

A Framework to Harness the Power of Quality Collaboratives to Improve Perinatal Outcomes

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Abstract: The Illinois Perinatal Quality Collaborative developed a framework for successfully engaging teams and implementing statewide obstetric and neonatal quality improvement (QI) initiatives. This framework includes: (1) engaging hospitals to create an environment of improvement; (2) motivating hospital teams to facilitate change at their hospital; and (3) supporting hospital teams through the 3 pillars of QI—collaborative learning opportunities, rapid-response data, and QI support—to achieve initiative goals and improve outcomes for mothers and newborns. Utilizing this framework, the Illinois Perinatal

Quality Collaborative Severe Maternal Hypertension Initiative engaged teams and achieved initiative goals.

Key words: perinatal quality collaboratives, obstetric quality improvement, collaborative learning, quality improvement support, severe maternal hypertension, perinatal outcomes

Introduction

Severe maternal morbidity and mortality in the United States are rising.^{1–3} In addition, preterm birth, infant mortality, and disparities across maternal and child health indicators all remain pressing national problems.^{4–6} There is a clear need for large scale interventions focused on the improvement of maternal and child health outcomes. Perinatal Quality Collaboratives (PQCs) are state networks of

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providers, nurses, hospital interdisciplinary quality improvement (QI) teams, and maternal and child health stakeholders who work together to improve health outcomes for mothers and newborns through the improvement of care delivery.⁷ PQCs are established or in development in almost all 50 states in the United States and are connected through the National Network of Perinatal Quality Collaboratives (NNPQC), a network supported by the Centers for Disease Control and Prevention that provides support, mentoring, and resources for PQCs to learn from each other's success and work together to implement QI science.⁷⁻⁹

PQCs use QI science to help hospital teams implement system and culture changes that improve care delivery. The Institute for Healthcare Improvement (IHI) Breakthrough Series is a prominent model of QI science implementation at the collaborative-level that is used as a framework for many PQCs.¹⁰⁻¹³ Applying the breakthrough series, multiple interdisciplinary hospital teams work together to achieve smart aims for selected initiatives with iterative learning sessions followed by action periods when hospital teams implement systems and culture change using small tests of change, called Plan-Do-Study-Act (PDSA) cycles.¹⁴

PQCs have demonstrated recent success in improving perinatal outcomes. For example, the California Maternal Quality Care Collaborative (CMQCC) obstetric hemorrhage initiative helped hospitals implement protocols for timely recognition and response to hemorrhage.¹⁵ There was a 20.8% reduction in severe maternal morbidity in hospitals that participated in the CMQCC obstetric hemorrhage initiative, compared with a 1.2% reduction in hospitals that did not participate in the initiative.¹² In addition, the Ohio Perinatal Quality Collaborative (OPQC) progesterone project worked with inpatient and outpatient settings to help implement protocols to identify women with increased risk for preterm birth and provide them treatment with progesterone.¹⁶

OPQC demonstrated a 13% reduction in singleton births before 32 weeks gestation among women with a prior preterm birth during their progesterone project.¹⁷ States have also seen success in increasing exclusive breastfeeding before discharge and reducing elective deliveries.^{10,18,19} Although an early review of quality collaboratives was not able to identify which specific features of PQCs correlated with changes in health outcomes,²⁰ an increasing number of publications on the work of PQCs has highlighted a number of best practices.

PQCs are directed by interdisciplinary leadership teams of clinical and QI experts from hospitals, health departments, and other diverse stakeholders.^{9,11,13,21-25} These groups determine the direction of the collaborative, the overall mission and goals, and the aims of specific initiatives. This ensures that stakeholders are engaged and committed to making the change proposed by the collaborative. Selection of topics that hospital frontline leadership (hospital unit managers, charge nurses, etc.) believe are important builds buy-in and fosters ownership among staff building a strong foundation for improvement.²⁶ Differing perspectives are discussed early and negotiated over time to achieve consensus on the next steps for the collaborative.

PQC initiatives engage key stakeholders in working together towards an achievable goal.^{11,23,24} Successful collaboratives align with national stakeholders, including the Alliance in Maternal Health (AIM), NNPQC, and Vermont Oxford Network (VON), that develop safety bundles/resources for hospitals to implement. Collaboratives develop realistic SMART (specific, measurable, achievable, realistic, time-bound) aims at the beginning of each initiative.^{7,13,27} For example, the OPQC's SMART AIM for the progesterone project was as follows: "to decrease premature births in Ohio before 32 weeks by 10%, by identifying women with increased risk early in pregnancy and starting treatment with progesterone."¹⁶ Having a sufficient

duration for each project helps collaboratives achieve their goals. Initiatives that are 18 to 24 months in length are better equipped to make sustainable culture change compared with shorter-term initiatives.²⁸ The selected initiative must be achievable within that time frame.

PQCs provide opportunities for collaborative learning to facilitate hospital-to-hospital communication and sharing. Collaborative learning takes the form of in-person learning sessions such as annual in-person meetings, and remote learning activities such as monthly webinars, to allow teams to share best practices and brainstorm solutions to barriers to improvement.^{10,13,18,19,29} For example, the Children's Hospital's Neonatal Consortium project implemented collaborative learning through webinars, in-person meetings, weekly QI team huddles, and ongoing QI education. According to the authors of the subsequent publication, "building a sense of community was critical in developing the respect and trust necessary to allow for transparency".¹³

PQCs also provide QI support to hospital teams so they can achieve QI success. PQCs facilitate formal relationships for problem-solving, supporting mentorship to help hospital teams work through challenges and increase engagement.¹³ PQCs also provide QI science training for teams, which helps teams to address barriers and develop small tests of change with PDSA cycles.^{11,13} With the support of the collaborative, hospital teams are thus able to achieve and sustain system and culture changes, which forms the foundation of statewide improvement.³⁰

Data collection and review is fundamental to the process of change-making within a collaborative. Review of initiative-wide data allows hospitals to compare their improvement to that of other hospitals, which can foster healthy competition and drive hospital improvement efforts.²⁸ PQCs use data to test collaborative-level process changes, whereas hospitals use data to monitor their progress towards achieving initiative aims.^{11,12,18,19,24,25} PQC data

collection is structured around a collection of 3 different kinds of data: *outcomes measures* which assess the impact of systems change on health outcomes, *process measures* which assess the changes to steps or parts of the system, and *structure measures* which evaluate system-level changes.³⁰ In addition, *balancing measures* are used to ensure that improvements to clinical practice do not cause unintentional harm.^{12,30} Collaboratives and teams review their QI data regularly to identify next steps and facilitate improvement quickly.²¹

PQCs apply organizational improvement strategies that are informed by lean thinking and Six Sigma. These models for process improvement aim to organize activities for maximum benefit while minimizing waste and encourage trust-building and respect and avoiding blame.³¹ PQCs use early improvements to encourage teams to prioritize QI and work together to overcome challenges. The use of data to drive QI change allows collaboratives to focus on improving processes and systems, rather than finding fault with certain hospitals or providers.^{22,26,28}

Although PQC models for improvement have been well described, previous literature has not included detailed descriptions of PQCs strategies for engaging hospital teams. In addition, variation in state PQC structure, strategies, and initiatives creates room for innovation and demonstrates the importance of describing individual PQC implementation strategies. The objective of this paper is to provide a systematic overview of the Illinois Perinatal Quality Collaborative's (ILPQC) process for successfully engaging teams and implementing initiatives. This framework includes: (1) engaging hospitals to create an environment of improvement; (2) motivating hospital teams to facilitate change at their hospital; and (3) supporting hospital teams through collaborative learning opportunities, rapid-response data, and QI support to achieve initiative goals and improve outcomes for mothers and newborns (Fig. 1). Finally, we demonstrate a case example of

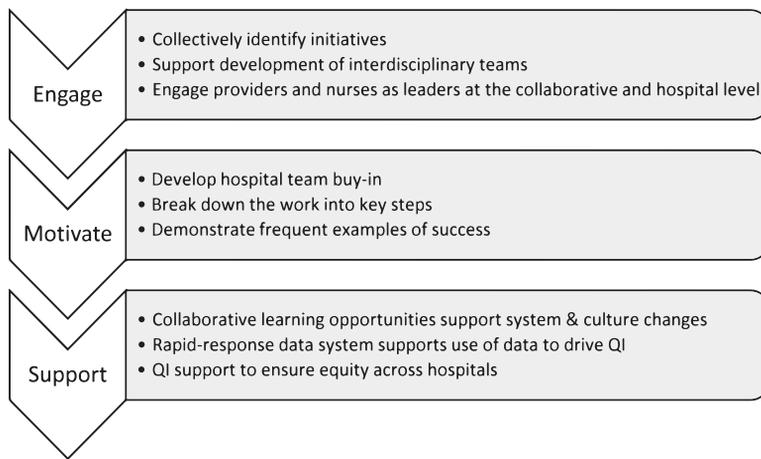


FIGURE 1. Illinois Perinatal Quality Collaborative’s process for engaging hospital teams and implementing initiatives. QI indicates quality improvement.

successfully engaging hospitals and providers in the hard work of improving care as illustrated by the Severe Maternal Hypertension (HTN) Initiative.

Engaging Hospitals to Create an Environment of Improvement

ILPQC utilizes a systematic approach for engaging hospitals in a statewide collaborative, with the goal of creating an environment that supports hospital-level improvement. There are 5 essential elements to hospital engagement that ILPQC employs (Table 1).

First, ILPQC facilitates the participation of providers, nurses, and key stakeholders across the state in collectively selecting ILPQC initiatives (Table 2). This is accomplished using the following strategies. (1) ILPQC develops an annual survey for hospital teams each year in preparation for our annual conference, which solicits hospital team priorities and interests for future initiatives. (2) ILPQC invites leaders from other state PQCs to speak at the annual conference to share overviews of their initiatives and to provide hospital teams with context regarding the scope of current and potential future initiatives. (3) ILPQC seeks input

TABLE 1. Five Essential Elements to Hospital Engagement

1. Facilitate collective statewide initiative selection
2. Develop multidisciplinary hospital-based quality improvement teams
3. Engage providers and nurses in collaborative leadership roles
4. Facilitate regular opportunities for collaborative learning
5. Support hospital team efforts to engage physicians and nurses in hospital-level quality improvement

TABLE 2. Steps to Identify Statewide Quality Improvement Initiatives

1. Conduct annual hospital teams survey in preparation for an in-person meeting
2. Learn from other state Perinatal Quality Collaboratives at the in-person meeting via guest speakers and sharing of materials
3. Seek input from key advisors and stakeholders early and often through a regular conference call and in-person meetings
4. Discuss future initiatives with hospital teams at the annual in-person meeting and conduct a vote

from key advisors, such as the ILPQC Obstetric Advisory Workgroup—a group of nurses, providers, and other stakeholders who meet monthly to advise and report on the progress of current and future initiatives—and the Illinois Department of Public Health (IDPH) Regionalized Perinatal System (RPS). In addition, ILPQC reaches out to key stakeholders early and often to consider their perspectives on statewide priorities. These stakeholders include lead state agencies, the hospital association, and professional organizations. (4) ILPQC facilitates a discussion with hospital teams during the ILPQC annual conference that results in a vote on future initiatives.

Second, ILPQC supports the development of multidisciplinary hospital-based QI teams to participate in QI initiatives, with providers and nurses engaged in active QI leadership at the hospital level (Table 3). The core staff of the collaborative reach out through the Illinois RPS and existing hospital team contact lists to inform hospital teams about the initiative. The ILPQC core staff include an Executive Director/Obstetric Lead, Neonatal Clinical Co-Leads, State Project Director/QI Lead, Project Coordinators, and Nurse Quality Manager who develop, implement and support statewide QI initiatives by supporting hospital QI teams. The RPS includes 10 administrative perinatal centers that

TABLE 3. Supporting Hospital Development of Multidisciplinary Quality Improvement Teams to Participate in Statewide Quality Improvement Initiatives

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1. Reach out to hospitals on an ongoing basis with key stakeholders/advisors and work together to address barriers to participation
 2. Draft letter of support with key stakeholders/advisors to share with hospital administration
 3. Provide a hospital team roster form to support hospital team formation
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supervise the obstetric hospitals in Illinois.³² ILPQC provides several resources/supports to teams to help them engage their leadership and develop their team. (1) ILPQC communicates with perinatal network administrators and hospital teams on an ongoing basis during the recruitment period to address barriers to hospital team participation. (2) The collaborative's core staff coauthors a letter with IDPH, with input from hospitals/providers on an advisory workgroup and leadership teams, to inform hospital administration about the initiative and its aims, including the evidence supporting a state-based QI initiative. (3) ILPQC provides an initiative-specific web-based team roster worksheet to help support hospital team formation. The hospital teams for all initiatives include a provider and nurse “champion” who will facilitate hospital leadership and staff buy-in and drive QI work, as well as other initiative-specific interdisciplinary team members (eg, an emergency department provider for a severe maternal HTN initiative). Provider and nurse champions drive the QI work at their hospitals and are essential in coordinating the work of the team. The team roster worksheet outlines hospital QI team activities that will be facilitated by the collaborative. These activities include meeting monthly as a hospital QI team and participating in monthly statewide collaborative team webinars, as well as attending 2 annual in-person meetings. In addition, QI teams commit to collecting, submitting, and reviewing monthly QI data with their team.

Third, ILPQC engages providers and nurses from hospitals across Illinois in collaborative leadership roles and workgroups to develop, implement, and direct next steps for each initiative through several mechanisms (Table 4). (1) ILPQC invites interested providers, nurses, and public health stakeholders to serve on the Obstetric or Neonatal Advisory Workgroup. This group provides input into the selection, development, and implementation of QI initiatives. (2) A group

TABLE 4. Opportunities to Engage Providers in PQC Leadership

Leadership Group	Level of Engagement
PQC Advisory Workgroups	Participate in monthly webinars and material review as needed
Initiative Clinical Leads	Participate in toolkit development and small group measure and material development meetings as needed
In-Person Meeting Breakout Facilitators	Facilitate 2 concurrent breakout discussions in once annual face-to-face meeting
Grand Round Speakers Bureau	Present ≥ 1 grand rounds presentations to requesting hospitals with the provided slide set

PQC indicates Perinatal Quality Collaborative.

of 2 to 4 providers and nurse clinical leads partner with the ILPQC obstetric or neonatal lead(s) to actively develop each initiative, including initiative-specific collaborative learning opportunities and toolkit resources that will be provided to hospital teams. The clinical leads for the initiative also serve as local experts in technical trainings offered by national partners, such as buprenorphine waiver trainings for obstetric providers working on a statewide opioid initiative to increase mothers with opioid use disorder linked with medication-assisted treatment, offered in partnership with American College of Obstetrics and Gynecology (ACOG) and American Society of Addiction Medicine (ASAM). (3) For each initiative, a group of 10 to 20 providers agrees to serve as members of a speakers’ bureau, delivering grand rounds talks at participating hospitals across the state using a comprehensive initiative-specific slide set that is developed by the collaborative. (4) Providers and nurses from each RPS administrative center across the state also serve as cofacilitators of breakout sessions at in-person meetings, leading a discussion of barriers to and opportunities for improvement on a specific QI topic and sharing their findings with the collaborative.

Fourth, ILPQC facilitates regular collaborative learning opportunities through structured team meetings. Two annual in-person meetings are offered for hospital teams and key stakeholders, including a mid-year meeting and a year-end conference. The 2-day mid-year meeting is located in a central location for statewide participants and regularly engages over 90% of hospitals, including over 300 physicians, nurses, and public health professionals. One day of the conference is focused on obstetric teams and 1 day is focused on neonatal teams; about one third of attendees participate in both conference days. Participants review the initiative aims, measures, and resources and learn successful initiative implementation strategies from national speakers in didactic plenary sessions. Participants also share their progress and lessons learned in an interactive storyboard session and discuss implementation barriers and strategies for improvement in breakout session discussions. This meeting is focused on opportunities for teams to engage deeply in the current initiatives and problem-solve by sharing strategies with other teams.

ILPQC also hosts an annual end-of-year conference that is a 1-day meeting, including both obstetric and neonatal teams. This meeting takes place outside the major urban center of the state. At the annual conference, hospital teams review statewide progress and QI strategies, learn about QI success stories and new initiatives from national QI leaders, share their QI work in a peer-reviewed poster session, and provide input on collaborative activities in obstetric, neonatal, or patient/family breakout sessions. In addition, hospital teams are recognized at the annual conference with awards for achieving initiative goals or completion of data submission, as well as recognition for top QI posters. Public health leaders, legislators, payors and other stakeholders, as well as patient and family advisors, are all invited to attend the annual conference. The attendance of our annual conference has grown every year, with the most recent year including a record turnout of nearly 450 participants.

In addition, ILPQC brings teams together monthly via teams calls or collaborative learning webinars. These calls involve a review of monthly progress for process, outcome, and structure measure data across the initiative to identify successes and opportunities for improvement. In addition, teams learn implementation strategies from national experts, share resources for implementing system and culture change, and share about their own team's progress, challenges, and improvement strategies through 10 minutes "Team Talks." These calls engage over 80 hospital teams and ≥ 150 participants during the average month, depending on the size of the initiative.

Fifth, ILPQC supports hospital team efforts to engage physicians and nurses in the success and sustainability of each QI initiative at the clinical level. We offer QI support calls to teams not yet meeting initiative goals to discuss specific strategies for engaging physician and nurses in their QI work. One strategy is providing targeted education to develop physician and nurse buy-in, such as providing Grand Rounds Speakers to deliver grand rounds and/or supporting hospitals in their implementation of training. Both grand rounds and web-based training highlight: the evidence on why this work is important, proven strategies for improvement, and what providers and nurses can do to help improvement efforts at their hospital. We also offer credit towards professional certification and licensure for actively participating in the QI initiatives. This includes the American Board of Obstetrics and Gynecology and American Board of Pediatrics Maintenance of Certification Pathways for Part IV Improvement in Medical Improvement Practice for physicians who attest to meaningful participation in a QI initiative (eg, serving as physician lead/champion on QI team, participating in collaborative learning opportunities, etc.). Nursing contact hours are available to nurses attending ILPQC in-person

meetings to maintain their nursing license. These programs help to attract and support provider and nurse participation in the work of the collaborative.

Motivating Hospital Teams to Facilitate Change at Their Hospital

Once teams have formed to support the work of the collaborative in the hospital, the next essential step is motivating teams to do the hard QI work ahead. ILPQC is intentional in developing hospital team buy-in and engaging providers and nurses in ownership of the initiative. The collaborative discusses early and often why this work is being done, why it matters, what steps hospital teams can take to facilitate change, and how success will be measured and monitored over time. We also provide support for the work through sharing the data behind the evidence-based practices, sharing national guidelines from professional organizations, and highlighting patient stories. This purposeful, motivational language continues over the course of the initiative to maintain team investment in the hard work of QI.

As ILPQC develops buy-in, we consider how our messaging connects with our teams. We use consistent, succinct key messages to describe the QI strategies needed to improve outcomes and emphasize why the initiative matters. Our goal is to help hospital teams feel empowered to make change happen at their hospital with support from ILPQC. ILPQC works with hospital teams to break the QI work down into key steps with achievable goals that include structure measures (eg, implementing a protocol or order set) that can help teams attain early wins that build the foundation for process and outcome improvements. National guest speakers attend team calls and conferences to provide detailed examples of success. Hospital teams also share both challenges

and their strategies for success through storyboard/poster sessions and breakout sessions at in-person meetings as well as during Team Talks on monthly webinars. This approach creates energy and excitement for improvement, demonstrates successful strategies used by other teams and breaks the improvement process down into key steps to not overwhelm hospital teams as they begin planning their hospital-level work. ILPQC creates an environment where potential competitors develop a shared goal and vision for improvement and see one another as colleagues, peers, mentors, and collaborators.

To actively spread information to teams on the steps to facilitate change, ILPQC communicates regularly with hospital teams to provide encouragement, host structured teams webinars, share monthly newsletters, and regularly update resources on our collaborative Web site (Table 5). The monthly newsletters include the team webinar content, key implementation strategies for the month’s topic, reminders and tips for data submission, and an outline of next steps for hospital teams. Our collaborative Web site has a page for each initiative which includes slides and/or recordings from teams’ webinars and the initiative toolkit consisting of key resources and implementation strategies.

ILPQC also motivates hospitals by recognizing teams when they meet milestones, maintain up-to-date data, and achieve

initiative goals. Providing teams with a certificate of recognition in the first year of the initiative help to reinforce active engagement, which continues to promote reflection and improvement. Recognition in the second or later years of an initiative focuses on meeting milestones and achieving initiative goals. This recognition takes the form of a letter of commendation to hospital administration with improvement data on performance measures sent to the hospital and/or a large banner for display at the hospital. The recognition awards are presented at ILPQC in-person meetings to celebrate the teams and their accomplishments and inspire other teams.

Supporting Hospital Teams to Increase Their QI Capacity

Once hospital teams are motivated to facilitate change at their hospital, ILPQC provides them with opportunities for collaborative learning, rapid-response data, and QI support to help them drive their QI work forward (Fig. 2). First, the opportunities for collaborative learning include: monthly webinars where teams take turns presenting Team Talks to share challenges, strategies and progress with the rest of the collaborative, QI Topic Calls led by a mentor hospital provide an opportunity for a smaller group discussion of challenges and strategies for topics identified by teams as needing additional assistance, in-person meetings provide additional important opportunities for teams to learn from each other through story boards, posters, and breakout discussion sessions. We also connect teams working on similar topics and with permission to share successful resources teams develop widely across the collaborative. We also engage successful teams from other state PQC’s to participate in our monthly webinars regarding key topics to share successful strategies. Providing opportunities for hospital teams to

TABLE 5. Regular Communication Empowers Hospital Teams to Make Change Happen

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1. Host monthly structured hospital team webinars
 2. Regularly update resources on the Web site
 3. Share initiative-specific monthly newsletters
 4. Facilitate interactive in-person meetings
 5. Host small group quality improvement topic calls for teams to discuss challenges/strategies for key topics
 6. Provide quality improvement support coaching calls for teams needing additional assistance
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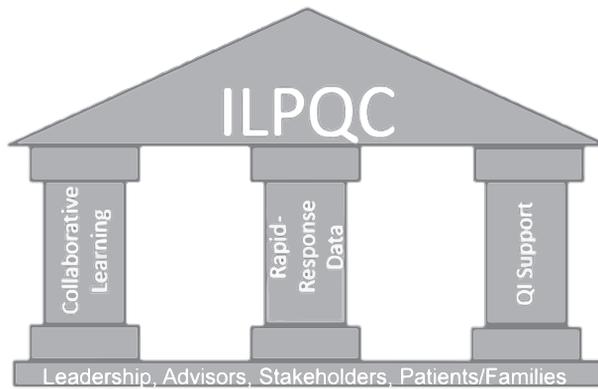


FIGURE 2. Three pillars to increase hospital QI capacity. ILPQC indicates Illinois Perinatal Quality Collaborative; QI, quality improvement.

learn from each other strategies for implementing systems and culture changes required for improvement at the hospital level is one of the most important benefits of collaborative participation.

Second, the rapid-response data system facilitates hospital teams' ability to measure their success and identify opportunities for improvement to drive QI. Before launching a new initiative statewide, ILPQC invites ~25 to 30 hospitals to participate in Wave 1 of the initiative so these teams can test and provide feedback on data collection forms and processes for the rest of the initiative. The goal is to create a process that balances data collection and entry burden with the value of reports that inform hospital QI efforts. Typically Wave 1 launch in January and monthly webinars are held with these hospitals through April to solicit feedback and make responsive iterative changes to the data forms and collection processes. The rest of the hospital teams are then recruited and the initiative is kicked off at the mid-year face-to-face meeting. Hospital teams start the initiative by collecting baseline data from the last 3 months of the prior year. Teams use the baseline data to set priorities, develop 30-60-90 day plans, and arrange their first PDSA cycles. Monthly data on key process, outcome, and structure measures are entered by teams into the data

system by the 15th of the following month through a secure web-portal. Hospital teams then review their progress vis-a-vis real-time web-based reports on key measures across time and compare their performance to other hospitals during monthly meetings with their hospital QI team. The hospital teams use the reports to plan improvement activities, including PDSA cycles, for the month ahead. Hospital teams are encouraged to share their monthly QI data with administrators, providers, and nursing staff, as well as track their compliance on key measures.

Third, ILPQC provides QI support to hospital teams with the goal of leaving no hospital behind, aiming to ensure equity in achieving initiative goals across hospitals regardless of birth volume, rural/urban location, or patient mix, for women and newborns receiving care (Fig. 3). ILPQC monitors monthly QI data for hospital teams that are not meeting the initiative goals. We provide QI topic calls which offer a small group/round robin forum to discuss barriers to and strategies for improvement with hospitals that are working on a specific improvement area. On each of these calls, a representative from one of the teams that have achieved improvement on that topic helps to lead the conversation. ILPQC core staff also

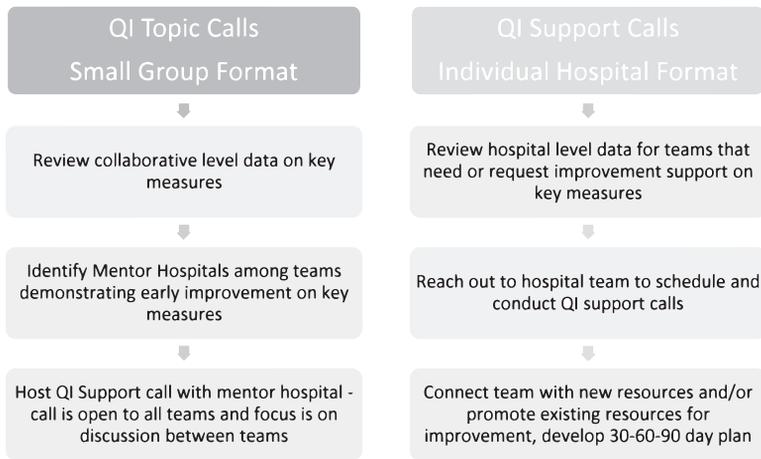


FIGURE 3. Primary quality improvement (QI) support formats.

host one-on-one 30-minute QI support calls with hospital teams who are not achieving improvement on measures. These calls include a review of the hospital team’s QI data, discussion of barriers to improvement, and development of a 30-60-90 day plan for next steps. On the basis of hospital team feedback we develop new resources or promote existing resources (eg, specific resources in the initiative toolkit) that are responsive to hospital team needs.

In addition to QI coaching, ILPQC provides teams with toolkits, resources and education opportunities to support QI success. ILPQC assists the hospital team in implementing evidence-based care guidelines to facilitate systems changes, helping to support every provider and nurse to deliver optimal care to every patient, every time, in every unit. This assistance comes in the form of protocols, clinical care checklists, order sets, guides for debriefs among the clinical care team, and electronic medical record prompts that teams can incorporate into their own institutional workflows. ILPQC provides teams opportunities to address culture change through provider and nursing staff education. Widely-used educational tools include Grand Rounds Speaker Bureau and slide set, easy to implement web-based

e-modules, clinical care simulations and drill sample scenarios, and discussion guides.

Finally, ILPQC supports hospital teams in planning for the sustainability of initiatives to maintain the gains they achieved during the active QI initiative. The RPS administrators are especially engaged to support and facilitate these efforts going forward. ILPQC develops a sustainability plan template for hospital teams to complete together, which includes strategies for compliance monitoring, new hire education, and ongoing yearly staff education plans. Hospital teams continue to enter data and review data reports in the collaborative data system. ILPQC convenes a teams’ webinar 2 to 4 times per year to review statewide sustainability data and share Team Talks on sustainability progress. Hospital teams share compliance monitoring data with their providers and nursing staff regularly and if they are not meeting benchmarks, the teams develop plans for provider and nursing staff engagement that includes PDSA cycles as needed. RPS administrators facilitate discussion of barriers to compliance with hospitals in their perinatal network in quarterly meetings. ILPQC also reviews statewide sustainability data monthly with the Obstetric Advisory Workgroup to develop next steps.

A Case Study of Engaging Hospitals in the Hard Work of Improving Care: The ILPQC Severe Maternal HTN Initiative

The ILPQC Severe Maternal HTN Initiative illustrates our approach to engaging hospitals in the hard work of QI. The HTN initiative aimed to reduce the rate of severe morbidities in women with severe preeclampsia, eclampsia, or preeclampsia superimposed on preexisting HTN by 20% between May 2016 and December 2017. In addition, hospital teams worked towards the following process measures and improvement goals:

- Increase the proportion of women treated for severe HTN in <60 minutes to at least 80% (time to treatment).
- Increase the proportion of women receiving preeclampsia education at discharge to at least 80%.
- Increase the proportion of women with follow-up appointments scheduled within 10 days of discharge to at least 80%.
- Increase the proportion of cases with provider/nurse debriefs to at least 50%.

The HTN Initiative began with the development of aims and measures, and designing the data system in collaboration with the ILPQC Obstetric Advisory Workgroup, 4 clinical leads (2 physicians and 2 nurses), the IDPH RPS, and Statewide Quality Council (SQC). SQC is a subcommittee of the IDPH Perinatal Advisory Committee that advises IDPH on issues related to the regionalized perinatal system in Illinois, including statewide quality initiatives. The initiative was designated a statewide quality initiative by SQC, which resulted in a letter from the IDPH Director and ILPQC Executive Director that was distributed to all hospitals in the state through hospital administration and the RPS network administrators. Network administrators received updates regarding hospitals in their network that had not yet submitted a hospital QI team roster, which included a participation agreement.

Recruitment efforts resulted in 110 out of a possible 120 hospital teams (representing over 95% of births) participating in the statewide initiative, including 23 Wave 1 hospital teams who reviewed, tested, and provided feedback on the HTN data collection and submission process from January through April 2016, and 87 Wave 2 hospital teams who joined the Wave 1 teams in May 2016. The HTN initiative began statewide with the 2-hour HTN Kick-off Webinar that included 284 participants from 97 hospitals, followed by an in-person day-long meeting on May 23, 2016, Springfield, Illinois that included 288 attendees from 101 hospitals.

As the HTN QI initiative launched, ILPQC provided QI resources and support to hospital teams to implement evidence-based practices and protocols that included the ACOG AIM Severe HTN in Pregnancy Bundle. Along with other resources the ILPQC Maternal HTN Toolkit was provided to teams via the www.ilpqc.org Web site and distributed to each team in a comprehensive binder at the ILPQC mid-year meeting. To unpack the toolkit, the following steps were taken. First, we worked with teams to implement standard processes for optimal care of severe maternal HTN in pregnancy, including standard order sets, protocols, and checklists for recognition of and response to severe maternal HTN. Hospital teams integrated these improvements into electronic health records and developed a process to ensure that providers have rapid access to intravenous and oral antihypertensive medications with a guide for administration and dosage (eg, standing orders, medication kits, rapid-response team). Education was provided for the obstetric, emergency department, and anesthesiology physicians, as well as midwives and nurses, to promote the recognition of and response to severe maternal HTN. Teams were provided resources to apply this education in regular simulation drills. Second, we worked with teams to implement systems to identify pregnant and postpartum women in all departments, including the emergency department,

and assess them for severe maternal HTN. This included protocols for measurement, assessment, and monitoring of blood pressure for all pregnant and postpartum patients, as well as materials that provided patient-centered education for women and their families on signs and symptoms of severe HTN and preeclampsia. Third, we worked with teams to implement protocols to treat severe maternal HTN in <30 to 60 minutes in every pregnant or postpartum patient with new-onset severe HTN (Table 6). This included protocols for appropriate medical management of severe HTN, a system to provide patient-centered discharge education materials on severe maternal HTN, and protocols to ensure patient follow-up within 10 days for all women with severe HTN and within 72 hours for all women on HTN medications. Finally, we worked with hospital teams to foster a culture of safety and improved care of patients with new-onset severe HTN, including a system to perform regular brief debriefs between the obstetric provider and nurses after all new-onset severe maternal HTN cases (ie, during the clinical encounter asking the question: “How did we do on time to treatment, what did we do well, what could we have done better?”). In addition, ILPQC provided a process to perform multidisciplinary systems-level reviews on all severe maternal HTN cases admitted to ICU, and guidance for incorporating severe maternal HTN recognition and response protocols into ongoing education (eg, orientations, annual competency assessments).

TABLE 6. Key Areas of Improvement For Hypertension Teams

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| 1. Improve time to treatment for severe maternal hypertension to ≤ 60 min |
| 2. Provide patient-centered discharge education materials on signs and symptoms of severe hypertension |
| 3. Assure timely follow-up (within 10 d for all women and 72 h for women on medication) |
| 4. Conduct debriefs with providers and nurses after all new-onset severe maternal hypertension cases |

To motivate teams in their efforts to implement QI at their hospital, we used team recognition as a driver for hospital improvement efforts. During the ILPQC obstetric teams mid-year meeting in May 2017 we provided the criteria to receive QI recognition awards to help focus teams' efforts in the final 6 months of the initiative. Teams were awarded Gold, Silver, and Bronze Level awards based on achievement of all of the structure measures and achievement of 4, 3, or 2 of the 4 process measures, respectively, by the third quarter of 2017. Awards were presented at the ILPQC annual conference in December 2017 and 53 hospital team awardees received a large vinyl banner that read “[Hospital Name] is committed to improving the quality of care for moms and babies” with a gold, silver, or bronze “ILPQC Quality Award” ribbon to hang at their hospital. The HTN initiative achieved its target on all initiative goals by the QI initiative ended in December 2017 and concurrent decrease in SMM in state population-level data over the course of the initiative.³³

As the active QI initiative was coming to an end, ILPQC supported hospital team efforts to finish the active initiative by achieving the initiative goals and then transition to sustainability. Hospital teams submitted the final month of the active QI initiative data (December 2017) by February 2018. A checklist for hospitals to ensure successful completion on the initiative was provided, which included: (1) all providers and nurses completed education on severe maternal HTN protocol; (2) a hospital team review of time to treatment data; (3) development of sustainability plan using a template provided by ILPQC; (4) a plan to continue data collection and reporting to the ILPQC Data System for compliance monitoring. To support hospital team data entry completion, ILPQC contacted hospital teams with data missing in the third quarter of 2017 to discuss strategies for

data completion and worked with the RPS network administrators to connect with hospital teams still working towards the 80% time to treatment goal. We continued to motivate hospital teams with recognition and all teams submitting all data through December 2017 and meeting or exceeding the 80% time to treatment goal received a letter to their hospital leadership acknowledging their achievements and a certificate.

Upon achieving QI initiative goals, hospital teams completed a sustainability plan template that included compliance monitoring of their data and plans for new hire education and ongoing staff and provider education. The data collection form for sustainability was reduced to key compliance measures to support hospital teams' focused efforts during the sustainability period. Hospital team sustainability plans addressed practical issues related to sustainability, including identifying a team member to collect and reporting compliance data to the ILPQC Data System; developing a data collection and submission plan; and setting up regular meeting times to monitor compliance on measures using the ILPQC Data System reports, which includes developing and implementing a response for following below benchmark goals.

ILPQC continued to provide support to hospital teams to sustain their gains in 2018. ILPQC provided a sustainability discussion guide to PRS network administrators to facilitate hospital discussions at quarterly network meetings. We facilitated hospital teams' webinars on HTN sustainability in January, March, June, and October of 2018 and also offered a QI topic call on sustainability plans in February 2018. We also provided continued access to education resources to teams including ACOG AIM e-modules and webcasts, grand rounds upon request, and other guidance on the implementation of education. The ILPQC Maternal HTN Toolkit remained online with occasional updates as needed.

Conclusions

The goal of PQC is to partner with hospitals, providers, nurses, and public health leaders to utilize QI strategies to implement evidenced-based practices to improve outcomes for mothers and newborns.⁷ As states across the country develop and expand PQCs it is important to consider strategies to increase the capacity of PQC to succeed. This paper adds to the literature by providing a review of strategies from ILPQC to engage and support hospitals in a PQC through a systematic framework for (1) engaging hospitals to create an environment of improvement; (2) motivating hospital teams to facilitate change at their hospital; and (3) supporting hospital teams to increase their QI capacity to work together on an initiative to improve outcomes for mothers and newborns. We also present a case example of how the implementation of this framework contributed to the successful uptake of the ILPQC Severe Maternal HTN Initiative across Illinois.

We learned several lessons on hospital and provider engagement from the Maternal HTN initiative. First, working closely with ACOG and AIM ensured that hospital needs were communicated and resources developed to meet those needs. Sharing ACOG Committee Opinions and other ACOG materials such as the ACOG/AIM Severe HTN in pregnancy bundle helped hospital QI teams facilitate buy-in with hospital administration and providers. The ACOG AIM e-modules were especially helpful for implementing education for all providers and nurses across hospitals. Second, we provided various opportunities to engage providers as leaders to facilitate breakout sessions at our in-person mid-year meetings, participate in the Grand Rounds Speakers Bureau, and serve as team champions on hospital QI teams. Third, hospital teams found that sharing monthly QI reports from the ILPQC Data

System with providers at their hospital was key to define the problem, motivate change, and facilitate improvement. Fourth, engaging providers and nurses in sustainability planning and compliance monitoring ensures the gains are sustained.

Limitations of the ILPQC framework include generalizability of these strategies across states with different geography, perinatal regionalization, and different PQC structures. In addition, funding constraints may limit how this framework can be utilized by developing PQCs. The strengths of this review include the success of this framework in both engaging hospital teams and assisting teams with the implementation of QI strategies and ultimately improved outcomes. This systematic framework was developed so that key components can be replicated or revised based on the setting and available infrastructure of established or developing PQCs.

Ultimately, the job of the PQC is to create a collaborative of hospital teams, providers, nurses, and public health leaders to identify a problem and launch a QI initiative that drives successful system and culture change at the hospital level, achieving sustainable improvements in outcomes for mothers and newborns. Making a sustainable change that improves population-level outcomes takes engaged stakeholders and hospital teams, communication, collaboration, rapid-response data, and ongoing QI support. With appropriate funding and infrastructure, PQCs can be well positioned to meet this challenge.

References

- Callaghan WM, Creanga AA, Kuklina EV. Severe maternal morbidity among delivery and postpartum hospitalizations in the United States. *Obstet Gynecol.* 2012;120:1029–1036.
- Creanga AA, Berg CJ, Syverson C, et al. Pregnancy-related mortality in the United States, 2006–2010. *Obstet Gynecol.* 2015;125:5–12.
- MacDorman MF, Declercq E, Cabral H, et al. Recent increases in the U.S. maternal mortality rate: disentangling trends from measurement issues. *Obstet Gynecol.* 2016;128:447–455.
- American College of Obstetricians and Gynecologists. ACOG Committee Opinion No. 649: racial and ethnic disparities in obstetrics and gynecology. *Obstet Gynecol.* 2015;126:e130–e134.
- Matthews TJ, MacDorman MF, Thoma ME. Infant mortality statistics from the 2013 period linked birth/infant death data set. *Natl Vital Stat Rep.* 2015;64:1–30.
- Martin JA, Osterman MJK. Describing the increase in preterm births in the United States, 2014–2016. *NCHS Data Brief.* 2018;312:1–8.
- Henderson ZT, Ernst K, Simpson KR, et al. The National Network of State Perinatal Quality Collaboratives: a growing movement to improve maternal and infant health. *J Womens Health (Larchmt).* 2018;27:221–226.
- Centers for Disease Control and Prevention. Developing and sustaining perinatal quality collaboratives: a resource guide for states; 2016. Available at: https://www.cdc.gov/reproductivehealth/maternalinfanthealth/pdf/best-practices-for-developing-and-sustaining-perinatal-quality-collaboratives_tagged508.pdf. Accessed November 28, 2018.
- Simpson KR. The National Network of Perinatal Quality Collaboratives: opportunity to enhance the care and outcomes for mothers and babies. *MCN Am J Matern Child Nurs.* 2018;43:125.
- Kacica MA, Glantz JC, Xiong K, et al. A state-wide quality improvement initiative to reduce non-medically indicated scheduled deliveries. *Matern Child Health J.* 2017;21:932–941.
- Lannon CM, Peterson LE. Pediatric collaborative improvement networks: background and overview. *Pediatrics.* 2013;131(suppl 4):S189–S195.
- Main EK, Cape V, Abreo A, et al. Reduction of severe maternal morbidity from hemorrhage using a state perinatal quality collaborative. *Am J Obstet Gynecol.* 2017;216:298.e1–298.e11.
- Grover TR, Pallotto EK, Brozanski B, et al. Interdisciplinary teamwork and the power of a quality improvement collaborative in tertiary neonatal intensive care units. *J Perinat Neonatal Nurs.* 2015;29:179–186.
- Institute for Healthcare Improvement. The breakthrough series: IHI's collaborative model for achieving breakthrough improvement; 2003. Available at: <http://www.IHI.org>. Accessed November 28, 2018.
- California Maternal Quality Care Collaborative. QI initiatives: obstetric hemorrhage; 2018. Available at: www.cmqqc.org/qi-initiatives/obstetric-hemorrhage. Accessed December 3, 2018.
- Ohio Perinatal Quality Collaborative. Projects: progesterone project; 2018. Available at: www.opqc.net/projects/progesterone. Accessed December 3, 2018.

17. Iams JD, Applegate MS, Marcotte MP, et al. A Statewide Progestogen Promotion Program in Ohio. *Obstet Gynecol.* 2017;129:337–346.
18. Ware JL, Schetzina KE, Morad A, et al. A statewide quality improvement collaborative to increase breastfeeding rates in Tennessee. *Breastfeed Med.* 2018;13:292–300.
19. Kaplan HC, King E, White BE, et al. Statewide quality improvement initiative to reduce early elective deliveries and improve birth registry accuracy. *Obstet Gynecol.* 2018;131:688–695.
20. Hulscher ME, Schouten LM, Grol RP, et al. Determinants of success of quality improvement collaboratives: what does the literature show? *BMJ Qual Saf.* 2013;22:19–31.
21. Henderson ZT, Suchdev DB, Abe K, et al. Perinatal quality collaboratives: improving care for mothers and infants. *J Womens Health (Larchmt).* 2014;23:368–372.
22. Gould JB. The role of regional collaboratives: the California Perinatal Quality Care Collaborative model. *Clin Perinatol.* 2010;37:71–86.
23. Gupta M, Donovan EF, Henderson Z. State-based perinatal quality collaboratives: Pursuing improvements in perinatal health outcomes for all mothers and newborns. *Semin Perinatol.* 2017;41:195–203.
24. Schouten LM, Grol RP, Hulscher ME. Factors influencing success in quality-improvement collaboratives: development and psychometric testing of an instrument. *Implement Sci.* 2010;5:84.
25. Pai VV, Lee HC, Profit J. Improving uptake of key perinatal interventions using statewide quality collaboratives. *Clin Perinatol.* 2018;45:165–180.
26. Mate KS, Rakover J. 4 steps to sustaining improvement in health care. *Harv Bus Rev.* 2016. Available at: <https://hbr.org/2016/11/4-steps-to-sustaining-improvement-in-health-care>. Accessed November 30, 2018.
27. Balakrishnan M, Falk-Smith N, Detman LA, et al. Promoting teamwork may improve infant care processes during delivery room management: Florida perinatal quality collaborative's approach. *J Perinatol.* 2017;37:886–892.
28. Bisognano M, Cherouny PH, Gullo S. Applying a science-based method to improve perinatal care: the institute for healthcare improvement perinatal improvement community. *Obstet Gynecol.* 2014;124:810–814.
29. Duckers ML, Groenewegen PP, Wagner C. Quality improvement collaboratives and the wisdom of crowds: spread explained by perceived success at group level. *Implement Sci.* 2014;9:91.
30. Schneider PD, Sabol BA, Lee King PA, et al. The hard work of improving outcomes for mothers and babies: obstetric and perinatal quality improvement initiatives make a difference at the hospital, state, and national levels. *Clin Perinatol.* 2017;44:511–528.
31. Gandhi TK. Leadership and vision for a culture of safety. *NEJM Catalyst*; 2018.
32. Illinois Department of Public Health. Perinatal regionalization; 2018. Available at: www.dph.illinois.gov/topics-services/life-stages-populations/infant-mortality/perinatal-regionalization. Accessed December 3, 2018.
33. Lee King P, Keenan-Devlin L, Gordon C, et al. Reducing time to treatment for severe maternal hypertension through statewide quality improvement. *Am J Obstet Gynecol.* 2018;218:S4.