

The Essentials of Surgical Quality Improvement Collaboratives

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One of the most important advances in the movement to improve the quality of surgical care has been the rise of statewide, regional, and national surgeon-led, quality improvement (QI) collaboratives. This chapter addresses the “why?”, “what?”, “how?” and “who?” of surgical QI collaboratives and describes a set of special considerations that should be considered when evaluating or developing such collaboratives.

Why? The Rationale for Surgical Collaboratives

For any individual surgeon, accomplishing QI can be a challenge. The insular nature of surgical practice makes it difficult to learn from others, and while there is an abundance of scientific publications and conferences to publicize major advances, there are few opportunities

to discuss the granular aspects of surgical care that may significantly impact outcomes. Even in a large group or academic practice, surgeons seldom work closely enough with each other to observe differences in patient selection, decision making, surgical technique and other processes of care that could represent opportunities for improvement. Furthermore, in a busy individual practice, let alone for a generalist who does many procedures at lower volumes, it is difficult to recognize patterns of infrequent, but major complications. Thus, it may be impossible for the individual surgeon to analyze processes of care or patient selection associated with poor outcomes, in order to make improvements. Although traditional morbidity and mortality conferences try to describe important events and may even attempt to determine cause and effect of individual complications, unless this is done on a more aggregated level, only the most obvious relationships can be identified and most M&M conferences do not link to QI interventions. Sustaining an individual interest in QI may also be challenging over the course of a career and building communities of interested colleagues willing to work together to advance quality may be a more effective approach. These observations provide a strong argument for surgeons to collaborate to analyze patient selection, processes of care, and outcomes, in order to improve quality.

One of the first surgical QI collaboratives was the Northern New England Cardiovascular Disease Study Group (NNECDSG), started by cardiac surgeons from five hospitals in Maine, New Hampshire and Vermont in 1987.¹ This group developed a uniform system to collect patient, process, and outcome data for patients undergoing coronary artery bypass grafting (CABG), with the goal of improving hospital mortality. They discovered substantial regional variation not related to disease severity, but rather to different processes of care. This was determined by analyzing collected data, discussing variations during semi-annual meetings, and conducting multidisciplinary site visits to observe subtle differences in techniques. Members were able to identify and act on opportunities for improvement because they had ownership of

the process and trusted the validity of the collected data. The result was a 24% reduction in hospital mortality after CABG across the region, with improvement at each center.¹ This experience illustrates the potential of surgical collaboratives to improve outcomes throughout a region, based on knowledge that could not have been gained within the individual centers.

Central to the effectiveness of surgical QI collaboratives is a common data registry which provides essential information, not easily obtained elsewhere. While individual hospitals or surgeons can develop and maintain a database, a common registry that is shared among many hospitals provides the ability to learn from the collected experience using common language and definitions. Once in place, a registry-based system can provide anonymous risk-adjusted comparison reports, to allow surgeons and hospitals to compare their processes of care with others, and to ultimately learn from the natural variation that occurs across the collaborative to determine which processes drive the best outcomes. Surgeons by nature are competitive, and all want to achieve the best results. If they are provided with actionable data and a clear path to improvement, our experience is that they will embrace it. This is the most important rationale for creating a surgical QI collaborative.

While a shared database is central to the effectiveness of a surgical QI collaborative, it is not sufficient. Many shared databases exist and have been used effectively for valuable research. Further, many national databases are used to provide comparative reports for users in order to stimulate QI. However, national databases are often perceived as being remotely owned and “report cards” instead of opportunities for QI that are driven by personal ownership. This may be particularly true if the initiative is hospital or payer sponsored, with data reports that focus on the hospital rather than the surgeon. In order to stimulate change, it is ideal for quality collaboratives to be surgeon-initiated, and to provide a strong sense of ownership, including confidence in the quality and value of the data being collected, as well as the content of the reports being generated. One method to encourage surgeon involvement is to create smaller

regional collaboratives that allow active participation, but which still use a centralized data collection and processing system. Smaller regional groups can then lead regional research and quality projects, and promote a joint purpose which may be more difficult to achieve in a single, national collaborative.

Additional important benefits of a collaborative approach to surgical QI include spreading costs over many institutions, creating economies of scale in QI interventions, the cultural and political benefits of linking surgeons and hospitals into a community, the potential to garner external funding, and ultimately, the potential to impact patient care in a multiplicative fashion beyond a single center. The ultimate rationale for a surgical QI collaborative is to learn from shared experience much more efficiently and effectively than can be learned separately. This requires an effective but realistic data collection mechanism and reporting system, a central organization structure, and a mechanism for developing group projects that focus on QI, which are discussed in the following sections of this chapter.

What? Different types of collaboratives, similarities/differences

Several types of collaboratives have emerged over the last decade. These include single state collaboratives organized by the local American College of Surgeons (ACS) Chapter, state hospital association or insurers, collaboratives of hospitals related by their academic activities or those within a healthcare delivery system, and virtual collaboratives of surgeons and centers focused on a specific topic or focus area. Table 1 includes a list of statewide and virtual collaboratives maintained by the ACS that, was current as of 2014. The authors of this chapter have been involved in leading several of these and have provided a brief description and insights based on their experience.

Table 1. Statewide and Virtual Collaboratives Maintained by the ACS (as of 2014).

Regional/System Collaboratives	Website
CTSQC - Connecticut Surgical Quality Collaborative	www.ctacs.org
DOD Air Force	http://www.af.mil/
DOD Army Collaborative	http://www.army.mil/
DOD Navy Collaborative	http://www.navy.mil/
DOD-Department of Defense Collaborative	http://www.defense.gov/
FSCI - Florida Surgical Care Initiative	http://www.floridasurgicalcare.org/
Fraser Health Systems Collaborative – Canada	http://www.fraserhealth.ca/
ISQIC - Illinois Surgical Quality Improvement Collaborative	http://www.isqic.org/
MSQC - Michigan Surgical Quality Collaborative	http://www.msqc.org/
PANC - Pennsylvania NSQIP Consortia	http://www.patientsafetyauthority.org/
Partners Healthcare Collaborative	http://www.connected-health.org/
Surgical Care and Outcomes Assessment Program	www.scoap.org
SQAN - Surgical Quality Action Network - British Columbia, Canada	http://bcpsqc.ca/clinical-improvement/sqan/
Society of Vascular Surgery Vascular Quality Initiative	http://www.vascularweb.org/practiceresources/vascular-quality-initiative/Pages/default.aspx
TSQC - Tennessee Surgical Quality Collaborative	http://www.tnscq.com/
UNYSQI - Upstate New York Surgical Quality Initiative	http://www.unysqi.org/
University of California CHQI Collaborative	http://health.universityofcalifornia.edu/innovation-center/
Virtual Collaboratives and Pilots	Website
CUSP SUSP	https://armstrongresearch.hopkinsmedicine.org/susp.aspx
ENT Pilot Collaborative (Peds)	https://www.enttrc.com/
Rural Collaborative	http://www.therhic.org/

The Florida Surgical Care Initiative: The Florida Surgical Care Initiative (FSCI) is a group of 54 Florida hospitals interested in improving surgical care and reducing cost. The project is coordinated by the Florida Hospital Association (FHA), began collecting clinical data in 2011, and includes a mix of teaching hospitals and both large and small community hospitals. Using a customized version of the National Surgical Quality Improvement Program (NSQIP) data collection system, variables related to general and vascular cases are collected by trained nurse reviewers, and submitted to the NSQIP database. Semi-annual reports are issued to every participant institution, with a focus on four areas- surgical site infections (SSIs), catheter-associated urinary tract infections (CAUTIs), colo-rectal outcomes, and adverse events in those age>65 yr.^{2,3} A de-identified composite of all participants' data is also furnished to the FHA to determine overall program progress.

The FSCI began with financial support of Florida Blue Cross and Blue Shield (FloridaBlue). This was a two-year grant which provided half of the NSQIP registration fees to participating hospitals. Although the net impact of the state program was a documented \$6.6 million dollar savings in avoided adverse events, FloridaBlue declined to continue project support, citing concerns that the many other insurance vendors were realizing a benefit from the program while avoiding any investment in its support. As a result of this decision, the FHA modified the FSCI concept to enable hospitals that did not want to spend \$8000 on a discounted NSQIP annual registration fee to submit its data to the National Healthcare Safety Network (NHSN), which is free. The revised FSCI now consists of an affiliation of 12 fully participating NSQIP hospitals, 11 hospitals that are using the "NSQIP-Lite" version, and approximately 30 facilities currently in the process of sending data to NSHN. As the initial version of FSCI was being completed, the FHA noted an increase in SSI, especially in the hospitals that had declined continued NSQIP-lite participation. Accordingly, the FHA has set reduction of SSI as the first major goal of the revised program.

The Society for Vascular Surgery Vascular Quality Initiative: The Society for Vascular Surgery (SVS) Vascular Quality Initiative (VQI) was launched in 2011 to improve the quality, safety, effectiveness, and cost of vascular healthcare by collecting and exchanging information between practice sites.⁴ It provides central, society-based administration under the auspices of the SVS Patient Safety Organization (PSO), which allows providers and hospitals to submit and analyze patient identified information for QI purposes without fear of reprisal, based on the Patient Safety Act. In addition to providing a common, national data collection and reporting mechanism, VQI includes a distributed network of 16 regional QI groups across the United States, patterned after the Vascular Study Group of New England.^{4,5,6} VQI leverages a national registry to perform risk-adjustment, analyses, and comparative benchmarking with regional groups that translate data on regional variation into specific QI projects.

The SVS VQI has nearly 300 participating hospitals or physician groups from 45 states. It tracks data from major open and endovascular surgical treatment of carotid, aortic, and lower extremity arterial disease, as well as hemodialysis access and vena cava filter placement. Detailed demographic, history, procedure, and outcome variables are recorded using a web-based system during initial hospitalization or outpatient procedure, as well as follow-up information entered at a one-year office visit. Data are matched with the Social Security Death Index to obtain long-term survival, and submission of consecutive cases is verified by an annual audit performed against claims data submitted by each VQI site. Real time reporting about major outcomes is available online for both physicians and hospitals. Custom analyses can be created to compare member's data to others in their regional quality group or to all VQI participants. Special reports are prepared for each regional group meeting, which show variation across centers, regions, and all VQI users. Processes of care, clinical outcomes, length of stay, and other cost proxies are available in these reports.

The SVS PSO is a separate limited liability company (LLC) under the governance of a board with representatives of the SVS and the American Venous Forum, plus representatives of each regional quality group. It has an Arterial and Venous Quality Committee to oversee projects, perform analyses, recommend quality reports, and promote national quality initiatives. It has a Research Advisory Committee to approve the release of non-identifiable datasets for quality research projects requested by VQI members.

The PSO structure of VQI affords several benefits for a QI registry. It protects the comparative analyses and other site specific QI recommendations from legal discovery, and it allows patient identified information to be submitted without consent or institutional review board approval, in order to easily match patients with claims or other data. Current VQI projects include matching with Medicare claims data to determine late complications and re-interventions after vascular procedures that are largely performed for Medicare beneficiaries. In addition to its use for member QI, the VQI is being used to evaluate safety and efficacy of medical devices used to treat vascular patients. In collaboration with the U S Food and Drug Administration (FDA), manufacturers may use VQI to obtain data needed for required post-approval studies, which has the distinct advantage of measuring device performance in real-world practice.

VQI is funded by payment from participating hospitals or physician groups. Any physician performing vascular procedures is eligible to participate, and VQI currently has not only vascular and general surgeons, but also cardiologists, radiologists, and other interventional specialties. Data from VQI or regional groups have been used as the basis for over 40 scientific publications, multiple presentations, and several successful QI initiatives. These have included improved use of beneficial preoperative medications, reduced reoperation for bleeding after carotid endarterectomy, and reduced restenosis by increased patching of carotid endarterectomy. Current quality initiatives include reducing length of stay after elective

procedure, improving survival with appropriate medications at discharge, smoking cessation after surgery, and reduction of procedural complications.

Surgical Care and Outcomes Assessment Program: The Surgical Care and Outcomes Assessment Program (SCOAP) is a surgeon-led QI initiative designed to track and reduce variability in surgical and other interventional practice and outcomes. SCOAP was developed in Washington State and is administered by the non-profit, Foundation for Healthcare Quality (FHCQ). The FHCQ is designated a “safe harbor” for QI initiatives, and is a Department of Health designated Coordinated Quality Improvement Program (CQIP), making SCOAP QI data protected from discovery.

SCOAP was motivated by investigations performed from 2000-2004 at the University of Washington’s Surgical Outcomes Research Center demonstrating significant variability in surgical outcomes across Washington State. These claims-based analyses lacked meaningful risk adjustment, process of care information and granular clinical details needed to actually improve quality. These reports were helpful in encouraging a surgeon-led, grassroots collaborative around performance surveillance using medical record-based data. SCOAP was started in 2005 and now includes more than 50 hospitals (~90%) across Washington State (including several in California and Oregon). Based in part through a grant from Washington State’s Life Science Discovery Fund in 2007, SCOAP expanded its initial focus on general surgery to include urology, vascular care, gynecology, cancer care, and spine interventions, driven by the input of various stakeholders in the SCOAP community.

The SCOAP data definitions and metrics are created and refined by this collaborative in response to new clinical evidence, emerging technology, or changes in practice. SCOAP has broad support and is a centerpiece of the Washington State Chapter of the ACS. Major state healthcare regulatory agencies and insurance plans now look to SCOAP data to measure the

quality of surgical care and have endorsed its use. Participation in the program is voluntary, but engagement is almost universal, accomplished largely by creating a community that shares best practices in a non-punitive fashion.

The program is supported by hospital-paid subscription fees based on the number of clinical modules they participate in. SCOAP data are reported back to hospitals on a quarterly basis through a web-based alert system and in real time at the hospital level. Hospitals view their own data, compared to the anonymized aggregate, and the reports include information about their benchmarked performance compared to other hospitals with flagged, color-coded metrics to understand performance “at a glance”. The quarterly reports are risk-adjusted to allow for an “apples to apples” comparison and are linked to actionable process of care performance. A separate section of the reports addresses the appropriateness of the indications for the procedures using criteria established by surgeons and other stakeholders.

Data collection is completed by a designated data abstractor at each hospital. The abstraction does not require clinically-trained staff, and to accommodate different levels of clinical experience and ease abstraction, each metrics is defined using a narrow data dictionary. A unique aspect of SCOAP is that more recent modules (spine and prostate) include patient reported outcomes (pain and function) at baseline and for up to two years after surgery.

SCOAP hosts an annual retreat, sharing progress and exploring opportunities for QI, and research. Hospitals are invited to share what they are doing with their data and to showcase SCOAPs impact on patient care. SCOAP has a strong focus on system and clinician behavior change to improve quality. For example in 2010, Washington became the first to accomplish universal adoption of a surgical checklist, modified to include process metrics (e.g., glucose testing and glycemic control in all surgical patients with diabetes) that SCOAP data revealed to be underperformed. In 2012 and in partnership with investigators at the University

of Washington, SCOAP surgeons deployed Strong for Surgery (S4S, www.strongforsurgery.org) in their offices, a checklist initiative focused on preoperative risk reduction. A program supported by Agency for Healthcare Research and Quality's (AHRQ) called the Comparative Effectiveness Research Translation Network (CERTAIN, www.becertain.org) was developed in 2011, building a set of "learning healthcare system" activities at SCOAP hospitals, enhancing the ability to perform comparative and cost effectiveness research and implementation research. A CERTAIN cost impact evaluation (conducted when hospitals were still joining the program) compared SCOAP and non-SCOAP hospitals and identified greater than \$50 million in savings from avoided complications over a three year period. CERTAIN's interest on pre-hospital risk minimization through S4S, its emphasis on decision and implementation science to influence clinician and patient decision making, and, more recently, a focus on ambulatory surgical centers and skilled nursing facilities aims to extend the impact and approach of SCOAP across the care continuum.

Michigan Surgical Quality Collaborative: The Michigan Surgical Quality Collaborative (MSQC) is a group of 65 Michigan hospitals interested in improving surgical care, and reducing cost. The group has been in existence since 2005 and consists primarily of large, community based hospitals. Using a customized electronic interface, variables important to general, vascular and gynecologic cases are collected by trained nurse reviewers, and submitted to a central data repository and analytic service, which provides real time risk and reliability adjusted feedback data to participating hospitals. Combined with regular structured site visits to best performing hospitals, and quarterly in person meetings to discuss results, the program has been successful in improving quality and reducing cost.

A unique feature of MSQC is that all costs associated with the program are supported by Blue Cross/Blue Shield of Michigan (BCBSM). Support is based on a "pay for participation" platform, which does not penalize poor performers nor reward good performers but recognizes

active participation in defined surgical QI activities. This approach helps to generate a collegial and noncompetitive atmosphere among individual providers and hospitals, resulting in a willingness to share best practices and to openly discuss poor results. Importantly, BCBSM is not privy to results from individual hospitals but is shown only aggregate data. Last year, MSQC was formally designated as a PSO by the AHRQ, which adds additional protections from discovery to the MSQC database. This serves to add confidence that the data will be used only for QI purposes. BCBSM has been generous in agreeing that MSQC should be an “all payer” database, including not only BCBSM patients, but also Medicare, Medicaid, and other privately insured individuals. Recently BCBSM reported that the statewide MSQC program had resulted in savings of 86 million dollars over a two year period for all patients, and a 49 million dollar saving to BCBSM patients specifically, representing a remarkable return on their investment.

MSQC is embarking on three broad initiatives over the next few years. The first initiative focuses on bedside and office based risk assessment, based on MSQC data, to help patients and surgeons make informed decisions about high risk surgery. In this endeavor, patients falling into a high risk category, and desiring to proceed, are entered into an intensive “pre conditioning” program, which involves progressive ambulation, smoking cessation, glycemic control, respiratory exercises, and nutritional and emotional counseling, all occurring in the month prior to an elective major procedure. The Centers for Medicare & Medicaid Services Innovation Center recently awarded multiyear grant support for this effort in MSQC hospitals. In another new effort, MSQC is embarking on a major partnership with anesthesia providers throughout the state, which involves developing a shared database with relevant anesthesia variables, the development of standardized anesthesia management protocols, the dissemination of anesthesia best practices in MSQC hospitals, and the full partnership of anesthesia providers with surgeons in MSQC. Finally, the MSQC is embarking on a video

coaching and analysis effort for colorectal surgeons, designed to give constructive feedback to participating surgeons with regard to their operative technique.

The Tennessee Surgical Quality Collaborative: The Tennessee Surgical Quality Collaborative (TSQC) was formed in 2008 as a three way partnership between the Tennessee State Chapter of the American College of Surgeons (TNACS), the Tennessee Hospital Association (THA), and the Foundation of Blue Cross/Blue Shield of Tennessee (BC/BS TN). Using the NSQIP data platform and regular review by collaborative members, by 2011 the program was able to show \$ 2.2 million in costs avoided per 10,000 general and vascular surgical cases in 10 hospitals.⁷ In 2012 the collaborative was expanded to 22 hospitals with a further grant from BC/BS TN. The program currently collects data on over 20,000 general and vascular surgical cases a year in 22 hospitals. These hospitals represent over 50% of the general and vascular surgical procedures done in our state. During this period, 2009-2013, general and vascular surgical mortality has statistically decreased 31.5% and \$29,400,000 in costs were avoided among the TSQC hospitals.

Surgical Unit Safety Program: The Surgical Unit Based Safety Program (SUSP) is an AHRQ-funded initiative that uses frontline engagement tools to promote teamwork and communication and executive partnerships to apply them to perioperative safety and SSI reduction. SUSP has tapped the collective wisdom of QI experts, diverse stakeholder groups, and clinicians to create a clinical community: a network of organizations accountable for efficient and effective sharing of knowledge, and supportive of improvement and innovation. This community includes national experts and project leaders, including faculty from the Johns Hopkins University, the ACS, the University of Pennsylvania, and the World Health Organization; and 150 peer hospitals and coordinating entities (CEs), such as state hospital associations and Hospital Engagement Networks (HENs).³ Through the implementation of evidence based clinical and cultural interventions, the goals of this project are to measurably

reduce SSIs and other major surgical complications and achieve significant improvements in safety culture. Teams participate in technical calls where the projects content is delivered as well as monthly coaching calls with other participating hospitals where horizontal learning and sharing is facilitated.

How? Keys to Building a Surgical QI Collaborative

There are common building blocks in developing a successful surgical QI collaborative including; a critical role of leadership, building a shared vision, assuring and maintaining funding and developing an infrastructure to support organizational requirements.⁸ Most programs have an identified leader; a physician, nurse, or hospital association leader that makes the running of the collaborative part of their “day job”. Surgeons with excellent skills can play that role but may not have the time needed to commit to that and often make up an advisory group that supports the group. Leaders should be experienced to credibly drive the collaborative development process. They must have a passion for the process and command the respect of the other collaborative stakeholders. Experience with QI, either in their practice or hospital, is very helpful; and ideally they should have previous experience in surgical leadership roles. This person may be expected to spend at least half their full-time equivalent (FTE) on such a project, best if funded by the organization but often this is volunteered time until the process is organized. This individual, together with other surgeon leaders drive the organization and deal with the multiple communications, and planning that goes into individual meetings. This operational leader should communicate with the group effectively, and serve as a central clearing house for contact amongst the group to receive information and disseminate that information effectively to all the members of the group.

The collaborative infrastructure may be a state chapter of the ACS, a university system of hospitals, a state hospital association, a non-academic healthcare system, or an insurer with a predominate market share in the state, region, or an area of the state. It should be an organization that can pull together a group of hospitals within the state, a portion of the state, or a region, to form the collaborative. One of the main challenges of the infrastructure is to build and maintain a culture of trust among the members of a group and a belief that their collaboration is for the good of all stakeholders; patients, hospitals, insurers and surgeons. There should be organizational agreement that no individual person or hospital can use improved results for marketing or competitive advantage. The most successful collaboratives make members believe that improvement in surgical quality across all groups is the goal and the collaborative serves as a “tide that raises all boats”. The infrastructure often houses either the data or the data analytics, and produces, distributes, or organizes reviews of performance reports that act as benchmarking activities.

At some point funds are required to support the infrastructure and leadership of all effective collaboratives. Ideally funds will also be raised to partially or fully support the hospitals' costs since financial barriers by hospitals are one of the more frequently cited barriers to participation. Funding the hospitals by insurers will encourage participation and recognize that payers have a major stake in surgical QI. Some collaboratives may have individual hospitals that are already enrolled in the NSQIP of the ACS with preexisting full funding by the hospitals, and this avoids the cost of a novel data collection system. That may not address the costs of organizing the collaborative and creating QI interventions.

One of the main roles of the collaborative infrastructure is to support QI interventions that build on data reports to actually change system and individual behavior. One of the ways this is accomplished is through regular meetings of the collaborative members, at intervals that range from quarterly to yearly, ideally in a central location in their state or region. Often such

meetings are done using more virtual modalities such as conference calls or web-connections. In person meetings are most often day-long events and include a planned program agenda where specific QI projects are discussed, hospitals discuss what they have done with their data to improve their outcomes and for the collaborative to share data and best practices. These meetings should be attended by a “Surgeon Champion”, the clinical data abstractor, and a member of the QI team at each site. The tone and optics of such meetings is critical for it is one of the main times that members learn to trust each other and share their data openly without fear of retribution. The meeting is sometimes held in conjunction with the state’s ACS Chapter meeting to further enhance the relevance of the state chapter.

Finally, there needs to be a method developed to decide what data should be disseminated, both for scholarly purposes but also for QI activities and for the public. A research and publication committee should be formed within the collaborative, and they should meet on a regular basis to guide the development of abstracts for national and regional meetings. Addressing public sharing of data is an important consideration that often requires a high level of program maturity, but may be an important component of payer support and is also an area where advisory committees may be helpful.

Who? Getting the right people involved

Collaboratives will vary in mission and focus with some being narrow (procedure-complication- or specialty- based) and others formed with the intent of addressing a broader scope of surgical complications or harm. Participants will vary depending on the scope of the work but without doubt, engaged frontline clinicians are the cornerstone of a successful collaborative and in the case of surgery-focused work, it is paramount that at least one surgeon from all participating hospitals is actively involved. Although surgeons are important for leading

change, implementation of local QI is complex and to affect change, a surgeon will need to work collaboratively with other disciplines (e.g., nursing, anesthesia, QI, infection control, etc.) at their hospital. Hospitals without engaged physicians rarely achieve the same level of success in collaboratives as those with physician leaders.⁹ Engaged clinicians alone will not have resources to support data collection and project management. Furthermore they cannot implement sustainable systems level changes to improve care are complex and change is fraught with barriers that frequently need executive support to breakdown. Therefore, teams require high level executive commitment (i.e., COO, CEO, CMO) to back their efforts. Diverse hospital participation is important, recognizing that small, large, community and academic hospitals all have opportunities to learn from each other. For example, academic hospitals with complex care structures can gain important insights into efficiency and streamlining care by comparing processes with community hospitals. It is essential to be open minded and recognize that all healthcare delivery systems have strengths and weaknesses and we can all learn from each other. Lastly, other stakeholders that have important interests, may serve as a potential funding source or otherwise be a barrier to success should be included in the collaborative. These may include leaders of insurance companies, regulators, hospital, or physician organizations and increasingly representatives of legal groups. More recently, the importance of including members of the public in such initiatives is being recognized. This helps assure that the patient's voice is kept central to discussions and often helps in discussions about transparency and public reporting.

Special Considerations

Some of these values that address questions of sharing data, peer review and competition are listed in Table 2. There are important regulatory requirements related to the collection and sharing of data. While every hospital gathers data for QI purposes and those

data are protected from discovery there has been concern, though little precedent that data shared for QI between hospitals are at risk for medicolegal claims. Many of the existing collaboratives have addressed this issue by taking advantage of statewide (e.g., Washington State CQIP status) or national protections (e.g., PSO status) for QI data sharing. This should be addressed early on in collaborative development. The infrastructure of the collaborative itself should be considered carefully. There are a range of options include LLC formation (SVS VQI), 501C-3 designation (SCOAP and Tennessee programs) and other partnership agreements that have important implications for use of the data, fee administration, receipt of gifts from industry and even discoverability of data. The role of payers/insurers is also a special consideration. Several of the more established programs receive all or some of their funds through insurers or collaborative enrollment is in some way promoted by payers through incentives or threats of alternatives. The role of payers should be carefully considered as some may want access to identified hospital data and this has been considered a significant barrier to hospital participation in the past. The use of the data for research and publication is a common interest and most collaboratives have special committees set up to address this. It is critical to acknowledge the members of the collaborative in publications and the use of so-called “corporate authorship” may be a way to recognize the group’s effort. The issue of public reporting is perhaps the most vexing for developing collaboratives. Early on in a collaboratives course the tension between the public’s right to know about outcome variability and the interest in getting hospitals (especially the most underperforming hospitals) to join may clash.¹⁰ Public reporting is most often a later step in the evolution of collaboratives, either once they have matured to the point that public release of data will not cause a threatened collaborative member to withdraw or because payer pressure would not allow it. Most collaboratives do not report publicly, with SCOAP and the Wisconsin collaboratives being exceptions and then with only process measures.

A critical issue is how to sustain QI collaboratives over time. A continual struggle for programs that rely on hospital fees is in helping member hospitals see value from the QI activities of the collaborative, especially given the uncertain business case for quality⁹ and a broad array of mandatory QI activities. One approach to sustainability has been flexibility in program activities, for example expanding the QI focus to include research or industry partnerships as a way to offset dues and support the growth of the program. Research grants and gifts can be used to develop programs and support operational activities, but these are usually time limited activities and cannot be relied on for the long haul. Sustaining momentum in the interests of collaborative members may also be a challenge. Enthusiasm for the idea of a collaborative needs to be cultivated and maintained during the long build up process needed to generate benchmarking reports and actually create changes that improve quality. Identifying early targets for QI that can demonstrate program success in changing system and surgeon behaviors related to improved quality is key to building momentum. Shifting the focus of QI once success has been achieved in a limited area helps keeps the program interesting to the members. Some collaborative have taken on a new clinical area each year and act like a “roving spotlight” to spark new energy. The challenge in shifting the focus of the QI collaborative, say from bariatric surgery to spine surgery is that the collaborative of bariatric surgeons may have little in common with spine surgeons. Creating a dynamic, flexible leadership, work groups within each clinical discipline that get to pick new metrics each year, and a fresh set of QI targets for each clinical discipline is helpful in maintaining interest. Lastly, creating and accomplishing a leadership succession plan is also a critical component of sustainability. Given many of these collaboratives have been spearheaded by a single individual, this requires the active cultivation and development of future leaders to avoid a “cult of personality” that may limit succession. Successful succession can be encouraged with term limits for leaders, broad leadership groups and appropriate compensation and administrative support, so that more people are willing to take on a leadership role.

Lessons Learned

We asked the leaders of several of the collaborative described herein about lessons “learned the hard way” and advice they had for those developing such programs. Here is a sample of their responses:

“Although a preexisting culture of trust is an advantage, if trust within the group does not immediately exist, it can develop in time. No matter how good you think your hospital looks today, over time certain outcomes will get better and certain will get worse. The key is to not get discouraged by early setbacks, if you persevere things will improve. Sustainability is one of the hardest things to develop. If you can consistently show quality improvement over time, sustainability will follow.”

“Consensus building around health care performance is difficult. Defining a performance metric is slow and must be done with painstaking detail. Getting the definition of the denominator and numerator correct is imperative. Agreement on the value equation is a holy grail. Multiple confounders exist that must be defined. What is the actual episode? How should an episode be defined? What is included in the cost component? Agreement is difficult among providers, administrators and payers. Our attempt into the efficiency world was short-lived and created much angst. We have never really revisited this topic and produced a public report. Fiscal considerations should never be ignored. Member organizations must be willing to demonstrate benefits to the members or the “no margin-no mission” concept will prevail. A collaborative must work hard to remain collaborative. When one individual or entity appears to be running the organization with little cooperative spirit, failure is probably not far away. Overuse of any one member’s resources is another recipe for discontentment and angst.”

“Semi-annual meetings of regional quality groups have promoted trust, mutual respect, and a sense of group commitment to quality improvement projects. These meetings maintain the enthusiasm of the group, which would likely ebb with less frequent meetings. Anonymous benchmark comparisons with others are highly valued by surgeons and hospitals and provide natural leverage to encourage compliance with quality improvement projects. A surgeon champion at each hospital is an essential ingredient for long term success of quality collaboratives. Research derived from registry data is an important motivating factor for participation by academic centers. The ability to demonstrate quality outcomes compared to others is an important motivating factor for participation by small, medium and large medical centers.

“Leading a collaborative is phenomenally rewarding but it is also very hard, full-time work, that is most often uncompensated and if supported financially at all, under-compensated by clinical standards. Most surgeons have never really learned to collaborate and have defaulted to competition as the most common relationship. You can change that by showing everybody what they have to gain, rather than lose. The academic centers often drive these initiatives but surgeons in community hospitals are the lifeblood of successful programs. That’s also where healthcare actually happens so learning to speak each other’s language about interests, intent and end-goals is essential. It really helps if payers use their power to support these initiatives, either through carrots or sticks. Payers are less likely to do so when they have limited market share. When targeting QI metrics, start with safety, move to quality and only at the end target appropriateness of care-any other order gets you in trouble with your main constituency, the surgeons.”

“Despite demonstrating global improvement, once the initial funding expired, many hospitals felt that their individual benefit was undefined and that no perceptible

change in the process of peri-operative care was accomplished. Rather than stimulating each hospital to seek additional guidance in applying the risk adjusted reports to specific programs of improvement, most administrators were apparently content to learn that their institutions were performing within expectations. At least two participating facilities chose to terminate as a cost cutting measure when the external support funding ended. Limited or no engagement by surgeons produced another barrier that may have actually worked against program success by messaging the hospital's administrative leaders that the surgeons were not supportive. In fact some surgeons' initial response to the program was vehement opposition and condemnation of the process as unacceptable administrative governance. Agreement on the expected level of performance from members of a collaborative, assurance that training and preparation have been accomplished, and ongoing support customized to these expectations is absolutely essential for initial success and sustainability of every multi-institutional collaborative.”

“There are increasingly more important priorities and initiatives related to perioperative quality improvement and fewer and fewer resources. Since hospitals are involved in so many programs it was challenging for teams to devote significant time and energy to our project. Most teams were dominated by quality improvement specialists and infection control practitioners, few frontline nurses, anesthesiologists or surgeons were able to secure non-clinical time for this work. As a result, few people implementing the program had a sense of what was “really happening to the patients.” Teams with strong surgical and executive leadership flourished but that was the exception as opposed to the rule. In many cases, executive leadership was in flux and surgeon hospital affiliations and employment arrangements were fluid. All team interactions were virtual through webinars and coaching calls and much of the horizontal learning facilitated by face to face interactions were lost. Despite adversity, teams persevered and tried to implement and sustain the work.”

Conclusion

Surgical QI collaborative are an exciting development in the landscape of interventions to improve the quality of care. In many ways they represent the highest calling of surgeons, to act as part of a fellowship, selflessly in advancing the interests of our patients. These initiatives are challenging to develop and may be even harder to sustain, but may be the most effective tool in accomplishing the goal of improved care. Participation in such collaborative can be very rewarding for members and leaders alike, and their growth and development needs to be supported by physicians, professional societies, payers, and policy makers in the years ahead.

References:

1. O'Connor GT, Plume SK, Olmstead EM, et al. A regional intervention to improve the hospital mortality associated with coronary artery bypass graft surgery. The Northern New England Cardiovascular Disease Study Group. *Jama* 1996;275:841-6.
2. Tepas JJ, Kerwin AJ, deVilla J, Nussbaum MS. Macro vs micro level surgical quality improvement: a regional collaborative demonstrates the case for a national NSQIP initiative. *J Am Coll Surg*. 2014 Apr; 218(4):599-604.
3. National Implementation of the Comprehensive Unit-based Safety Program to Eliminate Health Care-Associated Infections. Accessed at: <http://www.onthecuspstophai.org>
4. Cronenwett JL, Kraiss LW, Cambria RP. The Society for Vascular Surgery Vascular Quality Initiative. *J VascSurg* 2012;55: 1529-37.
5. Woo K, Eldrup-Jorgensen J, Hallett JW, et al. Regional quality groups in the Society for Vascular Surgery(R) Vascular Quality Initiative. *J VascSurg* 2013;57: 884-90.

6. Cronenwett JL, Likosky DS, Russell MT, et al. A regional registry for quality assurance and improvement: the Vascular Study Group of Northern New England (VSGNNE). *J Vasc Surg* 2007;46:1093-101; discussion 101-2.
7. Guillamondegui OD, Gunter OL, Hines L, et al. Using the National Surgical Quality Improvement Program and the Tennessee Surgical Quality Collaborative to improve surgical outcomes. *J Am Coll Surg*. 2012 Apr; 214(4):709-714.
8. Leape LL, Rogers G, Hanna D, Griswold P, Frederico F, Fenn CA, Bates DW, Kirle L, Clarridge BR. Developing and implementing new safe practices: voluntary adoption through statewide collaboration. *QualSaf Health Care* 2006;15:289-95.
9. Hall BL, Hamilton BH, Richards K, et al. Does surgical quality improve in the American College of Surgeons National Surgical Quality Improvement Program: an evaluation of all participating hospitals. *Ann Surg*. 2009 Sep; 250(3):363-376.
10. Smith, M, Wright A, Queram C, Lamb, G. *Health Aff* March 2012 vol. 31 no. 3 570-577. How Does Your Doctor Compare. *Consumer Reports- Health*. Feb 2013.