The Role of Regional Collaboratives: The California Perinatal Quality Care Collaborative Model

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- Perinatal quality improvement
- Neonatal intensive care unit
- Regional collaborative
- California

THE CASE FOR A REGIONAL APPROACH TO PERINATAL QUALITY IMPROVEMENT

Improving the outcome of the infants cared for in one’s neonatal intensive care unit (NICU) is the main objective of improvement projects that are pursued independently or as a member of a national collaborative. While improving the outcome of patients is a key motivator for NICUs that are members of a regional perinatal quality improvement collaborative, the very nature of the regional enterprise encourages each member to also take on the responsibility of improving the care and outcomes for the entire population of the region’s mothers and infants. Because of the scope of the members’ commitment, regional quality improvement collaborations represent the intersection of hospital-based and community-based medicine offering the possibility of coordinated improvement efforts conducted at both the hospital and community level. Let us consider what might drive such a coordinated approach. When clearly presented, data are often a key motivator for quality improvement. Fig. 1 shows the familiar comparison of an outcome across NICUs, a portrayal that often serves as a strong motivator for action among NICUs. Using the same data source, which includes the rates of antenatal steroid (ANS) administration to eligible mothers collected on the NICU dataset as well as the mothers’ residential zip codes (which in California is linked to the NICU dataset), one is able to map ANS use across the region served by the collaborative, creating potential motivators to action at the community level (Fig. 2). Regional quality improvement collaboratives enable envisioning a future where member teams will come from both the hospital and the...
community and where improvement bundles are developed that address hospital root causes, community root causes, and root causes that emerge at the interface between hospital and NICU care. Because data are a key motivator for improvement, an important goal for the California Perinatal Quality Care Collaborative (CPQCC) has been to construct a single database that can be used to inform process and outcomes improvement at both the hospital (see Fig. 1) and community level (see Fig. 2).

Although being a member of a national perinatal quality improvement organization or initiative may provide the tools for effective quality improvement, the shape of these tools is largely independent of the health care context within which the individual NICUs exist. An important potential offered by membership in a regional collaborative is that of understanding the nature of one’s regional network of perinatal care. In 2008, 41% of NICU admissions in California were acute, outborn neonatal transports. Given the large number of outborn admissions, a regional collaborative has the ability to provide a platform for quality improvement initiatives that can be directed not only to individual NICUs but also to quality improvement teams that are composed of health care providers from both the referral NICU and several of its major referring hospitals. The value of the network approach to quality improvement is based on the premise that ideal care often represents a continuum that extends from the care provided at the birth hospital and its nursery or NICU to the care provided at the referral NICU. For example, ideal initiatives developed to maximize the improvement of respiratory, nutritional, or severe asphyxia management must identify and create improvement bundles to address the cascade of root causes that emerge at the birth hospital, during transport, and at the referral NICU. While certain components of these bundles may be specific to each location, ideally they are designed and refined by a team from all 3 locations. Although the author knows of no current integrated projects, the interhospital collaborations that are nurtured within regional collabora-

![Antenatal Steroids](image.png)

Fig. 1. The distribution of antenatal steroid use in qualifying mothers giving birth in CPQCC Hospitals with community NICUs in 2005. (Courtesy of California Perinatal Quality Care Collaborative; with permission.)
and constrained by the region’s economic, sociodemographic, regulatory, payer, and geophysical context. In addition, the treatment style and its level of effectiveness appear to differ across regions. By taking these local factors into account, regional collaboratives are able to optimize the design and implementation of their improvement initiatives. A further advantage is that members of a regional collaborative are able to compare their performance to hospitals that are operating within a similar demographic, economic, and health services context. Benchmark performance becomes an even more meaningful and powerful motivator as it represents performance that has been achieved locally by one’s peers. The members of a regional quality improvement initiative represent a community of change. As a community, they share their approaches to overcoming obstacles to improvement. Whereas many of these obstacles are universal, many of them or their solutions are influenced by the regional context. Members of a regional collaborative have the advantage of being able to share the approaches that were found to work well within their region. In summary, while quality improvement initiatives conducted by individual NICUs and by membership in national collaboratives are important ways to improve care, regional quality improvement collaboratives offer many potential advantages.

**THE NATURE OF A REGIONAL PERINATAL QUALITY CARE COLLABORATIVE**

At its heart, a regional quality improvement collaborative is a complex organization with multiple stakeholders. A major challenge to the creation of a regional quality improvement collaborative is how to pull these stakeholders together when many of these stakeholders hold very differing opinions as to how health care should work and what should be its most immediate quality issues. For example, a consumer organization may be primarily concerned with creating regional report cards that allow the public to choose hospitals that have demonstrated the best results, and may not consider the investment of the enormous energy required to help hospitals improve their outcomes to be part of their mandate. On the other hand, physicians may be less enamored of public reporting, but willing to invest great energy in quality improvement efforts to improve the clinical outcomes of their patients. It is not unusual for the key stakeholders to have long-standing differences that must be addressed if they are to work together effectively. Bringing disparate stakeholders together requires (1) the identification of a highly valued, common goal and (2) an organizational structure that provides value and minimizes risk for each stakeholder. In the author’s experience, these are not easy tasks to accomplish and can be greatly facilitated by enlisting the aid of an experienced consultant in organizational development.

In the mid 1990s there was a great deal of payer activity to promote health performance report carding in California. In this environment, 4 major stakeholders saw the need for a California Quality Care Collaborative: (1) the California Association of Neonatologists (CAN), whose initial concern was with fair comparisons; (2) the State of California, Maternal and Child Health Branch (CA-MCH), which wanted to extend their analysis of risk-adjusted, neonatal mortality in California’s approximately 350 birthing hospitals to include risk-adjusted measures of neonatal morbidity; (3) California Children’s Services (CCS), one of the state’s largest payers of NICU care, which wanted an analysis of the quality of the care it was paying for; and (4) the David and Lucile Packard Foundation, which had supported the Vermont Oxford Network (VON) nationally and wanted to extend and promote the benefits of membership in this organization to its home state of California. A fifth key player was VON whose expertise, input, and support were essential components of the build. These champions met, sketched out a potential mission statement, identified key stakeholders,
and began the assessment of the potential benefits and risks for each stakeholder’s participation. Over the course of a year, CPQCC leadership met with each potential stakeholder individually to ascertain their reaction to the collaborative’s proposed mission and to explore how the collaborative might be structured to maximize the value and minimize the risk of each stakeholders’ membership. Significant efforts were made to engage the most senior representative of each stakeholder, which required not only the influence of the core project champions and a great deal of networking but also a careful consideration and succinct presentation of how membership in the collaborative could bring value to the stakeholder. Once key stakeholders had been engaged individually, pairs of stakeholders, whose histories suggested that they might have difficulty collaborating, were brought together to discuss the potential values and risks of pursuing common quality improvement goals. Boxes 1 and 2 list the core CPQCC stakeholders and the potential value that membership could bring. The major stakeholders who were essential to CPQCC’s creation and

Fig. 2. (A) Antenatal steroid percentages for eligible infants of 24 to 33 completed weeks’ gestation, California, 2005. Only infants 400 to 1500 g are included in the calculations for this map. (B) Antenatal steroid percentages for eligible infants 401 to 1500 g by zip code, Los Angeles County, 2005. Infants 401 to 1500 g and 24 to 33 weeks of gestation are included in the analysis. (Courtesy of California Perinatal Quality Care Collaborative; with permission.)
development are listed in Box 3. Although these individual and paired stakeholder meetings took almost a year to accomplish, these efforts were critical to the successful launching of CPQCC. By the time the initial CPQCC Executive Committee meeting was held, the major interstakeholder issues that could have been major stumbling blocks to CPQCC’s development had been already addressed, and the group was keen to get on with the work of creating the collaborative. During the course of these preliminary meetings with the potential stakeholders, there emerged not only a refinement in the mission of the collaborative but also an organizational philosophy that was formally addressed at the first Executive Committee meeting.

ROLE OF THE MISSION STATEMENT AND DEFINITION OF ORGANIZATIONAL PHILOSOPHY

Although the general goal of any quality improvement collaborative is to improve quality, exactly what is meant by quality improvement and specifically how one will go about achieving it has many interpretations. Because of these many interpretations, creating a mission statement is an essential step in building any collaborative enterprise. In essence, the mission statement addresses who you are, your overarching goal, and how you intend to achieve this goal. Although the collaborative may be made up of stakeholders and stakeholder factions with diverse positions,
Box 1
Core CPQCC stakeholders and potential value of membership

- California Association of Neonatologists (CAN)
  - Advocate for fair report cards with malleable outcomes
  - Provide quality improvement initiatives to improve outcomes
- State Maternal and Child Health Branch (CA-MCH)
  - Improve perinatal outcomes by reporting on risk-adjusted neonatal morbidity
  - Promote perinatal regionalization
- California Children’s Services (CCS)
  - Provide data to assess NICU medical quality of care
- Pacific Business Group on Health (PBGH)
  - Provide consumer-oriented quality assessment
- Vermont Oxford Network (VON)
  - Develop a regional model of VON

Courtesy of California Perinatal Quality Care Collaborative; with permission.

Box 2
Potential value of membership to individual NICUs

- Provide volume and demographic data
  - Administrative planning and strategic development
- Provide process and risk-adjusted outcomes data
  - Guide quality improvement activities, meet payers’ quality improvement requirements, contracting
  - Provide quality improvement support (workshops, toolkits, webcasts)
- Prepare mandated California Children’s Services Report
  - Analysis of match between an NICU’s infants needs and its capacity
  - Matching a NICU’s quality improvement activities to its outcomes
- Facilitate the California Hospital Assessment and Reporting Mandate (CHART)
  - Advocate for malleable quality indicators
  - Prepare risk-adjusted measures for release to CHART
- Develop and manage mandated California Infant Transport Database
  - Facilitate improving system to benefit both referring and receiving hospitals
- Develop and manage High-Risk Infant Follow-Up Database
  - Provide risk-adjusted, 3 year outcomes, including coverage, completion and barriers to care
- Provide participating physicians the opportunity to meet the American Board of Pediatrics (ABP) Maintenance of Certification, Part 4 quality improvement requirement

Courtesy of California Perinatal Quality Care Collaborative; with permission.
the mission statement’s goal(s) and operational approach to achieving those goals become the common ground that all of the stakeholders must agree to and value highly. Although a draft mission statement can be formulated and a rough plan of operations achieved fairly rapidly, it is critical that the individual collaborative members themselves have the freedom to hammer out and agree on who they are, the goals that they all value, and their agreed-upon path to achieving this goal, which can take several long sessions. Engaging an experienced expert in organizational development to conduct these meetings will greatly facilitate the creation of the collaborative’s foundation. In business organizations, the mission statement serves to succinctly state what the enterprise is about and is often posted prominently on walls, writing tablets, computer screens, and so forth, to constantly reinforce the “who we are, what we want to achieve, and how we go about it” message. In quality improvement collaboratives, the mission statement can often be used to resolve impasses that emerge due to stakeholder differences by reminding them that they are all trying to move toward a common, highly valued, and agreed-upon goal. As CPQCC grew and developed, all stakeholders were in agreement that the mission of CPQCC was “to optimize the health and outcomes of California’s pregnant women and their infants by developing a collaborative network of public and private, obstetric and neonatal providers, insurers, public health professionals and business groups to support self assessment, bench marking, and performance improvement activities for perinatal care.”

In addition to a mission statement, it is important to develop an organizational philosophy, which is a set of key principles that guide the structure, operations, and growth of the Collaborative. The main features of CPQCC’s organizational philosophy are that: (1) quality improvement is a worthwhile endeavor; (2) participating in the design and conduct of quality improvement initiatives is professionally rewarding;

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<th>Box 3</th>
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<td>Major stakeholders who were instrumental to CPQCC’s creation and serve as members of the CPQCC executive committee</td>
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- Perinatal Practitioner Organizations
  - California Association of Neonatologists
  - California Chapter Academy of Pediatrics
  - American College of Obstetricians and Gynecologists
- State of California
  - Maternal, Child, and Adolescent Health Branch
  - California Children’s Services (CCS)
  - Office of Vital Records
  - Office of Statewide Health Planning and Development
- Private Organizations
  - March of Dimes
  - Pacific Business Group on Health
  - California Hospital Council
  - David and Lucile Packard Foundation
  - Vermont Oxford Network, Inc (VON)
(3) CPQCC should be a bottom-up or grass roots organization; and (4) CPQCC should strive to optimize the value that it brings to its members and its stakeholders.

OVERVIEW OF CPQCC AND ITS ORGANIZATIONAL STRUCTURE

The CPQCC is a consortium of NICUs that cares for, collects, and stores clinical data on more than 90% of all neonates who receive neonatal intensive care in California. The CPQCC was initiated in 1997 by the California Association of Neonatologists, with the goal of blending academic and private neonatology into a common body politic to partner with various private and public institutions that share the common goal of improving health care outcomes for mothers and babies in California. Building on the VON and its data system, CPQCC became the first regional application of the Vermont Oxford Neonatal Network. The organizational authority for CPQCC comes from the California Association of Neonatology (CAN) and Stanford University serves as its fiscal intermediary. Although one could consider CPQCC a grass roots, physician-based organization, such a narrow view would miss the importance of the organization as also representing a true collaborative effort of multiple key stakeholders, all of whom guide CPQCC’s direction as members of its Executive Committee. Using CCS definitions, its 129 member Hospitals include 22 regional-level, 72 community-level, 25 intermediate-level, and 10 undesignated NICUs. (CCS is a state “HMS” program that sets the standards of care and outcomes for California’s NICUs, provides on-site classification and monitoring, and approves payment from public payers.) In 2008, CPQCC members cared for 18,671 infants, 64% (11,994) of whom were high-morbidity infants greater than 1500 g and 36% (6677) of whom were very low birth weight (VLBW). Forty-one percent (7638) of the infants were acutely transported during the neonatal period.

Leading CPQCC’s organizational structure is an Executive Committee that develops, prioritizes, and oversees the collaborative’s strategic plan. An Executive Steering Committee, made up of the project Principal Investigator, Administrative Director, Data Center Director, and Director of Quality Improvement, is responsible for the collaborative’s day-to-day operation as performed by 3 arms: the Data Arm, the Quality Improvement Arm, and the Research Arm.

The Executive Committee is made up of the key stakeholders (see Box 3). Because of the many sectors that make up neonatology in California, it was crucial that there was appropriate representation from across the state. In addition to membership of the current Chair of CAN and of the American Academy of Pediatrics (AAP), Perinatal Section, District IX, the Executive Committee (as well as all major committees) have balanced representation from Northern California, Southern California, and Academic, Private, and Medical System neonatology groups.

One of the first major decisions of the Executive Committee was to select increasing the rate of antenatal steroid (ANS) administration use as the first topic for quality improvement. A Perinatal Quality Improvement Panel was created under the Quality Improvement Arm to develop the toolkit, conduct workshops, and design the initiative. At the same time, it was felt to be essential that the Executive Committee establish a Data Release Subcommittee to develop a position with respect to public release of data that was in keeping with the collaborative’s approach to quality improvement. CPQCC’s fundamental position is that the goal of quality improvement is not to identify the few units that are particularly challenged, but rather to increase the performance of all the participating units. Operationally, it was believed that a successful quality improvement initiative should increase a desired outcomes mean and decrease its variation across the participating NICUs. Fig. 3 illustrates this achievement. Because
the results of this project were to be publicly released on the Pacific Business Group on Health’s Web site, the Data Release Subcommittee spent a great deal of time formulating a public description of the project that would fairly portray what could be inferred from this data. It was also decided that if, after reviewing its data, a Hospital did not want it to be publicly released, this was acceptable but would be noted on the public release site. In keeping with CPQCC’s fundamental position, it was decided that in any releases by the collaborative, only the names of the participating hospitals and their achievement as a group would be presented. A more complete description of this project is available.¹

The CPQCC’s approach of working together with a commitment to improving the performance of the group, rather than focusing on the identification and remediation of hospitals whose performance is below expectation, has helped to firmly establish CPQCC as a collaborative working together to improve outcomes in all members for the benefit of all of the mothers and infants across California. In keeping with this philosophy, hospitals performing below expectation are not viewed as “bad apples to be weeded out,” but rather as colleagues who are challenged in a specific area of care. Operating under the perspective that only by investing in quality improvement can clinicians be assured that their patients will have access to high-quality care in the future, the role of the CPQCC is to give them the tools and support to overcome these challenges. While physicians and hospitals easily accept this position, it may not fit the agenda of consumer advocacy members who may see the value of performance reporting as a tool for smart buying rather than as a motivator and guide for quality improvement. One of the dynamics of a collaborative is to strike a balance between these two positions.

The Data Release Subcommittee also established the policy that CPQCC members were not allowed to publicly release their confidential data nor use it for marketing purposes, with violation of this rule resulting in loss of membership in the collaborative. The recent increase in the need for transparency, however, especially from hospital leadership, has once again brought the issue of public release to the forefront. Two

Fig. 3. The goal of the CPQCC Quality Improvement Program is to move the group’s mean and reduce its variability, as is seen in the results for the Antenatal Steroid Quality Improvement Initiative. (Courtesy of California Perinatal Quality Care Collaborative; with permission.)
concerns are evident: first, that a hospital may choose only to publicize what is does well to the exclusion of areas in need of improvement, and second, the risk of data being released without the background information that is needed for informed nonmedical interpretation. To address the first concern, CPQCC is working on a transparency approach that would require the release of a panel of quality indicators. When the components of the panel have been finalized, the committee will then work on an accompanying patient-oriented description of the items, their risk-adjustment limitations, and any other caveats to their interpretation.

THE QUALITY IMPROVEMENT CHALLENGE

The quality improvement challenge is threefold: (1) to collect high-quality, reliable data; (2) to transform these data into information by developing risk-adjusted, confidential reports that inform and organize work; and (3) to move from information to action by supporting perinatal providers in their work of improving care and outcomes. First, consider the issue of data. One of the first tasks of the Data Arm was to assess CPQCC’s data needs. It was fortunate that all of the original 27 CPQCC members were also members of the VON, collected VLBW infant data using VON definitions/specifications, and received standard VON reports in which each NICU was compared with VON national metrics. Although the VON database was considered to adequately capture VLBW infants, it was deemed crucial that reports were created to provide comparisons and metrics that were specific to CPQCC members (the special group analysis is now a standard feature available from VON) and that collection of data on high-acuity infants of weight greater than 1500 g was begun. The CPQCC Data Committee recommended that a CPQCC Data Center be established to achieve these two goals as one of its first operational priorities. The goal was to create a portrait of each NICU’s activity with respect to who was cared for, what was done for them, and how well it was done. CPQCC-specific data forms were developed that could be scanned into a computer with the resulting data tapes being sent to VON. VON was then able to produce their standard reports, while CPQCC retained the ability to produce CPQCC-specific reports. Having collected the data, the next task was to develop reports that inform and organize the work of quality improvement. CPQCC’s approach was to develop an Internet-based, real-time data entry, data management, and report-on-demand information system (http://www.cpqccreport.org, logon 0000, password test to access a sample “real” report). The reports are structured so that they can be readily cut and pasted into spreadsheets for local analysis or powerpoint presentations. To increase accessibility to users who are uncomfortable with numbers, cartoon displays of one’s position with respect to the interquartile range of the comparison group (Fig. 4) were developed. Choice of comparison groups include (1) all infants, (2) only inborn infants, and (3) only outborn infants, across: (1) all CPQCC NICUs, (2) only NICUs of the same level of care, or (3) all NICUs in any of 11 Perinatal Regions of California. All major processes and outcomes are risk adjusted and reporting is specific to the location of the event. To aid interpretation, any significant result is automatically highlighted in blue by the system.

In 2007, an Acute Infant Transport Database was developed and added to the system. The database was specifically designed to collect information that would guide 5 specific issues that had been identified by focus groups as priority areas for improvement: (1) underutilization of maternal transport, (2) delayed decision to transport, (3) difficulty in obtaining a transport, (4) too long a wait for the team to arrive, and (5) variability in transport team competency. Fig. 5 shows the resulting 36-item transport form. Every item included on the form is essential to addressing 1 or more of the
5 priority issues identified. In 2008, data was collected on more than 7000 acute neonatal transports.

Beginning in 2009, CPQCC instituted a Quality Improvement Database for California’s statewide High-Risk Infant Follow-up program. The program follows high-risk infants from 28 days until age 3 years and will provide important outcome data for the NICUs that cared for these infants. In addition to long-term neurodevelopmental outcomes and autism screening, the database will assess rates of successful enrollment and program completion, as well as the medical and social needs of these infants and the extent to which they have been met at the individual program, regional, and state level.

Fig. 4. Example of CPQCC data report with cartoons showing the NICU’s position on the networks interquartile range. (Courtesy of California Perinatal Quality Care Collaborative; with permission.)
An important goal of the CPQCC data system is to provide information that can guide quality improvement activities at both the community and hospital level. To this end, with the sponsorship of the California March of Dimes, CPQCC has developed an All-California, Perinatal Data Resource that links the NICU clinical data with birth certificate, census, and infant and maternal hospital administrative discharge data. The dataset’s first projects include: (1) the identification of communities whose qualifying mothers have lower than expected ANS rates, and (2) the identification of geographic areas whose mothers have higher than expected elective early term deliveries. As regional collaboratives emerge, the linking of NICU data to local databases will be an important feature and will play a critical role in the development of coordinated community-hospital quality improvement initiatives.
The databases described here allow a region and its individual member NICUs to assess and prioritize potential areas for quality improvement. In addition they can be used to assess, in a global sense, the gains made as a result of a quality improvement initiative and, of major importance, the extent to which these gains are being maintained over time. Although accurate data are essential, these functions may not require high levels of granularity. Experience has shown that the selection, recording, and careful analysis of key process, outcomes, and balancing measures require the construction of a project-specific database, report structures (control charts), and metrics (such as time since last event) that are uniquely sensitive to tracking changes over short periods of time. However, an important step in the evolution of regional databases will be to identify those items that will facilitate tracking and maintenance of quality improvement gains, and incorporate these items into the core NICU database.

How one assures data quality remains an important issue. Initially, on-site data audits were conducted. While these were very informative, the time and expense made them prohibitive. A possible consideration for the future is a directed self-audit in which, following a data entry session, a few important items are asked to be reentered for confirmation. At present, the CPQCC employs logic and range checks at the time of data entry, as well as obtaining confirmation of records that exceed a threshold for missing or unobtainable items. Using a linked patient dataset, the consistency of items when an infant is transferred across member NICUs is also tracked. However, CPQCC’s major strategy is to address the needs of the data abstractors. The Data Contact Advisory Committee was one of CPQCC’s first committees, considered essential to any regional collaborative. This committee is made up of data abstractors from a wide range of data settings, from the night nurse who abstracts and enters data between his or her various clinical duties to staff whose sole job is data abstraction and entry. The Data Center Advisory Committee reviews and must approve all data manuals for clarity of definition, all data items for ease of abstraction, and all data entry screens and forms for ease of completion before implementation. Their input and final approval is essential because some items that neonatologists believe are readily available and clearly defined may be very difficult to abstract. A key CPQCC strategy has been to address the data quality horse before it leaves the barn. To this end, it conducts annual training for data abstractors throughout California. In 2009, 4 data training sessions representing 103 hospitals and including 156 participants were held. Though labor intensive, these meetings are an effective way to promote data quality.

QUALITY IMPROVEMENT

The Perinatal Quality Improvement Panel (PQIP) is a permanent subcommittee that began with the inception of CPQCC in 1997. Its aim is to support perinatal providers in California in their efforts to continuously improve perinatal outcomes and neonatal care. Important to PQIP’s success is its membership and their commitment. The panel is made up of neonatologists, maternal fetal medicine specialists, epidemiologists, and representatives from the CA-MCH, CCS, and Regional Perinatal Programs of California (RPPC). PQIP members volunteer their time and expertise to analyze CPQCC data, review current, relevant publications, and address local and national priority areas for quality improvement. Using this information, PQIP defines indicators and benchmarks, recommends quality improvement objectives, provides models for performance improvement, and assists providers in a multistep transformation of data into improved patient care. PQIP’s approach is to create, initiate, and complete
quality and research projects through the evaluation and application of evidence-based care.

A major challenge confronting any quality improvement organization is how to address the needs of all the NICUs in one’s region. Two issues arise: (1) developing an approach that would be accessible to the large number of sites within the region, and (2) aligning regional quality improvement priorities with those of the individual member hospitals. Initially, PQIP developed an inventory of toolkits addressing topics that were selected as being of high priority and supported these toolkits with academic presentations, workshops, and webcasts. This approach was extremely effective in building across California’s NICUs what Jeffery Horbar of VON refers to as the “Habit for Change.” Each year, CPQCC rolled out 1 to 2 toolkits at the yearly CAN meeting. This highly attended meeting provided the venue for presenting the academic findings and rationale for the improvement topic as plenary presentations, often by highly visible, nationally recognized experts. On a pre-meeting day, workshops were conducted that included a review of pre-workshop evaluations and mini root cause analyses. Participants included teams from the NICUs who brought completed pre-workshop analyses with them. The workshops addressed aspects of quality improvement with formal presentations, as well as discussions of root causes and approaches to overcoming them. The toolkits were very extensive, addressing fundamentals of quality improvement, potential best practices, the rationales supporting these best practices, typical root causes, and possible solutions. The workshop was followed up with a combination of workshops and webcasts. These toolkits are freely available (http://www.cpqcc.org) and include Antenatal Steroids Administration, Postnatal Steroids, Hospital Acquired Infection Prevention, Improving Initial Lung Function, Nutritional Support of the VLBW Infant, Perinatal Group B Streptococcus Prevention, Hyperbilirubinemia Prevention, Perinatal HIV Prevention, Delivery Room Management of the VLBW Infant, and Late Preterm Infant Management. Although it is clear that several of these initiatives have been effective in improving outcomes in participating units, the success of this approach in involving a major segment of the 129 member hospitals, or in effectively meeting their various quality improvement needs, is as yet uncertain.

Beginning in 2007, an evaluation and restructuring of PQIP’s functions and responsibilities was undertaken, and PQIP activities were broadened to include 4 foci: Quality Improvement Infrastructure, Education, Analysis, and Research. The skill set requirements for each focus has been identified and additional recruitment among clinicians and stakeholders is under way. During this time, the overall effectiveness of the standard “Toolkit-Workshop” approach to implementing quality improvement strategies was also called into question. Although early initiatives did not have an integrated evaluation component and had demonstrated some success with toolkit/workshops, the “community of learning” approach developed by the Institute for Healthcare Improvement (IHI) was emerging as not only highly effective but also suitable for statewide initiatives. This model, with its emphasis on the control chart and monthly reporting of process, outcome, and balancing measures, also meets the American Board of Pediatrics (ABP) Maintenance of Certification, Part 4 requirements. CPQCC’s first experience with this model was as a supporting partner in a collaborative to reduce catheter-related infections that eventually enrolled all of the Regional NICUs in California (see the article by Powers and Wirtschafter elsewhere in this issue). This collaboration, led by CCS and the California Children’s Hospital Association, began in late 2006 and was extremely successful, lending further support to PQIP’s decision to move from the “Toolkit-Workshop” approach to the IHI “Community of Change” approach. The first CPQCC-sponsored initiative using the IHI approach addressed
health care associated infections (HAI), with the aim of decreasing catheter-associated blood stream infection (CABSI) rates by 25% to 50% in participating California, community-level NICUs. Between the baseline (September 1, 2007 through February 29, 2008) and intervention (March 1, 2008 through December 31, 2008), crude CABSI rates decreased by 56.1%. CPQCC’s second collaborative, Breast Milk Nutrition, is currently under way with the goal of increasing the percentage of infants born at birth weights less than 1500 g who receive breast milk at discharge. In addition to the standard 3 learning sessions, collaborative members participate in monthly conference calls, which include data reports and strategy sessions, as well as a “Hold the Gains” meeting scheduled 6 to 8 months after the third (final) learning session. During all of these sessions, member hospitals participate in a free exchange of ideas, share strategies that have worked to overcome obstacles (which minimizes duplication of effort by each NICU to rediscover an effective solution), and experience the incentive of tacit competition. Unlike the open-ended, multiple strategies, toolkit approach, the IHI model uses an agreed-upon change bundle.

Even with the commitment to roll out an IHI-style collaborative every 18 months, there remains the formidable challenge of how to facilitate quality improvement at the individual hospital level in a way that is effective, documented, and qualifies participants for ABP recognition. As a result, CPQCC has begun developing a “QI-Lite” approach. In this context, “Lite” refers to the extent of the operational input from CPQCC during the course of the NICU’s quality improvement project, not to the extent of the NICU’s Quality Improvement commitment or activity. This approach will be more directed than previous Toolkit-Workshop strategies in that it will specify: (1) the elements that could be incorporated into a change bundle, (2) a selection of candidate outcome, process, and balancing measures, and (3) basic control chart and reporting templates. To meet the ABP requirements of participating in a valid and effective initiative, “QI-Lite” will also require a quality improvement mentor approved by CPQCC and a final report from the NICU that includes the monthly outcome, process, and balancing measures. Over the next year, the CPQCC plans to establish “QI-Lite” as a robust quality improvement support structure for California NICUs unable to participate in the current CPQCC regional quality improvement initiative due to a variety of potential reasons (their need to address a “local” higher priority quality improvement topic, the timing of the regional initiative, or the cost of participating in the CPQCC-sponsored IHI initiative, which currently ranges from $5000 to $7000 per project).

RESEARCH

Because the main activities of the CPQCC over the last decade have been focused on building the collaborative and conducting quality improvement initiatives, research has not been a major priority. Moving forward, the goal is to build the research base in the areas of epidemiology/health services research and quality improvement science. One of several CPQCC databases, the All-California Perinatal Quality Improvement Data Resource, links an infant’s (1) maternal residential, sociodemographic, census data; (2) birth certificate data; (3) acute infant transport data; (4) NICU clinical data; (5) maternal and infant hospital charges and ICD9 data; and (6) high-risk infant follow-up data to age 3 years, providing a strong foundation for research. This dataset has been used to investigate the extent of postnatal steroid use, the relationship between hypothermia (as defined by the World Health Organization) and neonatal mortality and morbidity, and an analysis of the characteristics, morbidity, and mortality of high-acuity, non-VLBW, NICU admissions. Studies
investigating (1) the strength of relationship between NICU measures of process and outcome, (2) the geographic distribution of antenatal steroid use, (3) the rate and characteristics of infants discharged home who are readmitted for exchange transfusion or bilirubin greater than 25 mg/dL, and (4) an analysis of the medical and social needs of high-risk follow-up infants at the time of their first follow-up visit are being actively pursued.

The CPQCC quality improvement science research agenda is still in the formative stage. In general, members have been pleased with the effectiveness and efficiency of the IHI model, especially with respect to the free exchange of ideas on overcoming obstacles, minimizing duplication, and the motivation provided by the structure’s “tacit competition.” A formal evaluation component has been built into these initiatives with the hope of identifying best approaches that could be formally tested in the future. While it is clear that the IHI approach is extremely effective over its initiation period, developing effective approaches to hold these gains will be a high priority research goal for CPQCC.

ON COLLABORATION

In this brief review the author has tried to present a picture of the aspirations, workings, and achievements of CPQCC, a regional collaboration to improve perinatal care. While it is never easy to align the often differing fundamental positions held by the various member factions and stakeholder groups, the common overarching goal of a universally agreed-upon mission statement can act as a magnet drawing the various components together. Moreover, rapid development of a first quality improvement initiative is an effective strategy to engage the participants in a way that allows them to demonstrate, share, and build on their individual expertise, and provides them a strong sense of professional accomplishment. The success of one’s first regional quality improvement initiative will not be recognized as solely the success of the participating NICUs, but as the success of all those who have contributed to creating, maintaining, and building the collaborative. Successful collaboration, while never easy, builds on itself.

REFERENCES