Creating Clinical Communities

Features
Methods, Tools, and Strategies
- Clinical Communities at Johns Hopkins Medicine: An Emerging Approach to Quality Improvement

Information Technology
- A Novel Design for Drug-Drug Interaction Alerts Improves Prescribing Efficiency

Care Processes
- Experience with Designing and Implementing a Bundled Payment Program for Total Hip Replacement

Performance Measures
- Effect of a Real-Time Pediatric ICU Safety Bundle Dashboard on Quality Improvement Measures

Departments
Rapid Response Systems
- Rapidly Increasing Rapid Response Team Activation Rates

Tool Tutorial
- Using Multidisciplinary Rounds to Improve Patient Safety Through Venous Thromboembolism Prevention Awareness

“The clinical communities have engaged clinicians from across the health system to participate in quality improvement and shared learning with peers.”
—Clinical Communities at Johns Hopkins Medicine: An Emerging Approach to Quality Improvement (p. 393)
There is strong pressure and interest to improve quality and value in health care. Too many patients suffer preventable harm and feel emotionally marginalized when they receive care. High health expenditures are wasted on medical care that does not improve patient outcomes.1 In response to policy efforts to reduce costs and improve quality, health care provider organizations, including primary care networks and home care services, are consolidating into larger health systems. Academic medical centers have participated in this trend, forming large networks both within and beyond their traditional catchment markets. Few academic health systems have demonstrated how they may draw on their expertise in health delivery science, link academic and community providers, and improve value.

One potential strategy to achieve better outcomes and value is to form clinical communities, which is a bottom-up approach to quality improvement (QI) that supports peer learning and reinforces or establishes shared norms.2 These communities are led by clinicians, have interdisciplinary membership, and focus on patient safety and QI in a clinical setting for a specific patient population or for a type of process. They work best when there is support from an administrative core for project management and access to resources, such as data analysis, and improvement tools. Clinical community leaders decide safety and quality priorities, set project goals, and agree to work collaboratively among themselves and their sponsoring institutions, and are accountable for measurable results. They can also focus on strategic goals for the health system.

Clinical communities evolved from previous approaches that used collaboration to achieve improvement, such as clinical networks and collaboratives. What differentiates communities from these other initiatives is their ability to use multiple designs, strategies, methods, and measures, drawing on pre-existing improvement models or creating new ones.3

There are advantages to using clinical communities rather than collaborative initiatives. First, having community mem-

### Article-at-a-Glance

**Background:** Clinical communities are an emerging approach to quality improvement (QI) to which several large-scale projects have attributed some success. In 2011 the Armstrong Institute for Patient Safety and Quality established clinical communities as a core strategy to connect frontline providers from six different hospitals to improve quality of care, patient safety, and value across the health system.

**Clinical Communities:** Fourteen clinical communities that presented great opportunity for improvement were established. A community could focus on a clinical area, a patient population, a group, a process, a safety-related issue, or nearly any health care issue. The collaborative spirit of the communities embraced interdisciplinary membership and representation from each hospital in each community. Communities engaged in team-building activities and facilitated discussions, met monthly, and were encouraged to meet in person to develop relationships and build trust. After a community was established, patients and families were invited to join and share their perspectives and experiences.

**Enabling Structures:** The clinical community structure provided clinicians access to resources, such as technical experts and safety and QI researchers, that were not easily otherwise accessible or available. Communities convened clinicians from each hospital to consider safety problems and their resolution and share learning with workplace peers and local unit safety teams.

**Conclusion:** The clinical communities engaged 195 clinicians from across the health system in QI projects and peer learning. Challenges included limited financial support and time for clinicians, timely access to data, limited resources from the health system, and not enough time with improvement experts.
Clinical communities are an emerging approach to QI to which several large-scale projects have attributed some success. For example, the national program to reduce central line–associated bloodstream infections throughout the United States formed a community of ICU teams in each participating state. The program’s success in Michigan was attributed to the effect that these communities had on changing behaviors. Also, in the Improving Lung Cancer Outcomes Project, 30 volunteer teams from National Health Service trusts in the United Kingdom formed a clinical community to reduce practice variations for patients with lung cancer. Participants felt that the community approach was a strong motivator of behavior change.

Leaders of Johns Hopkins Medicine (JHM) founded the Armstrong Institute for Patient Safety and Quality (Armstrong Institute) in 2011 to advance patient safety and quality research and training by integrating researchers across the university and by coordinating the improvement work throughout the health system. JHM is the academic health system under which the Johns Hopkins University School of Medicine and the Johns Hopkins Health System (JHHS) reside. One core strategy of the Armstrong Institute was to establish clinical communities to connect frontline providers from different hospitals across the health system to collaborate and improve quality of care and patient safety. Although the Armstrong Institute defines the parameters when establishing a community, provides the overarching patient-centered strategic objectives, and creates accountability, the community is “bottom up” in that members identify their goals and how to achieve them. In this article, we describe how clinical communities were established across JHHS hospitals.

Establishing Clinical Communities

Administrative Core

The Armstrong Institute’s director [P.J.P.], the senior director of QI, and two full-time senior project administrators [L.J.G., P.A.W.], who comprise its administrative core, began establishing clinical communities in September 2011.

The senior project administrators organize meetings, support community activities, and work to connect communities with experts and other resources (see “Enabling Structures for the Community,” page 391). For each community, the senior project administrators and the senior director of QI convene a small planning committee of frontline clinicians, staff, and administrators to help identify problem areas and manage the community. Community leaders are invited to join the planning committee to lend their expertise.

Setting

Five JHHS inpatient hospitals in Maryland and the District of Columbia (DC) participated in each of the clinical communities. One Johns Hopkins inpatient pediatric hospital in Florida, All Children’s Hospital, was included when pediatric or neonatal-related health care was involved. Three of the hospitals were urban academic medical centers, and three were community hospitals (Table 1, page 389). Fourteen communities have been rolled out in two clusters (Table 2, page 389). A community could focus on a clinical area, a patient population, a group, a process, a safety-related issue, or nearly any health care issue.

Initial Cluster of Clinical Communities

(September 2011–March 2012)

The five clinical communities in the initial cluster—the ICU, Hospitalists, Medication Safety (MS), Post Anesthesia Care Unit (PACU), and Neonatal ICU (NICU)—were chosen because they were considered high risk, the clinician leaders were interested in the community approach, and clinicians realized that there was great opportunity for improvement.

Clinical communities were initially introduced throughout JHM as a new approach to QI. Clinicians learned about these communities through targeted research seminars, presentations to clinical and quality leaders, e-mail, newsletters, and conversations with the Armstrong Institute director in the summer of 2011. After a type of community was identified, the planning committee gathered the names and contact information of clinicians who worked in this area at each hospital. Because this collaborative approach required interdisciplinary membership to be successful, we included staff, administrators, and other health professionals with a vested interest in improving patient safety and quality in the selected area.

The Armstrong Institute administrative core worked with each community planning committee to select leaders, which involved consideration of their expertise, respect within the
health system, ability to communicate and facilitate the work, leadership skills, ability to influence people, and willingness to actively lead the community. The director of the Armstrong Institute met with each potential leader to discuss the community, explore his or her interest in serving as a leader, and discuss core behaviors that embody the Armstrong Institute (“I am humble and curious. I respect, appreciate and help others. I am accountable to continuously improve myself, my organization and my community.”). Community leaders are expected to practice these behaviors. Physicians were chosen to lead most communities because the Armstrong Institute director and hospital administration agreed that without physician support up front, change could be difficult. Two communities represented clinical areas that were managed by nonphysicians; thus, the MS community was led by a pharmacist, and the PACU community was led by a nurse. In theory, we sought to assign two leaders to each

Table 1. Hospital Characteristics

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Type</th>
<th>Region</th>
<th>No. of Licensed Beds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Johns Hopkins Hospital</td>
<td>Academic</td>
<td>Urban</td>
<td>1,059</td>
</tr>
<tr>
<td>Johns Hopkins Bayview Medical Center</td>
<td>Academic</td>
<td>Urban</td>
<td>545</td>
</tr>
<tr>
<td>All Children’s Hospital</td>
<td>Academic</td>
<td>Urban</td>
<td>259</td>
</tr>
<tr>
<td>Howard County General Hospital</td>
<td>Community</td>
<td>Suburban</td>
<td>267</td>
</tr>
<tr>
<td>Suburban Hospital</td>
<td>Community</td>
<td>Suburban</td>
<td>229</td>
</tr>
<tr>
<td>Sibley Memorial Hospital</td>
<td>Community</td>
<td>Suburban</td>
<td>318</td>
</tr>
</tbody>
</table>

Table 2. Clinical Communities and Projects

<table>
<thead>
<tr>
<th>Initial Cluster of Clinical Communities</th>
<th>Launch Date</th>
<th>Projects/Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intensive Care Unit</td>
<td>September 2011</td>
<td>• Initiated validated practices for decreasing ventilator-associated pneumonia (VAP)</td>
</tr>
<tr>
<td></td>
<td>Kickoff meeting</td>
<td>• Patient and family participation</td>
</tr>
<tr>
<td>Hospitalists</td>
<td>November 2011</td>
<td>• Developed venous thromboembolism clinical pathways</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Developed a multi-institution dashboard of quality and productivity metrics by Hospitalist Program</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Compiled a list of medication safety functions among entities for purpose of standardization</td>
</tr>
<tr>
<td>Post Anesthesia Care Unit</td>
<td>January 2012</td>
<td>• Collated best practices, challenges, and ideas for collaboration</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Established a framework for handoffs</td>
</tr>
<tr>
<td>Neonatal Intensive Care Unit (NICU)</td>
<td>March 2012</td>
<td>• Built Johns Hopkins Medicine NICU dashboard for central line–associated bloodstream infection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Shared NICU admission data to develop guidelines and best practices to reduce hypothermia</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Cluster of Clinical Communities</th>
<th>Launch Date</th>
<th>Projects/Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient-Centered Care Across Maternity Services</td>
<td>November 2012</td>
<td>• Patient participation in community meetings</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Developed patient maternity experience survey</td>
</tr>
<tr>
<td>Cleaning, Disinfection and Sterilization</td>
<td>February 2013</td>
<td>• Identifying areas of risk across the health system</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Developing tools to monitor using a peer-to-peer methodology</td>
</tr>
<tr>
<td>Surgery</td>
<td>June 2013</td>
<td>• Comparing costs of consumables by surgeon, across entities, for open and laparoscopic colectomy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Developing Enhanced Recovery After Surgery protocols for colorectal surgery and standardizing patient education</td>
</tr>
<tr>
<td>Congestive Heart Failure (CHF)</td>
<td>July 2013</td>
<td>• Identifying heart failure patients (regardless of reason for hospitalization)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Created pathway for CHF management in ambulatory setting</td>
</tr>
<tr>
<td>Diabetes</td>
<td>November 2013</td>
<td>• Conducted gap analysis of diabetes resources across the Johns Hopkins Health System</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Developing pathway to improve ambulatory diabetes care by the primary care provider</td>
</tr>
<tr>
<td>Psychiatry and Behavioral Sciences</td>
<td>November 2013</td>
<td>• Developing a meaningful quality and safety dashboard</td>
</tr>
<tr>
<td>Spine</td>
<td>January 2014</td>
<td>• Developed Anterior Cervical Discectomy and Fusion pathway</td>
</tr>
<tr>
<td>Joint Replacement</td>
<td>February 2014</td>
<td>• Developing a systemwide hip and knee replacement program</td>
</tr>
<tr>
<td>Blood Management</td>
<td>February 2014</td>
<td>• Sharing of best practices to reduce transfusion overuse</td>
</tr>
</tbody>
</table>
community, one to represent academic medical centers and the other, community hospitals, to ensure that all members had a voice and to promote diverse engagement. In practice, this proved difficult. For example, the PACU community has only one nurse leader from the academic side (The Johns Hopkins Hospital). While community hospital clinicians were enthusiastic about the PACU community, work obligations prevented them from committing time to help lead.

After community leaders were selected and a list of potential members was compiled, the Armstrong Institute director e-mailed an invitation to dinner and a kickoff meeting. In the invitation, he explained the purpose of clinical communities and possible roles they could play in supporting systemwide efforts to partner with patients, their loved ones, and others to eliminate preventable harm, continuously improve patient outcomes and experiences, and eliminate waste in health care delivery. Communities were asked to organize their work into four categories, as follows:

- Safety (Comprehensive Unit-Based Safety Program [CUSP], preventable harm, teamwork, culture)
- Performance on externally reported measures
- Patient experience
- Value (efforts to reduce costs while maintaining or improving quality).

These are the four same categories used by the JHM Patient Safety and Quality Board Committee, a subcommittee of the full JHM board, to organize its own work. The director acknowledged that this new paradigm represented a fundamental shift in how clinicians and managers thought, acted, and communicated about patient safety and quality. He stressed that the power to improve quality would emerge from the community—and that the Armstrong Institute’s role was to support the community’s work.

**SECOND CLUSTER OF CLINICAL COMMUNITIES (NOVEMBER 2012–FEBRUARY 2014)**

After word spread throughout JHM about the first cluster of clinical communities, clinicians started approaching the Armstrong Institute director or other core administrative staff about establishing new communities. The second cluster of clinical communities started in November 2012 (Table 2). Newer communities followed a similar path to the initial five—that is, they were started because of interest expressed by self-identified leaders and other clinicians who wanted to do improvement work using the community approach. The timing of a community’s kickoff was based on availability of the community leaders and the director of the Armstrong Institute.

**Operating and Sustaining Clinical Communities**

Operating and sustaining the clinical communities were based on building relationships and enhancing trust. Everyone in a community may have worked in similar settings, but few community members knew one another well, and most had never worked together before. Moreover, QI efforts were fragmented across JHM. The kickoff event for the initial cluster of communities was more structured because the approach was new to Johns Hopkins clinicians and staff. Members in each community participated in team-building activities, which were followed by facilitated discussions and appreciative inquiry. In the second cluster, the initial meeting served as the kickoff, and the team leaders facilitated introductions and started discussions among members. Clinicians and staff were encouraged to share their stories, current practices, and frustrations. These conversations proved to be cathartic as common themes began to emerge. Regardless of whether a member’s practice setting was a large academic medical center or a small community hospital, the challenges were similar. Clinicians were devoted to optimizing patient care yet uniformly felt they had insufficient protected time, skills, and support from managers for analytics and improvement science.

The clinical communities chose monthly meetings on a recurring day and time, with most communities hosting meetings at Howard County General Hospital, which is the geographic midpoint for the other four hospital campuses (see Appendix 1, available in online article). Meetings were attended by clinicians, staff, and administrators from each hospital, by the leader(s) of the community, and by the assigned senior project administrator. The Armstrong Institute administrative core encouraged in-person meetings, at least during the initial development phase, to enhance human connection and to build compassion, understanding, and trust. Armstrong Institute leaders knew that it would take time to build trust and respect, to explore the work to be accomplished, and to discover the kind of ideas, methods, and mutual support that would genuinely be helpful. Thus, they theorized that to achieve community goals, members needed a safe place to present and challenge ideas, needed to be inspired into action, and, most of all, needed to habituate consulting each other for help. As members did this, they would deepen their relationships, discover common needs, and develop a collective way of thinking, approaching a problem, and developing a solution. Nevertheless, face-to-face meetings required a significant time commitment from community members. Some members had to drive more than an hour to the meeting site. Before every meeting, the community
Enabling Structure Within Each Unit: Formation of a Comprehensive Unit-Based Safety Program (CUSP)

Every clinical unit within each hospital without a safety team—that is, a CUSP team—was encouraged to form one. Although this was not necessary for the clinical community to function, the communities link similar CUSP teams from every hospital (for example, all ICU CUSP teams), building a “fractal” model (in which groups are linked horizontally and vertically throughout the health system) to link efforts across the health system. CUSP provides the structure for work on safety and QI, combining clinical best practices with the science of safety, with safety explained as everyone’s responsibility. All members of the unit learn the science of safety, deliberate over problems that cause patient harm, take ownership of those problems, and develop and implement solutions that are operational and sustainable. The CUSP team partners with a hospital executive, thereby involving him or her in addressing the safety challenges in a given area and discipline, which entails providing staff with the resources, supportive direction, and accountability necessary to improve care.

This collaborative approach to identifying and mitigating defects and risks fosters an evolution in unit culture. Frontline staff members embrace opportunities to improve patient experience and outcomes, viewing preventable harm as a problem that they can address. As such, the clinical community structure provided a balance of independence and interdependence between each hospital, with hospitals having CUSP teams, and the community the convener for peer learning among the CUSP teams. Within each community, the CUSP teams at each hospital worked to reduce risks in that unit and worked on goals common to the community.

Enabling Structures for the Community

The clinical communities could draw upon a diverse group of technical experts and safety researchers, through the Armstrong Institute administrative core, to support their improvement goals. The purpose was to provide the resources not available or easily accessible to clinicians across the health system—such as Lean Sigma, informatics, measure development, financial analysis, quality measures, human factors, teamwork, safety culture, implementation science, ethnography, statistical analysis, protocol development, and supply chain improvements. We now briefly describe some of these resources. For example, Lean Sigma experts are the backbone of technical support for the communities. They lend their process improvement expertise to assist clinicians in diagnosing and treating care delivery gaps and inefficiencies. Lean Sigma addresses common barriers to efficient high-quality care with Lean methods to reduce waste and improve flow and Six Sigma methods to reduce defects and unwanted variability. With the goal of creating frontline problem solvers, Armstrong Institute Lean Sigma Black Belts are teaching and mentoring clinicians in the application of Lean Sigma principles, tools, and systems. For example, a Black Belt is helping the Joint Replacement Clinical Community organize this clinical service and prioritize its work (Sidebar 1, page 392). In the near future, the Spine Clinical Community will work with a Black Belt to reduce length of stay and costs for lumbar fusion. Other problems, such as communication or teamwork, would require different improvement methods and resources.

As reported in Sidebar 2 (page 392), in the case of the Surgery Clinical Community, the Core Analytics team was crucial in providing the information that clinical communities needed to identify opportunities, and then the analytic tools to track their performance. Communities frequently requested detailed data about quality and costs because they wanted to improve quality, safety, and value. At times, this was challenging because the health system does not yet have an integrated electronic medical record or cost accounting system. The Core Analytics team helped communities integrate each hospital’s needs and objectives to realize economies of scale. During this process, a patient-centered focus was critical in keeping all stakeholders aligned. This common goal of providing better and more efficient care to patients kept the challenges of accessing and sharing data from derailing their efforts. For example, physicians in the ICU clinical community requested chart-abstracted data from the Epidemiology and Infection Control Department. The department’s director wanted to understand the reason for the request. After the director joined a clinical community meeting and learned about the importance of such data, collaborations on data sharing and report generation went more smoothly. Interactions with various data stewards demonstrated that transparency and engagement were critical in creating a sustainable information-sharing ecosystem.

Analytics tools, such as monthly dashboards and Web-based
Sidebar 1. Joint Replacement Clinical Community: Lean Sigma Support

At the kickoff of the Joint Replacement Clinical Community meeting in February 2014, members introduced themselves and discussed opportunities and challenges they faced in daily practice. They generated several good ideas for potential projects, yet knew they needed to start by mapping the current process from preoperative care through postoperative care. For the second monthly meeting in March, the Armstrong Institute project manager invited a Lean Sigma Black Belt to help facilitate and organize the work. The community members wrote all tasks included in the perioperative process on sticky notes and put them on a flip-chart sheet. The Black Belt project manager then organized the notes into a swim-lane diagram, which identifies tasks in the process and those responsible for each task. At the next meeting, the group analyzed the diagram for accuracy and began mapping out the perioperative process in detail.

Sidebar 2. Surgery Clinical Community: Core Analytics Team

Members of the Surgery Clinical Community, which was launched in June 2013, include surgeons, nurses, and anesthesiologists from the five health system hospitals in the Maryland-District of Columbia region and the senior epidemiologist of the Johns Hopkins Health System. The community is led by two surgeons, one from Sibley Memorial Hospital and the other from The Johns Hopkins Hospital (JHH), who recommended its formation on the basis of the impending requirement to report hospital-acquired colon infections to the state. Initial areas discussed as potential areas of focus included surgical site infection reduction, patient education materials, length of stay (LOS) reduction, patient experience, and supply utilization. The community chose cost of consumables for laparoscopic and open colectomies by surgeon as its project—only to quickly realize that collecting data from the operating room supply chain was not standardized across the health system and would therefore be too challenging to compare. The community then decided that it could have greatest impact in two areas: (1) implementing better protocols for enhanced recovery after surgery (ERAS) and (2) developing patient education for colorectal surgery.

Best practices with perioperative process measures such as perioperative nutrition, fluid management, surgical site infection prevention, and pain management were identified at each hospital, and the community developed protocols for the academic and community sites. The Core Analytics Team at the Armstrong Institute is currently collaborating with community members to develop a dashboard to track laparoscopic and open colectomies, with a focus on reducing LOS. Compliance with ERAS process measures and 30-day morbidity are being monitored through the American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP) subscription. At the community’s inception, only JHH was participating in the program, which the remaining four hospitals joined one year later. JHH’s ERAS program, which, with implementation in February 2014, is the most mature in the community, has achieved a two-day LOS reduction.

Reference

The clinical communities also sought to actively engage patients and their families. Community leaders knew that practicing more compassionate patient- and family-centered care meant seeking the wisdom and insights of patients and their families. A subgroup of members from the Patient-Centered Care Across Maternity Services Clinical Community met, developed ground rules for patient and family participation, and reached consensus on these rules with the entire community. Patients and families were recruited through advertisements in Johns Hopkins newsletters and through word of mouth. A senior project administrator e-mailed responders within 24 hours of their inquiry, explaining how they could contribute and the importance of openly sharing their hospital experience during a community meeting. The administrator followed up by phone to answer any questions and reinforce that their contributions were meaningful and that clinicians wanted to improve their practice and better respond to patient needs. Patients and family members were encouraged to talk honestly about their experience, including what went well, where care fell short, what they wished the health care team knew, and what they wished had happened. The information gleaned from patients sharing...
Discussion

The clinical communities have engaged clinicians from across the health system to participate in QI and shared learning with peers. Providers from nonacademic hospitals noted that the clinical community approach was refreshing, breaking the perception of academic medicine as dictating to them and the assumption that academic physicians have all the wisdom. In many instances, the opposite occurred, with academic members learning and adapting community-based processes. Trust increased when academic and community clinicians humbly admitted their shortcomings and openly shared their struggles and successes to help others. The partnerships between communities and finance gave clinicians the finance data they wanted but often lacked and accelerated efforts to reduce supply costs and enhance value.

Use of clinical communities across JHM builds on existing literature, helping to illustrate and validate key features that make communities effective. For example, Aveling and colleagues describe eight attributes of effective clinical communities. One attribute was a vertical core to manage and coordinate activities and provide measurement and improvement expertise; the Armstrong Institute is the vertical core. We carefully selected community leaders and assigned a senior project administrator to help convene members, build trust and a willingness to collaborate, link communities to resources, and be accessible for any related issues. Another attribute of effective communities was opportunities for shared learning. For example, following conversations in the NICU Clinical Community about delayed cord clamping, most hospitals made this standard practice in the unit.

Clinical community members also appreciated hearing the patient’s voice and presenting their accomplishments to the health system leaders. Patient participation in the community’s work helped clinicians understand and focus on patient needs. The community leaders saw their annual presentations before the JHM Patient Safety and Quality Board Committee as an opportunity to show their work, articulate their needs, and provide a mechanism for accountability.

The clinical communities created at Johns Hopkins have important implications for policy makers, payers, and QI researchers. In their work, they engaged 195 clinicians from across the health system in efforts to improve quality and reduce costs. One example is the Congestive Heart Failure Clinical Community’s work to standardize patient education. The existing materials were not easy to understand or comprehensive, often confusing the patient about his or her follow-up care. Congestive heart failure nurse educators from each hospital formed a subgroup, which reviewed existing educational materials and

EVALUATION PLAN AND ACCOUNTABILITY

Because the clinical communities are relatively new and evolving, we as yet have limited empirical data demonstrating their benefits. However, we have established an evaluation plan. After a project is selected, the community decides what metrics to use to evaluate improvement. For some projects, the teams might not have valid measures, or the burden of data collection for a valid measure may exceed the available resources. The communities are aligned with the health system’s strategic patient safety and quality goals, as commonly measured by length of stay, complications, HCAHPS (Hospital Consumer Assessment of Healthcare Providers) scores, and supply costs. Baseline data and postintervention time series data are collected after the intervention is implemented to feed back performance and monitor improvement. Several communities benchmark their performance against peer institutions and national databases. Each clinical community reports annually to the JHM Patient Safety and Quality Board, which provides strategic goals for the academic health systems and oversees all efforts toward these goals.
recommended revisions to the entire clinical community. The subgroup developed a one-page pamphlet, *Managing Heart Failure—Tips for Success*, which all patients with the condition receive during their hospitalization. The information from this pamphlet is now part of JHM’s policies for managing this patient population. As policy makers and payers continue making strides in these areas, they should look to clinical communities to support these efforts. The communities gave voice to all clinicians and staff who wanted to improve the quality of care delivered to our patients.

The clinical communities did face challenges. There was no financial support from hospital leaders for clinicians to participate in this work. Because this was a fairly new concept at the health system and because the number of communities grew rapidly, the infrastructure to support the community was often insufficient to provide the resources needed, particularly in terms of data. It was difficult to engage and involve community members who stayed at the periphery of their community’s work. Many clinicians wanted to join the group but were reluctant to assume more responsibility. Sometimes membership changed as projects evolved. Time commitment was a burden. The distance between hospitals meant travel times of up to 2 hours, in addition to the 1.5-hour monthly meeting.

A barrier to moving projects forward was timely access to clinical and financial data. Without accurate baseline data and timely feedback on new interventions, it was challenging to gauge improvement. Clinicians had to extract information from the electronic health record, QI databases (such as patient experience scores), and financial data sets. Each of these data sources is maintained by different groups and requires different skills to abstract data. It was difficult to obtain technology support to develop a dashboard and unified order sets. When resources were made available, they were allocated to different budgets within the JHHS, which the Armstrong Institute could not access. Although the clinical communities were linked to improvement experts with backgrounds in Lean Sigma and implementation science, these experts had many competing priorities, and the communities needed much more of their time.

**Recommendations for Other Health Care Organizations**

We created clinical communities in a health system with an existing institute dedicated to supporting patient safety and QI across the health system and with a substantial safety research infrastructure. The Armstrong Institute executes a transdisciplinary and science-driven approach to help advance the science of improvement and increase the effectiveness of interventions. The execution of this approach entails academic resources, such as human factors engineering, industrial psychology, and improvement scientists, but the represented skill sets are not necessary to support communities. Most hospitals should have the core resources needed for communities—staff versed in project management, Lean Sigma, and analytics. Thus, the clinical community approach likely can be broadly applied to academic and community health systems alike.

Before the work begins, the hospital’s executive leadership needs to understand that patient safety and QI progress at the speed of trust and begin with clinicians and staff closest to the patients. In our experience with QI work, which long predates the creation of the clinical communities, we learned that frontline staff know where the problems lie and what interventions will improve care, reduce variation in practice, and deliver value to the organization. The clinical community approach accomplishes this by convening clinicians and other pertinent staff and asking them how to improve care. Also, start small (for example, one clinical area) to gauge organizational readiness for change and talk often about the community to garner support for the model. In our effort, we started with five communities that had clinician leaders who were interested or already working in QI. These initial communities were a proof of concept, enabling word to spread about this model, prompting clinicians to approach us about an area that would benefit from a community.

**Key Elements**

Three key elements will help a clinical community succeed, as follows:

- Engage physician champions and seek multidisciplinary membership to ensure that all services with a vested interest are represented. In establishing a community, we thought broadly and beyond clinical services, taking care to include nonclinical staff with particular skills or experience that were crucial to the work. For example, risk management and regulatory compliance staff are part of the Cleaning, Disinfection and Sterilization Clinical Community.

- Assign an administrator with project management skills and dedicated time to organize meetings and support the work. The Armstrong Institute senior project administrators developed action plans, documented and tracked project status, kept community members on task and projects moving forward, and made connections and facilitated acquisition of resources as needed.

- Ensure that executive leadership provides sufficient resources for the infrastructure to support the communities.
Next Steps
To overcome challenges, Armstrong Institute leaders seek to ensure that each clinical community member receives support from his or her local hospital. In addition, the Armstrong Institute is working to find additional support to ensure that each community has the appropriate analytic support and a Lean Sigma Black Belt for process improvement. Finally, the communities are working with finance to document the cost savings associated with each community and to develop a business case to garner additional support for teams. The clinical communities and the infrastructure to support them are evolving; the benefits of tapping into the wisdom and passion of frontline clinicians endures.

The authors thank Christine G. Holzmuehler, BLA, for her thoughtful review and edit of an earlier version of the manuscript; Renee Demski, MSW, MBA, for providing leadership and guidance to the clinical communities; and Ronald Werthman, MBA, for supporting clinical community work.

Lois J. Gould, MS, PMP, and Patricia A. Wachter, MA, are Senior Project Administrators, Clinical Communities, Armstrong Institute for Patient Safety and Quality, Johns Hopkins Medicine, Baltimore. Hanan Aboumatar, MD, MPH, is Assistant Professor of Medicine, School of Medicine, Johns Hopkins University, Baltimore. Renee J. Blanding, MD, is Assistant Professor of Anesthesiology and Critical Care Medicine, Johns Hopkins Bayview Medical Center, Baltimore. Daniel J. Brotman, MD, SFHM, FACP, is Associate Professor of Medicine, and Janine Bullard, MD, and Maureen M. Gilmore, MD, are Assistant Professors of Pediatrics, School of Medicine, Johns Hopkins University. Sherita Hill Golden, MD, MHS, FAHA, is Associate Professor of Medicine, School of Medicine, and Associate Professor of Epidemiology, Bloomberg School of Public Health, Johns Hopkins University. Eric Howell, MD, is Associate Professor of Medicine, and Lisa Ishitii, MD, MHS, is Associate Professor of Otolaryngology-Head & Neck Surgery, School of Medicine, Johns Hopkins University. K.H. Ken Lee, DrPH, MHS, is Director, Value Analytics, Armstrong Institute for Patient Safety and Quality. Martin G. Paul, MD, is Chair, Department of Surgery, Sibley Memorial Hospital, Washington, DC. Leo C. Rotello, MD, is Director of Critical Care, Johns Hopkins Community Physicians, Suburban Hospital, Bethesda, Maryland. Andrew J. Satin, MD, is Professor and Director of Gynecology and Obstetrics, and Elizabeth C. Wick, MD, is Assistant Professor of Surgery, School of Medicine, Johns Hopkins University. Laura Winner, MBS, RN, is Director, Lean Sigma Deployment, Armstrong Institute for Patient Safety and Quality. Michael E. Zenilman, MD, is Vice Chair and Regional Director of Surgery, Washington, DC Region, Johns Hopkins Medicine. Peter J. Pronovost, MD, PhD, is Senior Vice President for Patient Safety and Quality, and Director, Armstrong Institute for Patient Safety and Quality; Professor of Anesthesiology and Critical Care Medicine, Surgery, and Health Policy and Management, Johns Hopkins University; and a member of The Joint Commission Journal on Quality and Patient Safety’s Editorial Advisory Board. Please address correspondence to Lois J. Gould, MS, PMP, lgould1@jhmi.edu.

Online Only Content
http://www.ingentaconnect.com/content/jcaho/jcqqs
See the online version of this article for
Appendix 1. Map of Maryland and District of Columbia Hospitals

References
Most of the clinical community monthly meetings were hosted at Howard County General Hospital, which is the geographic midpoint for the other four hospital campuses.