

Congenital Diaphragmatic Hernia Management

Eric Demers, M.D.

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Goal: To develop a consistent management philosophy for CDH patients that begins at birth and continues during transport and admission at CHRMC IICU.

General Principles:

1. Avoid lung injury by using "Gentle Ventilation": permissive hypercapnea/spontaneous respiration. This strategy has been used with success at Columbia and Florida (Shand's Children's Hospital).
2. Focus on preductal SaO₂ (also monitor postductal SaO₂). Target preductal SaO₂ ≥ 90 and pH ≥ 7.25.
3. Maintain blood pressure and preload with fluids and vasopressors as needed.
4. Allow time for changes to take place. It is very easy in CDH patients to escalate support without giving adequate time for changes to take effect.

Birth Hospital: Goal would be to have patient stabilized, ready for transport within 1 hour after birth.

1. Avoid "bag and mask" ventilation if possible.
2. Intubation at birth.
3. Repogle placed to low intermittent suction.
4. Vascular access: UAC/UVC. Vascular access should be performed by experienced staff. (Not a teaching case) (Line placement by senior resident, NNP, fellow or attending)
5. If Prenatal Diagnosis and term infant, would initiate Infant ground transport team as soon as possible after birth (by 30 minutes of age).
6. Ventilator Management: Minimize lung injury: (Columbia strategy).
 - a. Goal: PaCO₂ < 60 mm Hg, preductal SaO₂ ≥ 90, no paralysis.
 - b. Ventilator mode: SIMV or SIMV with PS.
 - i. Start with 20/5 x 40, Ti: 0.5 sec, FiO₂: 1.0.
 - ii. Can escalate PIP up to 25 but avoid increasing above 25 if at all possible.
 - iii. If infant tachypneic, labored breathing, PaCO₂ above 65 mm Hg, switch to 20/0 x 100, Ti: 0.3 sec. ["High Frequency Positive Pressure Ventilation"(HFPPV)] (This is needed in 50% of patients).
7. If preductal SaO₂ persistently < 90, trial iNO at 20 ppm.
 - a. If improved preductal SaO₂ or PaO₂, continue
 - b. If no improvement, discontinue iNO
8. Sedation: No paralysis. Can use opiates and/or benzodiazepines. Preference would be for bolus administration preoperatively. Consider continuous infusion postoperatively.

Transport Team:

1. Continue management strategy that birth hospital has initiated.
2. Bring iNO on all CDH transports.

CHRMIC ICU:

1. Continue ventilation strategy.
2. HFOV if conventional ventilation/HFPPV not working (PaCO₂ above 65 mm, persistent preductal SaO₂ < 80-85, labored breathing/tachypnea). In centers that use this ventilation strategy (permissive hypercapnea/spontaneous respiration), HFOV use required in 20% of the population.
3. ECMO if above not working.