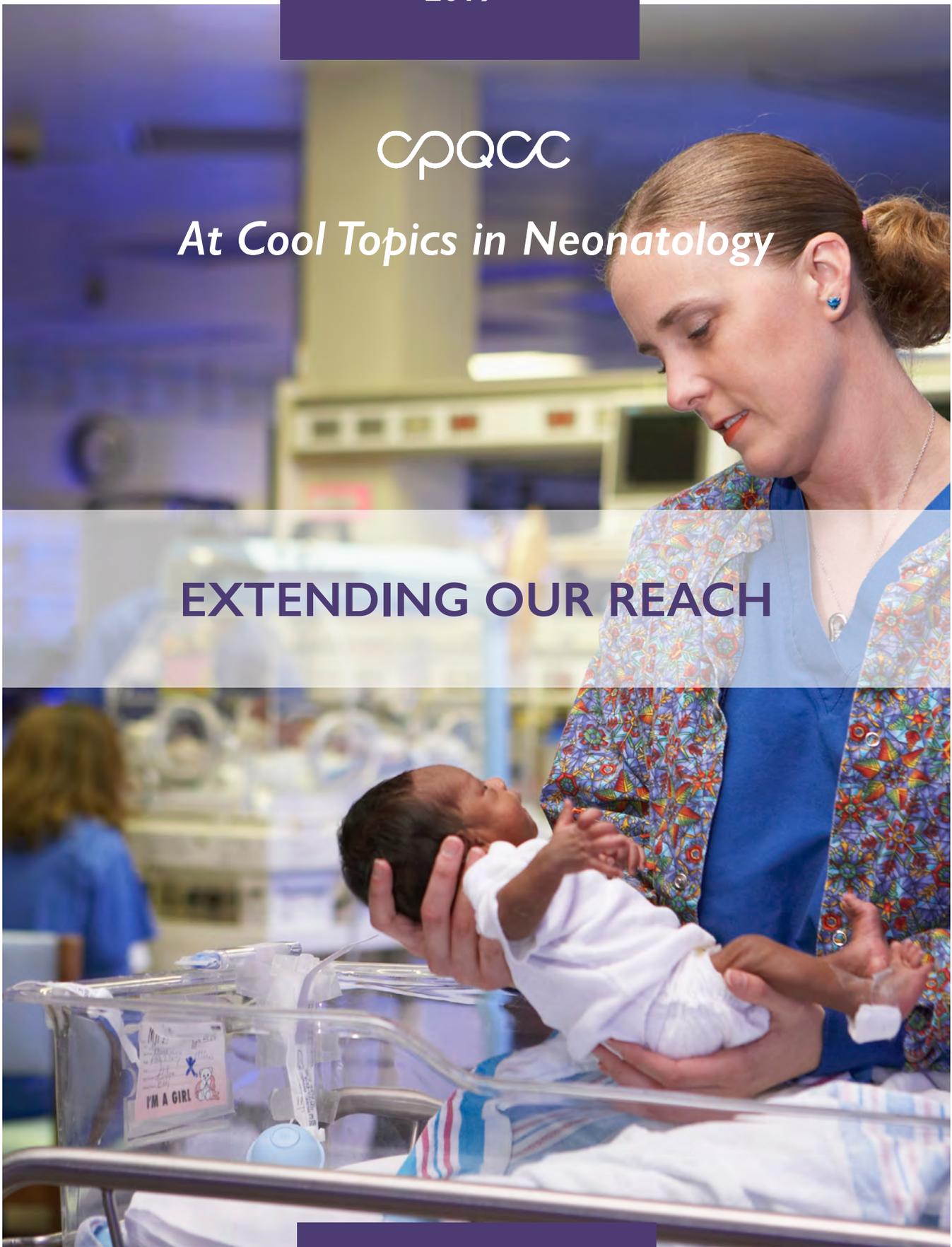


2019

CPQCC

*At Cool Topics in Neonatology*

**EXTENDING OUR REACH**



[www.cpqcc.org](http://www.cpqcc.org)



## EXTENDING OUR REACH

### *2019 Annual Update*

CPQCC publishes an annual update detailing major accomplishments from the previous year and select ongoing projects. The update is released at the “CPQCC at Cool Topics in Neonatology” meeting, the first day of the California Association of Neonatologists (CAN)’s yearly conference. For more information on CPQCC or the contents of this update, email [info@cpqcc.org](mailto:info@cpqcc.org).



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## ABOUT US

The California Perinatal Quality Care Collaborative (CPQCC) is a statewide network of California's neonatal intensive care units (NICUs) and High Risk Infant Follow-up (HRIF) clinics, housed at the Stanford University School of Medicine. CPQCC was founded in 1997 as the quality action arm of the California Association of Neonatologists (CAN).

We are committed to improving the quality of care for California's most vulnerable infants. As a member-driven organization, we strive to ensure that our work is guided by and responsive to the needs of health workers on the front line of care, as well as to the needs of their patients. As such, our work is directed by volunteer committees of neonatologists, nurses, developmental care specialists, data abstractors, and quality improvement (QI) experts from across the state who share our commitment to high quality neonatal care. Together, we are proud to be making substantial improvements to the health and wellbeing of California's infants.



# OUR IMPACT

CPQCC member hospitals have dramatically improved the quality of care for California's most vulnerable infants, leading to significant reductions in mortality and morbidity across the state. Between 2006-2015, our members contributed to:

21%

*Reduction in mortality for very low birth weight (VLBW) infants*

77%

*Reduction in hypothermic admissions*

99%

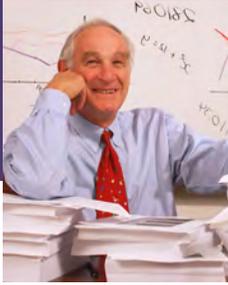
*Referral rate of VLBW infants to follow-up care*

49%

*Decrease in the rate of healthcare-associated infections*



# LETTER FROM LEADERSHIP



2018 was a busy year for us. This past August, the Centers for Disease Control published a report that showed that California was the only state to decrease perinatal mortality between 2014-2016. This achievement would not have been possible without the hard work and dedication of CPQCC member hospitals, which include over 90% of California's NICUs and 100% of CCS-approved HRIF clinics.

CPQCC is now a leading voice in the National Network of Perinatal Quality Collaboratives (NNPQC), helping to shape the direction of this nationwide group of state-based organizations. In addition, over the past year we presented at several national scientific and quality congresses, adding California's experience with neonatal quality improvement to the broader conversation. Our [more than 50 articles](#) published last year in the peer reviewed literature address important epidemiologic, health services, quality improvement, and clinical topics of interest, and our ongoing efforts around neonatal abstinence syndrome, health care disparities, and NICU disaster preparedness keep us at the forefront of pressing issues in neonatal care.

We continue to work extensively with our state partners; our sister organization, CMQCC; our host, Stanford University; the practitioners who volunteer their time to helping us innovate; and the California Association of Neonatologists, which continues to recognize us as their action arm for statewide quality improvement. Without these organizations and individuals, none of our accomplishments would be possible.

The devotion of this statewide community to improving the care and outcomes of our smallest babies motivates us each and every day. Thank you for everything you do to transform the lives of infants and mothers across California.

Sincerely,

**Jeffrey B. Gould, MD, MPH**  
Chief Executive Officer  
CPQCC

**Jochen Profit, MD, MPH**  
Chief Quality Officer  
CPQCC

**Henry Lee, MD, MS**  
Chief Medical Officer  
CPQCC

**Susan Hintz, MD, MS**  
HRIF Medical Director  
CPQCC

**Rebecca Robinson, MFA**  
Administrative Director  
CPQCC

# QI TOOLKIT ON NUTRITIONAL SUPPORT FOR THE VERY LOW BIRTH WEIGHT INFANT

## SECTIONS INCLUDE:



GENERAL PRINCIPLES OF VLBW NUTRITION



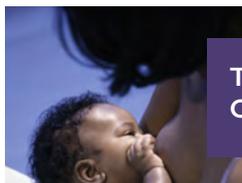
PARENTERAL NUTRITION FOR VLBW INFANTS



ESTABLISHING ENTERAL NUTRITION



HUMAN MILK/ BREASTFEEDING



TRANSITIONING TO ORAL FEEDS



DISCHARGE PLANNING & POST-DISCHARGE NUTRITION



CONTROVERSIES & UNRESOLVED ISSUES

In September 2018, CPQCC released the third revision to its quality improvement toolkit on Nutritional Support for the Very Low Birth Weight Infant. The 2018 revision includes important new references, streamlined recommendations, and evidence-based resources designed to promote rapid assessment of current nutritional practices, outline potentially better practices in VLBW nutrition, and enable rapid multidisciplinary improvement cycles.



*This has consistently been one of CPQCC's most popular toolkits. Not everyone has ROP, NEC, or needs a PDA ligation. But every baby needs good nutrition."*

*- Nancy Wight, MD, IBCLC, lead author of the 2018 revision*



TOOLKIT DOWNLOADS WORLDWIDE:

1,074

First month after release

2,610

Total since release

To download the toolkit, visit [www.cpqcc.org/nsvi](http://www.cpqcc.org/nsvi).

# MEMBER SPOTLIGHT

## ALTA BATES HRIF CLINIC

*CPQCC's dedicated member hospitals are the backbone of the organization and the reason that California has made such impressive strides in improving outcomes for vulnerable infants. Our "member spotlight" feature is an effort to recognize and showcase the tremendous work of our membership by focusing on the experiences of individual NICUs and HRIF clinics.*

We recently spoke with Tali Pinkham, RN, the High Risk Infant Follow-Up (HRIF) Clinic Coordinator at Alta Bates Summit Medical Center in Berkeley, California, to better understand the successes and challenges that HRIF clinics face and to learn how clinics are using the HRIF Reporting System to support site-specific process and quality improvement.

The Alta Bates HRIF Clinic has been in existence for over 25 years. It sees an average of 350 infants per year.

### THE SUCCESSES: STRONG COMMUNITY RESOURCES

More than anything, Pinkham credits the success of Alta Bates' HRIF Clinic to the richness of community support that is available to their patients. By looking at their data in the HRIF Reporting System, Pinkham can see that the number of infants and children that are followed in their clinic who are connected to services within the community is higher than the state average. This has made all the difference. "The clinic can't do it all," says Pinkham, "so we rely on the help of the community [to care for these children]."

Alameda County, where Alta Bates is located, benefits from Special Start, a collaboration between the Alameda County Public Health Department and UCSF Benioff Children's Hospital – Oakland. The program is designed as "long-term relationship-based family support" and provides ongoing home visits to infants that have been hospitalized in an Alameda Country NICU. The attention and continuity of care that Special Start case managers provide means that families throughout the county are well connected



*From left to right: Tali Pinkham, RN (Clinic Coordinator), Damien Tamayo Lira (patient), Joan Wenters (Psychologist), Jeniffer Lira (patient's mother), Marcia Gatson (Clinic Admin. Assistant), Chela Rios Munoz, LCSW (Special Start Home Visitor), Karla Romero (Interpreter), James Anderson, MD (Clinic Medical Director)*

to the resources they need. 85% of Alta Bates' HRIF families are on MediCal and often lack the resources to provide special care to their high-risk infants on their own. Home visits from Special Start help these families to navigate the system and understand the resources that are available to them. Special Start case managers remind families of their appointments at the HRIF clinic and often attend the appointments along with them, helping them to follow up with any referrals that are made.

However, programs like Special Start are not the norm statewide. 20-30% of high-risk infants across the state come in for their first HRIF core visit with an unmet need for medical and/or special service referrals. That percentage is even higher by the second visit. Without HRIF clinics, that unmet need for additional care would likely go unidentified, underscoring the vital importance of California's HRIF Program to the ongoing health and development of this vulnerable population.

**20-30% of high-risk infants across CA have an unmet need for medical and/or special services by the time of their first HRIF visit.**

## **THE CHALLENGES: FUNDING AND PATIENT DROP-OFF**

The clinic itself has struggled with a drop-off in patients after the second core visit. They have made administrative changes in order to better connect with families, to stress the necessity of all three visits, and to send more frequent reminders, often calling families to say that they “have a psychologist, neonatologist and nurse scheduled for two hours just for [their] baby” to emphasize the importance of attendance, but have continued to find it hard to get families in for the third visit.

Additionally, they are seeing an increase in families “lost to follow-up” before the first visit. Pinkham speculates that this may be due to the rising cost of housing in the area and an increase in transient families who deliver in the county and then move on. The clinic now sends a welcome letter to all families within a month of their discharge from the Alta Bates NICU outlining the goals of follow-up care and scheduling their first visit for the five-month mark. In addition, clinic staff have begun calling families to establish a connection within the first three months of discharge with the hopes that this will engage families earlier on and increase the chances that they show up for the first visit. They are also planning to roll out text message appointment reminders.

Challenges with declining attendance after the second visit and patients “lost to follow-up” are not uncommon for HRIF clinics statewide and are often compounded by the limited resources and lack of support that these clinics receive. Given the importance of HRIF visits in identifying unmet need for medical and special services, these challenges represent a significant missed opportunity to engage with infants and families who critically require additional care.

## **USING THE HRIF REPORTING SYSTEM FOR IMPROVEMENT**

Data from the Reporting System has helped clinic staff to discover that they were underutilizing their psychologists and has prompted them to make changes to correct the problem and free up critical resources. Prior to the changes, developmental testing was being conducted during the patient’s third core visit, which often is the least frequently attended. By comparing their clinic’s data with data from HRIF clinics across the state, the Alta Bates team discovered that other clinics were conducting developmental testing earlier on in the patient’s care. Based on this information, the Alta Bates team now schedules testing with a psychologist during the second core visit, followed by a brief check-up with a neonatologist, freeing up those neonatologists to spend more time on the critical first core visit.

Recently, the clinic has noticed that their data on nutrition and growth outcomes after NICU discharge suggests additional intervention is required. While the Alta Bates NICU team encourages parents to spend a concentrated 24-hour period in the NICU to learn what is required of caretakers after the infant is discharged and how feedings should be managed, the data points to a need for additional education and support in this area. The HRIF team plans to show the data to their NICU counterparts and work with them to find additional ways to improve nutrition and growth outcomes. \*

Pinkham emphasizes that her team “really appreciates the data” that are available to them through the HRIF Reporting System. It gives them a place to go when they have a question about the patients they are seeing and allows them to compare the care they are providing year to year. Best of all, it shows them where they can improve care for their patients.

*\* The Alta Bates NICU team is currently participating in CPQCC’s “Grow, Babies, Grow!” nutrition collaborative. You can read more about the collaborative on page 10.*

# GROW, BABIES, GROW!



*Updates from CPQCC's sixth multi-site quality improvement collaborative. Grow, Babies, Grow! is designed to help NICUs across California to optimize the growth and nutrition of their VLBW infants, with the goal of reducing growth failure at discharge.*

The Grow, Babies, Grow! collaborative is gaining in momentum day by day. Launched in October 2018, CPQCC's sixth multi-site improvement project using the Institute for Healthcare Improvement (IHI)'s collaborative quality improvement model has been non-stop action since day one.

The collaborative began with a learning session held on October 5, 2018 at the UC Davis School of Nursing in Sacramento. 100 people attended, representing all 22 registered sites. The learning session introduced sites to the quality improvement collaborative process; established the goals of the 18-month engagement, which includes 12 months of active work and a six-month sustainability phase; familiarized the hospitals with best practices to improve nutrition outcomes; reviewed and confirmed the consensus process and outcome measures for the collaborative; and defined expectations and timelines. Hospital teams were encouraged to walk away from the learning session with two-three things they could start working on by "next Tuesday" in order to jump-start the improvement process, and ended the day by working on their SMART (specific, measurable, achievable, relevant, and time-bound) aims.

After the learning session, the participating hospitals began using QI tools to test and implement the potentially better practices (PBPs) selected by the Grow, Babies, Grow! expert panel, such as ensuring breastmilk education/pumping in the first 12-24 hours after birth. Many of the PBPs

## THE PROBLEM

- 38% of very low birth weight babies (VLBW) across California leave the NICU having fallen one standard deviation or more from their initial birth weight parameters, compromising their future growth and neurodevelopmental potential later in childhood.
- Greater than 50% of babies born at less than 1,000 grams experience this same sub-optimal growth.
- Grow, Babies, Grow! aims to reduce the percentage of patients discharged as growth restricted in adjusted gestational age (AGA) VLBW patients by 20% in at least 80% of participating sites by October 1, 2019.

being used in the collaborative are derived from CPQCC's recently revised "Nutritional Support for the VLBW Infant" toolkit (see page seven for more information). Site teams also began entering data on their hospital's infants into a secure database.

Interaction between sites continues between learning sessions. Hospitals participate in monthly webcasts during which their teams "report out" on their successes and challenges and are able to learn from the experiences of their peers. Sites are often given pre-work assignments to complete beforehand to ensure that webcast discussions are focused and productive. In a recent webcast, hospital teams were chosen at random to present a "map" that communicated the rationale, status, and progress of their Plan-Do-Study-Act (PDSA) cycles. PDSAs are a frequently used tool for cycling through rapid "tests" of changes to practice in quality improvement projects. They provide a structured process to plan a test, carry out or do the test, study and learn from the consequences of the test, and ultimately

act on any modifications that need to be made for subsequent tests.

The collaborative's second learning session was held on February 8, 2019 and focused on examining problems related to nutrition in the NICU, developing a plan for an authentic PDSA, and implementing multiple iterative cycles. Sites shared lessons learned and challenges with their PDSA cycles and during break-out sessions, expert panelists facilitated discussions around various PBP's for improving nutrition and growth. A third, in-person learning session will be held on September 27th, and a fourth, virtually, in March 2020 during the sustainability phase.

While only time will reveal the results of the collaborative participants' hard work, it is clear that Grow, Babies, Grow! is continuing to foster a robust culture of collaboration and quality improvement across California.



## THE EXPERT PANEL

- Nutritionist – Maria Hetherington, RD, CSP (UCSF)
- Parent – Jennifer Canvasser, MSW (NEC Society)
- Neonatologist – Jae Kim, MD, PhD (UCSD)
- Clinical Nurse Specialist (CNS) – Mindy Morris, DNP, NNP-BC, CNS (Consultant)
- Collaborative Co-Director, Research Rep - Kurlen Payton, MD (Cedar Sinai)
- Lactation Consultant – Ruth Pletcher, BSN, RN, IBCLC (UCSD)
- Speech-Language Pathology – Karin Mitchell, MA, CCC-SLP, CLE, CNT (CHOC)
- Data – Joe Schulman, MD, MS (CCS)
- Context & Culture – Jenny Quinn, PhD, APRN, NNP-BC (NorthBay, Univ. of Arizona)
- Quality Improvement - Jochen Profit, MD, MPH (CPQCC)
- Collaborative Co-Director – Courtney Nisbet, RN, MS (CPQCC)

## THE VALUE OF MULTI-SITE COLLABORATION

- Reduces the gap between knowledge and practice
- Attempts to address the broad variation in practice
- Breaks down existing professional boundaries that inhibit improvement
- Recognizes that outcomes are the result of systems, not just individuals
- Literature suggests that improved practices and outcomes occur
- Accelerates improvement and exposes gaps
- Minimizes between-site repetition
- Allows functional benchmarking
- Allows free exchange of ideas and data
- Pools data
- Encourages standardization of practices
- Provides tacit competition
- Complements and supports research



# DELAYED CORD CLAMPING PILOT PROJECT

In 2016, delayed cord clamping (DCC) was recommended by the American College of Obstetrics and Gynecology (ACOG) for all babies, yet few hospitals were practicing it. Enter a committed group of California hospitals, determined to make DCC a routine practice, which approached CPQCC to start collecting DCC data on a pilot basis. Says Priya Jegatheesan, a neonatologist and Associate Director of the NICU at Santa Clara Valley Medical Center and one of the driving forces behind the pilot, “if you really want to make things happen for all babies, you have to have strong commitment to your cause and methodically influence change.”

Santa Clara Valley Medical Center (SCVMC) started practicing DCC in 2007 with the goal of decreasing their rates of intraventricular hemorrhage (IVH). The hospital had already worked on standardized delivery room management guidelines for infants born at less than 27 weeks’ gestation, including thermo-regulation and early continuous positive airway pressure (CPAP), and decided that DCC of 30 seconds was critical to the delivery room bundle. By 2011, the SCVMC team had decided that they had developed enough comfort with DCC of 30 seconds for preterm infants to extend the time to a minimum of a full minute, around the same time that the American Academy of Pediatrics (AAP) endorsed DCC of one minute for preterm infants. However, the team’s goal was that this practice should benefit all babies, not just preterm infants, and in 2013 they expanded the practice to cover all infants born at their hospital. In 2014, through an examination of the data that they had collected, the SCVMC team noted a reduction in rates of intubation and transfusion risk among infants who had received a longer duration of DCC, outcomes that they had not expected. Reassured

and reenergized, the team continued to promote the practice and to see improvements. By 2016, SCVMC had increased the duration of DCC to a minimum of two minutes and in 2018 they successfully increased it again, to a minimum of three minutes.

Despite her team’s success, Jegatheesan recognizes that practice change is not easy. Every time the team decided to increase the duration of DCC they faced frustration and pushback from other members of the care team. Frequent communication proved critical to combating this pushback. DCC advocates shared data on improved outcomes with reluctant team members,



*If you really want to make things happen for all babies, you have to have strong commitment to your cause and methodically influence change.”*

**- Priya Jegatheesan, MD, Associate NICU Medical Director, Santa Clara Valley Medical Center**

explaining the rationale behind increasing durations, and sharing relevant literature. Says Jegatheesan, “it required a lot of learning reinforcement and feedback.” The NICU nurse manager collaborated with Labor & Delivery nurses to establish a delivery room task force to discuss areas for improvement in delivery room care, such as increasing colostrum use and breastfeeding. These forums also allowed teams to bring up ongoing issues with DCC and work through them together.

Ultimately, the time spent encouraging conversation between the neonatology and obstetrics teams proved beneficial, not only for increasing buy-in

for DCC, but also for promoting conversation and collegiality in the delivery room. “Everyone is more comfortable now. It allowed us to be able to talk to each other, have [more productive] conversations and make fewer assumptions. It gave us a venue to talk and to go back and recognize everyone’s hard work. [Ultimately], it made everything a lot smoother.”

The SCVMC team’s success in implementing DCC provided valuable lessons for the statewide pilot. Recognizing that without data it would be almost impossible to influence change, but also that data collection on this topic would be difficult for CPQCC’s NICU-based members as it would have to happen in the delivery room, the pilot project

other materials and resources gathered during the pilot.

By 2017, the second year of the pilot, 52 CPQCC hospitals were participating and data collection appeared achievable. During webinars, participating members worked through challenges in gathering the data and were able to start analyzing the data to determine what was happening at their hospitals and how they were progressing. While SCVMC was able to increase the minimum duration of delayed cord clamping to three minutes, for many sites the pilot was a chance for them to determine how long a delay they should advocate for, and how long a delay was practical. As Jegatheesan explains, “based on our experience, targeting three minutes of DCC



was initially designed to determine whether it would be feasible to collect data on delayed cord clamping at all. Interested hospitals from across California were invited to participate.

The first goal of the pilot project was to determine the feasibility of data collection, and whether it would be best implemented via a paper form or additions to the EMR. The process included significant input from CPQCC’s Data Committee Advisory Group (DCAG), a volunteer group of data abstractors, nurses, and physicians from CPQCC member NICUs that oversees all of the organization’s data collection. Quarterly webinars allowed hospitals participating in the pilot project to learn from each other and discuss the best way forward. Jegatheesan’s team, including L&D and NICU nurses and a perinatologist, was the first to present, explaining why the hospital had decided to start practicing DCC, the barriers they faced, and how they developed a data collection form within their EMR. Recordings of the webinars are now publicly available on CPQCC’s website, along with

for all infants assures us that most infants, especially >90% of very preterm infants, achieve at least the sixty seconds of DCC that is recommended by the World Health Organization (WHO), Neonatal Resuscitation Program (NRP) and ACOG.”

By the end of the second year, the group determined that collecting DCC data was not only feasible but should be actively encouraged for all hospitals. In 2018, DCC was added to the standard set of CPQCC data collection items for all members.

Delayed cord clamping is now widely accepted as beneficial within the neonatology community, but data from the pilot showed significant variation in the DCC that infants are actually receiving. CPQCC hopes to spend the next two years collecting DCC data from across California to develop a robust understanding of how the practice is being implemented. From there, the quality improvement possibilities will emerge.

# HRIF-CVICU EXPANSION PROJECT

*Enhancing the referral of neonates with complex congenital heart disease from cardiac intensive care units (CVICUs) to High Risk Infant Follow-up (HRIF) clinics. HRIF clinics provide care to infants at risk of neurodevelopmental, behavioral, and growth delays from discharge to age three.*

CPQCC's High Risk Infant Follow-Up (HRIF) team is on a mission to extend its reach to all neonates across the state who would benefit from follow-up, wherever they have been cared for after birth. To determine where to focus their attention, they started with a question: "what can we learn from CPQCC's existing NICU and HRIF data sets?" It turns out, a lot.

The data showed a significant gap across California in neonates admitted to the NICU with complex congenital heart disease (CHD) who were eligible for HRIF but were not being identified and



referred. Further exploration with hospitals and stakeholders across the state revealed just how large these gaps were, extending beyond the population already captured in CPQCC's NICU Database and revealing that many HRIF-eligible neonates bypass the NICU entirely and are not referred.

With input from CPQCC's HRIF Executive Committee, the state's California Children's Services (CCS) division, issued a Program Letter: 01-0917 clarifying HRIF eligibility for complex CHD to support hospitals in identifying and referring qualified patients. In close partnership with CCS, CPQCC then launched the HRIF-CVICU Expansion Project in May 2018. The goal of the project is to identify the total neonatal CHD

population in California, identify challenges that may prevent these infants from being referred to HRIF, and implement solutions that make referral and registration easier. While the focus of the project is on cardiovascular intensive care units (CVICUs) for now, the changes to the referral and registration process that the team is working on include implementation of a direct Electronic Data Submission (EDS). This option will ultimately be available to all CVICUs and NICUs in CCS-approved hospitals to streamline referral and registration of eligible high-risk infants, wherever they are receiving care.

Complex CHD occurs in 6/1,000 live births, approximately one-half of which require surgical intervention in the neonatal period. Survival rates for these infants have significantly improved, due to advances in perinatal, neonatal, surgical and post-operative care. However, these infants are at risk for neurodevelopmental challenges without further intervention.

The first step in the HRIF-CVICU Expansion Project was assembling interested parties from across California, including representatives from the CVICUs, NICUs, and HRIF clinics of the eight hospitals which conduct the majority of neonatal cardiovascular surgeries, as well as key players from CCS. Through a series of meetings, the group identified the many pathways from birth to discharge that infants with CHD requiring surgery may follow. These discussions highlighted the complexity and variation in the referral patterns and patient flows across the state, as well as communication hurdles leading to missed identification and referral of HRIF-eligible patients. Also apparent was a deep dedication to process improvement. CPQCC has since

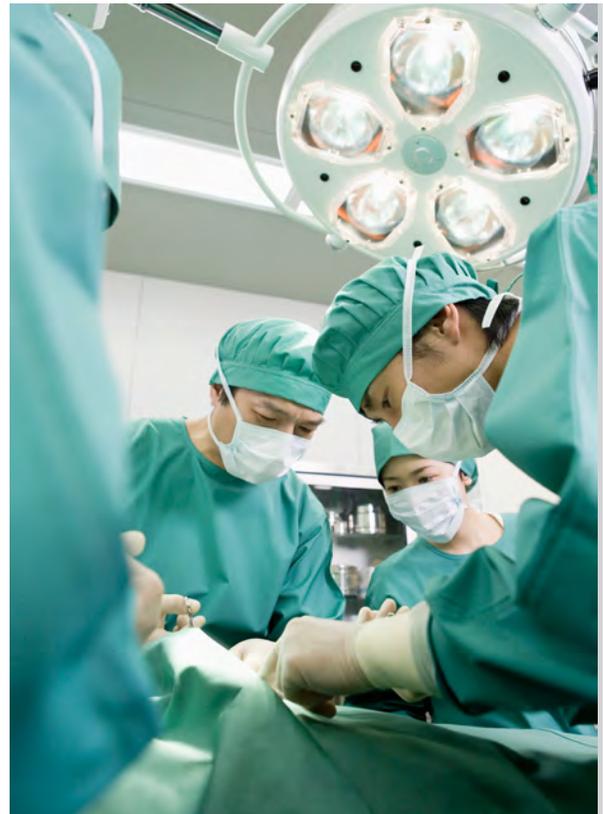
developed a short data form which the eight cardiac hospitals participating in the project are using to identify and track HRIF eligible CHD patients at their sites. The short form will also assist CPQCC's HRIF team in identifying the "true denominator" of eligible cardiac patients and thus the magnitude of the problem, something the state is particularly interested in learning. In addition, the team has begun implementing process improvements for those infants with complex CHD who are already included within the NICU Database. These patients are now flagged within CPQCC's NICU Reports site ([www.cpqccreport.org](http://www.cpqccreport.org)) in a "match

and HRIF clinic. The team will also be looking into the need to increase awareness of HRIF eligibility criteria and CCS expectations for referral, recognizing that different approaches may be needed in different parts of the state.

Though ambitious, the project underscores CPQCC's dedication to helping its member hospitals improve care; its commitment to working with stakeholders across the state; and most of all, its focus on extending its reach to all of California's vulnerable infants.

A retrospective analysis of CPQCC's NICU-HRIF data from 2013 to 2015 found:

- 41,689 infants were discharged home from the NICU. Of those, 2,124 had a significant CHD diagnosis. 62% of the infants with significant CHD diagnoses required surgery or other intervention.
- Only 46.2% of infants with a significant CHD diagnosis and 60.1% of those requiring intervention were referred to HRIF, although referral rates did increase in later years.
- Among the eight CPQCC hospitals with the highest CHD intervention rates there was substantial variation in referral numbers.
- Of those infants with CHD requiring intervention who were referred to HRIF at discharge, 72.4% were seen for their first core visit and only 55.6% for their second core visit. During those visits, substantial need for additional medical and special service referrals were identified.



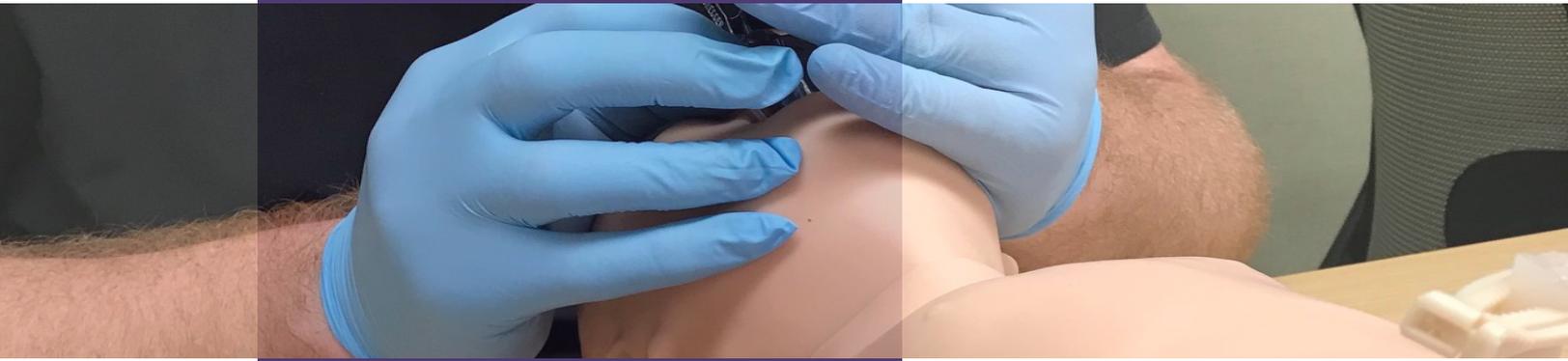
report" which links data from both the NICU and HRIF databases. In addition, the team has been determining what additional reports may be beneficial for CVICUs and how to best display that data.

Although significant progress has been made, there is still a long way to go. Next steps for the team include gaining a better understanding of local and regional practice variations and learning from hospitals which excel at coordination and communication between the NICU, CVICU,

#### HRIF ELIGIBILITY CRITERIA FOR PATIENTS WITH COMPLEX CHD:

- Admission to a Neonatal Intensive Care Unit (NICU) or directly to a Pediatric Intensive Care Unit or Cardiovascular Intensive Care Unit (CVICU) within the neonatal period AND
- Surgery or minimally invasive therapeutic intervention (such as catheter-based balloon angioplasty) for CHD during that hospitalization

# SIMULATING SUCCESS



*Simulating Success is being implemented in partnership with the Center for Advanced Perinatal and Pediatric Education (CAPE) at Stanford University School of Medicine. For more information about CAPE, visit [www.cape.stanford.edu](http://www.cape.stanford.edu).*

CPQCC launched Simulating Success in March 2018 with the goal of improving the performance of neonatal resuscitation teams using simulation-based training. Simulation-based training can improve the safety, efficiency and effectiveness of patient care during neonatal resuscitation, and may in turn lead to lower rates of neonatal mortality and serious morbidities, such as bronchopulmonary dysplasia (BPD) and hypoxic-ischemic encephalopathy (HIE). BPD affects up to 35% of very low birth weight infants across California.

Participants in Simulating Success are exposed to the principles of simulation and debriefing in various forms throughout the 15-month duration of the project. The project uses a train-the-trainer model and collaborative learning techniques in order to maximize learning across sites.

Sites start with online coursework spread over three months to introduce the fundamentals of simulation and debriefing through brief lectures by faculty from the Center for Advanced Pediatric and Perinatal Education (CAPE) at Stanford University. These foundational principles are reinforced through question and answer components and live webinar discussions with CAPE faculty. Sites then attend a two-day, in-person training at CAPE. While the online course is open to a larger group of future trainers from each site, the in-person training is

## OVERVIEW

- 15 sites enrolled, divided into four cohorts
- 45 simulation leaders trained (by April 2019)
- 15-month project which includes online modules, two-day in-person training at the Center for Advanced Pediatric & Perinatal Education (CAPE) and a 12-month implementation phase
- Implementation phase includes monthly webinars, two site visits, and personalized support to help sites run simulation scenarios and debriefings locally



*[The] Simulating Success CPQCC project has been a great springboard for us...to realize our goal of starting a sustainable simulation program. Our training and mentorship from CAPE has been invaluable to get it off the ground. It has enhanced and enriched our multidisciplinary team training experience with overwhelmingly positive feedback from physicians and staff. ”*

*- Participating neonatologist*

provided to three people per hospital who will lead the implementation of Simulating Success in their neonatal intensive care unit. In order to encourage multidisciplinary teams of simulation instructors, sites are advised to send leaders from each group of healthcare professionals responsible for neonatal resuscitation at their hospitals, including nurses, respiratory therapists, nurse practitioners, and physicians. The site leaders write a custom scenario that they bring to the in-person training and run with the other site teams in their cohort as trainees in their scenario. This allows the simulation instructor team from each site to gain experience with crafting learning objectives, designing a scenario, and running a simulation, with ongoing feedback and guidance from the CAPE faculty team. Each simulation instructor team then debriefs the trainees who participated in their scenario, which is often more powerful and instructive than the simulation itself. Well-trained simulation instructors are able to help trainees identify what went well during a simulation, what didn't, and why. Lastly, CAPE faculty conduct a "debrief the debriefer" feedback session to critique the debriefing and identify effective uses of debriefing strategies as well as areas where the instructor team could improve their debriefing further.

CAPE's debriefing methodology emphasizes taking the feelings out of the equation, a significant cultural shift from most other styles of debriefing in healthcare. During debriefs, participants are asked not how they felt about the simulation, but to analyze how the team performed and the effect of that performance on the patient. Simulation instructors are taught specific strategies for minimizing defensiveness during debriefings, dealing with emotion when it arises, facilitating discussion and asking questions, encouraging self-assessment by trainees, and drilling down to the root causes for both positive and negative individual and team performances.

Site teams return to their hospitals following the in-person training with two iPads from Simulating Success, preloaded with software for simulating vital signs to help facilitate the execution of simulation-based training scenarios at their home sites. One iPad can be used to record simulations and the other to record debriefs. This initiates the beginning of the 12-month implementation phase during which sites are encouraged to establish their own simulation-

based training program with ongoing support from the Simulating Success team. Sites send recordings of their trainings to the Simulating Success team, which reviews them and provides feedback to allow a virtual version of the "debrief the debriefer" session that was conducted during the in-person training. Site teams also join monthly webinars with others from their cohort during which the recorded simulations and debriefings are reviewed and key issues are discussed. The webinars are a vital part of the collaborative learning aspect of the project as they allow participants to interact across sites and learn from each other's successes and challenges.

To ensure regular support for quality improvement, each site receives two visits from a QI expert during the implementation phase, one near the beginning and another towards the end. During the 4 to 6-hour visit, the expert conducts a focus group interview with the site team that is deploying Simulating Success to discuss the status of their implementation phase, supportive factors, and any potential barriers; views a simulation and debrief; and is on hand to answer questions and troubleshoot any issues that have arisen. The QI expert supports the sites throughout the implementation phase, providing QI tools and guidance to build and sustain a successful program.

In January 2019, the last of the four cohorts began their online modules. As they kickstart the Simulating Success program, they are embarking upon the journey towards safer, more efficient, and more effective patient care during neonatal resuscitation.



*Let's face it. Effective simulation is not easy. It's a skill that takes a lot of practice. Ultimately, everyone's goal is to provide safe, efficient and effective care to our babies. With the support of the [Simulating Success] team and the training received, I have no doubt simulation-based training in our NICU will improve the effectiveness of our resuscitation teams and improve the outcome of our babies."*

*- Participating clinical educator*



# MOMS IN THE NICU PILOT PROJECT

## TOUCHSTONES

**CONSULT** – consult with mom about her birth story to jointly identify ways to reduce the risk of future preterm birth and improve overall health

**EMPOWER** – empower mom to take action on her own health

**SUPPORT** – support mom in developing and implementing a health plan

Mothers with preterm babies are at increased risk of postnatal health problems and tend to make less use of postnatal services and support than other women. Many of these mothers spend long hours in the NICU participating in their infants' care. Despite spending a great deal of time in this healthcare setting, the opportunity to engage these moms in the care of their own health is being missed.

The “Moms in the NICU” pilot, a joint collaboration between obstetricians and neonatologists funded by the March of Dimes, was launched to take advantage of the time that a mother spends in the NICU to engage and empower mothers to take action on their own health and to support them in preventing future preterm births. Although the causes of preterm birth are likely multifactorial, one major risk factor is a prior preterm birth. The “Moms in the NICU” pilot addresses this by clarifying details of their pregnancy that would optimize future prenatal care, providing information on the importance of an optimal interpregnancy interval (IPI) and the ways to achieve it, discussing appropriate interventions that may help prevent preterm birth in future pregnancies, and emphasizing the benefits of their addressing any ongoing health issues.

“Moms in the NICU” engages and empowers moms to improve their own health in between and during future pregnancies by: 1.) allowing them to tell their “maternal birth story,” in consultation with an obstetrician to clarify any misconceptions and gaps in their understanding and identify potential factors associated with their preterm

birth that could help them to manage future pregnancies; and 2.) developing a personalized health plan to support mothers to take actions which improve their health.

The project is currently being piloted at Lucile Packard Children's Hospital Stanford. A facilitator works with NICU nurses to identify moms who are ready for the intervention, usually those whose infants are past the critical period and are a few weeks from discharge. Once a rapport has been built with a mom and she has agreed to participate, she is scheduled for a birth story and health plan consult with a maternal-fetal medicine (MFM) specialist. Recognizing that not all hospitals will have access to an MFM specialist, the format of the pilot is adjustable so that any clinician with expertise and experience working on a labor and delivery service and with high-risk pregnancies, such as an obstetrician, nurse practitioner, physician's assistant or midwife, will be able to facilitate the maternal birth story and health plan consultation.

The consultation provides a vital opportunity for moms to discuss their birth experience and to obtain answers to any lingering questions they may have about what occurred. The act of having someone listen to their story and address concerns has had a therapeutic benefit for several of the moms counseled during the pilot project. In addition, the consulting clinician stresses the importance of addressing any chronic health conditions that the mom may have, such as hypertension or diabetes, dispelling any misconceptions that these health issues may be “normal” and facilitating the mom to take steps to address their health.

After the consultation, the team inserts relevant details from the pregnancy, labor and delivery (and in some cases postdelivery) into the “My Baby's Birth Story” section of the health plan handout.

## BIRTH STORY & HEALTH PLAN HANDOUT

**MY BABY'S BIRTH STORY** – Provides a record of what happened during pregnancy and the birth experience, including prior health conditions, previous surgeries, and any previous pregnancies.

**LETTING MY BODY RECOVER** – Details appropriate inter-pregnancy interval, depending on mom's situation, and information on birth control. Encourages LARC.

**TAKING CARE OF MY HEALTH RIGHT NOW** – Information on how to manage any chronic conditions (e.g. diabetes, hypertension, etc.) and/or how to reduce harmful behaviors (e.g. smoking) as well as on postpartum recovery.

**PLANNING FOR FUTURE PREGNANCIES** – General information on preconception and prenatal care for future pregnancies including information on diagnoses from birth story that mom should share with her OB/GYN.

**A PLAN FOR MY HEALTH** – actionable items to empower mom to take steps to ensure healthy future pregnancies and her own good health.

The rest of the handout includes guidance on a variety of health topics that the team can delete if the information does not pertain to the mom. The team can also insert specific recommendations that were made based on the discussion with the patient and any records that were available at the time.

The personalized handout is discussed with the mom prior to their infant's discharge and copies are provided for her to take home. The facilitator follows up with the mom on "activation" of the health plan within six weeks of her baby going home. This also gives the facilitator the chance to ask about any barriers to care that the mother experiences; for example, difficulty obtaining an appointment for medical services, or lack of transportation. Barriers mentioned during these discussions are currently being tracked and may be used to develop future quality improvement interventions.

Feedback on the pilot project collected six weeks after the intervention has been encouraging. Moms have reported experiencing reassurance, understanding, and in some cases, revelation and

relief as a result of the consultation and materials provided. Moms have noted that it was comforting to have an expert listen to their experience of what occurred during labor and delivery and have found it helpful to understand factors that may have caused them to deliver early. Says one mom, "I wanted to make sure I didn't miss anything and [that] everything I remembered was in fact what happened." Moms also appreciated having something to read and digest while they were spending time in the Intermediate Care Nursery waiting for their babies to be discharged.

The ideal timing of the intervention has been found to vary for each mom. Intervening too soon may mitigate the usefulness of the intervention, if moms are too distracted with the medical situation of their infant. On the other hand, some women may prefer the therapeutic effect of telling their birth story earlier and, may find it easier to consult the documents to remind them of the details later.

The intervention has also proved useful in prompting reflection about contraception use following pregnancy, a critical piece in maintaining a healthy interpregnancy interval and reducing the risk of a repeat preterm birth. One of the moms mentioned that "the intervention made me think harder about the contraception piece. At my OB's office, I was recommended POPs (progesterone-only birth control pills) but I had never picked [them] up. Hearing the importance of it made me reconsider and rethink it. Having been counseled on it again helped my decision to take POPs."

In addition, the team has found that having the obstetrical consultation take place within the NICU setting has the potential to strengthen the working relationships between obstetricians, neonatologists and their teams.

The "Moms in the NICU" team is now working on next steps for the pilot, including development of a toolkit to help other hospitals implement a similar program and expanding to a second pilot site. In time, they hope to expand the project nationwide, so that all moms in the NICU can be empowered and engaged to prevent a future preterm birth.

To learn more about "Moms in the NICU" and how it may work at your hospital, please contact Dr. Jeffrey Gould at [jb Gould@stanford.edu](mailto:jb Gould@stanford.edu).



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