

2014

Coordinated Perinatal Systems of Care

Recommendations to the Indiana Perinatal
Quality Improvement Collaborative (IPQIC)
Governing Council

Endorsed by the Governing Council on May 21, 2014





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COORDINATED PERINATAL SYSTEMS OF CARE

The Indiana Perinatal Quality Improvement Collaborative (IPQIC) System Development Committee is recommending that the Governing Council endorse the recommendation that Coordinated Perinatal Systems of Care be established that will promote high quality service delivery systems and risk appropriate health care before, during and after pregnancy for all women of childbearing age. There is significant evidence that a statewide coordinated perinatal system of care will improve infant mortality and morbidity and reduce the cost of care for high risk newborns. The Coordinated Systems will also promote and ensure that all hospitals, regardless of level, have an important role to play in assuring that all babies born in Indiana have the best start in life.

Literature Review

In 1976, a landmark document, *Toward Improving the Outcome of Pregnancy, Recommendations for the Regional Development of Maternal and Perinatal Health Services (TIOP I)*, was released by an ad hoc Committee on Perinatal Health.¹ Constructed from a growing body of evidence suggesting that rates of perinatal mortality can be greatly reduced if patients are identified early and given appropriate care,² the March of Dimes, along with member representation that included the American Academy of Family Physicians, American Academy of Pediatrics, American College (now Congress) of Obstetricians and Gynecologists, and the American Medical Association, proposed a system of regionalized care based on designated levels of care at each facility which included an inter-hospital transport system, and that would have formal oversight by a neutral entity.³ The impact of this document on perinatal health care delivery in the United States was broad and immediate as this ideal system of care began to be implemented in varying degrees by states over the next several decades. Further research looked at the economic impact and the overall cost effectiveness of implementing geographical systems of perinatal care.⁴

Several study reviews support regionalization as a conduit for improving perinatal mortality and morbidity.⁵⁻¹¹ The data suggest that states with formalized regional programs have lower infant mortality rates, better outcomes and resource utilization, and lower cost expenditures than states without such regionalization.¹² Improving perinatal mortality and morbidity rates is the ultimate goal, yet short-term measures of quality assurance can also include: access equality, appropriate capacity and

staffing, a reduction in inappropriate transfers, and networks that have robust local communication and collaboration.¹³

Strengthening perinatal systems of care in states that have unfinished business of high infant mortality is effective, especially among the most preterm infants.⁷ “Although they represent less than 2% of US births, 55% of infant deaths occur among very low birth weight infants.”⁵ A major intent of the March of Dimes TIOP I was to identify and transfer high-risk pregnancies *in utero*, as neonatal transfer is much riskier.¹⁴ Healthy People 2020 goals recognize increasing the proportion of very low birth weight infants born in Level III hospitals as a national priority measure, targeted to 83.7%.¹⁵ Indiana 2011 (latest data available) percentages are lower than national priority goals as well as overall US percentages at just 69%.¹⁶

The impact of appropriate care is not limited to the smallest and youngest premature infants. A review of 17 studies related to perinatal outcomes and regionalized perinatal systems found that, in addition to a decline in neonatal mortality overall, very low birth weight infants were more likely to be born in appropriate Level III facilities with a formal system of perinatal regionalization, which improved the outcome for infants admitted to Level I facilities.⁴ And finally, in addition to improving outcomes for high risk pregnancies and births, regionalization stratifies care by level in order to match perinatal patients by risk and ensures cost-effective utilization of available resources.¹⁷

Benjamin Disraeli, noted statesman, once said, “The health of the people is really the foundation upon which all their happiness and all their powers as a state depend.” The formal development of regionalized perinatal care will not be an easy task. In all instances of implementation, the perseverance of visionary individuals, hospitals, support organizations, and governmental entities working together with the purpose of improving perinatal health must be the overarching driver to achieve success.¹⁸

Definition

The Perinatal Center must meet the ACOG and AAP guidelines for a Level III Obstetric (OB) Unit and a Level III or IV Neonatal Unit. Its affiliate hospitals will meet the guidelines for Level I or II OB and for Level I, II and III Neonatal. The Level I or II OB and Level I,II and III neonatal units may be affiliated with more than one Perinatal Center. In addition all Perinatal Centers will be required to participate in the Vermont Oxford Network (VON) and the Indiana Vermont Oxford Network (IVON).

Roles and Responsibilities

The Perinatal Centers have the following responsibilities with their affiliate hospitals' delivery units:

1. Perinatal Conferences:

- Each Perinatal System is responsible for participating in a Statewide Perinatal Conference, sponsored by the Indiana State Department of Health, that brings together all perinatal systems to share timely regional mortality and morbidity statistics, identify best practices and/or challenges with time for solution discussion, evaluate regional FIMR and/or Maternal Mortality data, evaluate general transport data, and incorporate ISDH updates.
- Each Perinatal System and its affiliates must hold an annual meeting that would include timely local system mortality and morbidity statistics, also identify best practices and/or challenges with time for solution discussion, evaluate system FIMR and/or Maternal Mortality data, evaluate general transport data, and incorporate ISDH updates. Perinatal systems that share common geography are encouraged to jointly conduct their meetings.

2. Training for Affiliate Hospitals:

The Perinatal Center will provide training for their affiliate hospitals related to both obstetric and neonatal topics:

- Obstetric

Topics may include but are not limited to:

- Basic fetal heart rate monitoring(mandatory)/advanced fetal heart monitoring;
- High risk OB (e.g., identification of high risk patients, indications for transfer, development of protocols with neonatology);
- Conferences/Trainings developed to address local learning needs;
- Nursing exchange program (e.g., shadowing, orientation, nursing in-services);
- Perinatal hospice and bereavement training;
- Training for transport team personnel;
- Team training (communication and patient safety issues); and
- Conferences/Trainings developed to address local learning needs.

- Neonatal

Topics may include but are not limited to:

- STABLE (Post resuscitation/pre-transport Stabilization care of sick infants) S.T.A.B.L.E. stands for the 6 assessment parameters covered in the program: Sugar, Temperature, Airway, Blood pressure, Lab work, and Emotional support for the family;
- NRP (Neonatal Resuscitation Program);
- Nursing/ Respiratory therapy (RT) exchange program (e.g., shadowing, orientation, nursing in-services);
- Perinatal hospice and bereavement;
- Training of transport team personnel;
- Team training (communication and patient safety issues); and
- Conferences/Trainings developed to address local learning needs.

3. Quality Assurance

The Perinatal Center will be responsible for the implementation of the following obstetric and neonatal quality assurance metrics in affiliate hospitals as appropriate to each hospital's level of care. These data will be reported to the state and will be used to identify best practices that support optimal perinatal outcomes. The definition of each metric is contained in Appendix A.

- Obstetric Measures:
 - Maternal Death;
 - Sentinel Events;
 - Maternal transports;
 - Ruptured Uterus;
 - 5 minute Apgar<4;
 - Elective Delivery without medical indication at < 39 0/7 weeks gestation;
 - Delivery at >41 6/7 weeks gestation; and
 - Fetal Demise at >20 0/7 weeks;
 - Deaths in the delivery room;
 - Antenatal Steroid Administration; and
 - Any additional event identified by hospital staff.
- Neonatal Measures:
 - All neonatal transports;
 - Sentinel Events;
 - Infant Mortality > 12 hours;

- Infant Mortality < 12 hours
- Any respiratory support for VLBW babies at 36 weeks;
- Late onset sepsis/bacteremia;
- Hypothermia on admission;
- Mother's milk at discharge; and
- Any additional event identified by hospital staff.

4. Support Services that will be provided by the Centers to affiliate hospitals:

- Obstetric:
 - Maternal Fetal Medicine consults 24/7 (phone/telemedicine);
 - Maternal Fetal Transports 24/7;
 - Maternal Fetal Medicine outpatient services; and
 - Reliable and comprehensive communication system for initiating transport that can be readily accessed (i.e., one quick phone call to one number to initiate transport).
- Neonatal:
 - Neonatal consults 24/7 (phone/telemedicine);
 - Neonatal Transports 24/7;
 - Reliable and comprehensive communication system for initiating transport that can be readily accessed (i.e., one quick call to one number to initiate transport); and
 - Implementation of Developmental Follow up Program.

5. Coordination of Maternal-Fetal and Neonatal Back Transports to Affiliate Hospitals

The Perinatal Center and affiliate hospital physicians will discuss patient(s) to be transferred in order to assure that patient is stable for transfer and the receiving hospital is capable of continuing care. The plan of care must be determined jointly. Perinatal Center specialists (Maternal-Fetal Medicine and Neonatology) will be available for questions, consultation and support regarding shared patients.

If a shared patient is discharged directly from perinatal center, specialists will discuss the patient with their primary physician(s) to discuss plan of care, and ensure continuity of care

- **Maternal Fetal:** After discussion with the referring obstetric provider, there will be a written plan of care for follow up locally for the remainder of the pregnancy. This can be in the discharge summary sent to the local provider. A sample form is included in Appendix B. The plan of care will

reflect local levels of care that can be provided by the referring hospital and provider (i.e. Gestational age based care, etc).

- **Neonatal:** Regional perinatal centers will make every effort to transfer patients back to affiliate (referring) hospitals (level 4 to 3 and 2, level 3 to 2) when appropriate and by mutual agreement as specified in the MOU. Perinatal Centers will be responsible for ROP follow up if needed. Perinatal centers will work with affiliate hospital at time of discharge and provide developmental follow up as needed and assist with any subspecialist follow up

6. Transition to post-partum and interconception care

At the time of maternal discharge, the discharging OB/MFM will communicate with the referring OB/FP about the outcome of the pregnancy. This communication would include the diagnosis, brief description of inpatient management and outcome. The OB/MFM will make recommendations for post-delivery care, inter-pregnancy care and management strategies for the next pregnancy. This information will be shared with the patient. This information may be documented on a “form” that the patient and referring MD can view and keep.

7. NICU Transition to Home & Follow-up Program

Each Perinatal System will be responsible for the following activities:

- Retinopathy of Prematurity (ROP) Screening;
- Implementation of a Developmental Clinic for high risk newborns; and
- Assistance in accessing pediatric subspecialty care as needed.

8. Develop & Implement Agreements (MOU)

The Perinatal Center and its affiliates will need to develop and implement individual agreements that specify the relationship and reciprocal responsibilities that each will have. This is especially important when hospitals affiliate with more than one Perinatal Center. Frequency of visits and specific educational support will be determined by the needs of each affiliate hospital, and described in the agreement;

- Data sharing agreements must be part of MOU; and
- Perinatal Centers will provide training and support, but ultimate responsibility for patient care and outcomes will remain with individual hospitals

The MOU will need to address issues from both the perspective of the Perinatal Center and the Affiliate Hospitals.

The following are components that must be discussed in the MOU:

1) Regional Perinatal Centers:

- a) Coordination of regional meetings;
- b) Training (as specified in MOU) for affiliate hospitals;
- c) Annual visit to affiliate hospitals to evaluate outcomes and assist with quality assurance;
- d) Support services (as specified in MOU) to affiliate hospitals including transports; and
- e) Support for the transition of patients from specialists (MFM/neonatologists) to primary physicians.

2) Affiliate Hospitals:

- a) Compliance with state standards requirements;
- b) Collection of quality assurance data;
- c) Attendance and participation in regional meetings;
- d) Collaboration with perinatal centers and provision of data during annual visit to evaluate outcomes; and
- e) Collaboration with perinatal center related to transition home and back transports of shared patients.

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Appendix A: Perinatal Centers Quality Measures

Perinatal Centers Quality Measures

Neonatal Measures							
				Report by Each Level of Care			
Metric	Definition	Numerator	Denominator	Level I ¹	Level II	Level III	Level IV
<u>N1. All neonatal interfacility transports</u>	Quality Measures identified in the <i>Indiana Perinatal Transport Standards</i>			E	E	E	E
<u>N2. Sentinel events</u>	<p>“A sentinel event is an unexpected occurrence involving death or serious physical or psychological injury, or the risk thereof. Serious injury specifically includes loss of limb or function. The phrase "or the risk thereof" includes any process variation for which a recurrence would carry a significant chance of a serious adverse outcome.”</p> <p>Reference: http://www.jointcommission.org/sentinel_event.aspx</p>	# of Sentinel Events		E	E	E	E
<u>N3. Mortality > 12 hours</u>	<p>Infants who did not die in the delivery room and who survived more than 12 hours after birth. If your patient is transferred to a higher level nursery, and dies there, the mortality is assigned to your hospital</p> <p>Reference: Vermont Oxford Network</p>	# of deaths	All admissions	E	E	E	E
<u>N4 Mortality < 12 hours</u>	Babies that die in the first 12 hours after delivery and who did not die in the delivery room	# of deaths	All births ≥ 22 weeks	E	E	E	E

¹ Level I is the well newborn nursery. If a hospital has a Level I and another Level NICU, data must be reported separately.

Perinatal Centers Quality Measures

Neonatal Measures							
				Report by Each Level of Care			
Metric	Definition	Numerator	Denominator	Level I ¹	Level II	Level III	Level IV
<u>N5. Any respiratory support at 36 weeks</u>	VLBW infants either continuously or intermittently receiving supplemental oxygen at 36 weeks gestational age or discharged to home before 36 weeks on oxygen. Reference: Baby Monitor/Vermont Oxford	# VLBW infants who meet Vermont Oxford criteria for “Chronic Lung Disease” and/or “Oxygen at Discharge”	All VLBW survivors to age 36 weeks GA or discharge	NA	E	E	E
<u>N6. Late Onset Sepsis/ Bacteremia</u>	A positive blood culture, obtained in the presence of compatible clinical signs of septicemia, occurring after 72 hours, and treated with antibiotics for ≥ 5 days. Includes culture positive episodes in which the infant dies before an intended therapy of five or more days is completed. Vermont Oxford	All infants diagnosed with late onset sepsis as per VON criteria	All admissions	NA	E	E	E
<u>N7. Hypothermia on admission</u>	Axillary temperature less than 36 degrees centigrade within 60 minutes after birth. Reference: Bhatt, White, et al., <i>J Perinatal</i> 2007;27:S45-47, Reference: Baby Monitor	All infants with Temperature <36.0°C	All admissions with temperature measurement in the first hour	E	E	E	E

Perinatal Centers Quality Measures

Neonatal Measures							
				Report by Each Level of Care			
Metric	Definition	Numerator	Denominator	Level I ¹	Level II	Level III	Level IV
<u>N8(a). Babies weighing < 1500 gms at birth discharged on own mother's milk</u>	Babies weighing <1500 grams at birth discharged on any amount of own mother's milk	# of babies weighing <1500 grams at birth discharged on any mother's milk	# of babies weighing < 1500 grams at birth discharged to home	NA	E	E	E
<u>N8(b) All other babies with own Mother's milk at discharge</u>	Babies weighing >1500 grams at birth who were exclusively breastfed or who were fed formula in addition to own mother's milk at discharge.	# of babies weighing >1500 grams who were fed only own mother's milk and # of babies who were fed own mother's milk and formula.	# of babies who were eligible for breastfeeding. Babies who were stillborn, born, pre-term or twins are not included.	E	E	E	E
<u>N9. Any additional event identified by hospital staff</u>				E	E	E	E

Perinatal Centers Quality Measures

Obstetric Measures						
Metric	Definition	Numerator	Denominator	Level I	Level II	Level III
<u>OB1. Maternal death</u>	For reporting purposes, a pregnancy-related death is defined as the death of a woman while pregnant or within 1 year of pregnancy termination—regardless of the duration or site of the pregnancy—from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes. Reference: http://www.cdc.gov/reproductivehealth/maternalinfanthealth/pmss.html	# of patients who meet the criteria	All patients who deliver	E	E	E
<u>OB2. Sentinel event</u>	A sentinel event is an unexpected occurrence involving death or serious physical or psychological injury, or the risk thereof. Serious injury specifically includes loss of limb or function. The phrase, 'or the risk thereof' includes any process variation for which a recurrence would carry a significant chance of a serious adverse outcome. Reference: http://www.jointcommission.org/sentinel_event.aspx	# of Sentinel Events		E	E	E
<u>OB3. Maternal interfacility transports</u>	Quality Measures identified in the <i>Indiana Perinatal Transport Standards</i>			E	E	E
<u>OB4. Ruptured uterus</u>	Uterine rupture typically is classified as either complete (all layers of the uterine wall separated) or incomplete (uterine muscle separated but visceral	# of women who meet the criteria	All deliveries	E	E	E

Perinatal Centers Quality Measures

Obstetric Measures						
Metric	Definition	Numerator	Denominator	Level I	Level II	Level III
	peritoneum is intact). Incomplete rupture is also commonly referred to as uterine dehiscence. Reference: Williams Obstetrics					
OB5. <u>5 minute APGAR <4</u>		Babies with an Apgar <4 at 5 minutes	All deliveries	E	E	E
OB6. <u>Elective delivery without medical indication <39 0/7 weeks gestation</u>	Elective deliveries without medical indications that are performed before 39 0/7 weeks. Web Link to ISDH/IPQIC Guidelines to Reduce Early Elective Deliveries, January 2014	All deliveries without medical indication less than 39 0/7weeks	All deliveries under 39 0/7weeks	E	E	E
OB7. <u>Delivery at >41 6/7 weeks</u>		# of deliveries that meet the criteria of >41 6/7 weeks	All deliveries	E	E	E
OB8. <u>Fetal demise at >20 0/7 weeks</u>	Fetal death” means death prior to the complete expulsion or extraction from its mother of a product of human conception, irrespective of the duration of pregnancy, and which is not induced termination of pregnancy. The death is indicated by the fact that after such expulsion or extraction, the fetus does not breathe or show any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles. Heartbeats are to be distinguished from transient cardiac contractions; respirations are	Number of fetal deaths	All deliveries	E	E	E

Perinatal Centers Quality Measures

Obstetric Measures						
Metric	Definition	Numerator	Denominator	Level I	Level II	Level III
	to be distinguished from fleeting respiratory efforts or gasps.” Reference: http://www.cdc.gov/nchs/data/misc/itop97.pdf ACOG Practice Bulletin #102 (March 2009)					
<u>OB9. Deaths in the delivery room</u>	Deaths that occur after birth and before admission to the nursery.	All deaths that meet the definition	All deliveries	E	E	E
<u>OB 10. Antenatal Steroid Administration</u>	Antenatal corticosteroids administration to pregnant women between 24 weeks of gestation and 34 weeks of gestation who are at risk of preterm delivery within 7 days Reference: <i>ACOG Practice Bulletin #127, June 2012</i>	Women who delivered between 24 weeks of gestation and 34 weeks of gestation, who received at least one dose of antenatal corticosteroid, at least 12 hours prior to the delivery	All preterm deliveries between 24 weeks of gestation and 34 weeks of gestation	E	E	E
<u>OB11. Any additional event identified by hospital staff</u>				E	E	E

Appendix B: Transport Quality Measures

Standard II: Maternal-Fetal Quality Assurance

2.1 In addition to complying with all reports and records rules in 836 IAC 1-1-5, the certified provider of the Maternal Fetal Transport Program shall track the following benchmarks:

- a. Delivery \leq 30 minutes from arrival at receiving hospital;
- b. Diversion of transport due to maternal and or fetal status change in route;
- c. Incidence of loss of communication with medical control for anything longer than 5 minutes;
- d. Change in transport asset (ground to air or vice versa);
- e. Delivery in route;
- f. Incidence of sentinel events;
- g. Transport crew member injury during transport;
- h. Any reason for transport delay:
 - i. Accident—Motor Vehicle Ambulance, flight;
 - ii. Delay in unscheduled transport dispatch time is \geq 15 minutes;
 - iii. Delay in unscheduled transport enroute time is \geq 15 minutes;
 - iv. Mechanical failure of ambulance or aircraft that leads to a transport delay;
 - v. Equipment failure;
 - vi. Weather or road related (constructions, accidents) issues;
 - vii. Crew member;
- h. Maternal fetal injury during transport; and
- i. Maternal and or fetal status deemed unstable for transport at sending facility.

2.2 When a sentinel event occurs, the perinatal transport team, medical director, and medical control physician must have a debrief. The debrief must be initiated within 72 hours and the root cause analysis completed within 5 working days.

2.3 Teams are required to have a pre-transport briefing regarding the patient(s) condition prior to assuming care of the patient(s).

2.4 Each perinatal transport team shall have written internal quality review procedures/protocols.

2.5 Each hospital with an perinatal transport team shall implement a routine schedule of Quality Improvement meetings and a record of minutes maintained.

2.6 Transport teams must conduct quarterly reviews of the following elements and maintain documentation of the reviews in compliance with 836 IAC 1-1-5(c):

- a) Transport indication(s);
- b) Medical and/or nursing intervention performed or maintained;
- c) Time of intervention:
 - a. patient response to interventions; and
 - b. appropriateness of intervention performed or omission of needed

Standard II: Maternal-Fetal Quality Assurance

intervention

- d) Patient outcome at arrival of destination;
- e) Patient's change in condition during transport;
- f) Timeliness and coordination of the transport from reception of request to lift off or ambulance enroute time;
- g) Review of Pre-transport inspection documentation
- h) Safety practices documented;
- i) Operational criteria:
 - a. number of completed transports;
 - b. number of aborted or canceled flights/transports due to weather;
 - c. number of aborted or canceled flights/transports due to maintenance;
 - d. number of aborted or canceled flights/transports due to patient condition and alternative modes of transportation; and
 - e. number of aborted or canceled flights/transports due to unavailable team.
- j) Communications center or organization must monitor and track:
 - a. Instrument Flight Rules (IFR)/Visual Flight Rules (VFR);
 - b. Weather at time of request of the referring and accepting facility and during transport if changes occur;
 - c. Transport acceptance to lift off times or the road times; and
 - d. All aborted and cancelled transport requests - times, reasons and disposition of patients as applicable.

Standard VI: Neonatal Quality Assurance

6.1 In addition to complying with all reports and records rules in 836 IAC 1-1-5, the Certified Provider of the Neonatal Transport Program shall track the following benchmarks:

- a) Unplanned dislodgement of therapeutic devices;
- b) Radiograph verification of tracheal tube placement;
- c) Average mobilization time of transport team;
- d) First attempt tracheal tube placement success:
 - a. visualizations;
 - b. attempts at placement;
- e) Rate of transport-related patient injuries;
- f) Rate of medication administration errors;
- g) Rate of CPR performed during transport;
- h) Incidence of sentinel events;
- i) Unintended neonatal hypothermia upon arrival to destination;

Standard VI: Neonatal Quality Assurance

- j) Transport crew injury during transport; and
- k) Standardized patient care hand-off performed (site specific protocol used).

6.2 When a sentinel event occurs, the neonatal transport team, medical director, and medical control physician must have a debrief that is initiated within 72 hours and the root cause analysis completed within 5 working days.

6.3 Teams are required to have a pre-transport briefing regarding the patient(s) condition prior to assuming care of the patient(s).

6.4 Each perinatal transport team shall have written internal quality review procedures/protocols.

6.5 Each hospital with a neonatal transport team shall implement a routine schedule of Quality Improvement meetings and a record of minutes maintained.

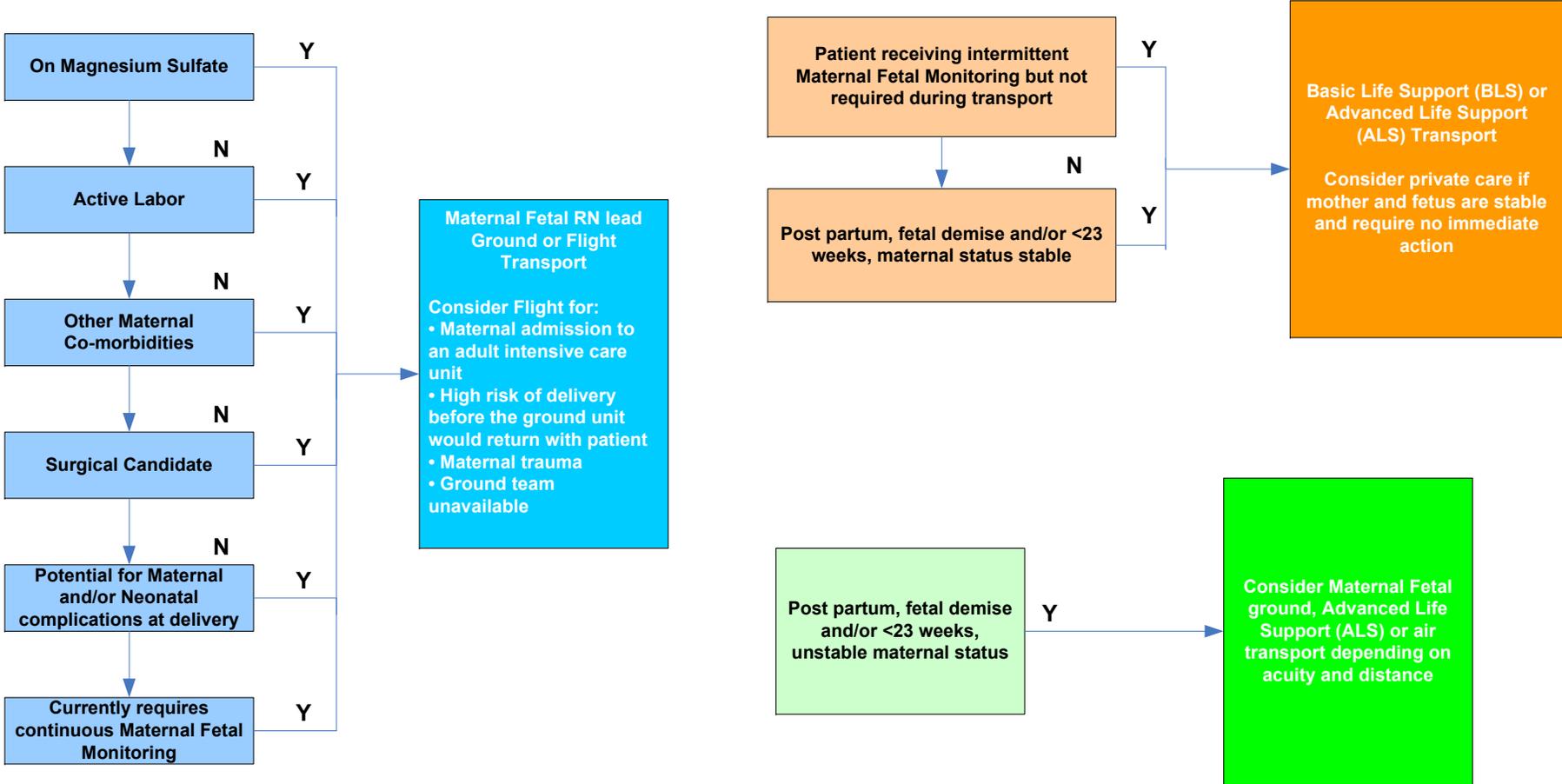
6.6 The neonatal transport team conducts a Quarterly Review of the following elements and maintain documentation of the reviews in compliance with 836 IAC 1-1-1-5(c):

- A. Reason for transport;
- B. Mechanism of illness;
- C. Medical intervention performed or maintained;
- D. Time of intervention consistently documented for:
 - a. patient response to interventions; and
 - b. appropriateness of intervention performed or omission of needed intervention;
- E. Patient outcome at arrival of destination;
- F. Patient's change in condition during transport;
- G. Timeliness and coordination of the transport from reception of request to lift off or ambulance enroute time;
- H. Pre-transport check of ambulance by EMT on Transport records;
- I. Operational criteria to include, at a minimum, the following quality indicators:
 - a. number of completed transports;
 - b. number of aborted or canceled flights/transports due to weather;
 - c. number of aborted or canceled flights/transports due to maintenance;
 - d. number of aborted or canceled flights/transports due to patient condition and alternative modes of transport;
- J. Communications Center of organization must monitor and track:
 - e. Instrument Flight Rules (IFR)/Visual Flight Rules (VFR)
 - f. weather at time of request and during transport if changes occur; and
 - g. all aborted and canceled transport requests - times, reasons and disposition of patients as applicable.

Appendix C: Transport Algorithms

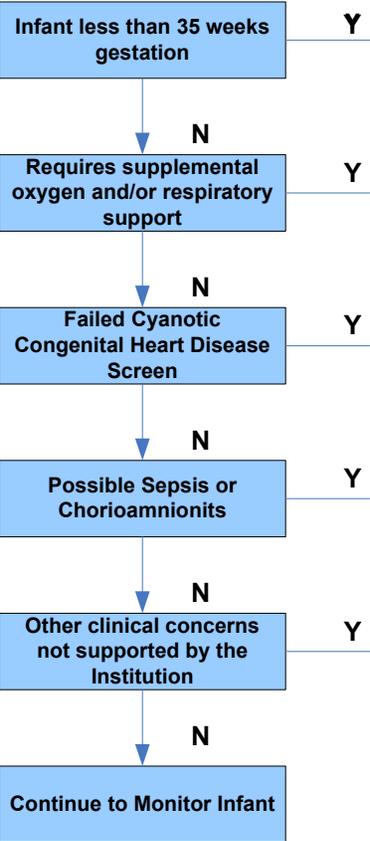
**Draft Maternal Fetal Transport Algorithm
October 2013**

≥ 23 Weeks with Viable Fetus

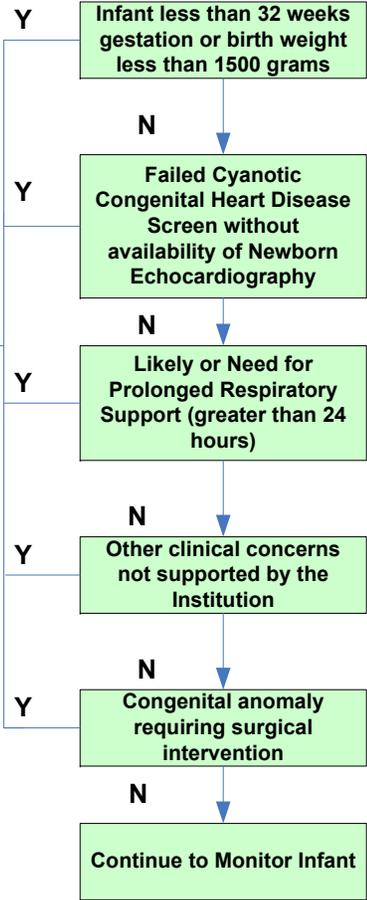


**Draft Neonatal Transport Algorithm
October 2013**

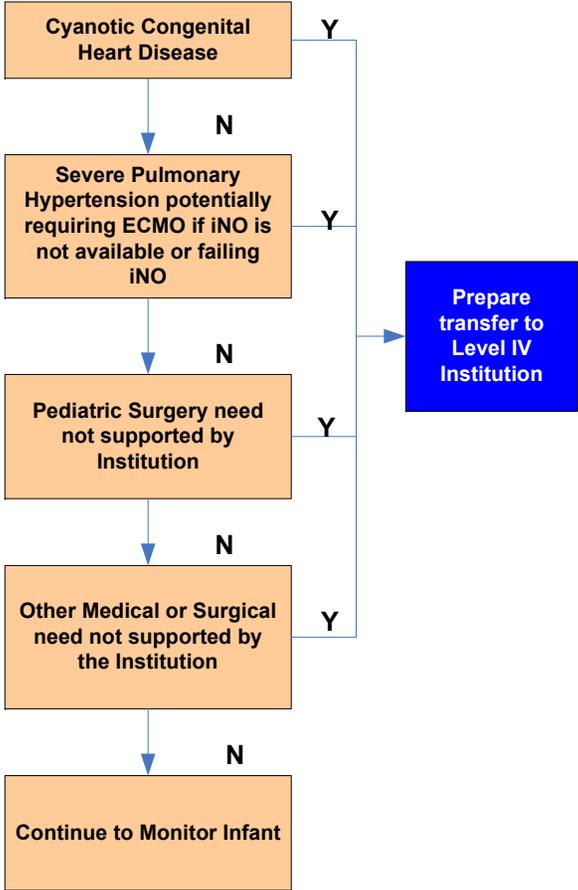
LEVEL I NURSERY



LEVEL II NURSERY



LEVEL III NURSERY



Prepare infant for transfer to Level III or Level IV Institution

Prepare transfer to Level IV Institution

Appendix D: Shared Patient Responsibilities

SUMMARY OF RECOMMENDATIONS FOR ANTEPARTUM CARE AFTER HOSPITALIZATION

Patient Name:	Gestational Age:
Sending Hospital:	Date of Discharge:
Primary Physician:	
Phone Number for any Questions (24/7):	
Receiving Hospital:	
Primary Physician:	Contact Information:
Diagnosis at Discharge:	Medications at Discharge:
Antepartum Surveillance Frequency Recommendations:	Frequency of Prenatal Visits:
<input type="checkbox"/> BPP: _____ <input type="checkbox"/> NST: _____ <input type="checkbox"/> Growth Ultrasound: _____ <input type="checkbox"/> Cervical Length: _____	<input type="checkbox"/> Primary OB: _____ ○ Next Appointment: _____ <input type="checkbox"/> Tertiary Center: _____ ○ Next Appointment: _____
Delivery Timing:	Delivery Route:
	<input type="checkbox"/> Cesarean <input type="checkbox"/> Vaginal <input type="checkbox"/> Operative Vaginal
Delivery Site:	Additional Recommendations:
<input type="checkbox"/> Local Hospital <input type="checkbox"/> Tertiary (or higher level) center)	

SUMMARY OF RECOMMENDATIONS FOR NICU PATIENTS AT DISCHARGE

Patient Name:		Gestational age at birth:
		Gestational age at discharge:
Hospital:		Date of Discharge:
Discharge Physician:		
Phone Number for any Questions:		Email:
Primary Physician:		Contact Information:
BW _____ % LT _____ HC _____ % _____ DC WT _____ % LT _____ HC _____ % _____ Main (Active) Discharge Diagnoses:		Medications at Discharge:
FEEDING INSTRUCTIONS:		IMMUNIZATIONS GIVEN (if any):
FOLLOW UP APPOINTMENTS:		HOME HEALTH CARE FOLLOW UP: (name of agency/frequency of visits ordered)
		ADDITIONAL RECOMMENDATIONS:

Appendix E: Annotated Bibliography

1. Bode, M. O'Shea, M., Metzguer, K., Stilies, A. (2001). Perinatal regionalization and neonatal mortality in North Carolina, 1968-1994. *American Journal of Obstetric Gynecology*, 184(6), 1302-1307.

Bode et al. study the trends of neonatal mortality in a changing health delivery environment in North Carolina from 1969-1994. Authors analyzed the number of weighing 500-1500 g, what level of hospital they were born in, and whether there was a correlation in where they were born and the mortality rates. Authors conclude the likelihood of very low birth weight neonates being born outside level III hospitals decreased by an average of 24 percent from 1968-1994 and after 1974 birth in a hospital with level III services was associated with a reduced rate of mortality.

2. Bridgman Perkins, B. (1993). Rethinking Perinatal Policy: History of Evaluation of Minimum Volume and Level-of-Care Standards. *Journal of Public Health Policy*, 14(3), 299-319.

Bridgman Perkins gives the historical origins of perinatal standards in the United States from the 1930s through the 1970s. The author details the change in opinions beginning in the 1980s as the health care system in the United States became more competitive in nature. The paper notes that the discrepancy between the research findings and changes in the delivery of care continues to be problematic from a financial standpoint.

3. Committee on Fetus and the Newborn. (2012). Levels of neonatal care. *Pediatrics*, 130, 587-597.

“Levels of neonatal care,” is an updated policy statement that reviews levels of care for neonates in the United States since the 2004 policy statement by the American Academy of

Pediatrics (AAP). Authors present new data since the 2004 AAP statement which largely support a well-defined regional system of perinatal care. The statement provides standards for health outcomes data comparisons, standardized definitions for public health, and standardized definitions for healthcare providers who provide neonatal care in the United States.

4. Clement, M. (2005). Perinatal Care in Arizona 1950-2002: A Study of the Positive Impact of Technology, Regionalization and the Arizona Perinatal Trust. *Journal of Perinatology*, 25, 503-508.

Clement describes the changes in perinatal care in Arizona from 1950-2002 and its positive impact on neonatal outcomes. The paper measures these outcomes quantitatively by analyzing birth and death records in 1950 and 2002 in order to report the change in mortality rate over time. Clement acknowledges a significant reduction in neonatal mortality rates over the past 50 years which he attributes to both advancement in technology and health policy developed to reduce infant mortality and disparities in the state.

5. Hein, H. (2004). Regionalized perinatal care in North America. *Seminars in Neonatology*, 9, 111-116.

In this paper, Hein details the status of regionalized perinatal health care in North America using the Iowa regionalization model. He reviews the history and evolution of regionalization in the 1960s and 1970s and the role of the March of Dimes in setting the first set of national guidelines for regionalized perinatal systems of care. In conclusion, Hein makes suggestions for controlling the impact of managed care on regionalization and quality perinatal care and makes a case for maintaining a regionalized system and prioritizing utilizing outcome data when making policy decisions.

6. Philip, A. (2005). The evolution of neonatology. *Pediatric Research*, 58(4), 799-815.

Philip gives a history of the practice of neonatology in the United States beginning with first meeting of the perinatal section of the American Academy of Pediatrics in 1975. Philip surveys the important innovations in technology which coincided with the subspecialty practice. In conclusion, Philip notes that the change and improvement in neonatal care in the United States as “remarkable” despite the fact that challenges still exist in the field of modern neonatology.

7. The American College of Obstetrics and Gynecology. (1975). Toward improving the outcome of pregnancy: Recommendations for the regional development of perinatal health services. *Journal of the American College of Obstetrics and Gynecologists*, 45(5), 375-384.

This policy statement, which was published by the American College of Obstetricians and Gynecologists in 1975, is the first recommendation for a regionalized system of perinatal care. The document outlines the hospital levels of care and the basic requirements of each level for optimal care. The document further outlines recommendations for communication, collaboration, and referral networks that must exist in a functional system. The final recommendation in this document acknowledges the financial burden to the higher level designated hospitals and patient number minimums for each level.

8. March of Dimes. (2010). Toward Improving the Outcome of Pregnancy III. [PDF] Retrieved from: <http://www.marchofdimes.com/materials/toward-improving-the-outcome-of-pregnancy-iii.pdf>

Toward Improving the Outcome of Pregnancy III (TIOP III) is a toolkit which intends to guide practitioners and policy makers in improving the quality, safety, and performance in the

sphere of perinatal care. TIOP III distinguishes itself from the previous TIOPs by focusing on the application of evidence based practice and acknowledging the importance of a woman's health throughout her life-course and its impact on a healthy pregnancy.

9. Staebler, S. (2011). Regionalized Systems of Perinatal Care. *Advances in Neonatal Care*, *11*(1), 37-42.

Staebler presents options for policies on regionalization of perinatal care from a “doing nothing” (p. 39) approach to a state or federally mandated regionalized system of care. A “deregulation” (p. 37) of neonatal services occurred in the United States as the number of neonatologists and NICUs grew beyond geographical need and hospitals began operating under a more competitive model. The four policy options Staebler presents are no standardization, organizational/individual health system standardization, incremental changes at the state or federal levels, and formal regionalization. While the author gives the pros and cons of each option, she recommends option four, formal regionalization, as it “has the potential to decrease unnecessary duplication of services...improve morbidity and mortality, decrease costs, and promote better utilization of limited workforce personnel” (p. 41).

10. Shaffer, E. (2001). State Policies and Regional Neonatal Care: Progress and Challenges 25 Years After *TIOP*. [PDF] Retrieved from: <http://www.equalhealth.info/wp-content/uploads/Final-NICU-Report.pdf>

This study, completed for the March of Dimes, is the results of a survey of state health departments and of literature on perinatal systems and their operation in the United States. The study includes current, by state, (as of the writing of the report) terminology for neonatal intensive care unit (NICU) levels, policy for defining NICU levels of care, and its enforcement,

as well as how the systems have changed or are currently changing. Major findings of the study include: substantial variation among states on levels of care definitions, little public knowledge of NICU levels, and disparate opinions exist among facilities and staff on NICU levels.

11. Yu, V. Y.H., Dunn, P. M. (2004). Development of regionalized perinatal care. *Seminars in Neonatology*, 9, 89-97.

Yu and Dunn present a brief history of regionalized perinatal care in Canada, the United Kingdom, Australia, and the United States. The authors conclude that while regionalizing perinatal care has great benefits in birth outcomes in all countries studied, there is commonality in problems that arise when attempting to institutionalize a system of care. Additionally, authors further conclude that while developing and maintaining regionalized perinatal care is a difficult task, it can be achieved once the multidisciplinary teams and institutions are able to reach a common vision for the health of the population.

12. Van Mullen, C. Conway, A., Mounts, K., Weber, D., Browning, C. (2004). Regionalization of perinatal care in Wisconsin: A changing health care environment. *Wisconsin Medical Journal*, 103(5), 35-38.

Van Mullen et al. describe changes in perinatal health delivery structure in Wisconsin and the results of an increase in NICUs and neonatologists since the 1970s. This paper is a product of a series of meetings initiated by the Wisconsin Association for Perinatal Care (WAPC) in order to discuss the changing perinatal health environment and worsening of perinatal outcomes in the state. The authors conclude that the competitive health marketplace and lack of coordinated services have “led to the unnecessary duplication of services within a single community or geographic region, with the potential fragmentation and decreased coordination of

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Annotated Bibliography

care resulting in potential fragmentation and decreased coordination of care resulting in increased patient morbidity and mortality, as well as increased cost” (p. 37). The WAPC will continue to review the status of the state’s regionalization of perinatal care including implementing designations for standard levels of care and defining perinatal outcomes with a focus on quality of care.