Improvement Collaborative Tool Kit

The MSQC LHS Model

MSQC
Michigan Surgical Quality Collaborative

The purpose of this toolkit is to describe the concept of an improvement collaborative as a Learning Health System and how it has been operationalized to accelerate and disseminate improvement of clinical practice in the Michigan Surgical Quality Collaborative (MSQC).

If you have any questions or need additional information please contact us at **MSQCCustomerSupport@med.umich.edu**. We hope you find this toolkit helpful!

The MSQC Team

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Krapohl, GL., Schoeni, M., Hemmila, M., Hendren, S., Bishop, K., Rocker, C., Fasbinder, L., Rogers, R., Spencer, S., Englesbe, MJ., Campbell, DA. The Collaborative Improvement Toolkit: The Michigan Surgical Quality Collaborative (MSQC) Learning Health System Model. https://msqc.org/collaborativeimprovementtoolkit/*: Ann Arbor, MI: University of Michigan. Updated April 2019.*

I. The Improvement Collaborative as a Learning Health System for Healthcare Quality Improvement and Patient Safety

Keeping up with changing healthcare evidence and practices is challenging even for the best organizations. Hospitals must stay abreast of clinical quality metrics and manage the growing burden of administrative reporting requirements to avoid financial penalties for noncompliance. In short, the ability to understand how to successfully monitor and improve healthcare quality/patient safety is critical to an organization. Building on the foundation of quality improvement systems in other industries, such as Continuous Quality Improvement (CQI) and Total Quality Management (TQM), many healthcare organizations are attempting to tackle this challenge by creating a Learning Health System (LHS) infrastructure. The LHS is grounded in the belief that there is an opportunity to "learn from every patient." This requires a data, analysis, and action infrastructure that can respond in real time to accelerate improved performance and the adoption of best practices (Friedman et al., 2017; Smoyer, Embi, & Moffatt-Bruce, 2016). The National Academy of Medicine (NAM) is advocating the LHS for integrating the key concepts of developing a culture of learning, sharing knowledge, and accelerating improvement (Olsen, Aisner, & McGinnis, 2007). See Figure 1 for core characteristics of a LHS (Friedman et al., 2017).

For purposes of this paper, Healthcare Quality Improvement and Patient Safety are synonymous; Healthcare quality is patient safety and patient safety is quality healthcare.

Five Characteristics of a Learning Health System (LHS)

1. Each patient represents a learning opportunity to do better (learn from every patient)
2. Knowledge (data) supports decisions
3. Improvement is continuous and ongoing
4. Can happen routinely and with economy of scale
5. Culture

FIGURE 1: Five Characteristics of a LHS

An example of a type of LHS that continues to gain momentum for its ability to share knowledge and rapidly disseminate change is the formation of an improvement collaborative. Formation of an improvement collaborative is a strategy whereby teams from different organizations work together with the purpose of improvement the process, quality, or efficiency of a targeted area with the intention of rapid spread and dissemination (USAID, 2008). Harnessing together the knowledge from diverse teams, experiences, and additional resources, a collborative seeks to accelerate improvement and collapse the gap in adoption of evidence-based medicine from years to months. In addition, a collaborative builds an infrastructure of learning that may not structurally exist in traditional quality improvement approaches. All of these goals can be accomplished with an economy of scale that is unmatched within a single organization (AHRQ, 2014; USAID, 2008).

Background

The collaborative approach for healthcare quality improvement was pioneered in the early 1990s with parallel efforts by the Department of Veterans Affairs National Surgical Quality Improvement Program (VA-NSQIP) and the Northern New England Cardiovascular Disease Study Group (Khuri, 2005; Schouten, Hulscher, van Everdingen, Huijsman, & Grol, 2008). The VA-NSQIP was a national system for surgical outcomes measurement that employed risk adjustment to make fair comparisons between institutions. The Northern New England Cardiovascular group was a regional group focused on decreasing mortality in cardiac surgery, employing close collaboration between surgical teams to establish and share best perioperative care and technical practices. Both of these programs resulted in significant reductions in surgical mortality (Khuri et al., 1998; Schouten et al., 2008). VA-NSQIP established the type of data and analysis required; the regional collaborative showed that providers could learn and improve through sharing best practices.

Stimulated by the success of these programs, the professional association of the American College of Surgeons (ACS) developed the National Surgical Quality Improvement Program (NSQIP)(Khuri, 2005). Other commercial entities with similar

visions for improving healthcare quality were established, such as the University Health System Consortium for academic medical centers and The Leap Frog Group. In the 1990s, the IC approach was incorporated into the Institute of Healthcare Improvement (IHI) Breakthrough Series BTS as a springboard for an IC approach to several healthcare problems (Nadeem, Olin, Hill, Hoagwood, & Horwitz, 2013) 2013). Governments as well as nongovernmental organizations have likewise sponsored improvement programs with a public health focus based on IC strategies (AHRQ, 2014; de Silva, 2014; USAID, 2008).

In 2004, building on the success of the national programs, Blue Cross and Blue Shield of Michigan/Blue Care Network (BCBSM/BCN) incorporated regional collaborative improvement as a major component of its Value Partnership program and began supporting the initiation of new regional, state-based ICs in several specialty areas (BCBSM Value Partnerships, 2019). These regional ICs, some of which are adjuncts to large national programs, have advantages over national efforts in that they are more agile, foster grassroots participation, and offer a more accessible and personal hands-on approach to management (Hemmila & Jakubus, 2017).

Improvement collaboratives differ from single center initiatives (or “closed quality improvement”) in both organization and structure. In general, the distinguishing features of a collaborative model of quality improvement include an organizing/coordinating center, a governing body, clinical expertise, at least 5 participating sites (hospitals, departments, or specialty groups), and the ability to share data.

Elements Critical to the IC LHS

Whether the improvement collaborative is large or small, focused regionally or nationally, or focused on one disease or many, there are distinguishing features common to all (AHRQ, 2014; de Silva, 2014; USAID, 2008). Below are the elements that we have found essential to our collaborative, the Michigan Surgical Quality Collaborative (MSQC).

A Culture of Trust and Respect

A culture of trust and respect among collaborative members is paramount. The ability to share ideas, promulgate successes, participate in discussions, and share data is enabled by a culture of respect and trust. In our experience, while participating hospitals may be competitors for business, that is not the case for improving quality and patient safety; participants willingly share best practices cross-agency and without restraint. A non-competitive, trusting environment is commonplace; never has there been a situation where one site is using their data against another hospital.

Building this type of culture begins with strong leaders and well-defined policies and procedures. Leaders who are experienced, passionate, and dedicated provide the vision and inspiration for establishing trust and respect. In parallel, clear policies and procedures should be in place, and clear expectations should be set. Legal procedures and specifications for the sharing of data or business associate agreements for the assistance of vendors are often a time-limiting but necessary step. Because sharing data among competing institutions is sensitive, achieving the status of a Patient Safety Organization (PSO) can further guarantee the highest protections of data security and use (MSQC, 2017).

Support and Infrastructure

While the vision and strategic direction of the collaborative is accomplished by the leadership and/or governing body, a centralized coordinating center is necessary for providing the operational management of the program activities. The scope of work for our improvement collaborative is categorized into four main core components that provide the foundation for strong program structure and management. These core components are:

1. Business Operations – Contractual arrangements, internal and external communications, funding, budget, data safety and security, vendor management, and administrative support.
2. Clinical Coordination – Clinical data collection activities to include data definitions, training/education, and inter-rater reliability.
3. Quality Improvement – Quality management expertise to support QI teams at the sites. Knowledge of regulatory and quality reporting requirements and updates to new measure specifications.
4. Data, Outcomes, & Analysis – Perform data assurance, management, and analysis.

Additional information: Organization and Structure

Reliable Data and Measurement Goals

Data-driven quality improvement is a pillar of a successful improvement collaborative. For reliable data, collaboratives may create new data collection systems or serve as an adjunct to another established data registry. If possible, and when necessary, data can be used from existing sources or other projects and not a stand-alone platform.

Regardless of the data used, it needs to be structured and standardized for easy comparison across the organizations of the collaborative (NQRN, 2016), and it must be reliable and valid. It is crucial to ensure that there are systems in place to check the data, since the results will be used to identify best practices (USAID, 2008). Front line clinicians will be quick to identify faulty data and dismiss findings if there are not systematic mechanisms in place for validation. At the hospital or aggregate level, the importance of sound, valid data to inform analysis is critical for success. It is important to note the distinction between a registry and an improvement collaborative; you don't have to be a registry to be an improvement collaborative, or vice versa. However, some type of standardized data measurement—though not necessarily data collection—is necessary for the improvement collaborative concept to achieve success.

Additional information: Data Collection and Validation

Audit and Feedback

Audit and Feedback occurs on two levels, at the collaborative level between sites and organizations and also at the individual provider level. From a collaborative level, sites are able to benchmark and chart their progress on measured goals. Their performance and improvement should be risk and reliability adjusted so that it is comparable among other sites. Progress is monitored, and feedback is provided at regular and frequent intervals via paper reports or analytic platforms. When an improvement project involves specific practice requirements, such as surgical outcomes, feedback can be provided at the individual surgeon or physician level. In comparison with organizational feedback, individual feedback may even be more effective, since it provides a "community of practice"(Fung-Kee-Fung et al., 2009) that can help engage clinicians and nurture increased learning opportunities within professional practice.

Additional information: Data Analysis and Reporting

Shared Learning

A defining feature of an improvement collaborative —and one that is also a characteristic of a LSH—is the practice of sharing knowledge. Opportunities for sharing emerging science, practice-based experiences, and successes and failures have a powerful impact on quality improvement. Although passive opportunities for sharing knowledge exist, structured opportunities such as conference calls, meetings, webinars, workshops, forum discussions, and site visits can be more effective (AHRQ, 2014). Therefore, a coordinated annual calendar of opportunities to share knowledge and promote engagement and interaction among collaborative participants makes a type of "living laboratory" for learning and discovery. Shared learning also prevents "reinventing the wheel," which can occur when organizations are working on the same issues in parallel without learning from each other's successes and failures.

Additional information: Collaborative Meetings | Site Visits | Workshops

Accelerated Dissemination

Sharing knowledge and avoiding "reinventing the wheel" promote the efficient and effective spread and dissemination of improvement. The accelerated dissemination of operational and organizational knowledge beyond the initial organization or team is a hallmark of the improvement collaborative approach and distinguishes it from the traditional CQI models (USAID, 2008). A basic strategy for accelerated dissemination is an implementation toolkit. Published and updated as part of the coordinating center functions, implementation toolkits are a compendium of best-practices that members can access, thus reducing time spent on researching and compiling.

The infrastructure of an improvement collaborative also serves as a vehicle when a scale-up strategy for healthcare improvement is necessary. For example, timely interventions to combat the recent opioid epidemic demand a scale-up strategy that is both accelerated and efficient. Knowledge of how many prescription opioids are necessary for a routine colectomy surgery can be promulgated among the surgeons in the collaborative, and adoption of these practices can quickly reduce the amount of opioids in the community without impacting patient pain control, rate of readmission, or emergency department visits (MOPEN, 2019). Using the IC approach not only enables swift adoption of best practices, but also the capacity for practice-based learning to occur simultaneously.

The Positive Deviance Approach

Quality improvement projects within a collaborative often introduce new ideas and incorporate emerging science or new technologies. For projects looking to increase efficiency and streamline current processes, the "positive deviance" approach is employed: that is, a recognition of best practices that already exist within the collaborative so that they can be learned and replicated to produce similar favorable outcomes (Pascale & Sternin, 2005; Positive Deviance Initiative, 2016). The Positive Deviant approach, pioneered by the late Richard Pascale, Ph.D., and his colleagues, provides a foundation for improvement whereby best practices are identified from the "bottom-up"—and the top-down approach is jettisoned.

Change and ownership are generated within the collaborative. Inspiration to increase efficiencies, streamline current processes, and supplant dogma and fixed attitudes comes from positive examples. Thus, the Positive Deviance approach is well suited for the improvement collaborative model. With this approach as the underpinning, the coordinating center serves as a facilitator rather than an arbiter of the improvement process. All practitioners become students of the process. The coordinating center can facilitate the sharing of processes and tools, as well as arrange for mentoring relationships between sites. Thus, improvement is accelerated within the collaborative.

Additional information: The MSQC LHS Model

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II. The Michigan Surgical Quality Collaborative Learning Health System Model

Mirroring the features of the traditional "Plan, Do, Study, Act" (PDSA) approach to quality improvement and the LHS cycle, the MSQC Model incorporates multidimensional infrastructure to continuously learn, improve, and share/disseminate. Also built into the model is the capacity for innovation and discovery, where novel approaches to surgical quality improvement are captured. See Figure 2.

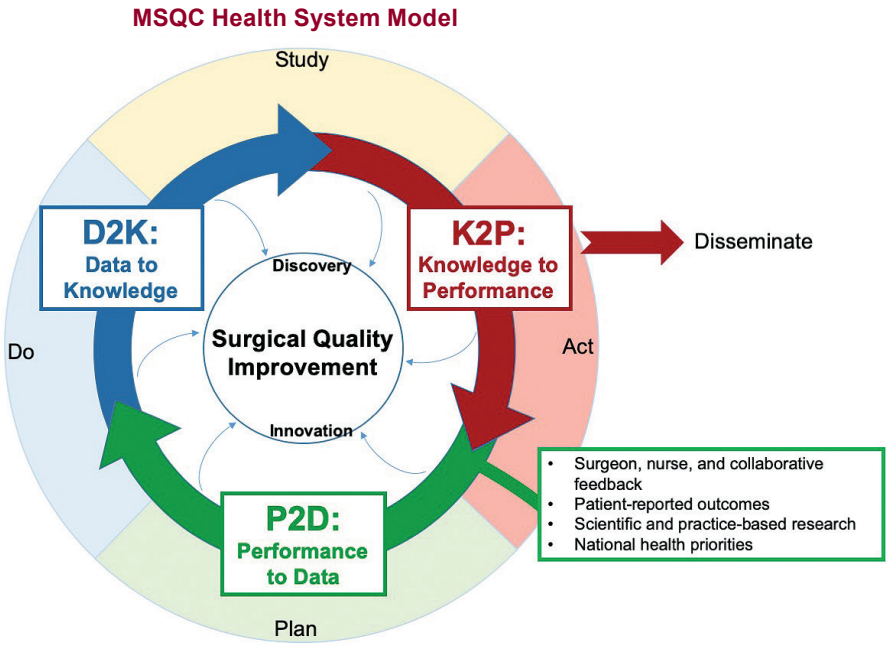

FIGURE 2: MSQC Learning Health System Model

Performance to Data

In concert with traditional models, the momentum of the MSQC learning system cycle begins with an exploration of emerging ideas, clinical questions, or improvement opportunities. Unlike other single-center improvement efforts, the MSQC Model bands several hospitals together in such a way that ideas arise from the real-world laboratory of a collaborative "community of practice," which includes not only surgeons and nurses but a myriad of healthcare professionals (Fung-Kee-Fung et al., 2009). This "community of practice" includes both academic- and practice-based research. Additional input and ideas come via the MSQC Committee structure, with contributions from committees such as the Definition Committee (updating and evaluating data definitions), the Executive Committee (overseeing strategic priorities), and the Research and Publication Committee (shaping the future of clinical inquiry). Further improvement ideas are solicited via surveys, presentations, online forum discussions, and direct communications with the coordinating center. Perhaps the most important contribution to this model is patient input. Patient feedback—whether communicated directly, via patient satisfaction surveys or patient-reported outcomes, or indirectly, via the healthcare team—can have a strong influence on the collaborative initiatives. The ability to gather input from so many ideas is one of the unique and successful features of a collaborative approach.

Once the focus for a quality improvement project is determined to require project management (and /or financial resources), the cycle is set in motion. Basic project management skills are employed to plan for structured data collection, analysis, and systematic review. Time for reflection and learning is important and is built into the planning.

Data to Knowledge

An important next step is to determine what data is necessary to demonstrate improvement. Will there be a need for additional variables? Can existing variables be modified for data analysis? Variable definition and development is one of the most important contributions to this process. The addition of a simple dichotomous variable may appear easy, but that is not always the case. Take the example of asking for a weight of the uterus after a hysterectomy. It seems straightforward, yet we quickly realized that pathology reports vary widely in how weight is reported. Some pathologists include only the weight of a uterus (removing the tumor mass, since that was the "diseased" portion of anatomy), while others include everything, diseased or not. A definition without this detail will unintentionally skew the data. Creating a clear, simple unit of measure may be

one of the most tedious, yet most important, aspects of the planning process. Likewise, testing the variable in a live, but limited, beta-tested capacity is also important during the early planning phases. In this phase, mistakes can be detected early without impacting timeline or expending unplanned resources.

Throughout this initial process, there is concurrent relationship building among, and within, the collaborative members. The preliminary phase of preparation and planning sets the stage for collaborative-wide implementation.

Operationalizing the improvement is the next phase. Meetings, site visits, calls, and workshops are instrumental in learning how to operationalize and disseminate implementation information. Targeted site visits give the coordinating center the information it needs to share with the collaborative. For improvement projects that have already collected established outcomes, workshops give the highest and lowest performing sites an opportunity to discuss the operational aspects impeding or accelerating improvement. In some cases, the coordinating center will align sites that are working on the same projects to exchange ideas and lessons learned. This phase allows for the pragmatic, real-world exchange of ideas and solutions not found in the typical “tool kit” or scholarly works.

At this phase, the role of the coordinating center is to support and facilitate. Support may occur in the form of administrative support, coaching, providing resources, or setting up meetings and phone calls. Regularly scheduled phone calls and consultations assist the sites in meeting their goals. An online forum fosters communication among the SCQRs.

When planning and implementation are done successfully, reviewing the results and refining the progress is critical to continual learning and improvement. It is here, at the sites, that the project reveals important and valuable information for others to learn. A project examining surgeon-specific reporting noticed high rates of morbidity were attributed to surgeries that were done after hours; a project for readmissions in colectomy noticed the diagnosis was largely due to constipation. These types of findings fueled the cyclical iterations of improvement. And in contrast to single institution projects, these lessons were shared with other hospitals in the collaborative.

To help fuel this learning, data are evaluated continuously. A 24/7 analytic display of data to track and monitor measures of interest allows immediate evaluation of data trends. Whether the hospitals are large or small, community or academic, or administer to different populations of patients, risk and reliability adjustment enables similar comparisons.

There will likely be errors in the data collection process that require correction. For example, we found that the placement of a decimal point was not programmed correctly, and therefore, we had a false spike in creatinine levels and a false spike in reported renal damage. Systematic review of the data helps to capture errors early in the process. Depending on the procedure, issue, or process measure, it may take time to accumulate enough cases to analyze effectively. Generally, formal evaluation of the project is necessary after about a year of data collection and intermittent analysis. Feedback from the collaborative helps to inform the process and make refinements.

Refinements of the improvement process are shared among the collaborative. The sites summarize what was learned and make comparisons of the data with other sites. Obstacles or barriers encountered during the process are shared via online forums, meetings, and workgroup calls, in the hopes other sites will learn from their experience. Display of site analysis in rank order allows sites to identify if they are achieving success in relation to other hospitals. The amount of variation among sites is consistently revealing. How can the outcomes with the same procedure/process vary so much from similar sites? For the sites that demonstrate the highest performance in a given area, the “positive deviance assertion” is that they are doing something right.

Knowledge to Performance

The sharing of information is most important during the final phase of the process. The learning opportunities that arise out of this stage of the cycle are the most valuable in terms of time and resources. Taking important information we have learned to another collaborative or group interested in this area accelerates learning for all. While learning occurs at all points in the cycle, sharing the learning is most valuable at this point since it encapsulates the success (and failures) of the issue. At this phase, the action is concentrated at the level of the coordinating center. The decision to adopt, adapt, or abandon an improvement effort is reviewed. Collaborative-wide improvements, or a lack thereof, are communicated to stakeholders. The decision to sustain a project is considered.

Have the goals been achieved? Was the project successful? Are resources available? The committee infrastructure of the MSQC provides an important collection of expertise for these decisions.

A demonstration of the value of the performance improvement focus is imperative. This includes performance, evidence of quality improvement work, and an achievable outcome or process measurement goal. In parallel, a demonstration of return on investment (ROI) provides a demonstration of the fiscal bottom line. For stakeholders, like BCBSM, who invest in collaborative improvement, ROI is often realized through reduced morbidity and the avoidance of complications and unnecessary procedures. Contributions to the scientific literature and the spread of quality and patient safety practices to other hospitals are important, but are not easily reflected in cost savings. Patient satisfaction, in the form of patient-reported outcomes or increased patient resources, is measurable but is also difficult to calculate in terms of the value equation. The demonstration of value is often a longitudinal goal, with a timeline of approximately 3 years in order to allow the iterative cycle of improvement to begin to yield sustained benefit.

Throughout the quality improvement process, innovation and discovery are given equal weight and importance. The importance of contributing to the scientific body of knowledge is inherent in this process. Clinical questions arise that demand additional inquiry. Likewise, the process of quality improvement gives rise to clinical innovations that propel the improvement process in new and exciting directions. Whether resulting in a new clinical finding, a new technology, or a change in practice, the ability to harness creativity in the collaborative learning process is inherent in this model.

From concept to practice, the LHS within the improvement collaborative infrastructure at the MSQC has facilitated the successful acceleration, dissemination, and adoption of improvement endeavors. Because the process was generated from the bottom up, traditional obstacles of buy-in and resistance to change are overcome, and the culture of respect and trust further catalyze the speed of dissemination. Operationalizing the LHS takes into account the traditional approaches of quality improvement, but places special emphasis on learning, discovery, and innovation. As a result, clinicians are able to work within a system that supports the ability to learn and improve simultaneously.

Fung-Kee-Fung, M., Watters, J., Crossley, C., Goubanova, E., Abdulla, A., Stern, H., & Oliver, T.K. (2009). Regional Collaborations as a Tool for Quality Improvements in Surgery: A Systematic Review of the Literature. Ann Surg, 249(4), 565-572. doi:10.1097/SLA.0b013e31819ec608.

III. Starting an Improvement Collaborative

Beginning a quality collaborative is a potentially intimidating task, but one that can have tangible benefits at the individual patient, institutional, regional, and national levels. When forming such a collaborative, many questions can arise including: Why are we starting this collaborative? What can we accomplish? How does this approach differ from existing institutional level performance improvement? In considering answers to these questions it is important to remember several points:

- Organizations, hospitals, and clinical departments share common problems.
- Performance improvement is local with unique solutions tailored to the environment of each area.
- Regional collaborative quality initiatives are a form of *efficient* information exchange. These initiatives provide access to data and flexible incorporation of data elements focused on problems of interest to the collaborative.
- Collaboration allows for diversity of ideas and rapid dissemination of new information and findings.
- Regionally-based quality improvement programs offer an alternative to large nationally-centered programs with the potential advantages of *grassroots* participation, flexibility, and accessible program management.

In total, the collaborative environment identifies variation in practice. Individual outcomes are seen within a spectrum of peer level performance. Perhaps most importantly, a collaborative environment offers guidance on what potential actions can be taken to enable positive change. When considering a collaborative structure, a good initial starting point is to visit or discuss your plans with an existing collaborative. There are many different types of collaboratives in terms of areas of interest and geographic location. Typically, you will be building upon or synchronizing with a form of local or regional organization that is already in place.

The importance of collaborative leadership cannot be overstated. The leader or leaders must be trustworthy, credible, and committed to transparency. The success of the collaborative must be the primary objective. A crucial point is that leadership must function independent of the political environment which will be encountered in any large group of hospitals and hospital systems. For example, nascent collaborative groups often stumble on a single problem – where will the group's coordinating center reside? The answer to that question lies in determining what leader can best put regional politics aside and function fairly in a "home-grown" or other political environment.

As the collaborative leadership begins to form, it is important to take a realistic inventory of the resources that are available. A few important things to consider early in the development of the collaborative are the following:

- Is there a funding source?
- What infrastructure currently exists? What could easily be built or expanded?
- Do you have access to the data? Does the data you will use have face validity or will this topic have to be addressed? Can you modify the data collection process to allow collection of custom created data elements? Is there a means of data analysis and reporting?
- How, when, and where should the collaborative meet?

The following links are resources that may be helpful to begin planning and coordinating a collaborative infrastructure for quality improvement and patient safety:

https://www.ahrq.gov/sites/default/files/wysiwyg/professionals/quality-patient-safety/quality-resources/tools/mednetresourceguide/mednetresourcedguide.pdf

https://www.usaidassist.org/sites/assist/files/the_improvement_collaborative.june08.pdf

https://www.thepcpi.org/pcpi/media/documents/nqrn-registry-business-case-tool.pdf

https://www.ncbi.nlm.nih.gov/pubmed/26936373

http://www.ihi.org/resources/Pages/IHIWhitePapers/TheBreakthroughSeriesIHIsCollaborativeModelforAchievingBreakthroughImprovement.aspx

https://www.cdc.gov/reproductivehealth/maternalinfanthealth/pdf/best-practices-for-developing-and-sustaining-perinatal-quality-collaboratives_tagged508.pdf

IV. Organization and Structure

a. Leadership and Management

Effective collaborative leadership is essential. The Director is the driver of goals, serves as the cheerleader of projects, and provides overall direction and vision for the collaborative. If there is a governance structure, the Director works in tandem to assure that the priorities and strategic direction of the collaborative are on course.

Likewise, the staff selected to run the day-to-day operations should display similar passion and a skill set of administrative and clinical expertise. Irrespective of funding or governance structure, there are four core components to the operational structure for collaborative improvement. In the BCBSM collaboratives initiatives, the operational structure is called the coordinating center and it provides the foundation for a strong program coordination and management (see Figure 3).

FIGURE 3: Coordinating Center Components

Quality Improvement

Quality Improvement expertise is necessary to support QI teams at the sites. This must include thorough knowledge of regulatory and quality reporting requirements and of updates to new measure specifications. This component can encompass many aspects of other components, and thus can be a shared responsibility among all members of the coordinating center.

Data Outcomes and Analysis

Data, Outcomes & Analysis performs systematic and ad hoc data assurance, management and analysis. Expertise for this team includes a strong statistical background and data management skills, as well as experience in quality improvement. Although not always required, improvement collaboratives (like the MSQC) partner with a third-party vendor to run the registry and analytic platform.

Business Operations

The Business Operations component includes the administrative management of the program such as contractual arrangements, internal and external communications, funding, budget, data safety and security, vendor management, logistics, and administrative support. Expertise of this team requires knowledge of contractual, legal, and data compliance. Project management and coordination expertise ensures communications, operations, deliverables, and governance structures are executed timely and reliably. Technical skills enable the coordinating center to leverage new methods of communication, learning, and sharing. Many well-established collaboratives also have Executive Directors that lead the operations of the collaborative.

Clinical Site Coordination

The Clinical Site Coordinators are responsible for managing the clinical data collection activities to include data definitions, training/education, and interrater reliability. This includes the day-to-day interactions with nurse abstractors assisting in data collection questions and conducting routine training and education. Keeping Surgical Clinical Quality Reviewers (SCQR) up-to-date on clinical training and developing educational resources is a lot of work and the time and resources it takes to accomplish these tasks cannot be underestimated. Clinical knowledge and expertise are essential for these duties.

b. Governance

Depending upon the funding source and charter of a collaborative, different governance mechanisms may exist. These can be in the form of the following:

- Advisory Committee – Group of collaborative participants that serves to advise the collaborative leadership on direction, new projects, and problems, and serves as a sounding board.
- Executive Committee – A more formal arrangement than the advisory committee and has a structure that typically votes on action items and determines collaborative leadership.
- Corporation – A collaborative that is part of a large hospital or healthcare corporation may have an oversight structure that reports to and through the corporate leadership infrastructure.
- Government – State or county government can include collaborative management within their operative infrastructure.

While not essential, a governance structure can help guide and support collaborative efforts. Whether a formal voting board or an informal committee, the aim is to garner multidisciplinary and interdisciplinary leadership. Essential to any structure, formal or informal, is communication and management so that it is utilized as intended and not devoid of involvement. It is important to establish guidelines for the relationship, and this can set the stage for collaborative success.

V. Operations

a. Collaborative Meetings

The cornerstone of collaborative quality improvement is regularly scheduled face-to-face physical meetings. These multidisciplinary and interdisciplinary meetings are learning laboratories where the exchange and interaction within the collaborative fosters the introduction of new ideas, stimulates discussion, and serves as a vehicle for dissemination of best practices. Collaborative meetings are planned at least three times a year sometimes at different locations, days and times to try and accommodate the needs of all participants (i.e., religious holidays, school breaks) and maximize participant attendance. The meeting is open to all participants at the sites, however, the Surgeon Champion and Surgical Clinical Quality Reviewer are expected to attend. Depending on the content, attendance from other specialties on the quality improvement team may include, anesthesiologists, nurse anesthetists, hospitalists, infection preventionists, and administrators.

In our experience, the most effective and fulfilling meetings have a theme or focus such as sepsis, anesthesia issues, opioids, or infection. Driving the focus of the meetings are data revealing areas of high variability, outliers in performance, or areas of clinical inquiry, such as normoglycemia in surgery or mechanical bowel preparation. A guest speaker, ideally someone nationally-recognized in the feature topic, can anchor the meeting content, especially when the presentation integrates the results from the analysis of the collaborative data. This is an effective way to highlight where the collaborative stands relative to national standards or benchmarks and also helps the speaker tailor the presentation to those areas requiring attention.

The operational aspects of the meeting are critically important. Since physical, face-to-face meetings require travel, they should be planned at least a year in advance to be respectful of the time of busy professionals. A pleasing venue with audiovisual ability, Wi-Fi, ample parking and good food, will go a long way to increase the success of the meeting. Our participants have given feedback on which days of the week work best but Friday meetings have had the greatest attendance for MSQC (likely because it is not a popular day for surgery). Others have found meetings on a Saturday are best because it is less disruptive to the workweek. Participants have also requested moving the meetings to different physical locations around the state and this has not only been well received, but offers an opportunity for hospitals in close proximity to have higher attendance at the meeting. See Figure 4 for the MSQC 'Top 10' tenets for an effective and efficient collaborative meeting.

Meetings are most beneficial when there are different formats that engage all types of learners. This can be challenging depending on the size of the meeting and audience participation may suffer. To offset the disadvantage of limited participation at large meetings, the use of technology such as Survey Monkey and Poll Everywhere can help solicit participation. Even in smaller audiences or groups, this technology can help promote feedback, especially on controversial topics (Hemmila & Jakubus, 2017). At almost every meeting, there is the opportunity to present improvement efforts either with a panel discussion or individual presentation of sites. Teams are encouraged as

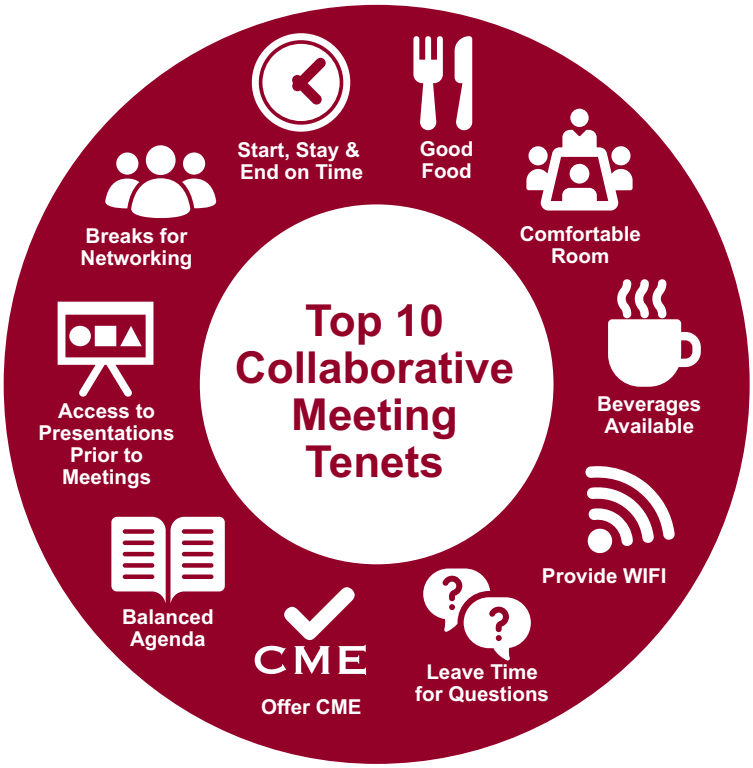

FIGURE 4: MSQC Top 10 Collaborative Meeting Tenets

this illustrates the importance of multidisciplinary involvement. Time allotted for questions and discussions after these presentations further promote audience participation.

Incorporating patient experience into the collaborative meeting programming is a method worth pursuing. While not always feasible to have a patient, presenting patient reported outcomes (PROS) or methods to achieve patient-centered care are valuable adjuncts to any improvement issue. A patient recovering from opioid addiction after surgery shows that the opioid epidemic much more than simply a statistic. The collaborative gives participants the opportunity to ask the patient questions about his surgery, treatment, and recovery that are invaluable to learning and future discussion. The meeting evaluations for topics involving patient involvement are consistently strong.

Without fail, every meeting receives praise for structured time to network among colleagues. Programming time in for lunch and short breaks are done with this intent. One could argue the crux of the meeting happens during this time when relationships are built and the culture of the collaborative is strengthened.

One important item to emphasize for meeting planning is a pre-meeting with the speakers. This pre-meeting, usually 4-8 weeks in advance of the event, is an opportunity for the coordinating center to discuss the operational aspects of the meeting, review the final agenda, and answer any questions. In response to collaborative feedback, the speaker's presentations are always provided in advance of so that the participants can have electronic access during the presentations. Generally, we have found that paper copies are costly and often wasted, and we leave the option to print hard copies to the participants themselves.

A frequently asked question is how the MSQC keeps sustained attendance at the meetings. Unique to the MSQC and the other BCBSM funded collaboratives in Michigan, many of the participants at meetings are incentivized with credit allotted to their hospitals BCBSM Value-based purchase agreement. Hospitals that participate in the Value Partnerships through BCBSM Pay-for-performance Program reward hospitals for improvement and quality. This financial model, in conjunction with the opportunity to be awarded Continuing Medical Education (CME), strong content, and efficiently run meetings, consistently results in close to 100% of organization participation.

One final task to ensure a successful meeting is incorporating a formal meeting evaluation process. A tool to solicit feedback about the meeting content and organization is a valuable to spark new ideas and promote improvement within the coordinating center. Besides comments pertaining to the temperature of the room, to where the feedback seems endless and defines intervention, most comments give the necessary praise and criticism to continuously promote improvement. After every meeting, dedicate at least a few hours to review the meeting evaluations as a team. Additionally, be prepared to respond to participants concerns either individually (if they leave their name) or in further collaborative communications. Finally, follow-up communications to participants and presenters conveys both appreciation and gratitude for their time and support of the collaborative mission.

Hemmila, M. R., & Jakubus, J. L. (2017). Trauma Quality Improvement. Crit Care Clin, 33(1), 193-212. doi:10.1016/j.ccc.2016.08.010

AHRQ Link to Meeting Planning Resource Guide

(pages 22–23 and 37)

b. Site Visits

A distinguishing feature of the MSQC is the emphasis on site visits. Site visits are an opportunity to build relationships, witness improvement at the point of care, and see what is working and what is not. Our director frequently uses the idiom of "kicking the tires" to describe the importance of a hands-on approach to evaluating quality.

Site visits are planned with a specific purpose in mind and these can be separated into 3 main types. The first is requested by the hospital itself in order to bring in expertise on a specific area of improvement. For example, a visit focused on a specific subset of patients where the surgical site infection rate is high or a visit to a hospital that wants help getting an enhanced recovery protocol initiated. Since these visits are requested by the sites rather than the coordinating center, the expertise of the team is determined by the particular needs of the site.

The second type of site visit is directed to sites that are the best performers in a given measure. Best practices are identified on these visits, and they are then analyzed and shared with the collaborative. A common way this is done is through a "panel discussion" at a quarterly meeting, at which top performing sites share their methods and other participants ask lots of questions.

The third type of visit, and most infrequent, are the site visits the coordinating center requests for hospitals with consistently low performance on a given measure. These site visits are used as an opportunity to review the data with the stakeholders in order to better understand the reasons for the low performance. This type of visit may be combined as a visit to a hospital system in order to bring in all the stakeholders and leadership necessary for success.

Regardless of the type of site visit, thorough planning and coordination of the visit will ensure the best results. The most labor intensive preparation for the visit is the analysis and reporting of the site's individual data. The analysis includes core process and outcomes measures and a drill down of the measures in the greatest detail possible. For example, a high rate of surgical site infection can be broken down by specialty or procedure. The coordinating center assembles the multidisciplinary team and expertise required for the visit which can include surgeons, anesthesiologists, nurses, specific clinical or technical expertise (i.e., pharmacist, perfusionist), administrators, and information technologists. Likewise, a list of suggested participants invited to the hospital is prepared for the site. Critical to the success of the visit is participation by hospital leadership in at least some portion of the time. A detailed checklist for the site visit guides the planning (see Figure 5); however, this serves as a guide only. Each visit is tailored to the purpose of the visit. After the visit the site is provided with a summary of action. Follow-up phone calls are conducted at the discretion of the site.

Site Visit Checklist

3-6 Months Before the Visit

- ☐ Identify Site
- ☐ Choose Team Members
- ☐ Identify Site Point of Contact
- ☐ Discuss Potential Date(s)
- ☐ Venue: _____

4-12 Weeks Before the Visit

- ☐ Prepare Timeline and Target Dates
- ☐ Assist with Site Attendee List
- ☐ Site Responsibilities:
  1. Invitation to Site Participants
  2. Room Reservation(s)
  3. Breakfast/Lunch & Participant Preferences
  4. AV Requirements
  5. Parking
  6. Name Tags (If Required)
- ☐ Prepare Initial Agenda
- ☐ Internal Meeting to Review Agenda Presentations (Focus)
- ☐ Identify Reports Need For Handout
- ☐ Prepare Slide Presentations

1 Week Before the Visit

- ☐ Prepare Handouts
- ☐ Send Updated Agenda
- ☐ Final Coordination of Logistics (Parking, Contact Phone Numbers)

Post Visit

- ☐ Summary of Visit
- ☐ Thank You Letter to Site
- ☐ Thank You Letter to MSQC Presenters

FIGURE 5: Site Visit Checklist

In our experience, something new is learned from every site visit and is mutually beneficial for both the coordinating center and the hospital. An interesting corollary of the visits is the ability to build relationships and establish a culture of trust among the participants. These qualities are the foundation to the learning health system process. Although the cost of a site visit is high in terms of personnel, time, resources and travel, and the intangible benefits are difficult to measure, the merits of the visit are rarely disputed and the resultant quality improvement is best captured in the success of the collaborative, and not necessarily individual sites.

Experienced clinicians on our site visit team comment that they can predict the performance of the hospital within the first 5 minutes of the visit. While first impressions of the organization and the feel of the hospital give important indications of performance, we have found that even those sites deemed outstanding rarely demonstrate superior results in every measure across the board. Rather, hospitals excel in different areas and frequently the potential to learn, and the opportunities for improvement are revealed in every site visit. Whether on the side of the coordinating center or the participating site, all become students on a site visit.

c. Workshops

In keeping with the positive deviance approach, collaborative improvement strategies should also include targeted workshops. The workshops are designed to provide an opportunity for a team from a high performing site to be paired with a team from a low performing site to determine the best practice-based interventions deemed successful in improving patient care (see Figure 6). Just as important as the success stories are the opportunities to learn from other hospitals what strategies failed, met significant obstacles, or were unsustainable. The teams leave the 4-6 hour workshop with a compendium of strategies to employ in their respective institutions. Some may argue that there is no benefit for the high performing sites to learn from this type of approach, however, we have found just the opposite. As discussed previously, high performing hospitals may be outstanding in one area, but fall short in others so the learning is often reciprocal. In planning which sites participate in the workshop, it is not unusual to have a high performing site and a low performing site within the same healthcare system. This speaks to the limits of a “one size fits all” approach to quality improvement.

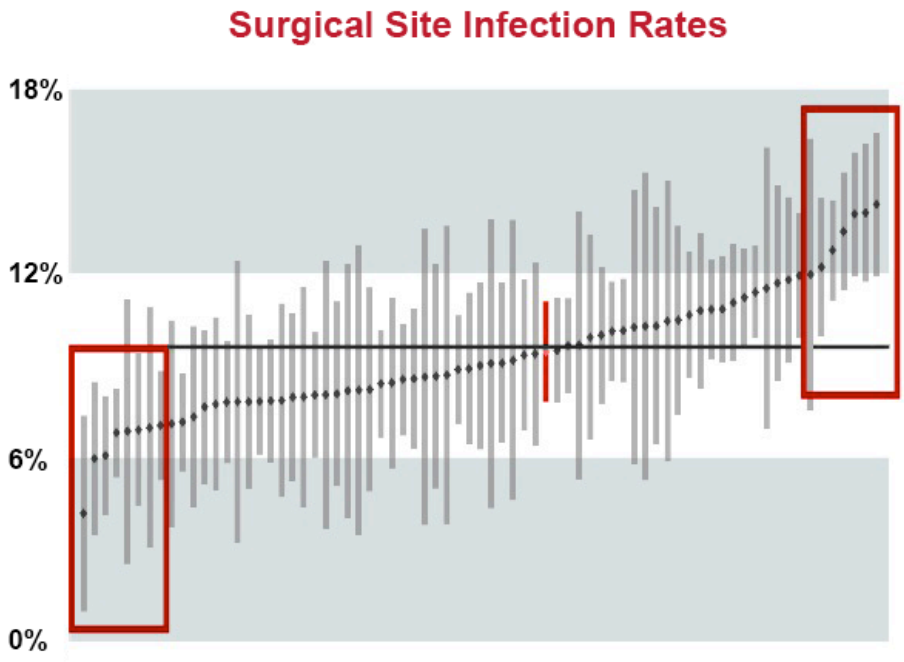

FIGURE 6: Caterpillar plot of highest and lowest performing hospitals

d. Patient Safety Organization

The Michigan Surgical Quality Collaborative (MSQC) is listed as a Patient Safety Organization (PSO) by the Agency for Healthcare Research and Quality (AHRQ), on behalf of the Secretary of the U.S. Department of Health and Human Services.

This designation is an important confirmation that MSQC provides all of our participating sites the most appropriate protections. MSQC is one of three patient safety organizations in Michigan and 83 nationally. This designation denotes high-level quality and security in the way MSQC gathers, analyzes, and shares data for each of the MSQC hospitals to use in their quality work.

The MSQC PSO Administrative Toolkit contains a selection of slides explaining MSQC, its background, structure, role as a CQI, and value proposition. It contains details of MSQC's collaborative, evidence-based approach to best practice and quality improvement, some key results and achievements, and informational screenshots of MSQC's unique data and reporting platform. In addition, there is a learning module to give additional information about the data protections and responsibilities of using data with protections under the PSO laws.

In the interest of improving surgical care, favorably affecting patient outcomes, and widely promoting best practices, MSQC is making these documents accessible with minimal restriction. Please be respectful of their use; use rightful citation and refrain from reproducing or using these documents outside of their intended purpose.

If you have any questions, or need further informational resources, please don't hesitate to contact MSQCCustomerSupport@med.umich.edu

For additional information on PSO: https://www.pso.ahrq.gov/

MSQC PSO Learning Module

VI. Measuring to Improve

a. Data Collection and Validation

The MSQC collects data for the adult population who have had non-trauma related general surgery. In addition to the general surgery core procedures, optional data collection is available for vascular and gynecologic (hysterectomy) surgeries. In total, the MSQC program encompasses over 300 surgical procedures. The MSQC also collects data for targeted quality initiatives such as colorectal cancer, hysterectomy, opioid use, and data measures to implement an Enhanced Recovery Program. Participation in any of the special projects is optional and determined at the site level but often corresponds with quality initiatives chosen by the site.

Tools and Resources

The collection of quality, robust, clinical data requires both resources and knowledge. For resources, it will be essential to have the infrastructure in place to support a secure and compliant data collection platform. Either via vendor or home-grown, there are policies, procedures and agreements that are essential before any data collection and sharing can begin. Setting up a customized data management infrastructure is a large task, but can provide almost unlimited flexibility and responsiveness regarding data use and performance improvement possibilities.

If your collaborative will be managing its own data, it is recommended that a comprehensive data management plan be formulated in consultation with information technology experts and legal support. The data management plan should include what types of agreements are needed between participants (see Figure 7). Proper safeguards should be put in place to protect data with password access, encryption, and server backup of files. Use of secure file transfer mechanisms and software is recommended. Typically, data will be transferred in, cleaned, collated, and stored in master files at the coordinating center. Collaborative participants may desire access to the data to conduct performance improvement projects. Policies and mechanisms should be devised to allow creation and transfer of a participant use file to satisfy this need. If a third-party is used for data analysis and reporting, a business agreement will need to be put in place to handle data transfer and responsibility.

Critical tools for successful data collection are important. For the MSQC, the nurse needs to have access to a computer with reliable and secure internet access to complete data abstraction functions. Because the MSQC workstation is web-based, the SCQR can access it via an internet browser at any time. The operative log, a record of the surgical procedures performed at a site, as well as the patient's operative report, help prepare for the data collection process. CPT® Codebook and ICD-10-CM Codebook are resources that will assist in the assignment and understanding of appropriate codes. Depending on the measure, data can be collected from multiple sources which include medical records (paper and electronic; hospital and clinic), administrative records, and databases for billing or care management. It is highly

Agreements and Forms	Description
Business Associate Agreement (BAA)	Used to establish a relationship between a HIPAA covered entity and business associate for sharing full protected health information and describing breach management
Confidentiality Agreement	Used to protect confidential discussions from disclosure
Data Sharing Agreement (DSA)	Used for sharing of non-public datasets containing full protected health information
Data Use Agreement (DUA)	Used for sharing of non-public datasets containing limited dataset protected health information
General Services Agreement (GSA)	Used to describe the goods or services to be exchanged by another party
Membership Application Form	Used to request collaborative membership
Memorandum of Understanding (MOU)	Used to formalize collaborations with internal or established parties
Remote Access Agreement (RAA)	Used to establish remote access validation
Statement of Work (SOW)	Used in project management to define project-specific activities, deliverables and timelines for an entity providing services to a client

FIGURE 7: Common Collaborative Documents and Description

recommended to have “dual monitors” so that abstracted data is entered simultaneously while gathering information. Also important is a workplace without constant interruptions as quality abstracting takes concentration and focus.

Sampling Methodology for Data Collection

Because of the potentially large volume of cases that meet inclusion criteria, the MSQC uses a sampling methodology to ensure a systematic collection and representation of procedures. The methodology is based on weekly cycles; each calendar year is divided into forty-six (46) 8-day cycles. The cycle rotates every 8 days to ensure that each cycle begins with a different day of the week. The 8-Day Cycle Schedule lists the date range for each of the forty-six (46) cycles, and is used to determine the start date for selecting cases of a cycle. Cycle 1 always begins on January 1 of the year and begins at 00:00 or 12:00 am of the first day and ends at 23:59 of the last day. Within the cycle, the SCQR identifies MSQC eligible cases using the Operative Log.

An important part of the preparation for data abstraction is to designate the principal procedure that allows the case to be MSQC eligible. This designation of the principal procedure using a CPT® (Current Procedural Terminology) code sets the groundwork for the remaining abstraction as not all variables are collected for all CPT® codes. CPT® assigns a specific code to each procedure and is widely used by surgeons for reporting and billing medical procedures.. Each procedure is assigned a specific CPT® code. Determining the appropriate CPT® code is an important part of the data workflow process as this helps to set the framework for the data abstraction and allows for risk adjustment.

As well as capturing the CPT® code assignment for the principal procedure that allows the case to be MSQC eligible, the SCQR will also capture other procedures performed during the operative/anesthetic event. This will allow for the abstracted data to be risk adjusted, which will help to reflect the overall clinical picture for a case. For example, a patient who presents for a routine carotid endarterectomy will not have the same severity of illness or morbidity as a patient who presents for a carotid endarterectomy with a Coronary Artery Bypass Grafting (CABG). This process of CPT® code assignment is further discussed in SCQR training and the Data Definitions and Variables Manual.

Using MSQC’s stratified sampling algorithm contained within the MSQC Workstation, a pre-determined quantity of cases will be assigned during each cycle. Once the maximum program-eligible cases have been identified by the MSQC Workstation, no further case selection is required. Case sampling resumes with the start of the next 8-day cycle.

The MSQC sampling methodology utilizes an equal allocation stratified sampling procedure to identify cases for abstraction. This method pulls from the entire MSQC eligible case population so that the procedures selected represent a true probability sample. Procedures from all CPT® codes are stratified into procedure groups and a simple random sampling procedure is employed within each stratum. Each case within a stratum has an equal probability of being sampled. Since the stratum represents the known proportion of the population, the sample selected reflects an accurate proportion of the total population. Using this approach also reduces selection bias since the case selection process is done entirely through an electronic sampling algorithm program without user interference. The result of the equal allocation stratified sampling procedure increases the statistical validity of the sample by creating an opportunity to make direct generalization to the hospital population and meaningful analysis of previously low volume procedures.

Another important piece of the data collection is capturing 30-day postoperative occurrences. The MSQC captures and reports 30-day morbidity and mortality for all cases that meet program criteria for inclusion. Morbidities and/or mortality of each case must be followed through 30 days postoperatively from the date of surgery. Information regarding patient hospital readmissions, returns to the operating room, and presentations to emergency departments/urgent care clinics in the 30-day postoperative period are also collected.

Data Integration

Cutting down on the amount of time the nurse is actually abstracting data and tilting the balance toward using that expertise to analyze the data and influence QI is the ultimate goal. Despite the move to electronic records in the majority of sites, moving to full data integration has been slow. While a preponderance of our hospitals use a form of data automation to reduce manual data collection for variables such as laboratory values and demographics, setting up these processes with hospital IT departments is difficult and frequently not a high priority for the sites. Even with monetary

incentives, data integration still encounters technical and organizational obstacles. Concerted efforts to increase data automation in sites as well as volume of variables collected is a top priority for the MSQC. Natural Language Processing is not yet at the stage for implementation but is a promising technology for the near future.

Knowledge and Training

The knowledge of the data collection process is achieved through systematic and ongoing training for the SCQR. The new SCQR receives an orientation to the MSQC data collection requirements by three methods – one-on-one, within a group, and on-line/webinar. During this training, a detailed review of the MSQC Program Manual is offered to help familiarize the SCQR to the program requirements and to assist them in formulating a method for consistent and accurate data collection. Introduction to the MSQC Workstation is provided through a webinar. This webinar provides step-by-step instruction on preparing the workstation for sampling and allows the opportunity to experiment with data entry within the test-site version of the Workstation. One month following the SCQR "go-live" date, the SCQR receives feedback via a remote or on-site chart review. SCQRs new to the program will be required to complete certification status within four to six months of joining the program by successfully completing a certification examination with a score of ≥90%. Certification is required biennially for all MSQC SCQRs (full-time, part-time, and alternate). The certification exam is administered electronically through the MSQC Learning Center. SCQRs may take the certification examination a maximum of 3 times in order to obtain a minimum passing score of 90%.

Several years ago, the MSQC implemented a Definitions Help-line (DHL) for the SCQRs. The DHL serves as a consolidation center for fielding questions related to clinical abstraction and difficult clinical scenarios requiring additional clinical expertise. This service helps support the SCQRs in the field while also helping the coordinating center decipher and learn from the questions raised. The DHL also maintains a log of the questions received, enabling additional learning opportunities for all.

Other collaboratives have asked us whether or not the skills of a registered nurse are required for data abstraction. The answer to that question depends on the type of the data that is being abstracted. In the MSQC, the skilled reading and interpreting of the operative report, the pathology results, and the nuances of the surgical procedures are critical to the variables collected. In our experience, this clinical information is best interpreted by a Registered Nurse. For example, something as simple as conducting a 30-day follow-up can require nurse's expertise when a family member asks a question or in the unfortunate case of when the patient has died. Additionally, the requirements of our program to simultaneously facilitate the quality improvement projects are helpful when a nurse is involved. With clinical expertise, the nurse may notice trends in the data even before it is analyzed. Experienced nurses are also aware of the formal and informal hospital hierarchy (i.e., how to get things done) and are knowledgeable about when and how to summon support and buy-in for QI projects. On a practical note, and since our program gets funding support for the data abstractor, having the job qualifications and salaries similar across all sites is helpful.

Data Validation and Interrater Reliability (IRR)

The IRR is an important tool to validate the reliability of the data collected and inform various processes across the MSQC. It provides opportunities for collaborative learning and educational processes for both the MSQC site and the Coordinating Center. Each year the MSQC audits a pre-determined number of sites based on when a previous IRR was completed, noted data inconsistencies, or SCQR requests. In most cases, the IRR is conducted remotely via requested temporary access to audited records. The cases reviewed are identified in accordance with MSQC policy and reviewed by the Coordinating Center clinical site support nurses, biostatisticians, and analysts. Each site is expected to attain a rate of agreement of ≥95%. Sites that attain less than 95% receive remedial training and additional review. At the final debriefing, the MSQC prepares a formal report of the IRR assessment, including a list and description of the identified disagreements, as well as any related education provided to the site's SCQR(s), Quality Manager, and Surgeon Champion. The IRR approach is one of the most important and effective methods of assuring the data the highest quality.

Additional specific information on data collection, training, or interrater reliability can be provided upon request at MSQCCustomerSupport@med.umich.edu.

b. Data Analysis and Reporting

Risk adjustment is crucial to the hospital-to-hospital comparisons done routinely by MSQC. Risk adjustment modeling and reporting development represent a combined effort between the MSQC analytic team and a commercially contracted vendor ArborMetrix. The risk adjustment process corrects for patient severity of illness and ensures that provider comparisons are similar. Some hospitals and physicians treat more high-risk patients and this creates a challenge in comparing complications, utilization, and mortality rates for patients with the same condition but different health status. Risk-adjustment uses statistical models to account for the clinical risk factors that differ between patients. For example, an 85-year-old female with multiple comorbidities is more likely to suffer adverse outcomes than a healthy 50-year-old male undergoing the same procedure. To determine which covariates to include, we use advanced statistical methods (e.g., stepwise regression models) as well as clinical expert opinion. Covariates most frequently included are: age, sex, race, and comorbidity information where available. For surgical procedures, the application also adjusts for procedure specific risk factors (ArborMetrix, 2014).

After the process of risk adjustment, the outcome data is also reliability adjusted. The purpose of reliability adjustment is to account for statistical noise and thus ensure more accurate estimates of risk-adjusted hospital outcomes (Dimick, Ghaferi, Osborne, Ko, & Hall, 2012). In our model, a value of “0” means the outcome is 100% noise (completely unreliable) and a value of “1” means the outcome is 100% signal (perfectly reliable). If you have a rate of 0.0% and your sample size is small, this may be the result of chance (i.e., good luck) and with reliability adjustment your “true” rate will likely be closer to the overall average. Reliability considers both the hospital sample size (“noise”) and the amount of true variation across hospitals (“signal”) for a given measure. For example, a zero morbidity occurrence rate out of two operations (0/2) is not the same as zero occurrences out of one hundred operations (0/100). With a smaller number of cases it is more likely that this is due to chance and is not indicative of true performance (ArborMetrix, 2014).

Risk and reliability adjusted data are reported back to participating sites in a suite of continuously updated and available online reports that are on the website for each site to use and review. These reports contain benchmarking data generated from averages of all participating sites within the collaborative. In addition to the robust selection of standard and custom reports, the data analysis features within the MSQC reports application equip the user with the capability to drill down to case level detail for review and/or export, providing opportunity for early and on-going identification of areas for quality improvement. Additionally, a hard-copy Executive Summary Report is distributed to sites annually to assist in the review and critique of quality improvement initiatives. Through detailed study of these reports, the comparative outcome statistics may reveal areas for process improvement. Specialty analytics and ad hoc report development are performed by the coordinating center biostatistician via an on-line data request process.

Poor quality data is dealt with at the time of data submission. Problems such as out of range or missing data are often identified automatically since these issues are built into the workstation programming. For other problems detected during the manual and automated data auditing and cleaning process, participant centers may be contacted for correction. A data validation process (interrater reliability) is conducted systematically by the clinical nurse reviewers to assure compliance with the standardized data definitions.

ArborMetrix. (2014). Risk and Reliability Adjustment for Web-based Platform. Ann Arbor MI.

Dimick, J.B., Ghaferi, A.A., Osborne, N.H., Ko, C.Y., & Hall, B.L. (2012). Reliability Adjustment for Reporting Hospital Outcomes with Surgery. Ann Surg, 255(4), 703-707. doi:10.1097/SLA.0b013e31824b46ff.

VII. Strategies to Sustain Momentum

Early and sustained participant engagement matters. The collaborative leadership should solicit feedback and opinions from the collaborative membership, as they have the most familiarity with institutional data collection, data reporting, and performance improvement. Achieve commitment from front-line members such as Surgeon Champions and Surgical Clinical Quality Reviewers by listening to them and seeking their input. It is helpful if the collaborative makes meetings and conferences convenient and high yield so that participants derive demonstrable benefit from ongoing participation. One must realize that these are busy people who are not only giving up time that they could be using elsewhere but also being asked to add work to their already busy lives. The collaborative leadership, therefore, must make sure that value is offered in return.

Selection of performance improvement projects should take positive deviance into account and attempt to produce meaningful change while avoiding being onerous. Early, easy wins are key to building momentum. Performance improvement projects can be either collaborative wide or individual. Incentivizing and scoring of performance improvement should be carefully considered as a means to track progress and encourage robust engagement towards achieving collaborative goals.

Communication with the collaborative needs to be ongoing and deliberate. In addition to meetings, newsletters, and on-line forums, Twitter and website updates keep the collaborative well informed and prepared. It also serves to nurture the “community of practice” and collegiality among the individual collaborative members. At least annually, solicit feedback from the collaborative on all aspects of the collaborative – operational, administrative, and clinical. This serves as an effective and efficient tool to improve from within. Similarly, a few days each year should be set aside to review the collaborative short- and long-term goals. Taking time to pause and reflect on past and future goals keeps the momentum and enthusiasm strong.

VIII. Appendices

Appendix A: MSQC Project Proposal

MSQC PSO Policies and Procedures

Title of Policy: MSQC Project Proposal
Policy Number: 600.01
Effective Date: October 2014

I. Purpose
The purpose of this policy is to standardize the process for submission, review, development, and implementation for proposed Projects to the Michigan Surgical Quality Collaborative (MSQC).

II. Background
The Michigan Surgical Quality Collaborative (MSQC) offers a flexible data collection platform designed to accommodate new and innovative ways to examine best practice. The MSQC recognizes the importance of adapting our data collection to capture clinically relevant data, while maintaining a standardized data set to allow for valid and accurate comparisons over time.

To accommodate novel ideas for advancing surgical quality, MSQC will consider proposals to alter the data collection platform through the 'MSQC Project Proposal' process.

III. Policy
Potential Projects must be submitted, reviewed, developed, and implemented in accordance with this policy's procedures to ensure procedure-targeted program changes are made within the best interest of the collaborative.

Projects are defined as procedure-targeted investigations requiring:

1. The use and/or change of the existing MSQC data collection platform and
2. The use of MSQC staff resources.

IV. Procedure
SUBMISSION

1. Project proposals must be submitted by a Surgeon Lead to the MSQC Coordinating Center using the MSQC Project Proposal document.
    a. Electronic submissions – MSQCCustomerSupport@med.umich.edu
    b. Hard copy submissions –
    Attn: Michigan Surgical Quality Collaborative
    2800 Plymouth Rd.
    Blg. 16; 1st Floor
    Ann Arbor, MI 48109

REVIEW

1. MSQC Project Proposals will be reviewed as they are received, by the MSQC Program Director and Operations Director.
2. Each proposal will be evaluated based on the following factors:
    a. Proper and full completion of the charter document.
        i. Incomplete submissions will be returned to the applicant with a limit of two proposal submissions for any Project Proposal.
    b. MSQC resources required.
        i. MSQC will review to determine if the proposed budget, project duration, and internal staffing support are fully justified and reasonable in relation to the proposed project.
    c. Reciprocal benefit to the collaborative.
        i. MSQC will evaluate the overall contribution offered to the collaborative by each Project. Priority will be given to Projects outlining the delivery of final findings to the collaborative, member hospitals, and/or the MSQC Coordinating Center.
    d. Appropriate fit with MSQC values and mission.
3. Proposals that sufficiently meet the above criteria will be presented by the Surgeon Lead to the MSQC Coordinating Center at the next designated Workgroup Meeting.
4. After internal review, the MSQC Coordinating Center will bring forth the proposal to the MSQC Executive Committee for final approval.
5. At any point in the review process, communication to the Surgeon Lead will result in one of the following:
    a. Request for Modification(s) of the Project Proposal. Submissions may require alterations to provide adequate support of Project or to accommodate a more appropriate fit with the needs of MSQC.
    b. Acceptance of the Project Proposal. Notification of acceptance will be followed by communications outlining a timeline and schedule for MSQC support of the project.
    c. Denial of the Project Proposal. Reviewers may provide guidance to the applicant or recommend against resubmission without fundamental revision.

DEVELOPMENT & IMPLEMENTATION

1. Accepted Proposals will be assigned an internal MSQC Lead to assist in the development and implementation processes necessary for the Project.
2. Upon Project approval, Surgeon Lead(s) and other Project Support Staff will be required to sign the MSQC PSO Statement of Understanding in order to obtain any MSQC PSO data (see References and Resources).
3. Each request for data issued to the Surgeon Lead or other Project Support Staff for the purpose of Project review and analysis must be documented through the completion of the electronic MSQC Data Request Form (see References and Resources).
4. Timelines and Milestones. The Coordinating Center will require the Surgeon Lead and other Project Support Staff to develop and manage the Project timeline in accordance with their Project Proposal and in cooperation with their assigned MSQC Lead. The documented timeline should accommodate the following milestones:
    a. Project Duration
        i. Project Start Date.
        ii. Project End Date.
    b. Data Collection
        i. Changes to the Workstation: If changes to the workstation are required for Project-specific data collection, the timeline must coordinate with the include MSQC Vendor Policy 700.01 (see References and Resources).
        ii. Variables and Definitions: Each variable must have an associated definition approved by the MSQC Lead and documentation of these definitions must be provided to the Coordinating Center.
    c. Participation
        i. Eligibility: Define participation eligibility and document the guidelines for participation.
        ii. Recruitment Plan: Establish the recruitment plan to identify potential sites; plan for contacting sites, etc.
        iii. Training and Support: An agreed upon training and support plan must be developed and documented to accommodate any definition and/or technical issues that may arise during all stages of implementation.
        iv. Beta Testing and Feedback: Pilot MSQC sites may be identified for a limited or phased roll-out of the Project.
    d. Results/Findings
        i. Data Sharing Plan: Develop a plan for the request, receipt, storage, and destruction of Project related data requests. Identify the number of data requests associated with the Project, how the data will be stored in compliance with HIPAA/HITECH guidelines, and the plan for destroying/returning Project data at the conclusion of the Project.
        ii. Data Collection Review/Validation: Within six weeks to three months of Project start date, the Surgeon Lead is responsible for facilitating an initial review of the Project data to ensure variables are being collected properly and confirm that data points will sufficiently meet the aims of the Project. Timeframes can be adjusted based on case volume accrual and statistical significance.
        iii. Year 1 Evaluation: After six months to one year of collected data, Surgeon Lead will be required to present the preliminary findings and next steps to MSQC Coordinating Center at a Workgroup Meeting assigned by the Coordinating Center. Timeframes can be adjusted based on case volume accrual and statistical significance.
        iv. Final Analysis: The Project timeline must include a dissemination plan to facilitate sharing of best practices discerned from achieving project aims. The Surgeon Lead will be required to disseminate Project findings through presentation(s) at collaborative meetings and publication(s) of the final analyses.
5. Timelines will be reviewed by the Coordinating Center on a regular basis to maintain full and timely completion of each milestone. It will be the responsibility of the MSQC Lead to report out on the progress of each Project at regularly scheduled Team Meetings.
6. If an applicant, at any point in the process, fails to meet the terms and conditions of the proposal parameters, MSQC may take one or more enforcement actions, which include withholding further support, or wholly or partly suspending the project, pending corrective action.

V. References and Resources

- MSQC Project Charter
- Project Timeline
- 700.01 MSQC Program Updates & Changes Affecting Variables, Definitions, MSQC Workstation, & Reporting
- Statement of Understanding

Appendix B: MSQC Forum

SQC PSO Policies and Procedures

Title of Policy: MSQC Forum
Policy Number: 300.03
Effective Date: 6/16/2014
Responsibility: Business
Revision Date: 3/2/2015
Review Date: October 2016

I. Purpose
This document provides the policies and procedures for the MSQC Forum email discussion list.

II. Background
The MSQC Forum is an email-based discussion group intended for SCQRs, MSQC clinical support staff, and other MSQC members to discuss and exchange ideas, experiences, opinions and questions related to MSQC's mission, including, but not limited to, quality improvement initiatives, best practice, and general operational issues.

III. Policy
All contributing members of the MSQC Forum must abide by the policies below.

Posting Policy (i.e. mandatory)

1. Protected Health Information (PHI), as covered by the HIPAA Privacy Rule*, must not be sent to the Forum.
2. Responsibility for the content of any message sent to the Forum rests entirely with the sender. MSQC accepts no responsibility for the content of any member email sent to the Forum.
3. Keep messages on topic. All email messages sent to the Forum must be of direct interest to the MSQC audience.
4. For security reasons, and to mitigate the possibility of PHI being posted, attachments and inline images are not allowed.
5. Do not post any information or other material protected by copyright without the permission of the copyright owner.
6. Do not send advertisements, spam, virus warnings, forwarded jokes, chain letters, petitions, business solicitations, or political endorsements etc. to the Forum.
7. Personal attacks and offensive language will not be tolerated. Personal disagreements should be taken off the Forum to personal email.
8. Add a signature tag on all messages, including your name, affiliation, and email address. Images included in signature files are not allowed.
9. Complaints about Forum members' behavior, unsubscribe requests, and other administrative concerns should be sent directly to MSQCCustomerSupport@med.umich.edu, not to the Forum.

Guidelines for Successful Discussion (i.e. highly encouraged)

1. Keep messages concise and to the point.
2. Use a subject line that clearly describes the content of your email.
3. Open discussion is encouraged. Contribute something new and substantial that adds to the conversation and encourages further discussion.
4. Questions are welcomed, but please contribute to the Forum as well as benefiting from it. Answer others' questions as well as asking them yourself.
5. Be civil, respectful, and professional. Do not say anything by email that you would not be prepared to say in person. Avoid emailing the Forum when angry or upset.
6. Remember that replying to a Forum message will send an email to 'all' Forum members, including MSQC Coordinating Center staff. Send personal responses directly to the sender, not to the Forum.

1. Data definition questions should be submitted through the Data De inition Form.
2. Specific questions for the MSQC Coordination Center should be sent to MSQCCustomerSupport@med.umich.edu
3. Technical Support requests for the Workstation and Reports Application should be submitted to MSQCCustomerSupport@med.umich.edu.

IV. Procedure

1. All SCQRs will be added to the MSQC Forum by default.
2. Members can unsubscribe from the Forum at any time by emailing MSQCCustomerSupport@med.umich.edu
3. To send a message to the MSQC Forum, members should send an email to msqcdiscussionlist@msqcforum.org
4. The Forum will be monitored by MSQC Coordinating Center staff, but not moderated, meaning email will not be filtered or checked for content, and will go directly to all Forum members.
5. MSQC reserves the right to remove the member from the Forum for any violation of Forum posting policies and guidelines.

V. References and Resources

- HIPAA Privacy Rule

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