Florida Perinatal Quality Collaborative
at The Lawton and Rhea Chiles Center for Healthy Mothers and Babies

Golden Hour Part I: Delivery Room Management

MAYA BALAKRISHNAN, MD

FPQC GOLDEN HOUR PART I PROJECT CHAMPION

UNIVERSITY OF SOUTH FLORIDA

ASSISTANT PROFESSOR OF PEDIATRICS

DIVISION OF NEONATOLOGY

FPQC NEONATAL MEETING

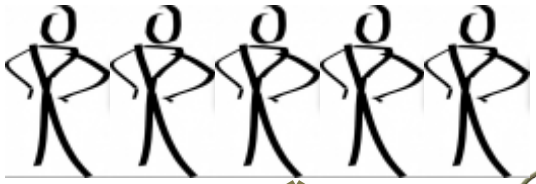
10/2013

Objectives

1. Discuss FPQC leadership & its role in this initiative
2. Discuss evidence-based measures in Delivery Room (DR) management
   - Teamwork
   - Thermoregulation
   - Oxygen administration
   - Delayed cord clamping
3. Discuss current status of Golden Hour initiative

Quality Collaborative Function

- 1 Neonatology & 1 Obstetric project each year
- Each hospital develops & implements *individualized* guidelines
- Minimum data collection required
- FPQC electronic data collection & analysis
- Provide coaching & reports



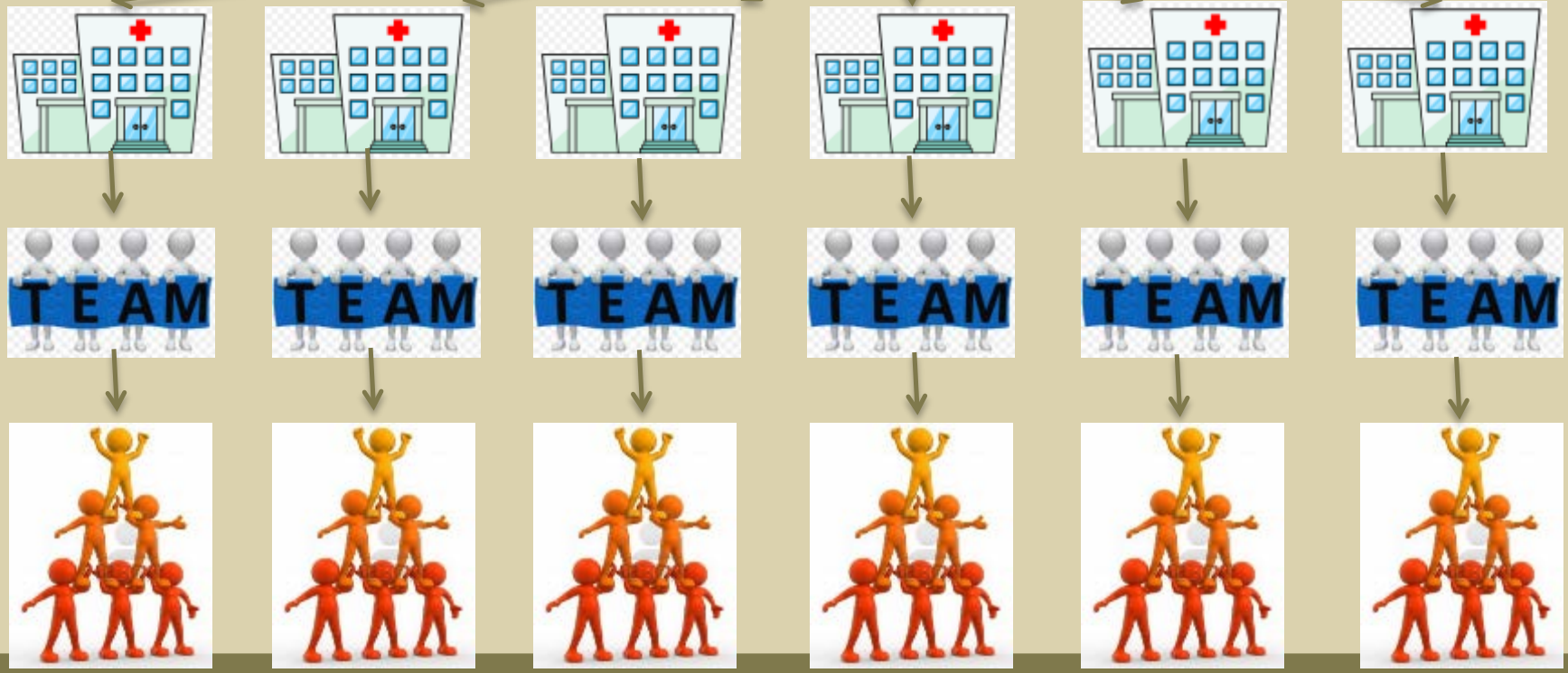
FPQC Leadership:
J.Curran, B.Sappenfield, L.Detman
D.Hardy, M.Balakrishnan

OB Project:
Postpartum Hemorrhage

Neonatology Project:
Golden Hour Part I: Delivery Room management project

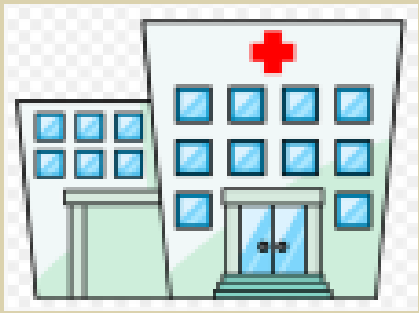
Quality Leader:
Terri Ashmeade

Project Sponsor:
Maya Balakrishnan



Selection of Pilot Hospitals

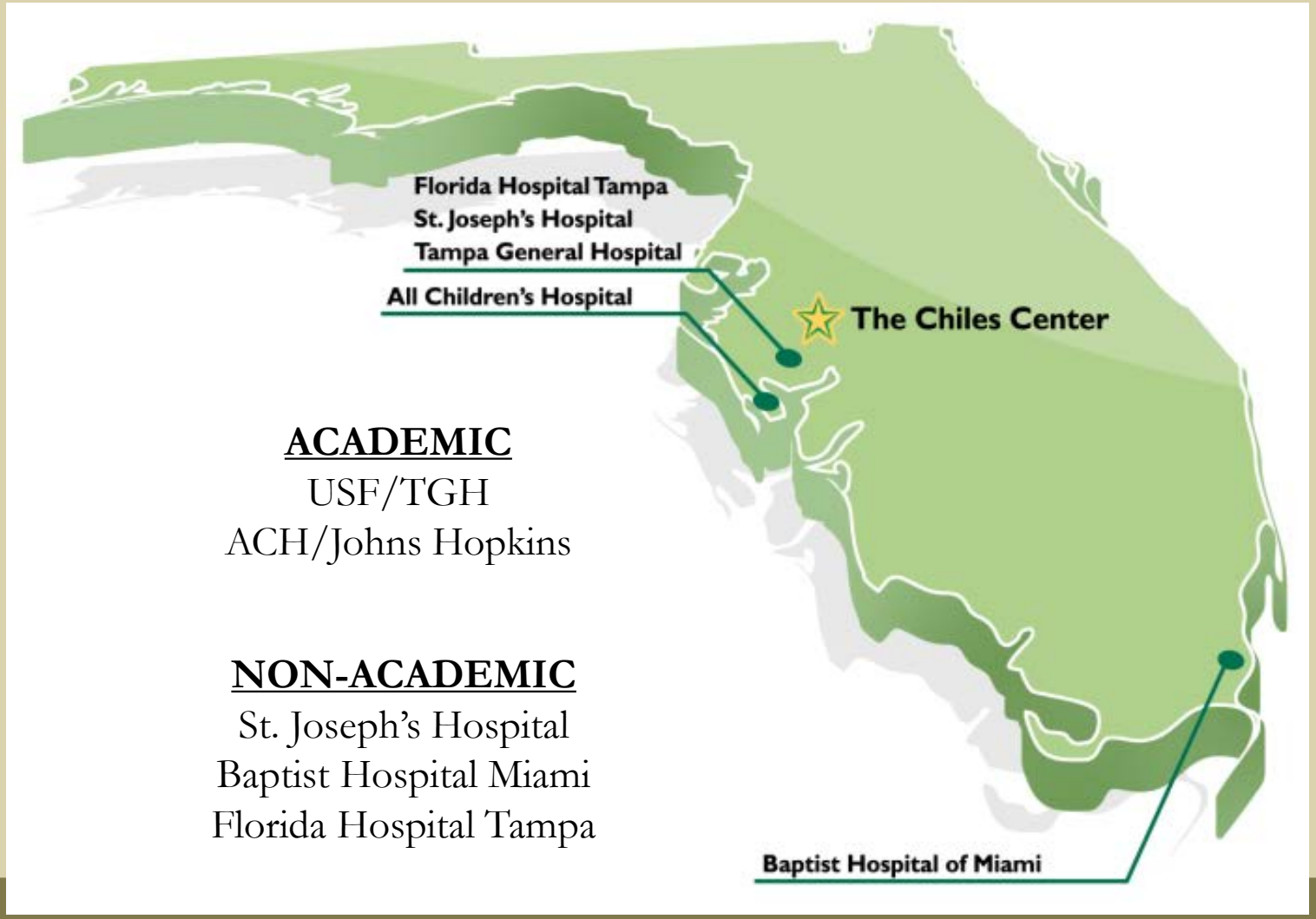
- Participate in FPQC
- Deliver babies with
  - GA≤30 6/7 wks
  - anticipated BW≤1500g
- Expressed interest in participation



<u>Looked for variety in:</u>

- # births
- extent of existing quality infrastructure

Selection of Pilot Hospitals



ACADEMIC
USF/TGH
ACH/Johns Hopkins

NON-ACADEMIC
St. Joseph's Hospital
Baptist Hospital Miami
Florida Hospital Tampa

Pilot Hospital Teams

Core team

Minimum of 4 members

- Administrative Lead
- Physician Lead
- Nurse Lead
- Data Lead

Each hospital has a multidisciplinary team

Consider involvement:

- Respiratory therapy
- Pharmacy
- Nursing (e.g. charge nurses, transport/delivery team nurses, nurse practitioners)
- Labor & Delivery

The Golden Hour

- Transition from fetal → neonatal life
  - Many complex physiologic changes

<u>Interventions in this time period may affect:</u>

- Short term morbidities (e.g. thermoregulation, hypoglycemia)
- Long term morbidities (e.g. CLD, ROP, IVH)
- Mortality

While there is no direct causation, studies show a strong association

Quality Improvement Suggests…

- Management of Golden Hour could be:
  - Standardized
  - Evidence-based practices
  - Multidisciplinary team approach

- Goal in GA ≤30 6/7 wks ***OR*** anticipated BW≤1500 g
  - More efficient care at delivery & immediate post-delivery period
  - Improve short & long term outcomes

FPQC Golden Hour Project Proposal

Value of Golden Hour Quality Initiative

- Clinically important in neonatology
- There exists potential for process & quality improvement
- Specific & measurable process & outcome measures
- *Some* measures taken can potentially affect *all* babies

Golden Hour Part I:

Addresses Delivery Room management

Golden Hour Part II:

Addresses immediate post-delivery management

Background

Standardized DR practices aimed at:

- enhancing teamwork
- maintaining normothermia
- avoidance of hyperoxia/hypoxia
- delaying umbilical cord clamping

→→ improved outcomes in VLBWs

Evidence-Based Measures in DR Management

1. **TEAMWORK**
2. **THERMOREGULATION**
3. **OXYGEN ADMINISTRATION**
4. **DELAYED CORD CLAMPING**

Teamwork

- Communication errors identified as root cause of ~72% of perinatal deaths & injuries[1]

Consistent, scripted care has shown benefit

- Nonmedical fields (e.g. aviation, nuclear energy, military)[2]
- Medical fields (e.g. CV surgery, emergency, trauma)[3,4]

Principles learned from these fields are used in Golden hour management

1. Joint Commission Sentinel Event: 30, 2004. 2. Leape, 2001. 3. Rosenstein, 1997. 4. Cornwell, 2003

Teamwork benefits the NICU

- Planning/scripting of roles/tasks
  - Communication, timeline, SIM training
- Established goals w/resuscitation & early management strategy helps
  - Communication in multidisciplinary team
  - Allow for feedback & education
  - Facilitates coordination & consistency among providers
  - Prevents avoidable errors

1. Leape, 2001. 2. Rosenstein, 1997. 3. Cornwell, 2003

VON does not capture any measure for teamwork

By 12/2014 pilot hospital sites
will implement a specific DR management plan
for infants with
GA ≤30 6/7 wks OR anticipated birth weight ≤1500 g
with the goals of:

>50% of DR teams having **assigned roles**

>50% of DR teams with **team debriefings w/in 4 hours** of delivery

Evidence-Based Measures in DR Management

1. TEAMWORK
2. **THERMOREGULATION**
3. OXYGEN ADMINISTRATION
4. DELAYED CORD CLAMPING

Effects of Hypothermia & Hyperthermia

RS	CVS	CNS	Metab	
Pulmonary vasomotor tone	Low BP	Cerebral blood flow	Low glucose	IVH
Difficult resus-citation	Delayed transition		Lactic acidosis	Late onset sepsis
O2 consump-tion / RR			Water losses	Mortality

Hyperthermia associated w/cardio-respiratory compromise & lethargy

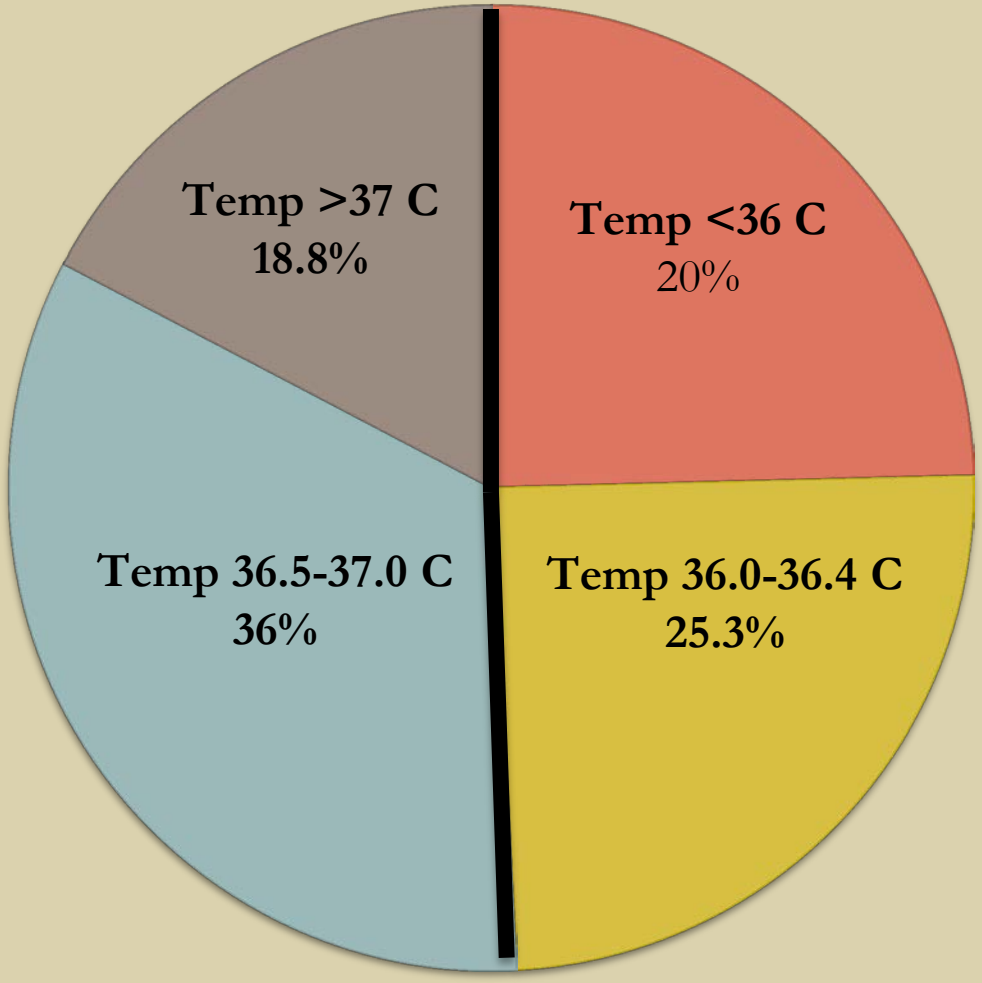
Thermoregulation

A naked infant at room temperature can burn 150 kcal/min[1]

- VLBWs are vulnerable to cold stress
- Many studies show small babies w/low GA are at risk
- Maintaining VLBW in neutral thermal environment significantly reduced mortality[2]

1. Sol, 2008. 2. Silverman WA, Fertig JW, Berger AP. The influence of the thermal environment upon survival of newly born preterm infants. Pediatrics 1958 ; 22: 876-85.

Admission Temperature

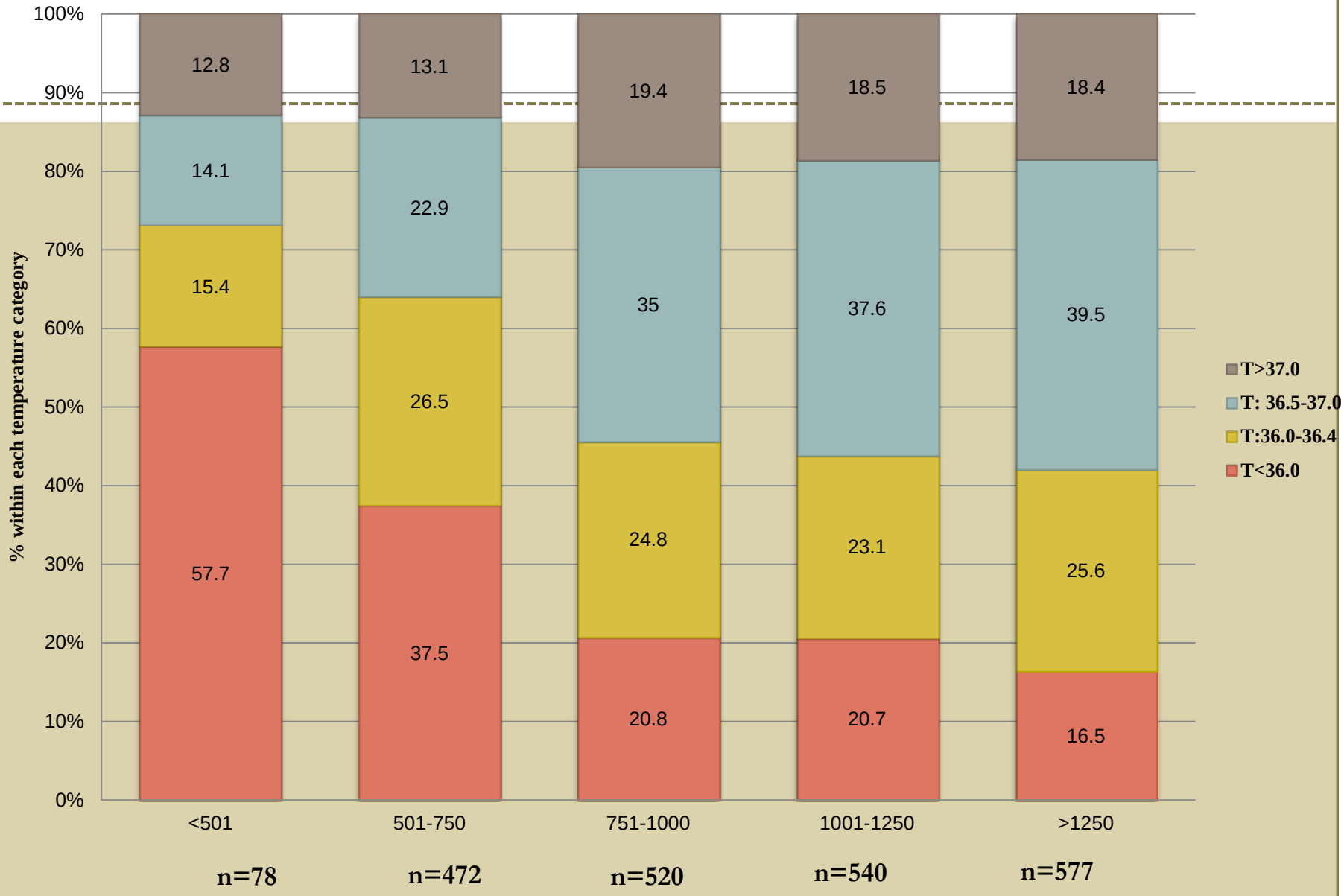


~50% of VLBWs have a low admission temperature

Goal temperature: 36.5-37.5 C

FPQC 2012 Data (n=2,294)

FPQC VLBW Admission Temperature by Birth Weight (2012)



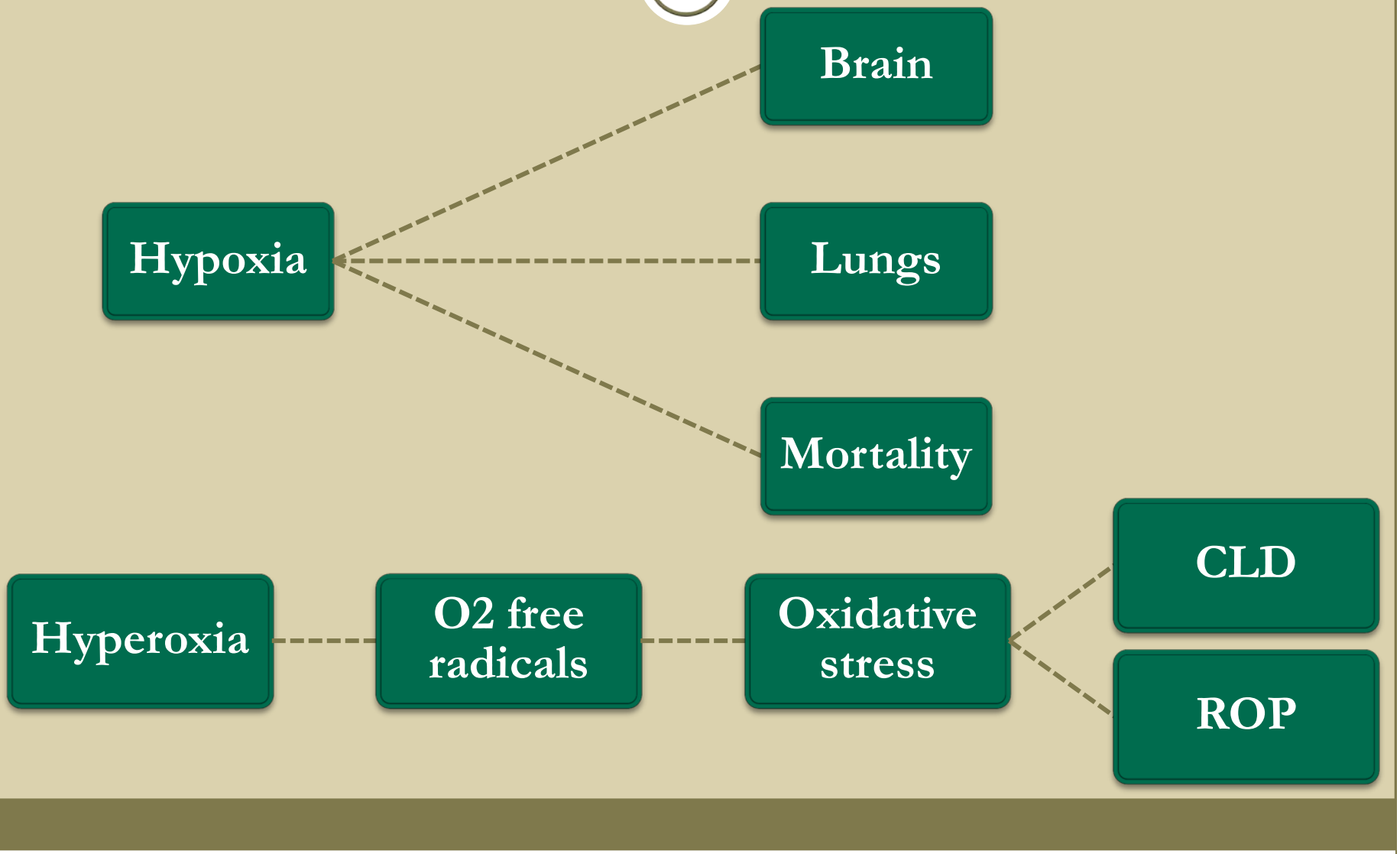
By 12/2014 pilot hospital sites
will implement a specific DR management plan
for infants with
GA ≤30 6/7 wks OR anticipated birth weight ≤1500 g
with the goal of:

≥75% of infants
with a **NICU admission temperature**
of **36.5°-37.5°C**

Evidence-Based Measures in DR Management

1. TEAMWORK
2. THERMOREGULATION
3. OXYGEN ADMINISTRATION
4. DELAYED CORD CLAMPING

Dangers of Hypoxia & Hyperoxia



NRP Recommendations
6th Edition

- DR goals mirror expected O2 saturation increases from fetal levels
- Same goals apply to preterm & term infants

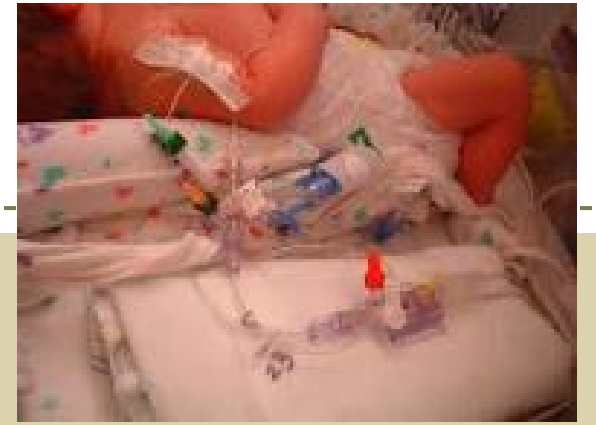
Titrate FiO2 to maintain pre-ductal O2 sats:	
1 min	60-65%
2 min	65-70%
3 min	70-75%
4 min	75-80%
5 min	80-85%
10 min	85-95%
>10 min	follow unit protocol

VON does not capture compliance w/NRP O2 administration standards

Respiratory Care

	% (n)
DR oxygen	84% (2,248)
DR CPAP	29% (2,249)
DR surfactant	29% (2,248)
CLD	23% (2,000)

VON FPQC data 2012



By 12/2014 pilot hospital sites
will implement a specific DR management plan
for infants with
GA ≤30 6/7 wks OR anticipated birth weight ≤1500 g
with the goal of:

≥50% compliance
with **NRP oxygen targets** (85-95%)
at **10 minutes** of life

Evidence-Based Measures in DR Management

1. TEAM WORK
2. THERMOREGULATION
3. OXYGEN ADMINISTRATION
4. DELAYED CORD CLAMPING

Delayed Cord Clamping

Delayed Cord Clamping is endorsed

WHO

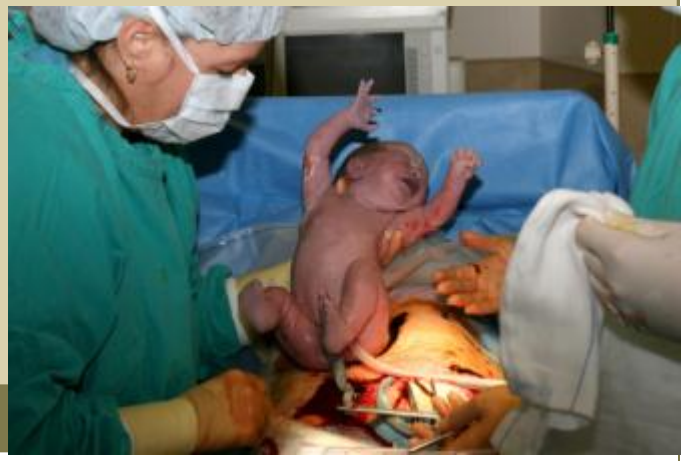
American College of Obstetricians & Gynecologists

Society of Obstetricians & Gynecologists of Canada

European Association of Perinatal Medicine

International Liaison Committee on Resuscitation

- Preterms: 30-60 seconds
- Offers potential transfusion benefit
  - C-sections: 5-15 ml/kg
  - Vaginal births: 10-30 ml/kg



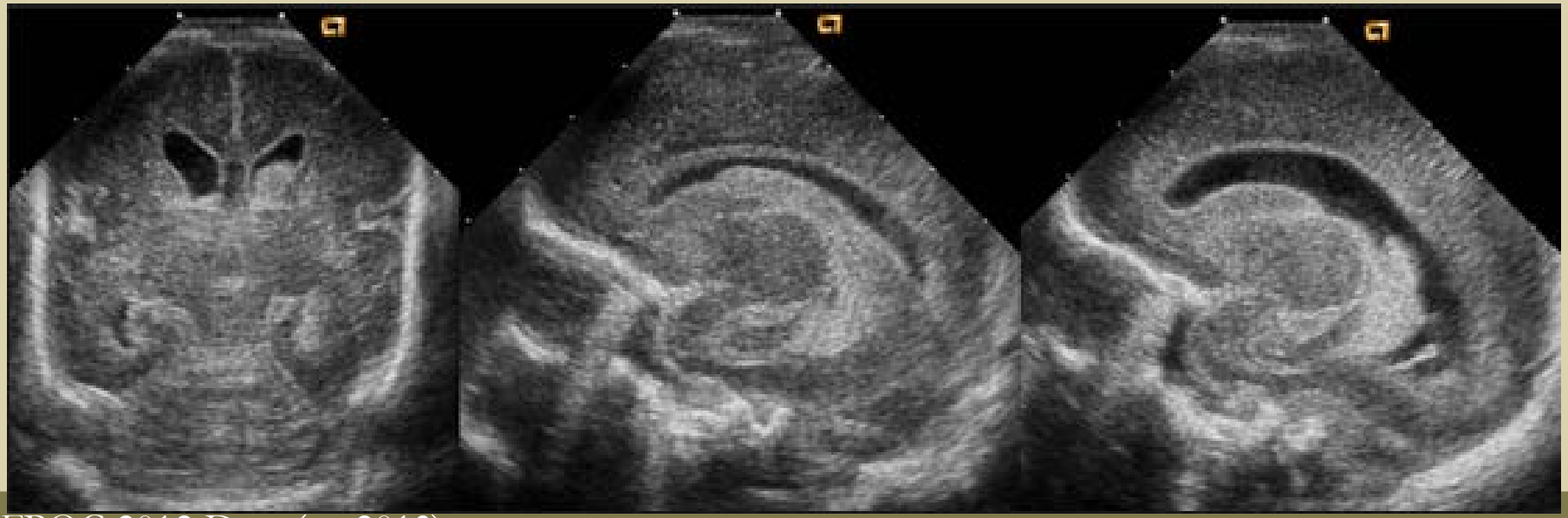
Delayed Cord Clamping

Advantages	Perceived Disadvantages
• Increased Hb • Decreased transfusions • Increased systemic BP • Decreased incidence IVH • At 1 y/o: Increased Hb, serum ferritin, & iron stores	• Increased Tbilirubin* • Increased phototherapy* • Polycythemia* • Urgency of resuscitation# • Temperature on NICU admission#

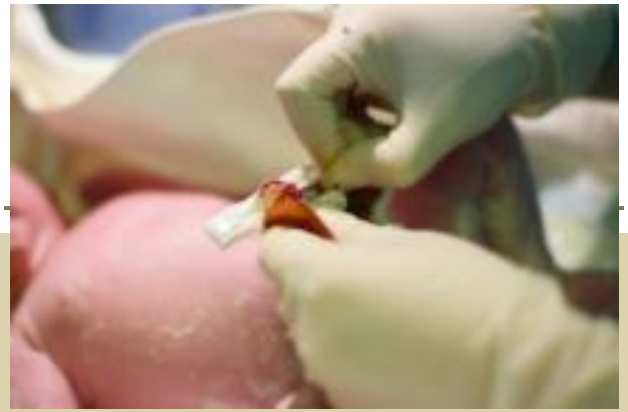
***Inconsistent results in multiple studies.**
 # no significant difference in Apgars, cord pH, NICU admit temp. degree of respiratory distress

IVH

FPQC 2013 Data	
Any IVH	25.4%
Severe IVH	9.3%



FPQC 2012 Data (n=2013)



By 12/2014 pilot hospital sites
will implement a specific DR management plan
for infants with
GA ≤30 6/7 wks OR anticipated birth weight ≤1500 g
with the goal of:

≥50% compliance
with **delayed cord clamping** for **30-60 seconds**

Project Aims

- GA ≤30 6/7 wks OR anticipated birth weight ≤1500 g
  - 5 pilot sites, x 5-15 infants/month at each site → ~1,000 infants
- DR team notified of delivery → NICU admission
- QI cycles from 10/2013 to 12/2014

1. >50% of DR teams having **assigned roles**
2. >50% of DR teams w/**debriefings** w/in 4 hours of delivery
3. ≥75% w/NICU **admission temperature** of 36.5°-37.5°C
4. 50% w/NRP oxy**gen targets** (85-95%) at 10 minutes of life
5. ≥50% w/**delayed cord clamping** for 30-60 seconds

Timeline

3/2013

- FPQC annual conference
- Presented Golden Hour QI project

5/2013

- FPQC leadership selected Golden Hour initiative

7/2013

- Recruited 5 pilot NICUs
- Pilots developed multidisciplinary improvement teams
- Project charter signed
- Hospital CEO letters signed

Timeline

8/2013

- Pilots process mapped their site's DR process
- Developed evidence-based DR toolkit

Partnering to Improve Health Care Quality for Mothers and Babies

Florida Perinatal Quality Collaborative Potentially Better Practice Guidelines in Golden Hour Part I: Delivery Room management

Potentially Better Practices	Supporting Evidence
TEAM WORK & ANTENATAL MANAGEMENT **FPQC goal:** *Develop and utilize a specific delivery room (DR) management plan in infants with GA ≤30 6/7 wks or anticipated BW ≤1500 g who are admitted to the NICU to facilitate: 1. Pre-defined DR team roles assigned in ≥50% of deliveries, 2. DR team debriefings within 4 hours of delivery in ≥50% of infants.*	
Organize DR care as you would NICU care[1] Determine your hospital's process for DR management. Useful quality improvement methodologies include: • Scripting • Process mapping (e.g., fishbone diagrams, value stream mapping) • Lean thinking approach (i.e., increase efficiency, reduce waste in time/materials) • Evaluation of process parameters	Premature and very low birth weight (VLBW; ≤1500 g) infants have unique requirements for effective transition from fetal to extra-uterine life. They are at increased risk for severe hypothermia and respiratory failure, which significantly increases the risk of morbidities and mortality. Creation of a DR environment that closely mimics the NICU, appropriate preparation, and effective interventions decreases these risks.[1]
Utilize a standardized, scripted, multi-disciplinary approach to enhance coordination and guidance of initial management for all newborn infants.[2]	The resuscitation and initial stabilization of newborn infants is a transition consisting of several discrete processes that require coordination of personnel and equipment. Events occurring during this transition can affect immediate survival and long-term morbidity. A coordinated team effort improves outcomes.[2]

Timeline

8/2013

- Pilots process mapped their site's DR process
- Developed evidence-based DR toolkit
- Consensus on data and improvement measures

Study ID #: ___ ___ ___

FPQC Golden Hour Part I QI Data Collection Sheet

(Complete for those who have birth GA ≤ 30 6/7 wks *OR* anticipated BW ≤ 1500 g *AND* survives to NICU admission)

Birth weight (whole number)	grams	**Gestational age** (mark data source)	weeks days ☐ best clinical/obstetric estimate ☐ 1st trimester U/S ☐ 2nd trimester U/S
Delivery type	☐ vaginal ☐ C-section	**Delayed cord clamping after delivery** (30-60 seconds)	☐ yes ☐ no **1st Hct:** _____ % (one decimal)
Date of birth (MM/DD/YY)	/ /	**Time of birth**	: (military time)
Apgar score at 5 minutes		**Time of NICU admission**	: (military time)
Resuscitation required *any* chest compressions	☐ yes ☐ no	**Resuscitation required ET or IV epinephrine**	☐ yes ☐ no
Pre-delivery DR preparation: (check all that apply)	☐ Delivery team briefing prior to anticipated delivery ☐ Equipment check prior to delivery ☐ Radiant warmer turned to 100% heat prior to delivery		
Method of temperature regulation used (check all that apply)	☐ Attention paid to ambient room temperature ☐ Chemical warming mattress activated prior to delivery ☐ Hat applied to baby's head within 2 minutes of life ☐ Polyethylene wrap applied to baby within 2 minutes of life Other / Comments:		
Temperature on NICU admission	°C *OR* °F ☐ axillary ☐ rectal ☐ other:		
Monitoring supplemental oxygen use (whole numbers)	**Pulse ox probe on RUE & connected to oximeter w/in 2 min of life:** ☐ yes ☐ no **Pre-ductal oxygen saturation at 10 minutes of life:** % **FiO2 at 10 minutes of life:** %		
DR team roles (check all that apply)	**Team leader:** ☐ yes ☐ no **Circulation:** ☐ yes ☐ no **Airway:** ☐ yes ☐ no **Scribe:** ☐ yes ☐ no **Other:**		
Timing of DR debriefing	☐ within 4 hours of resuscitation ☐ after 4 hours of resuscitation ☐ no debriefing		
Name 1-3 opportunities for improvement discussed in debriefing:	1)		
	2)		
	3)		

Other comments:

All data collected in this document strictly is for quality improvement purposes only and is not part of the baby's medical record.

Tentative Goals

8/2013

- Pilots process mapped their site's DR process
- Developed evidence-based DR toolkit
- Consensus on data and improvement measures
- Developed FPQC database to provide monthly reports
- Submitted IRB for FPQC database

Florida Perinatal Quality Collaborative

At The Lawton and Rhea Chiles Center for Healthy Mothers and Babies

Partnering to Improve Health Care Quality for Mothers and Babies

FPQC

Study NICU ID?

- ○ All Children's Hospital/Johns Hopkins Medicine, St. Petersburg
- ○ Baptist Hospital, Miami
- ○ Florida Hospital, Tampa
- ○ St. Joseph's Hospital, Tampa
- ○ University of South Florida/Tampa General Hospital, Tampa

Study Neonate ID#? (Unique 3 digits starting with 001 and upwards)

Birth Weight? (Grams in whole numbers)

Gestational Age?

Weeks

Days

Timeline

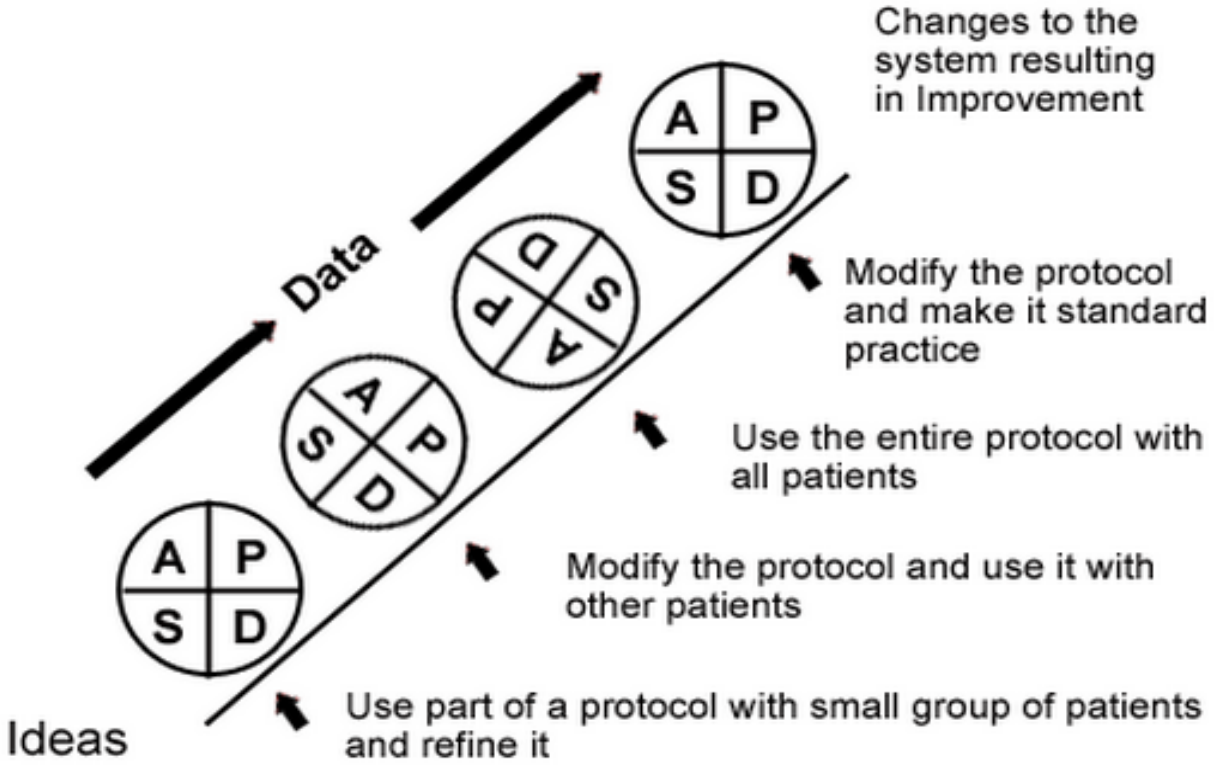
9/2013

- Submitted ABP MOC credit application
- Data Use Agreements signed
- Developed Project listserv
- Developing FPQC project mini-site
- Pilot sites
  - developed DR management guidelines
  - start baseline data collection
- FPQC neonatal meeting

10/2013

- TeamSTEPPS training webinar
- Baseline data entry into FPQC database

10/2013



- Pilot sites enter data monthly
- FPQC provides coaching & monthly benchmarking reports

12/2014

Facilitating communication

- Project newsletter monthly

Florida Perinatal Quality Collaborative

Partnering to Improve Health Care Quality for Mothers and Babies

GOLDEN HOUR PART I: DELIVERY ROOM MANAGEMENT

Congratulations on being a pilot hospital site!

Our goals are to implement evidence-based practices associated with teamwork, thermoregulation, oxygen administration, and delayed cord clamping to improve care quality and better outcomes in infants ≤30 6/7 wks or with anticipated birth weight ≤1500 g. We are thrilled at the interest this project has generated and are excited to get started. The following sites have committed to this project:

- All Children's Hospital/Johns Hopkins Medicine, St. Petersburg
- Baptist Hospital, Miami
- Florida Hospital, Tampa
- St. Joseph's Hospital, Tampa
- University of South Florida/Tampa General Hospital, Tampa

Please feel free to contact Maya Balakrishnan at mbalakri@health.usf.edu with any questions, concerns, or suggestions. Together we can make a difference in the quality of care our babies receive!

The FPQC Leadership Team

Inside This Issue:
- Communication Update
- August Project Goals
- Quality Focus: Process Mapping

Facilitating Communication Between FPQC sites

We hope to achieve this goal through the following:
- Monthly conference calls will be scheduled starting in September 2013.
- Dr. Balakrishnan will contact each site at least once each month to discuss data analysis and any concerns/questions that arise.
- We are developing a series of 4-6 training lectures covering topics of quality improvement, CUSP training, and TEAMSTEPPS training.
- A FPQC Golden Hour list-serve is being developed. We will grant access as soon as possible.

SAVE THE DATE:

NEONATAL-FOCUSED MEETING: SEPTEMBER 27, 2013

9:00 AM - 3:00 PM

Annual meeting for Florida's current Level III NICUs to review VON Centers and FPQC data (2012 and 5-year aggregate data)

Who Should Attend: Physician and nurse teams from each Level III NICU (2 per team recommended)

Location: Bilsbin Room, The Lawton and Rhea Chiles Center for Healthy Mothers and Babies
3111 East Fletcher Avenue Tampa, FL 33613

Costs: Free registration. Attendees are responsible for travel costs. FPQC will provide lunch.

For the draft agenda or to RSVP, please email fpqc@health.usf.edu.

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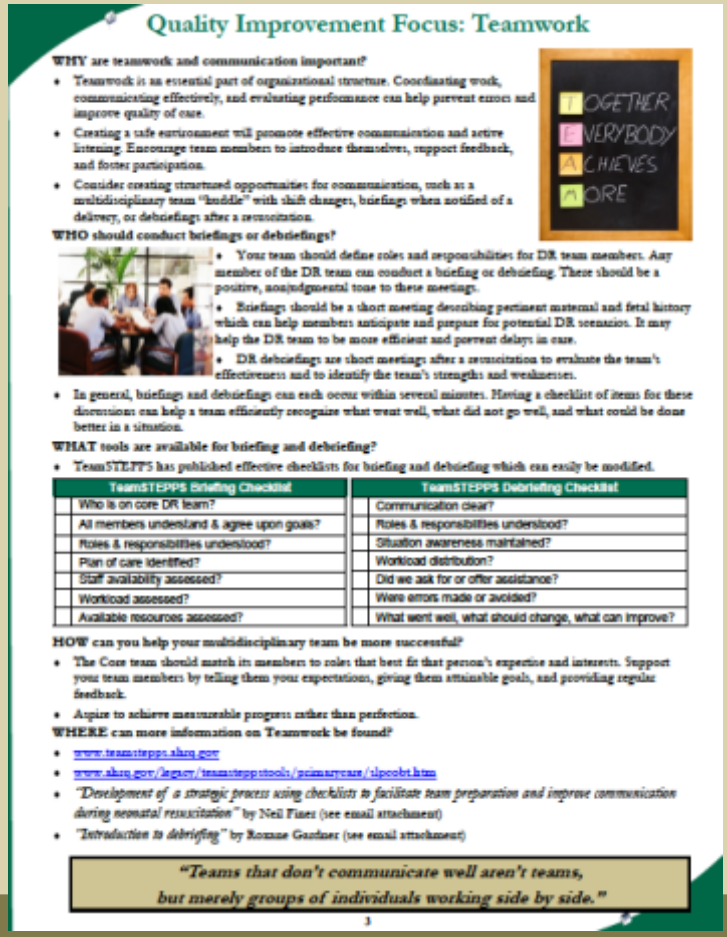

Quality Improvement Focus: Teamwork

WHY are teamwork and communication important?
- Teamwork is an essential part of organizational structure. Coordinating work, communicating effectively, and evaluating performance can help prevent errors and improve quality of care.
- Creating a safe environment will promote effective communication and active listening. Encourage team members to introduce themselves, support feedback, and foster participation.
- Consider creating structured opportunities for communication, such as a multidisciplinary team "huddle" with shift changes, briefings when notified of a delivery, or debriefings after a resuscitation.

WHO should conduct briefings or debriefings?
- Your team should define roles and responsibilities for DR team members. Any member of the DR team can conduct a briefing or debriefing. There should be a positive, nonjudgmental tone to these meetings.
- Briefings should be a short meeting describing pertinent maternal and fetal history which can help members anticipate and prepare for potential DR scenarios. It may help the DR team to be more efficient and prevent delays in care.
- DR debriefings are short meetings after a resuscitation to evaluate the team's effectiveness and to identify the team's strengths and weaknesses.
- In general, briefings and debriefings can each occur within several minutes. Having a checklist of items for these discussions can help a team efficiently recognize what went well, what did not go well, and what could be done better in a situation.

WHAT tools are available for briefing and debriefing?
- TeamSTEPPS has published effective checklists for briefing and debriefing which can easily be modified.

	TeamSTEPPS Briefing Checklist		TeamSTEPPS Debriefing Checklist
	Who is on core DR team?		Communication clear?
	All members understand & agree upon goals?		Roles & responsibilities understood?
	Roles & responsibilities understood?		Situation awareness maintained?
	Plan of care identified?		Workload distribution?
	Staff availability assessed?		Did we ask for or offer assistance?
	Workload assessed?		Were errors made or avoided?
	Available resources assessed?		What went well, what should change, what can improve?

HOW can you help your multidisciplinary team be more successful?
- The Core team should match its members to roles that best fit that person's expertise and interests. Support your team members by telling them your expectations, giving them attainable goals, and providing regular feedback.
- Aspire to achieve measureable progress rather than perfection.

WHERE can more information on Teamwork be found?
- www.teamstepps.ahrq.gov
- www.ahrq.gov/legacy/teamsteppstools/primaryuse/clpoobt.htm
- *"Development of a strategic process using checklists to facilitate team preparation and improve communication during neonatal resuscitation"* by Neil Finer (see email attachment)
- *"Introduction to debriefing"* by Roxane Gardner (see email attachment)

"Teams that don't communicate well aren't teams, but merely groups of individuals working side by side."

3

Facilitating communication

- Project newsletter Qmonthly
- Project leader will make Qmonthly calls to site leaders
- Quarterly conference calls between sites
- Project listserv
  - contact mbalakri@health.usf.edu to be included
- FPQC project mini-site to share materials/tools

Facilitating QI education

- Monthly quality focus in newsletter
- Webinars
  - quality improvement, CUSP training, TeamSTEPPS training

TeamSTEPPS Training Webinar

Laura Haubner, MD, CPHQ, CHSE will be presenting our first webinar on application of TeamSTEPPS methodology to the Golden Hour in October 2013 (date and time to be announced). Dr. Haubner is an Associate Professor in the Division of Neonatology at USF's College of Medicine. She is a TeamSTEPPS master trainer. The webinar will include discussion on the following topics:

- Team structure, critical aspects of teamwork, and the importance of a shared mental model
- Discuss communication techniques and strategies for briefing, huddles, and debriefing
- Golden hour applications for leadership, mutual support, situation monitoring, & communication.

Please contact her at lhaubner@health.usf.edu if you are interested in having Dr. Haubner visit your site for more intensive TeamSTEPPS training.

Why Participate?

- Improve the quality and consistency of care
- Improve health outcomes in a vulnerable population
- Foster teamwork
- Develop your hospital's quality infrastructure
- Receive ABP MOC credit

Contact Maya Balakrishnan at mbalakri@health.usf.edu if your site is interested in joining our efforts.