Rate (ISO CAB)	1.5%	n/a		Q1 2014
✕ ▲	STS - Mortality (ISO CAB)	1.9%	1.5%		Q1 2014
✕ ▲	STS - Complication Stroke Permanent (ISO CAB)	2.1%	1.4%		Q1 2014
✕ ▼	STS - PostOp Renal Failure (ISO CAB)	2.2%	1.9%		Q1 2014
✕ ▲	STS - ReOp for Graft Occlusion (ISO CAB)	1.0%	0.3%		Q1 2014
★ —	STS - Tamponade Requiring ReOp (ISO CAB)	0.0%	1.6%		Q1 2014
✕ ▼	STS - Mortality All Cases	2.0%	1.8%		Q1 2014
—	PSI 12 DVT/PE	3	n/a		Q1 2014
—	PSI 14 PostOp Wound Dehiscence	0.00	n/a		Q1 2014
✕ ▼	SSI CABG Procedures	2.0%	1.49%		Q1 2014
✕ ▲	STS - Deep Sternal Infection (ISO CAB)	05%	0.4%		Q1 2014
C - Medical and Clinical Knowledge					
—	Formal Peer Reviews	0.00	n/a		Q1 2014
E - Interpersonal and Communication					
—	Patient Complaints	0.00	n/a		Q1 2014
★ ▼	Patient Satisfaction (IP-HCAHPS) Score Avg	90%	85.2%		Q1 2014
▲	Patient Satisfaction (IP-HCAHPS) Survey Count	25	85		Q1 2014
✕ ▼	Patient Satisfaction (MedOff-CGCAHPS) Score Avg	92%	96.0%		Q1 2014
▲	Patient Satisfaction (MedOff-CGCAHPS) Survey Count	20	n/a		Q1 2014
F - Systems Based Practice					
	Consult TAT Comply Rate	95%	n/a		Q1 2014
	Consult TAT Comply in 24hr Rate	93%	n/a		Q1 2014

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SPC Alert Legend

Most recent period is below Lower Control Limit
Most recent period is above Upper Control Limit
Process shift: Most recent 8 periods are all above the Center Line
Process shift: Most recent 8 periods are all below the Center Line
Most recent 6 periods are all increasing
Most recent 6 periods are all decreasing
Green border: The alert is in a positive direction
Red border: The alert is in a negative direction
No border: There is no target direction for the indicator

Fig. 15.5 *Quality metrics and incentives*. Working with the CEO of the health system, quality, patient safety, and efficiency goals have been established. One year and 3 year goals have been established. The responsible party for the success of these goals is listed and includes the CMO, CQO, CFO, CEO, and department chairs. These goals are then used in the compensation and incentive basis of key leader contracts

As performance and quality improvement are important elements of all population health management approaches, we sought to explore how a performance improvement strategy focused on patient safety improvement could be developed and deployed in a large academic medical center. Operations councils were created that were an extension of the process improvement models, including Lean and Six Sigma, because they employ traditional process improvement techniques with a focus on building a collaborative culture that incorporates front line staff in the process.

Each Operations Council identified a facilitator who was part of the front line staff that could dedicate time to being trained as a Yellow Belt Lean Six Sigma facilitator while still staying clinically active. The facilitators were nurses, pharmacists, and technicians. The facilitators completed Lean Six Sigma Yellow Belt training through Ohio State's Fisher College of Business in their first year of Operations Council deployment. All process improvement projects had to be in alignment with the health system key result areas of Innovation and Strategic Growth, Productivity and Efficiency, Quality, and Service and Reputation.

Overall, Operations Councils have reduced medication harm events, mortality, and patient safety events among patients who arrive with life-threatening and difficult care issues, contributing to

VBP Metrics	Baseline Year 1 (FY14)	Baseline Year 2 (Threshold) FY2015	Year 1 Goal	Stretch Goal	Responsible Parties
PSI 90	0.65	0.64	0.62	0.59	ALL
HCAHPS Overall Rating	73.7%	75.3%	79.4%	84.6%	ALL
HCAHPS Doctor Communication	80.5%	81.1%	82.8%	85.2%	ALL
HCAHPS Nurse Communication	81.0%	80.3%	81.0%	83.5%	CMO, CNO, CNE, CQO
AMI 30 Day Mortality	0.96	1.07	0.93	0.81	CQO, CMO, CEO
PC-Elective Delivery Prior to 39 weeks	5.7%	3.4%	2.9%	2.1%	CQO, CMO, CEO
CAUTI	1.634	1.156	0.854	0.00	ALL
SSI Colon Surgery	1.028	0.982	0.751	0.00	ALL
Medicare Spending Per Beneficiary VBP Points	0.997	0.998	0.98	0.82	ALL
Readmissions CHF	18.9%	22.0%	18.3%	16.2%	CQO, CMO, CEO, UH
Readmissions AMI	11.8%	11.2%	9.6%	8.1%	CQO, CMO, CEO
Readmissions PN	16.6%	14.9%	11.6%	9.9%	CQO, CMO, CEO, UH
Readmissions COPD	18.8%	19.9%	15.9%	13.2%	CQO, CMO, CEO
Readmissions HIP and KNEES	3.9%	2.9%	2.5%	1.8%	CQO, CMO, CEO
Total Falls per 1000 patient days	2.10	1.64	1.55	1.15	CMO, CNO, CNE, CQO
Injury Falls per 1000 patient days	0.37	0.32	0.28	0.15	CMO, CNO, CNE, CQO
ALOS Index	0.99	0.98	0.97	0.94	ALL

Fig. 15.6 *On time start improvements as a result of front line engagement*. As a result of countermeasures put in place by the key stakeholders of the process in the perioperative arena, the on time start times improved from 35% to over 80%. The number of delay minutes has dropped from a peak of 5414 to 1347 min. Sustainability will be ensured by continuous monitoring and establishing accountability

a 22% reduction in patient safety events across the entire medical center over the past 2 years [31, 34].

In the perioperative arena, the Operations Councils have been trying to improve on time starts. By approaching this age-old problem from the front line, surgeons and nurse engagement was assured and facilitated the preoperative readiness, continuous measurement and feedback, leveraged informatics support and continuous cost analysis of delays. As a result of countermeasures put in place by the key stakeholders of the process in the perioperative arena, the on time start times improved dramatically across the entire medical system from 35% to over 80% (Fig. 15.6). The number of delay minutes has dropped from a peak of 5414 to 1347 min. Sustainability will be ensured by continuous monitoring and establishing accountability.

Performance Management and Accountability

Managing the Tension Between Quality, Efficiency, and Patient Satisfaction

With the passage of the Affordable Care Act authorizing the use of Hospital Value-Based Purchasing (HVBP) contracts, the landscape for hospital reimbursement has again changed. The Centers for Medicare & Medicaid Services (CMS) HVBP program now reimburses hospitals for an increasing number of patient experience elements, including measures of both quality and patient satisfaction. This has led to segmentation of the concept of patient experience.

For example, US healthcare systems tend to have a variety of departments that govern the patient experience. Although all health system leaders are tasked to improve HVBP measures, the involvement of these different leaders perpetuates the problems of a fractured health system as each tries to maximize his or her piece of the reimbursement pie. Thus, although the elements of patient experience may be interconnected, the result of this varied involvement promotes siloed thinking because of competing priorities.

Despite the ostensible aim of CMS to be inclusive of all elements of quality, the result of HVBP contracts in most health systems is fragmentation of the quality goal instead of encouraging consideration of a holistic patient experience.

The pressures of HVBP have created a tension among the organizational priorities of safety, efficiency, and patient satisfaction. We propose that the solution to this problem is to incentivize a cultural shift within healthcare systems toward

patient-centered care (PCC), possibly through including PCC measures in the CMS HVBP formula. There is evidence that PCC improves clinical outcomes and patient experiences, and PCC can be justified on the basis of a business case [5]. Yet PCC requires a change in organizational culture from being "provider focused" or "reimbursement focused" to "patient focused," and this can only occur with the engagement of top leadership and a strategic vision that prioritizes PCC [6]. To make this change within their organizations, health system managers should focus on improving meaningful communication between patients and hospital staff, including requiring staff training in PCC and communication skills. Additionally, within the healthcare delivery system there is an opportunity and need to establish patient expectations [53, 54].

As healthcare organizations make the transition to value from volume considerations, we must stay true to the core of our missions and consider the many aspects of patient experience including patient safety, satisfaction, and quality. By integrating and not segregating these elements, we can keep in mind the true, multidimensional experience of patients [59, 60].

Dash Boarding and Bench Marking for Surgeons and Departments

There are many quality and patient safety metrics for which surgeons can be held accountable. Ideally, these should be in alignment with the institutional goals, and the targets should be set in keeping with system expectations (Table 15.4). Each division should have goals as seen in Fig. 15.3 and then each cardiac surgeon and general surgeon should also have goals as detailed in Fig. 15.4. The surgeon-specific metrics must be set in relation to his/her peers and be measured no more than every quarter. Every surgeon should have access to his/her data and the division head and department Chair should attest to having reviewed them every 6 months. Surgeons should be able to help influence their metrics to which they are held accountable, and be part of the process improvement projects that influence their success. Lastly, in as much as registry data is clinically validated and within the realm of surgeon control, it should be used as much as possible in the benchmarking for surgeons relative to their peers both institutionally as well as nationally. The level of transparency is somewhat dependent on the state in which the medical center is found, but more transparency drives more improvement in that surgeons are naturally proud and competitive.

Incentives and Compensation Aligned with Outcomes

There are many models of incentive and compensation and each institution will have their own. One example of a scorecard that aligns institution goals with 1 and 3 year success and assignment of responsible parties is seen in Fig. 15.5. While the incentive model of metric success has long been used, more CEO and Chairmen are moving toward at-risk dollars that are only captured with successful attainment of goals [61]. Among some key top institutions, performance-based pay is more prevalent in primary care than in subspecialties, and the most consistently identified performance domains are quality, service, productivity, and citizenship. Interviewed organizations tie a relatively low percentage of total compensation to performance. Procedural specialties often remained RVU or adjusted RVU based for all forms of compensation. At the Cleveland Clinic, Mayo Clinic, and Iora Health, for example, physicians are 100 % salaried. At Group Health and Kaiser Permanente (Southern California) more than 90 % of total physician compensation is salary. Importantly, even organizations that tie little or no compensation to performance attempted to track and encourage performance on a variety of metrics by conducting internal performance reviews. Furthermore, performance data for individual physicians is transparent in most systems; physicians are able to see their own performance and rank, as well as that of their colleagues.

At most organizations, senior leaders set overarching strategic aims, and then work closely

with front line physicians and department chiefs to develop fair and meaningful performance metrics. Most organizations use a combination of group and individual metrics to make allocation decisions about compensation. Across large systems, the most consistent performance domains are quality, service, productivity (generally measured by RVUs), and teamwork or citizenship. Most organizations have less than 10% of total compensation at risk, with payments distributed across three to five different domains, each containing several metrics but that consistently approaches with many metrics—and little at-risk compensation for each metric offers weak incentive to achieve any particular goal [61].

Future Leadership in Value-Based Care

Academic Development of Administrative Roles and Outcome Researchers

Surgeons have the unique ability to influence healthcare. As clinicians, innovators, and researchers, we can help to formulate how we will be measured and set forward standards to which we need to adhere. As such, more and more surgeons are taking on administrative roles, both large and small, in hospitals and healthcare systems [63]. To that end, surgeons need basic training in management techniques and tools, as well as the support of leadership to enable them to succeed. The time spent in administrative roles must be seen as important as in the operating room when these surgeon-administrators are able to influence the outcomes and efficiencies of a healthcare environment. With the current value-based care transformation paradigm, the time for change is upon us and we must train and enable our future surgeons and junior faculty to not only understand the changing landscape but to also be able to influence it. In addition to leadership support for this new type of surgeon-leader, there must be some basic infrastructure in place in every surgical department including data analytics for both quality and financial outcomes. As leaders we can only influence what we can measure; and measurement and change is the responsibility of the CSQO as well as surgeon-leaders who are facilitating administrative changes needed for the healthcare of tomorrow.

Succession Planning for Quality Leaders

Despite tremendous advances in healthcare, we continue to fall short in providing the best care to surgical patients. No one surgeon can fix or transform healthcare and we are now on a journey from systems organized around individual surgeons to a team-based approach focused on patients and families [14]. Surgeons must be part of this revolution and engage in the shared purpose of providing value-based care to all patients. Engaging surgeons in change requires clarification of goals and defining value-based care—ultimately, patients must be first in the equation. Interprofessional care should be the standard to which the CSQO adheres and should really foster the training and development of not only faculty but also medical students and residents, so they take away the right attitudes towards patient care and how to get to reliable outcomes [42, 64]. The ACGME has established the Clinical Learning Environment Review (CLER) program as a key component of the Next Accreditation System with the aim to promote safety and quality of care by focusing on six areas important to the care in teaching hospitals and to the care residents will provide during a lifetime of practice after completion of training. The six areas encompass engagement of residents in patient safety, quality improvement and care transitions, promoting appropriate resident supervision, duty hour oversight and fatigue management, and enhancing professionalism [39, 42, 44]. With current medical student curriculum development and resident requirements, the CSQO should lead by example; engaging all members of the team, both early and late career surgeons, so that our transformation to provide

truly value-based care is sustainable. We should pay special attention to the learns transitions of surgical trainees as they progress from students to residents and fellows and onto full fledged surgeons [62].

Key Points

- Medical errors most often evolve as a consequence of more than one simultaneously co-occurring contributing factor.
- In patient safety, identification of opportunities for improvement is more productive than assigning blame.
- There are many examples of how patient safety can be improved by instituting coordinated approaches to error identification and reduction.
- The role of leadership is essential in promoting and maintaining the culture of patient safety.
- Among evolving trends is the increasing direct involvement of patients and their families in safety initiatives.

References

1. Grover FL, Johnson RR, Shroyer AL, Marshall G, Hammermeister KE. The veterans affairs continuous improvement in cardiac surgery study. Ann Thorac Surg. 1994;58(6):1845–51.
2. Khuri SF, Daley J, Henderson W, Hur K, Demakis J, Aust JB, Chong V, Fabri PJ, Gibbs JO, Grover F, Hammermeister K, Irvin 3rd G, McDonald G, Passaro Jr E, Phillips L, Scamman F, Spencer J, Stremple JF. The Department of Veterans Affairs' NSQIP: the first national, validated, outcome-based, risk-adjusted, and peer-controlled program for the measurement and enhancement of the quality of surgical care. National VA Surgical Quality Improvement Program. Ann Surg. 1998;228(4):491–507.
3. Kohn KT, Corrigan JM, Donaldson MS. To err is human: building a safer health system. Washington, DC: National Academy Press; 1999.
4. Davis R, Barach P. Increasing patient safety and reducing medical error: the role of preventive medicine. Am J Prev Health. 2000;19(3):202–5.
5. Landrigan CP, Rothschild JM, Cronin JW, et al. Results of reducing intern's work hours on serious medical errors in intensive care units. N Engl J Med. 2004;351(18):1838–48.
6. Campbell EG, Singer S, Kitch BT, Iezzoni LI, Meyer GS. Patient safety climates in hospitals: act locally on variations across units. Jt Comm J Qual Patient Saf. 2010;36(7):319–26.
7. Leape LL, Berwick DM. Five years after to err is human. What have we learned? JAMA. 2005;293:2384–90.
8. Liao JM, Etchegaray JM, WIliams ST, Berger DH, Bell SK, Thomas EJ. Assessing medical students' perception of patient safety: the medical student safety attitudes and professionalism survey. Acad Med. 2014;89:343–51.
9. Perez B, Knych SA, Weaver SJ, Liberman A, Abel EM, Oetjen D, Wan TTH. Understanding the barriers to physician error reporting and disclosure: a systemic approach to a systemic problem. J Patient Saf. 2014;10:45–51.
10. Frankel AS, Leonard MW, Denham CR. Fair and just culture, team behavior, and leadership engagement: the tools to achieve high reliability. Health Serv Res. 2006;41(4 Pt 2):1690–709.
11. Mohr J, Abelson H, Barach P. Leadership strategies in patient safety. J Qual Manag Health Care. 2003;11(1):69–78.
12. Mohr J, Batalden P, Barach P. Integrating patient safety into the clinical microsystem. Qual Saf Healthcare. 2004;13:34–8.
13. Bennis WG, Thomas RJ. Leading for a lifetime. Boston: Harvard Business School Press; 2007.
14. Rose J, et al. A leadership framework for culture change in healthcare. Jt Comm J Qual Patient Saf. 2006;32(8):433–42.
15. White SV. Interview with a quality leader: Kent Bottles, MD, President of ICSI, on transforming care for the future. Interview by Susan V. White. J Healthc Qual. 2010;32:31–8.
16. Sanchez J, Barach P. High reliability organizations and surgical microsystems: re-engineering surgical care. Surg Clin N Am. 2012;92(1):1–14. doi:10.1016/j.suc.2011.12.005.
17. Phelps G, Barach P. Why the safety and quality movement has been slow to improve care? Int J Clin Pract. 2014;68(8):932–5.
18. Johnson J, Barach P. Quality improvement methods to study and improve the process and outcomes of pediatric cardiac surgery. Prog Pediatr Cardiol. 2011;32:147–53.
19. Vincent C, Moorthy K, Sarker SK, et al. Systems approaches to surgical quality and safety: from concept to measurement. Ann Surg. 2004;239:475–82.
20. Hu Y-Y, Arriaga AF, Roth EM, et al. Protecting patients from an unsafe system: the etiology and recovery of intra-operative deviations in care. Ann Surg. 2012;256(2):203–10.
21. Bognar A, Barach P, Johnson J, Duncan R, Woods D, Holl J, Birnbach D, Bacha E. Errors and the burden of errors: attitudes, perceptions and the culture of safety in pediatric cardiac surgical teams. Ann Thorac Surg. 2008;4:1374–81.

22. Institute of Medicine. Crossing the quality chasm: a new health system for the 21st century. Washington, DC: The National Academies Press; 2001.
23. Mallet R, Conroy M, Saslaw LZ, Moffatt-Bruce S. Preventing wrong site, procedure and patient events using a common cause analysis. Am J Med Qual. 2012;27(1):21–9.
24. Cima RR, Brown MJ, Hebl JR, et al. Use of lean six sigma methodology to improve operating room efficiency in a high-volume tertiary-care academic medical center. J Am Coll Surg. 2011;213(1): 83–92.
25. Stawicki SP, Cook CH, Anderson 3rd HL, Chowayou L, Cipolla J, Ahmed HM, Coyle SM, Gracias VH, Evans DC, Marchigiani R, Adams RC, Seamon MJ, Martin ND, Steinberg SM, Moffatt-Bruce SD. Natural history of retained surgical items supports the need for team training, early recognition, and prompt retrieval. Am J Surg. 2014;208(1):65–72.
26. Musson D, Helmreich RL. Team training and resource management in healthcare: current issues and future directions. Harvard Health Policy Rev. 2004;6(1):25–35.
27. Dunn EJ, Mills PD, Neily J, et al. Medical team training; applying crew resource management in the Veterans Health Administration. Jt Comm J Qual Patient Saf. 2007;33(6):317–25.
28. Neily J, Mills PD, Young-Xu Y, et al. Association between implementation of a medical team training program and surgical mortality. JAMA. 2010;304: 1693–700.
29. Haynes AB, Weiser TG, Berry WR, et al. A surgical safety checklist to reduce morbidity and mortality in a global population. N Engl J Med. 2009;360: 491–9.
30. Salas E, Baker D, King H, Battles J, Barach P. On teams, organizations and safety. Jt Comm J Qual Saf. 2006;32:109–12.
31. Moffatt-Bruce SD, Hefner JL, Mekhjian H, McAlearney JS, Latimer T, Ellison C, McAlearney AS. What is the return on investment for implementation of a crew resource management program at an academic medical center? Am J Med Qual. 2015. pii: 1062860615608938; epub ahead of print.
32. Cassin B, Barach P. Making sense of root cause analysis investigations of surgery-related adverse events. Surg Clin N Am. 2012:1–15. doi:10.1016/j.suc.2011.12.008.
33. Johnson J, Haskell H, Barach P, editors. Case studies in patient safety: patients and providers. Jones and Bartlett Learning; 2015. ISBN: 9781449681548.
34. Provost L, Murray S. The data guide. Associates in Process Improvement and Corporate Transformation Concepts: Austin, TX; 2007.
35. Cassin B, Barach P. Balancing clinical team perceptions of the workplace: applying 'work domain analysis' to pediatric cardiac care. Prog Pediatr Cardiol. doi:10.1016/j.ppedcard.2011.12.005.
36. Reason JT. Managing the risk of organization accidents. Brookfield, VT: Ashgate; 1997.
37. Singer SJ, et al. The culture of safety: results of an organization-wide survey in 15 California hospitals. Qual Saf Health Care. 2003;12(2):112–8.
38. Dekker S. Just culture: balancing safety and accountability. Aldershot, England: Ashgate; 2007. xii, 153 p.
39. Bell SK, et al. Accountability for medical error: moving beyond blame to advocacy. Chest. 2011;140(2):519–26.
40. Frankel A, et al. Patient safety leadership walkrounds. Jt Comm J Qual Saf. 2003;29(1):16–26.
41. Gluck PA. Physician leadership: essential in creating a culture of safety. Clin Obstet Gynecol. 2010;53(3):473–81.
42. Singh R, et al. A comprehensive collaborative patient safety residency curriculum to address the ACGME core competencies. Med Educ. 2005;39(12):1195–204.
43. Cady RF. Strategies for leadership: nursing leadership for patient safety. JONAS Healthc Law Ethics Regul. 2005;7(1):1.
44. Colla JB, et al. Measuring patient safety climate: a review of surveys. Qual Saf Health Care. 2005;14(5):364–6.
45. Jones KJ, et al. The AHRQ hospital survey on patient safety culture: a tool to plan and evaluate patient safety programs. In: Henriksen K et al., editors. Advances in patient safety: new directions and alternative approaches (Vol. 2: Culture and redesign). Rockville, MD: Agency for Healthcare Research and Quality; 2008.
46. Frankel A, et al. Patient safety leadership walkrounds at partners healthcare: learning from implementation. Jt Comm J Qual Patient Saf. 2005;31(8):423–37.
47. Smith EA, Akusoba I, Sabol DM, Stawicki SP, Granson MA, Ellison EC, Moffatt-Bruce SD. Surgical safety checklist: productive, nondisruptive and the "right thing to do". J Postgrad Med. 2015;61(3):214–5.
48. Moffatt-Bruce S, Hefner J, Nguyen MC. What is new in critical illness and injury science? Patient safety amidst chaos: are we on the same team during emergency and critical care interventions? Int J Crit Illn Inj Sci. 2015;5(3):135–7.
49. Landrigan CP, Parry GJ, Bones CB, Hackbarth AD, Goldman DA, Sharek PJ. Temporal trends in rates of patient harm resulting from medical care. N Engl J Med. 2010;363:2124–34.
50. Urbach DR, Goveindarahan A, Saskin R, Wilton AS, Baxter NN. Introduction of surgical safety checklists in Ontario, Canada. N Engl J Med. 2014;370(11): 1029–38.
51. Phelps G, Barach P. In response to Buist article. BMJ 2013:347 "What went wrong with the quality and safety agenda?". http://www.bmj.com/content/347/bmj.f5800/rr/666499.
52. Wale JB, Moon RR. Engaging patients and family members in patient safety—the experience of the New York City Health and Hospitals Corporation. Psychiatr Q. 2005;76(1):85–95.
53. Reid Ponte P, et al. Linking patient and family-centered care and patient safety: the next leap. Nurs Econ. 2004;22(4):211–3. 215.
54. Furman C, Caplan R. Applying the Toyota Production System: using a patient safety alert sys-

tem to reduce error. Jt Comm J Qual Patient Saf. 2007;33(7):376–86.
55. Cooper DS, Jacobs JP, Chai PJ, Jaggers J, Barach P, Beekman RH, Krogmann O, Manning P. Pulmonary complications associated with the treatment of patients with congenital cardiac disease: consensus definitions from the Multi-Societal Database Committee for Pediatric and Congenital Heart Disease. Cardiol Young. 2008;18 Suppl 2:215–21.
56. Bacha EA, Cooper D, Thiagarajan R, Franklin RC, Krogmann O, Deal B, Mavroudis C, Shukla A, Yeh T, Barach P, Wessel D, Stellin G, Colan SD. Cardiac complications associated with the treatment of patients with congenital cardiac disease: consensus definitions from the Multi-Societal Database Committee for Pediatric and Congenital Heart Disease. Cardiol Young. 2008;18 Suppl 2:196–201.
57. Omachonu V, Barach, P. Quality Function Development (QFD) in a Managed Care Organization. Qual Prog 2005:36–41.
58. Winlaw D, d'Udekem Y, Barach P. Where to now for paediatric surgery? ANZ J Surg. 2011;81:659–60.
59. Moffatt-Bruce S, Hefner JL, McAlearney AS. Facing the tension between quality measures and patient satisfaction. Am J Med Qual. 2015;30(5):489–90.
60. Senot C, Chandrasekaran A, Ward PT, Tucker AL, Moffatt-Bruce SD. The impact of combining conformance and experiential quality on hospitals' readmissions and cost performance. Manag Sci. 2015.
61. Khullar D, Kocher R, Conway P, Rajkumar R. How 10 leading health systems pay their doctors. Healthc (Amst). 2015;3(2):60–2.
62. Warm E, Englander R, Pereira A, Barach P. Medical education learner handovers: an improvement model (CLASS), Acad Med, 2016.
63. Satiani B, Sena J, Ruberg R, Ellison EC. Talent management and physician leadership training is essential for preparing tomorrow's physician leaders. J Vasc Surg. 2014;59(2):542–6.
64. Vohra P, Daugherty C, Mohr J, Wen M, Barach P. Housestaff and medical student attitudes towards adverse medical events. Jt Comm J Qual Patient Saf. 2007;33:467–76.