

# Clinical Pathway for Delivery Management: Planned Delivery of Neonates in Fetal Center

## Inclusion criteria:

Pregnant patients evaluated and approved for C-Section birth or inpatient admission by The Fetal Center at Nationwide Children's Hospital.

## Exclusion criteria:

Pregnant patients not evaluated and approved for C-Section birth or inpatient admission by The Fetal Center at Nationwide Children's Hospital.

**\*Candidacy determined based on fetal diagnosis and maternal health status.**

**Dry Run/Case Walk Through scheduled as clinically indicated by Fetal Center Staff**

## Neonatal Stabilization Team (Team members may be adjusted based on specific diagnosis or resuscitation needs)

- 2 RNs
- 2 APPs
- 1 RT
- 1 Neo Fellow
- 1 PAA delivery team Neo
- Specialists based on diagnosis

Maternal visit to Fetal Center prior to delivery to obtain maternal and baby consents<sup>†</sup> and estimated fetal weight (EFW). Visit scheduled as close to delivery date as maternal-fetal status allows.

NCH delivery order set completed in Fetal Chart under NICU admission encounter by NCH delivery team APP, Fellow, or PAA Neo, using EFW for medication orders

Neonatal Stabilization Team attends preoperative huddle/role call and checks equipment/medications as per Delivery Team Resuscitation Plan and arrives prior to C-Section start time

C-section performed and neonate delivered

See delivery planning sheet

[CDH](#) , [EXIT](#) , [Generic](#)

Pregnant Patient evaluated in the Fetal Center by multidisciplinary Team- PAA Neo, NCH MFM and other NCH consultants

Potential Candidate\* for scheduled C/S delivery at NCH?

No

Exit Pathway

Yes

Fetal Procedure Review Committee (FPRC) Multidisciplinary discussion

Final decision for NCH delivery? (based on fetal Dx and maternal health status)

No

Exit Pathway

Yes

1. PAA fetal consult neontologist notifies the Neonatal Stabilization Team leads of the delivery date and time.  
2. PAA delivery attending completes and distributes Resuscitation Plan.

Scheduled delivery date agreed upon by the multidisciplinary team and family.

Neonate needing immediate surgery?

Yes

Transfer to adjacent OR for postnatal intervention. Neonatal Team signs out to peds anesthesia and surgery

No

Transfer to NICU or CTICU on warmer bed for ongoing care. Neonatal team signs out to Primary Care Team

End Pathway

**This document reflects planning for the care of the neonate. Pregnancy/ peripartum care is provided by the Obstetrics (OB)/Maternal-Fetal-Medicine (MFM) team, per their policies and procedures.**

## Additional Team Members based on fetal Dx may include

ENT  
Pediatric Surgery  
Cardiology  
Cardiac Intensive Care  
Pediatric Anesthesiology  
Others as needed

## <sup>†</sup>Baby consents

- Admission
- Blood
- +/- Neonatal PICC
- +/- ECMO
- +/- Clinical Trials
- +/- Genetic Testing
- +/- postnatal surgery and anesthesia consents

# Clinical Pathway for Delivery Management: Unexpected Delivery following Fetal Intervention

## Inclusion criteria:

Pregnant patients evaluated and approved for C-Section birth or inpatient admission by The Fetal Center at Nationwide Children's Hospital.

## Exclusion criteria:

Pregnant patients not evaluated and approved for C-Section birth or inpatient admission by The Fetal Center at Nationwide Children's Hospital.

**\*Candidacy determined based on fetal diagnosis and maternal health status.**

**Dry Run/Case Walk Through scheduled as clinically indicated by Fetal Center Staff**

## Neonatal Stabilization Team (Team members may be adjusted based on specific diagnosis or resuscitation needs)

- 2 RNs
- 2 APPs
- 1 RT
- 1 Neo Fellow
- 1 PAA delivery team Neo
- Specialists based on diagnosis

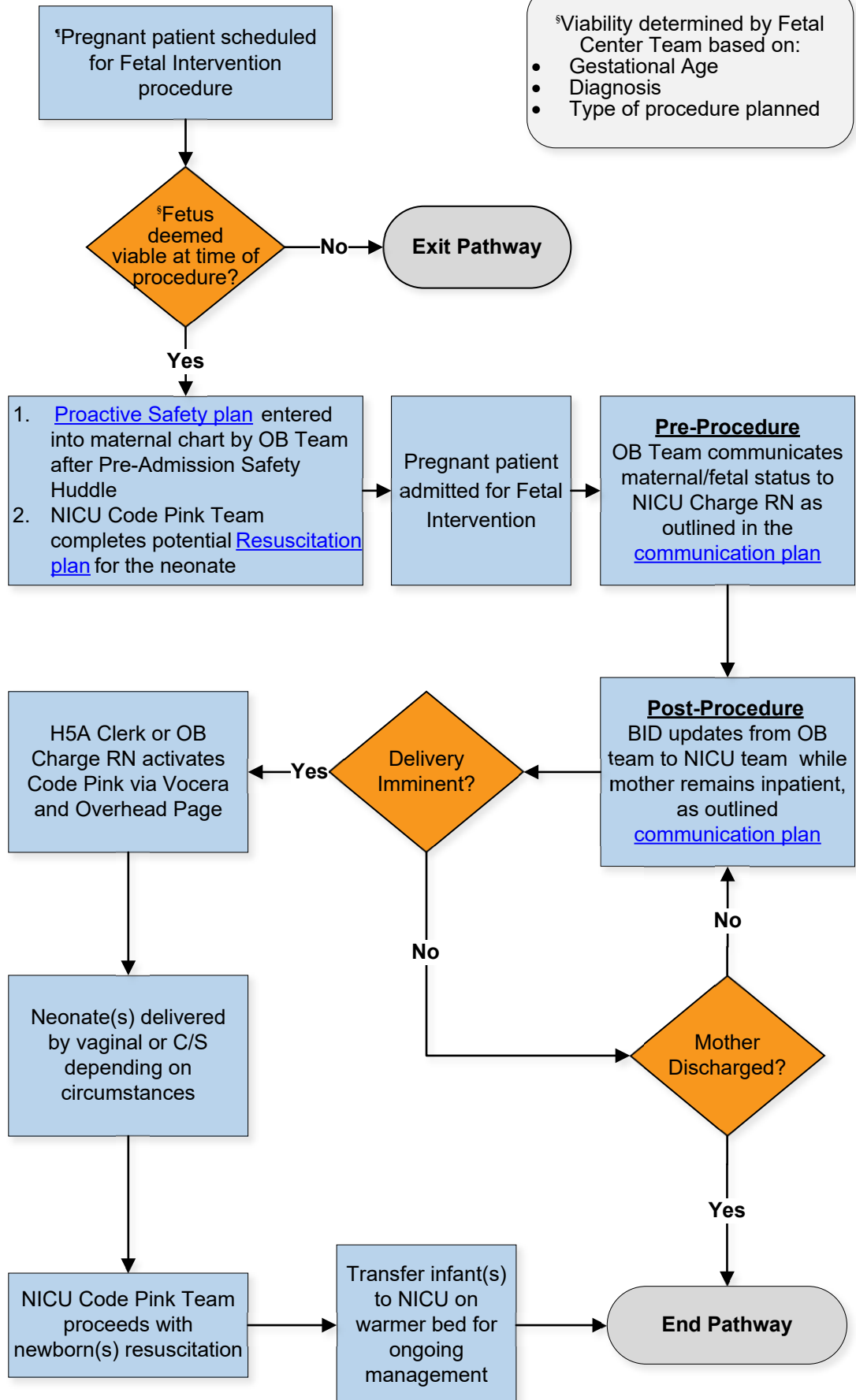
## Broadcast urgent message to CODE Pink:

"Code Pink, [location of delivery]" then call ECC for overhead page

**This document reflects planning for the care of the neonate. Pregnancy/peripartum care is provided by the Obstetrics (OB)/Maternal-Fetal-Medicine (MFM) team, per their policies and procedures.**

**\*Viability determined by Fetal Center Team based on:**

- Gestational Age
- Diagnosis
- Type of procedure planned



# Inclusion & Exclusion Criteria

**Inclusion criteria:**

Pregnant patients evaluated and approved for C-Section birth or inpatient admission by The Fetal Center at Nationwide Children's Hospital.

**Exclusion criteria:**

Pregnant patients not evaluated and approved for C-Section birth or inpatient admission by The Fetal Center at Nationwide Children's Hospital.

**\*Candidacy determined based on fetal diagnosis and maternal health status.**

**This document reflects planning for the care of the neonate. Pregnancy/peripartum care is provided by the Obstetrics (OB)/Maternal-Fetal-Medicine (MFM) team, per their policies and procedures.**

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# Diagnosis & Definition

Fetal Diagnoses considered for delivery at NCH (this list is not entirely inclusive)

- Upper Airway Obstruction necessitating Ex Utero Intrapartum Therapy (EXIT) or anticipated difficult airway
  - Neck masses, oropharyngeal masses
  - Severe microretrognathia, severe macroglossia
- Critical Congenital Heart Disease
  - Fetal cardiac intervention in current pregnancy
  - All Level 4 and 5a cardiac deliveries
  - D-transposition of the great arteries with intact ventricular septum
  - Tetralogy of Fallot with absent pulmonary valve
  - Mediastinal Teratoma with concern for cardiac compromise
- High Risk Fetal Lung Lesion:
  - Affected lung tissue representing >50% of total fetal lung volume (TFLV) or cyst volume ratio (CVR) >2.0 at >33 weeks GA
  - Risk for hyperinflation postnatally (macrocytic congenital pulmonary airway malformation (CPAM), congenital lobar emphysema/overinflation)
  - Severe mediastinal shift
- Type I sacrococcygeal teratoma (SCT)
- Any SCT with concern for hydrops or combined cardiac output (CCO) > 625 ml/min/kg
- Fetal disease processes with high risk of pulmonary hypoplasia, such as giant omphalocele or anomalies of the renal system
- Moderate to severe congenital diaphragmatic hernia (CDH) with high risk of hemodynamic instability
- Current pregnancy in which open fetal surgery was performed
- Additional diagnoses as considered and discussed by the multidisciplinary Fetal Center team caring for the patient, in conjunction with the patient's primary obstetrician and/or maternal-fetal-medicine physician

Fetal/Maternal Diagnoses that should be discussed as relative contraindications depending on individual factors

- Placenta accreta spectrum
- Excessive Body Mass Index (BMI)
- Maternal cardiac disease
- Maternal Pulmonary disease
- Maternal Hematologic disorder
- Maternal Malignancy
- Maternal HIV
- Maternal Anesthesia risk; airway assessment; sleep apnea
- Aneuploidy (Trisomy 13 or 18) or other potentially life-limiting condition in fetus. Confirmed fetal genetic diagnosis with expected poor prognosis

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# Testing:

- Fetal diagnostic workup specific to individual fetal anomalies.
- Fetal monitoring per policy for inpatient pregnant patients

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# Admission Criteria

- This pathway only applies to the delivery management of newborns born to patients scheduled for cesarean section or admitted for a fetal intervention.
- Neonates: All newborns delivered either by scheduled c-section or following unanticipated delivery will be admitted to the appropriate ICU based on diagnosis (NICU or CTICU)

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# Assessment & Monitoring

Pregnant patient and fetal monitoring per policy.

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# Recommended Treatments

Appropriate postpartum and neonatal care as indicated.

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# Deterioration & Escalation of Care

- The Fetal Center has developed policies for management of maternal obstetric emergencies.
- All neonates delivered at NCH (planned or unanticipated) are considered high-risk, and our NICU/CTICU teams are capable of providing all necessary evaluation and treatment

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# Discharge Criteria & Planning ? Delete

- Delivery is complete and baby is transferred to the appropriate ICU
- Postpartum care, discharge, and follow up per [OB policies/procedures](#)

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# Patient & Caregiver Education

Counseling during Fetal Center visits based on diagnosis.  
Additional education available on [NCH Fetal Center website](#)

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# Risk Awareness & Zero Hero

- The Fetal Center has created risk awareness processes including fetal procedure review committee, proactive safety huddles, contingency plans, and preoperative huddles.
  - Patients who may benefit from a scheduled c-section or fetal intervention are evaluated for maternal risk profile and potential fetal/newborn benefit by the fetal procedure review committee.
  - Proactive safety huddle is conducted when feasible prior to planned admission to Fetal Services (H5A-FS) for scheduled c-section or fetal procedure, and a proactive safety plan is entered into the chart. If a patient presents to the fetal center and it is determined that an unscheduled procedure is indicated, the fetal procedure review committee meeting and proactive safety huddle may be combined.
  - Contingency plans are developed and scanned into the medical record should the patient experience an obstetric complication or onset of labor prior to scheduled c-section or after a fetal intervention.
  - For fetal interventions, if the fetus is deemed viable, this will be noted in the proactive safety plan (Appendix 2), and the code pink team will complete a resuscitation plan (Appendix 3) .
  - A preoperative huddle is conducted prior to proceeding to the operating room for team members to discuss any specific patient risk factors and confirm mitigation plans.
- During and following a fetal intervention, Fetal Center OB nursing will keep NICU team apprised of maternal/fetal status until discharge as outlined in the Communication Plan (Appendix 4)
- H5A-FS representative reports status of inpatients on the daily safety call
- Inpatients on H5A-FS are discussed in the daily NICU huddle.
- Regular multi-disciplinary simulations are held for both code pink unplanned deliveries and scheduled high risk deliveries to maintain skill competency.

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# Key References

1. Colby CE, Carey WA, Blumenfeld YJ, Hintz SR. Infants with prenatally diagnosed anomalies: special approaches to preparation and resuscitation. *Clin Perinatol*. 2012;39(4):871-887. doi:10.1016/j.clp.2012.09.012
3. Pruetz JD, Wang SS, Noori S. Delivery room emergencies in critical congenital heart diseases. *Semin Fetal Neonatal Med*. 2019;24(6):101034. doi:10.1016/j.siny.2019.101034
3. Sawyer T, Lee HC, Aziz K. Anticipation and preparation for every delivery room resuscitation. *Semin Fetal Neonatal Med*. 2018;23(5):312-320. doi:10.1016/j.siny.2018.06.004
4. Sethi N, Klugman D, Said M, et al. Standardized delivery room management for neonates with a prenatal diagnosis of congenital heart disease: A model for improving interdisciplinary delivery room care. *J Neonatal Perinatal Med*. 2021;14(3):317-329. doi:10.3233/NPM-200626
5. Sewell EK, Keene S. Perinatal Care of Infants with Congenital Birth Defects. *Clin Perinatol*. 2018;45(2):213-230. doi:10.1016/j.clp.2018.01.007

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# Quality Measures

- Process:
  - Utilization of admission order sets
  - Compliance with entry of Apgar scores into delivery summary by NICU team
  - Compliance with entry of delivery room attendance note entered by NICU team
- Outcome:
  - 'Golden Hour' metrics: Admission temperature obtained upon arrival to NICU/CTICU and blood glucose within 60 minutes of admission.
  - CDH ECMO free survival
  - Survival to discharge in non-palliative patients

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## Potential Areas for Research

- Maternal and fetal/neonatal outcomes following delivery in a free-standing children's hospital
- Impact of simulation on team preparedness for rare/complex deliveries

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# Pathway Team & Process

## Pathway Development Team:

### Leaders:

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## Clinical Pathways Program:

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## Clinical Pathway Approved:

Associate Chief Medical Officer, Center for Clinical Excellence:

Ryan Bode, MD, MBOE

Advisory Committee Date: *December, 2022*

Origination Date: *December, 2022*

Revised: *December, 2025*

## Clinical Pathway Development

This clinical pathway was developed using the process described in the NCH Clinical Pathway Development Manual Version 6, 2022. Clinical Pathways at Nationwide Children's Hospital (NCH) are standards which provide general guidance to clinicians. Patient choice, clinician judgment, and other relevant factors in diagnosing and treating patients remain central to the selection of diagnostic tests and therapy. The ordering provider assumes all risks associated with care decisions. NCH assumes no responsibility for any adverse consequences, errors, or omissions that may arise from the use or reliance on these guidelines. NCH's clinical pathways are reviewed periodically for consistency with new evidence; however, new developments may not be represented, and NCH makes no guarantees, representations, or warranties with respect to the information provided in this clinical pathway.

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**For more information about our pathways and program please contact:**  
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# Delivery Planning Sheet Congenital Diaphragmatic Hernia

## NCH Complex Delivery Team Planning Sheet—High Risk CDH

Planned delivery Date:

Mothers Name/MRN:

Baby Name/MRN:

EFW:

### Special Equipment

Stocked/set up warmer bed, Neopuff, airway box, delivery room cart

- Standard High-risk Resuscitation set up with 50% O<sub>2</sub>, starting pressures of 20/5 via Neopuff
- Will have flow inflating bag as back up

Use air/O<sub>2</sub> sockets on OR boom for Panda warmer, keep tanks on warmer for transport, RT to have back up tanks available

Large bore OG tube (10F Salem Sump preferred)

Suction catheters for ETT

Pneumo kit

Surfactant (FETO patients only)

XR cassette in drawer (depending on XR machine) /XR tech on call to OR

STAT UVC tray—place if additional resuscitation needed (fluid, epi, etc)

PIV supplies—preferred access if needed only for sedation in OR/prior to transport

*If mother is COVID+, standard COVID precautions for Delivery team apply. N95 masks are available in the NICU*

**NICU Team and Roles:** NICU Team to arrive at \_\_\_\_\_AM (60-90 minutes prior to mother's arrival in OR)

| Role                                                 | Name | Responsibilities                                                                                                                     |
|------------------------------------------------------|------|--------------------------------------------------------------------------------------------------------------------------------------|
| Team Leader<br>(Neonatology attending and/or fellow) |      | <ul style="list-style-type: none"><li>Complete delivery room order set prior to delivery date</li><li>Supervise bed set up</li></ul> |

|                                           |  |                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                           |  | <ul style="list-style-type: none"><li>Confirm “go status” during time out</li><li>Scrub to receive baby and transport to warmer</li><li>Direct resuscitation</li><li>Aid with procedures if needed</li></ul>                                                                                                                                                                                                     |
| Head of Bed<br>(Neonatal Fellow or APN 1) |  | <ul style="list-style-type: none"><li>Intubate and initiate PPV via neopuff</li><li>Trouble shoot ventilation</li><li>Transition to other procedures as needed</li></ul>                                                                                                                                                                                                                                         |
| APN 1 or 2                                |  | <ul style="list-style-type: none"><li>Help secure ETT and place OG tube</li><li>Auscultate for HR and breath sounds</li><li>Place hat</li><li>PIV placement if needed</li><li>Assist with compressions/procedures if needed</li></ul>                                                                                                                                                                            |
| APN 2 or 3 (if available)                 |  | <ul style="list-style-type: none"><li>Ensure STAT UVC prepped, insert if needed</li><li>Assist with compressions if needed</li><li>Assist with additional procedures if needed</li></ul>                                                                                                                                                                                                                         |
| RNs (2)                                   |  | <ul style="list-style-type: none"><li>Ensure meds/ fluids /PIV supplies prepped</li><li>Warm/dry and remove wet linens</li><li>Place CR monitor and pulse ox leads, temp probe</li><li>HR check</li><li>Place PIV (limit to 2 attempts)</li><li>Document Resuscitation</li><li>Be prepared to provide compressions if needed; if progresses to code, will need to rotate out help with meds, recording</li></ul> |
| RT                                        |  | <ul style="list-style-type: none"><li>Assist with bed set up</li><li>Ensure XR plate in place</li><li>check airway/respiratory equipment</li><li>Adjust neopuff PIP and FiO<sub>2</sub> as needed during resuscitation</li><li>Help secure ETT</li><li>Suction airway if needed</li><li>Take over provision of PPV via neopuff as needed.</li></ul>                                                              |
| Pharm D                                   |  | <ul style="list-style-type: none"><li>Ensure meds drawn up from orders, help with additional doses as needed</li></ul>                                                                                                                                                                                                                                                                                           |

Additional Medications for Neo team (should be pre-ordered using NCH delivery order set, in fetal chart, under inpatient admission encounter)

- Fentanyl 2 mcg/kg IV x2
- Vecuronium 0.1 mcg/kg IV x2
- Atropine 0.02 mg/kg IV
- Versed 0.2 mg/kg IN x2
- Fentanyl 1mcg/kg IN x2
- NS bolus 10mg/kg x3
- 1 unit O neg blood on call
- Code Epinephrine (0.1mg/kg ETT x2, 0.02mg/kg IV x2), epi gtt
- (defer Vit K and erythro admin until after transfer to NICU)
- Other meds per delivery attending preference

### Resuscitation Goals prior to Transfer to NICU

- HR >100, ideally saturations >70-80%
- ETT confirmed via CXR
- PIV in place – if needed

### NICU Admission Plan

- Administer Vit K and erythromycin in NICU
- UAC/PAL placement, DL PICC placement
- Document ETT position via CXR.
- Fluids, labs, antibiotics as dictated by clinical status.

[Planned Delivery Algorithm](#)

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# Delivery Planning Sheet Ex-Utero Intrapartum Treatment (EXIT)

## NCH Complex Delivery Team Planning Sheet—EXIT

Planned delivery Date:

Mothers Name/MRN:

Baby Name/MRN:

EFW:

### Special Equipment

Stocked/set up warmer bed, Neopuff, airway box, delivery room cart

- Standard Resuscitation set up with 21% O2, starting pressures of 20/5 via Neopuff
- Will have flow inflating bag as back up
- Utilize transwarmer as baby will be exposed/wet for some period of time before transfer to warmer bed

Use air/O2 sockets on OR boom for Panda warmer, keep tanks on warmer for transport, RT to have back up tanks available

Suction catheters for ETT

XR cassette in drawer—ensure XR tech on call to OR

Surfactant

STAT UVC tray—place if additional resuscitation needed (fluid, epi, etc)

PIV supplies—preferred access if needed only for sedation in OR

*If patient is COVID+, standard COVID precautions for Delivery team apply. N95 masks are available in the NICU*

### Overview of fetal monitoring and care while on placental support:

- NICU APN or RN sterile at OR table for PIV placement/resuscitation support
- Place sterile hat to help maintain temperature
- OB places pulse ox on wrist and hands off cable to OB anesthesia
  - Pulse oximeter located by OB anesthesia. If that is not picking up a signal, use the portable pulse oximeter that is placed in a sterile bag on the field
- HR monitoring via US probe—performed by OB or cardiologist
- Medication administration: Anesthesia will hand off fetal cocktail to MFM
- Medical control of Fetus
  - Sterile self-inflating bag with peep valve should be on the sterile field. If resuscitation needs to be initiated, ENT and Neonatal RN/APN can coordinate provision of PPV
  - Parameters at which procedure should be aborted should be determined among all group members prior to initiation
- Should code meds need to be given, EXIT will be aborted and an emergent UVC should be placed by the fellow and medications should be administered. ETT Epi should also be available

**NICU Team and Roles:** NICU Team to arrive \_\_\_\_ (60-90 min prior to maternal arrival in OR)

| Role                                                 | Name | Responsibilities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------------------------------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Team Leader<br>(Neonatology attending and/or fellow) |      | <ul style="list-style-type: none"><li>• Complete delivery room order set prior to delivery date</li><li>• Supervise bed set up</li><li>• Confirm “go status” during time out</li><li>• Direct resuscitation</li><li>• Aid with procedures if needed</li></ul>                                                                                                                                                                                                                                                                                        |
| Head of Bed<br>(Neonatal Fellow or APN 1)            |      | <ul style="list-style-type: none"><li>• Dry head, face</li><li>• Start PPV via Neopuff</li><li>• Transition to UVC placement if needed</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                     |
| APN 1 or 2                                           |      | <ul style="list-style-type: none"><li>• Scrub to help with IV access and/or PPV while on placental bypass</li><li>• Assist ENT with the transfer of the baby—ENT to maintain control of airway/ETT until secured</li><li>• Help secure ETT with ENT and RT once transferred to warmer</li><li>• Dry head and place new hat</li><li>• Place PIV (if infant stable; limit to 2 attempts)</li><li>• Transition to UVC placement if needed for resuscitation</li></ul>                                                                                   |
| RNs (2)                                              |      | <ul style="list-style-type: none"><li>• Ensure meds/ fluids /PIV supplies prepped</li><li>• Warm/dry and remove wet linens</li><li>• Place CR monitor and pulse ox leads, temp probe</li><li>• HR check</li><li>• Warm/dry and remove wet linens once ETT secured</li><li>• Place PIV (limit to 2 attempts)</li><li>• Document Resuscitation</li><li>• Be prepared to provide compressions if needed; if progresses to code, will need to rotate out help with meds, recording</li><li>• Place PIV (if infant stable; limit to 2 attempts)</li></ul> |
| RT                                                   |      | <ul style="list-style-type: none"><li>• Assist with bed set up</li><li>• Ensure XR plate in place</li><li>• check airway/respiratory equipment</li><li>• Help secure ETT with ENT and APN</li></ul>                                                                                                                                                                                                                                                                                                                                                  |

|         |  |                                                                                                                                                                                                                                                            |
|---------|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|         |  | <ul style="list-style-type: none"><li>• Suction airway if needed</li><li>• Adjust neopuff PIP and FIO2 as needed during resuscitation</li><li>• Take over provision of PPV via neopuff as needed.</li></ul>                                                |
| Pharm D |  | <ul style="list-style-type: none"><li>• Additional med doses available for Neo team admin (see med lists) if needed<ul style="list-style-type: none"><li>○ Note, OB Anesthesia will prepare fetal IM cocktail for use on sterile field</li></ul></li></ul> |
|         |  |                                                                                                                                                                                                                                                            |

### Resuscitation Pearls

- MFMs will attempt to apply pulse to arm (whichever is most easily delivered at the time of uterine incision). POC US will also be available to monitor HR during procedures, or scalp electrode may also available. Focus on fetal heart rate, not saturations, while fetus remains on placental bypass, as expected saturations will be fetal levels (50-75% acceptable, as long as fetal HR appropriate)
- Infant will be late preterm, without onset of labor (hopefully). Also infant will not cry at delivery prior to securement of airway. Anticipate need for airway suctioning to clear fluid, *potentially higher initial inflation pressures to recruit*.
- Dry head/face well to allow for ETT securement; ***defer lifting infant to remove wet blankets until ETT is secured.***
- Consider surfactant after initial attempts to clear airways with suction and recruit with PPV. Confirm ETT placement (either with direct visualization by ENT or via CXR) prior to administration, due to potentially abnormal length of trachea
- Transfer of maternal volatile anesthetics to fetus may cause fetal/neonatal vasodilation, consider fluid boluses
- Transfer on warmer bed. Drape with warm blankets for privacy during transport to NICU
- Ensure adequate sedation prior to transport (consider additional dose of paralytic for transport)

**Fetal Anesthesia Cocktail: IM (have enough for 2 rounds)—Mixed by OB anesthesia, handed off to MFM**  
**Will need to be redosed after ~20 min, if still on placental bypass**

Fentanyl: 5mcg/kg

Vecuronium: 0.1 mg/kg

Atropine: 0.02 mg/kg

Additional Medications for Neo team after termination of placental bypass—to be drawn up by PharmD

- Consider having an ADDITIONAL fetal cocktail ready for single IM injection
- Surfactant
- Fentanyl 2 mcg/kg IV x2
- Vecuronium 0.1 mcg/kg IV x2
- Atropine 0.02 mg/kg IV
- Versed 0.2 mg/kg IN x2
- Fentanyl 1mcg/kg IN x2
- NS bolus 10mg/kg x3
- D10 bolus x2
- 1 unit O neg blood on call
- Code Epinephrine (0.1mg/kg ETT x2, 0.02 mg/kg IV x2)
- (defer Vit K and erythromycin admin until after transfer to NICU)

### NICU Admission Plan

- Administer Vit K and erythron in NICU: ensure ETT is WELL SECURED before applying erythromycin
- Consider umbilical line placement based on clinical status/respiratory support needs
- Document ETT position via CXR.
- Fluids, labs, antibiotics, as dictated by clinical status.

[Planned Delivery Algorithm](#)

[Unexpected Delivery Algorithm](#)

# Delivery Planning Sheet Generic

**NCH Complex Delivery Team Planning Sheet— Generic**

Planned delivery Date:

Mothers Name/MRN:

Baby Name/MRN:

Fetal Diagnosis:

EFW:

**Special Equipment**

Stocked/set up warmer bed, Neopuff, airway box, delivery room cart

- Unique aspects of delivery room management/Adjustment to NRP algorithms based on diagnosis:

Use air/O2 sockets on OR boom for Panda warmer, keep tanks on warmer for transport, RT to have back up tanks available

**NICU Team and Roles:** NICU Team to arrive at 60-90 min prior to planned C-section start time

**\*\*\*Modify Role Assignments as needed based on diagnosis and anticipated resuscitation needs\*\*\***

| Role                                                 | Name | Responsibilities                                                                                                                                                                                                                                                                                                      |
|------------------------------------------------------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Team Leader<br>(Neonatology attending and/or fellow) |      | <ul style="list-style-type: none"><li>• Complete delivery room order set prior to delivery date</li><li>• Supervise bed set up</li><li>• Confirm “go status” during time out</li><li>• Scrub to receive baby and transport to warmer</li><li>• Direct resuscitation</li><li>• Aid with procedures if needed</li></ul> |
| Head of Bed<br>(Neonatal Fellow or APN 1)            |      | <ul style="list-style-type: none"><li>• Intubate and initiate PPV via neopuff</li><li>• Trouble shoot ventilation</li><li>• Transition to other procedures as needed</li></ul>                                                                                                                                        |
| APN 1 or 2                                           |      | <ul style="list-style-type: none"><li>• Auscultate for HR and breath sounds</li><li>• Place hat</li><li>• PIV placement if needed</li><li>• Assist with compressions/procedures if needed</li></ul>                                                                                                                   |
| RNs (2)                                              |      | <ul style="list-style-type: none"><li>• Ensure meds/ fluids /PIV supplies prepped</li></ul>                                                                                                                                                                                                                           |

|         |  |                                                                                                                                                                                                                                                                                                                                                                                      |
|---------|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|         |  | <ul style="list-style-type: none"><li>• Warm/dry and remove wet linens</li><li>• Place CR monitor and pulse ox leads, temp probe</li><li>• HR check</li><li>• Place PIV if needed (limit to 2 attempts)</li><li>• Document Resuscitation</li><li>• Be prepared to provide compressions if needed; if progresses to code, will need to rotate out help with meds, recording</li></ul> |
| RT      |  | <ul style="list-style-type: none"><li>• Assist with bed set up</li><li>• check airway/respiratory equipment</li><li>• Adjust neopuff PIP and FiO2 as needed during resuscitation</li><li>• Help secure ETT</li><li>• Suction airway if needed</li><li>• Take over provision of PPV via neopuff as needed.</li></ul>                                                                  |
| Pharm D |  | Ensure meds drawn up from orders, help with additional doses as needed                                                                                                                                                                                                                                                                                                               |

**Order Potential Medications for Neonatal Resuscitation**

- Should be pre-ordered using NCH delivery order set, in fetal chart, under inpatient admission encounter)

**Resuscitation Pearls Based on Diagnosis:**

**Receiving Unit Post-Resuscitation:**      NICU      CTICU      OR

**Physiologic Goals Prior to Transfer:**

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# Proactive Safety Plan

| Call Element                                                                                                                                                                                                                                                                                             | Responsible Party                                                              | Completed?                                                              | Notes                                                                                                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|-------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| Brief clinical overview                                                                                                                                                                                                                                                                                  | Maternal Fetal Medicine Physician                                              | [ ] Yes [ ] No                                                          |                                                                                                                |
| Procedural plan or review                                                                                                                                                                                                                                                                                | Maternal Fetal Medicine Physician                                              | [ ] Yes [ ] No                                                          |                                                                                                                |
| Anesthesia plan or review                                                                                                                                                                                                                                                                                | Anesthesiologist                                                               | [ ] Yes [ ] No                                                          |                                                                                                                |
| Diagnostics review (*for pre-procedural calls, may discuss prior to “Procedural plan or review”)<br>Echocardiography<br>Advanced Imaging<br>Fetal U/S<br>Fetal MR                                                                                                                                        | Primary Surgeon                                                                | [ ] Yes [ ] No [ ] NA<br>[ ] Yes [ ] No [ ] NA<br>[ ] Yes [ ] No [ ] NA |                                                                                                                |
| Input from other services (as needed)                                                                                                                                                                                                                                                                    | Maternal Fetal Medicine Physician requests input from other services as needed | [ ] Yes [ ] No [ ] NA                                                   | Team(s) Involved:<br>Preop<br>OR<br>PACU<br>NICU<br>PICU<br>HSA<br>Fetal Nursing<br>Pharmacy<br>Patient Safety |
| Maternal Current risks or concerns:<br>Hemorrhage Risk: Low, Medium, High<br>Type/Screen x 2 sent?<br>Positive antibody screen?                                                                                                                                                                          | Primary Surgeon/Anesthesia                                                     | [ ] Yes [ ] No                                                          |                                                                                                                |
| Maternal Anticipated concerns and mitigation plans<br>Procedural:<br>Post-procedural:<br>Postpartum care:<br>Adult Hospital for transfer:<br>Fetal Anticipated concerns and mitigation plans<br>Is the fetus viable: yes or no<br>If viable please include any special considerations for resuscitation: | Primary Surgeon to lead the discussion                                         | [ ] Yes [ ] No                                                          |                                                                                                                |
| Summary<br><br>Proactive Safety Plan – was this ordered in Epic ?<br>Specify which adult hospital for transfers and any triggers for early transfer.                                                                                                                                                     | Primary Surgeon or PICU Faculty                                                | [ ] Yes [ ] No<br><br>[ ] Yes [ ] No*                                   |                                                                                                                |

## Proactive Safety Huddle: Key Element Checklist

Patient Name: \_\_\_\_\_ Date: \_\_\_\_\_

Timing of call: [ X ] Pre-Procedure [ ] Immediate Post-Procedure [ ] Prior to floor transfer [ ] Other (specify)\_\_\_\_\_

Preferred Timing of Calls (if team available) weekdays between \*\*PM, weekends \*\*PM  
Immediately Post-procedure: 1 hour after arrival (if patient stable) POD#1/prior to floor transfer: \_\_\_\_\_

## Proactive Safety Huddle – Maternal Fetal Medicine

- Purpose of proactive safety huddles:
- Mitigate risk and concerns
  - Enhance communication across multidisciplinary teams
  - Raise situational awareness to improve patient outcomes

### Huddle Participants:

| Role                                                                                                                        | Participant                                  |
|-----------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| Primary Surgeon                                                                                                             | Oluseyi Ogunleye                             |
| Surgeon                                                                                                                     |                                              |
| Clinical Lead and Education Nurse Specialist                                                                                | Lisa Miller                                  |
| Fetal Center Nurse Coordinator                                                                                              | Becky Corbitt; Beth Swartz                   |
| Fetal Nurse                                                                                                                 |                                              |
| Fetal Ultrasound Technologist                                                                                               |                                              |
| Scrub Nurse                                                                                                                 |                                              |
| Anesthesiologist                                                                                                            | Vanessa Olbrecht; Seth Hayes                 |
| Anesthesia tech                                                                                                             |                                              |
| OR Nurse Manager                                                                                                            | Nicole Henson                                |
| OR Charge Nurse/Circulating Nurse (Must)                                                                                    | Janet Nikolovski                             |
| OR circulating Nurse                                                                                                        |                                              |
| Neonatologist (if viable fetus)                                                                                             |                                              |
| Neonatal Nurse Practitioner (if viable fetus)                                                                               |                                              |
| NICU RN (if viable fetus)                                                                                                   |                                              |
| PICU Attending                                                                                                              | Tensing Maa                                  |
| PICU Fellow                                                                                                                 |                                              |
| PICU Nurse Manager                                                                                                          | Jessica Dopkiss                              |
| PICU Nursing Clinical Leader                                                                                                | Lori Humphry                                 |
| Huddle Facilitator                                                                                                          |                                              |
| Medication Safety Officer or Jackie Magers (Clinical Pharmacist) -- (ad hoc if related to risk mitigation with medications) | Jackie Magers, Troy Kienzle                  |
| Preop Nurse Manager                                                                                                         | Lisa Carney                                  |
| PACU Nurse Manger                                                                                                           | Renee Wolfe                                  |
| PACU Educator                                                                                                               | Natalie Friess                               |
| HSA Nurse Manager                                                                                                           | Ann Hoffman                                  |
| Surgical APPs                                                                                                               | Nicole Jenkins                               |
| Patient Safety Specialist                                                                                                   | Summer Dougherty, Rebecca Cook, Maria Moauro |

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# Resuscitation Plan

**NCH Code Pink Team: Resuscitation plan for unplanned delivery following fetal intervention**

Mothers Name/MRN:

**Baby Name/MRN:**

**EFW:**

**EGA at time of fetal procedure:**

**Special Equipment**

Stocked/set up warmer bed, Neopuff, Fetal Nursing team to set up and do initial check on H5 and OR warmer beds when mother is admitted for fetal procedure, including checking that tanks on warmer bed are full

- Consider use of air/O2 sockets on wall (H5A-FS) or on boom (OR), and reserving tanks for transport

RT to have back up tanks available

Airway Bag, Emergency Medication Box, and Go-bag stocked in NICU

General Resuscitation Needs:

ETT size: ☐ 2.0   ☐ 2.5   ☐ 3.0   ☐ 3.5   ☐ 4.0

Laryngoscope blade size: ☐ 000   ☐ 00   ☐ 0   ☐ 1

Face mask size: \_\_\_\_\_

LMA available? ☐ Y   ☐ N

☐ FETO balloon puncture kit

**Other Resuscitation Pearls (Dx -specific)**

To be discussed during Proactive Safety Huddle

**NICU Team and Roles:**

| Role                                                 | Responsibilities                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Team Leader<br>(Code Pink PAA Neonatology attending) | <ul style="list-style-type: none"><li>• Team Leader, Direct resuscitation</li></ul>                                                                                                                                                                                                                                                                      |
| Head of Bed<br>(Neonatal Fellow or APN)              | <ul style="list-style-type: none"><li>• Dry head and place Hat</li><li>• Manage airway— suction, CPAP/PPV, intubation as needed</li><li>• Transition to UVC placement or compressions if needed</li></ul>                                                                                                                                                |
| APN or Fellow                                        | <ul style="list-style-type: none"><li>• Auscultate HR and Breath sounds</li><li>• Compressions if needed</li><li>• Transition to STAT UVC if needed</li></ul>                                                                                                                                                                                            |
| RNs (2)                                              | <ul style="list-style-type: none"><li>• Warm/dry and remove wet linens or help secure in bag as needed</li><li>• Place CR monitor and pulse ox leads, temp probe</li><li>• Document Resuscitation</li><li>• Be prepared to provide compressions if needed; if progresses to code, will need to rotate out help with meds, recording</li><li>• </li></ul> |
| RT                                                   | <ul style="list-style-type: none"><li>• Adjust neopuff PIP and FIO2 as needed during resuscitation</li><li>• Held secure ETT</li><li>• Suction airway if needed</li><li>• Take over provision of PPV via neopuff as needed.</li></ul>                                                                                                                    |

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# Communication Plan

## Fetal Center Patient-NICU Code Pink Communication

Population: Fetal Center inpatient interventional procedure (removed viable because Code Pink Team assistance may be needed if non-viable fetus is delivered unexpectedly)

### Prior to admission:

- A. Maternal Proactive Safety Huddle
  - a. Location: Fetal Center or Teams
  - b. Participants:
    - i. Fetal Center team
    - ii. PAA Fetal Consult or Delivery Attending or designee
- B. NICU Code Pink Huddle
  - a. Location: NICU
  - b. Participants:
    - i. NICU Code Pink team, leadership
- C. Day to night-time sign out of impending am maternal admission
  - a. Physician level: 16:00 sign-out
  - b. Neonatal APP level: 18:30 sign-out
  - c. Charge Nurse level: 18:30 sign-out

### Admission/Procedure Day:

- A. Fetal Center Nurse provides real-time updates/status changes to NICU Charge RN via Vocera
- B. Real-time updates on Epic Storyboard
- C. PM daily huddle: 20:30
  - a. Fetal Center Nurse reports status update of fetal inpatients via Vocera to nighttime NICU Charge RN
  - b. NICU Charge RN relays updates to Code Pink Team

### Post-procedure Day:

- A. Director of Fetal Services or designee reports Fetal Center inpatients at organizational daily safety call held M-F at 8:30 am (no weekends or holidays)
- B. AM Daily NICU Huddle M-F at 8:30 am; weekends and holidays 9:15 am
  - a. Fetal Center Nurse provides inpatient updates to Code Pink Team
  - b. NICU Charge RN reports updates within daily post-huddle email
- C. Fetal Center Nurse reports relevant status changes to NICU Charge RN via Vocera
- D. Real-time updates on Epic Storyboard
- E. PM daily huddle: 20:30
  - a. Fetal Center Nurse reports status update for Fetal Center inpatients to nighttime NICU Charge RN via Vocera
  - b. NICU Charge RN relays updates to overnight Code Pink Team
- F. Fetal Center Nurse notifies NICU Charge RN when patient is discharged via Vocera

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Algorithm](#)

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Algorithm](#)