Protocol for PDA Device Closure in Premature Infants in the Catheterization Laboratory

Updated: 2/2025

Prior to Procedure:

1. Echocardiogram to be performed at bedside 24-48 hours prior to the cath procedure to confirm PDA size, direction of shunt, existing obstruction of LPA and/or DAo, function, and presence of any other congenital heart disease. This should be performed prior to transfer from referring facility.

Day before Procedure:

1. Pre-cath labs (within 24-48 hours):
    a. Type and Cross – make sure current active one in place (1 unit PRBCs on call for procedure)
    b. CBC
        i. PRBC transfusion—If Hct < 30% (Hgb < 10), transfuse with 15 ml/kg prior to procedure.
        ii. Platelet threshold goal > 75,000. If < 75,000 discussion between cardiology, NICU and anesthesia to determine need for platelet transfusion.
    c. BMP – check renal function as AKI/renal failure may limit contrast administration during catheterization
2. IV access to be obtained in NICU prior to procedure. 2 PIV's or a PIV and PICC if possible. *See below for consideration of PICC placement.
3. Place Cerebral and Renal NIRS to obtain baseline **Should use the 7100 machine if able*

Day of Procedure:

1. Informed E-consent obtained by cath team
2. Patient Preparation
    a. Ensure no transfusions needed prior to cath (see above for parameters)
    b. Assure adequate IV access
    c. Infuse dextrose containing fluids to prevent hypoglycemia while NPO (4-6 hours prior to cath start time based on anesthesia NPO guidelines)
    d. Consider hydrocortisone 1mg/kg/dose IV q8h x3 for infants with history of adrenal insufficiency and/or exposure to systemic steroids. First dose given in NICU prior to procedure. Consider not giving hydrocortisone if recent NSAID use within 72 hours, weighing risk/benefit.
3. Respiratory support and endotracheal tube – Neonatologist and anesthesiologists to discuss intubation of baby the morning of the procedure prior to anesthesia arrival at bedside
    a. NICU staff/RT/Anesthesia to discuss mode of ventilation – anesthesia machine vs. set up of NICU ventilator with extended vent tubing in cath lab prior to transport
4. Cath Lab Preparation:
    a. Prior to Transport Cath lab room temperature must be above 75F. Table with Bair Hugger and warming lights must be at least 82F. Temp will be verified by digital room thermometer (warming lights are stored in 3rd floor anesthesia work room)
    b. Blood will be requested by AFCH Hybrid OR RN and stored ins AFCH Hybrid blood cooler prior to start of case.
5. NICU nurse and neonatologist/fellow/NNP hand off patient to anesthesia team
6. NICU nurse, respiratory therapy, and anesthesia team to transport patient to cath lab (per NICU & Anesthesia protocols)
    a. If infant < 1800 g:
        i. Transport in isolette with transport ventilator on shuttle. No hand bagging of baby during transport
        ii. NICU nurse to remain with baby for entire procedure to assist cath team and anesthesia with meds/pumps/positioning and transport
7. Temperature probe to be placed in esophagus prior to draping baby.
8. Blood pressure cuffs to be placed on both legs prior to draping to ensure access to noninvasive BP during case. Connect BP to left leg (assume venous access on right). After venous access, switch connection to right leg if access was obtained on the left.
9. Maintain renal NIRS for intraprocedural monitoring.

10. Patient Positioning – Foam padding under head. Head turned toward right shoulder to allow for TTE access. Gauze roll under hips to lift pelvis. Gauze wrap around lower legs to maintain straight, neutral position.
11. Prep with betadine (no chlorhexidine/ChloraPrep). Cleanse with normal saline using sterile technique.
12. Monitor – record the timing of device deployment in the procedure log
13. NICU RN, RCP, anesthesia, and cath MD to transport infant back to NICU in pre-procedure bed (isolette, giraffe warmer, etc.) post procedure. Shuttle and warmer to be plugged in during procedure to keep warm.

Post Procedure:

1. Pt likely to return to NICU intubated
    a. Extubation after >4-6 hours at discretion of Neonatologist and the cath providers
    b. Discuss with cardiology team plan for sedation and paralysis
2. NPO for at least 8 hours post op, then consider beginning trophic (20 ml/kg/day) feeds
    a. Resume pre-op feeding volumes following echo post procedure day 1 or at discretion of neonatologist
3. CXR upon return to NICU and in the AM
4. Assess patient:
    a. Assess site and ipsilateral leg for color, pulses and bleeding;
        i. Q15 minutes for 1 hour
        ii. Q 30 minutes for 2 hours
        iii. Q 1 hour x2
        iv. Then q 4 hours
    b. Keep leg straight for 4 hours
5. If patient has a bradycardia/desaturation event that is not responding, consider device embolization.
    a. Place pulse oximeter on lower extremities (not the one the cath was done on) to monitor for desaturation.
    b. Order CXR and contact cardiologist if any concerns for device migration.
6. Monitor Renal and cerebral NIRS
7. Echocardiogram in the AM on post procedure day 1 to confirm device position and to ensure no obstruction of left pulmonary artery or descending aorta.
    a. Repeat/scheduled echo at 1 week, 4 weeks, 3 and 6 months post procedure
8. Labs:
    a. POD1 BMP, no additional scheduled labs unless clinically indicated.
9. RN to remove cath dressing post procedure day 1.
    a. Call cath MD or NP if there are questions/concerns.
    b. Do not need to put a Band-Aid on site
    c. Assess site for signs and symptoms of infection. Call cardiologist if concerned.
    d. Assess site with each diaper change.

* PICC line:

- If considering PICC placement - ideally place in upper extremity prior to procedure as upper extremity PICC line can be used as marker for device placement. If possible, avoid placing a right lower extremity PICC as this is preferred access site for catheterization.
- If lower extremity PICC in place, do not remove and discuss access issues with cath lab team and anesthesia.