Congenital Diaphragmatic Hernia (CDH): Post-Operative Care

Children's Mercy KANSAS CITY | Evidence Based Practice

Abbreviations:
OT = Occupational therapy
PEEP = Positive end-expiratory pressure
PO = By mouth

Infant following surgical repair of CDH

QR code for mobile view

Special Considerations

- Indications for extracorporeal membrane oxygenation (ECMO) do not change in the post-operative period
- Continue Pulmonary Hypertension Management
- If chest tube present, leave to water seal, **not** suction
- Continue near-infrared spectroscopy (NIRS) monitoring until acidosis is resolved and infant has normal urine output
- Pleural effusion is an expected sequelae of repair

Post-Operative Ventilatory Management

- Pulmonary toileting with mucolytic should be considered after 48 hours following repair, pending clinical stability.
- May need to increase ventilatory support in the immediate post-operative period to regain stability; however the objective remains gentle ventilation
- Continue permissive hypercapnia CO_2 45 - 65 mmHg as long as infant is sensitive to CO_2 changes and pH remains > 7.25
- If peak pressures > 25 cmH_2O are needed to generate pre-operative tidal volumes, consider trial of decreased PEEP (*as low as 3 cmH_2O*) or transition to high-frequency oscillatory ventilation (HFOV)
- If there is evidence of a mass effect (*e.g., mediastinal shift or decreased respiratory compliance*), consider drainage and investigate etiology (*e.g., tension pneumothorax, chylothorax*), obtain chest X-ray and notify surgery

Nutrition

- Begin daily weights
- Higher caloric requirements are frequently required for up to 2 months post-operatively
- Utilize breastmilk (*use donor human milk if maternal milk is not available*)
- Regardless of gestational age (GA), advance feeds at the 32 - 34 weeks GA 1.5 - 2 kg Enteral Feeding Guideline pace (ICN Enteral Feeding Guidelines)
- Fortify with hydrolyzed formula, (*Alimentum/Pregestimil/Nutramigen*)
  - For formula fed, transition to all hydrolyzed formula after demonstrating tolerance to full volume fortified donor milk
- Consult OT and engage Lactation as soon as enteral feeds are introduced

Post-Operative Pain Management

- Post-operative pain management should be individualized and guided by a clinically relevant and validated pain scoring tool
- Consider IV acetaminophen to reduce opioid requirements
- Monitor for neonatal withdrawal symptoms and wean accordingly

Ventilatory Weaning

- Due to increased need for sedation and risk of pulmonary hypertension, neonates are generally not weaned for 48 - 72 hours post-operatively
- Earlier weaning may be necessary
- Consider neurally-adjusted ventilatory assist (NAVA)
- Ensure extubation criteria are met

Earlier Ventilatory Weaning

- Over ventilation (CO_2 < 45)
- Over oxygenation (SpO_2 > 98%)
- Receiving large tidal volumes (> 6 mL/kg or more than received pre-operatively)

CMH iNO Guidelines

Before Discharge

- Record weight, length, and head circumference
- Obtain chest X-ray, echocardiogram, and brain MRI
- Ensure immunizations are up-to-date (*including respiratory syncytial virus [RSV]*)
- Assess hearing
- Schedule outpatient follow up with NEON clinic, Cardiology, and Pediatric Surgery
- Share discharge expectations, follow-up outpatient care, and long-term considerations with family

Discharge Expectations

- Goal is breathing unassisted in room air if possible. If not possible, the goal is to maintain normal SpO_2 with a specified maximum flow rate
- 100% enteral feeds, ideally by mouth; however, CDH infants due to their prolonged respiratory course may need NG-tube (*refer to NICU Home NG Algorithm*) or G-tube

Follow-Up Outpatient Care

- Pediatric Surgery
- NEON clinic
- Cardiology

Long-Term Considerations

- Bowel obstruction
- Reflux
- Volvulus
- Recurrence
- Pulmonary hypertension
- Pulmonary hypoplasia

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Link to synopsis and references

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