

## ECMO Transfer Criteria

### General:

1. We urge you to consult with a neonatologist as you consider ECMO. **612-813-6295**.
2. All criteria for transfer assume an effort to stabilize with appropriate use of mechanical ventilation and inotropic therapy.
3. These are not criteria for ECMO, rather, they are an attempt to identify patients with a high likelihood of benefiting from ECMO, at a point when transfer is reasonably safe.
4. Patients with congenital diaphragmatic hernia, sepsis, shock, or poor myocardial function deteriorate quickly and may die prior to meeting ECMO criteria. These patients should be transferred early, depending on the distance from the ECMO center.

### Recommended Criteria for Transfer to an ECMO Center:

- An OI (oxygenation index) > 25. (> 15 for diaphragmatic hernia patients)  
OI = (MAP x FiO<sub>2</sub> x 100) divided by PaO<sub>2</sub>. Ex. OI = (15 x 1.00 x 100) / 60 = 25
- Mean airway pressure of > 15 cm H<sub>2</sub>O (> 12 for diaphragmatic hernia patients)
- Amplitude or Peak Inflating Pressure of > 35 (> 25 for diaphragmatic hernia patients)
- Failure to improve within 4-6 hours of high frequency ventilation or nitric oxide to an OI < 25
- Hypercarbic respiratory failure with pH < 7.25, on a PIP > 30, or AMP > 35
- A plasma lactate > 25 mg/dl (> 3mM/L), and not improving on moderate inotropic therapy
- Mixed venous saturation < 65 % in 100% oxygen and dopamine > 10 mcg/kg/min.
- Persistent hypotension or acidosis (pH < 7.25 or base deficit > 5) despite an Inotropic Equivalent > 35. Inotropic Equivalent = DOPamine(mcg/kg/min) + DOButamine(mcg/kg/min) + EPInephrine(100Xs mcg/kg/min) + NORepinephrine(100Xs mcg/kg/min) + ISOproterenol(100Xs mcg/kg/min) + MILrinone(15Xs mcg/kg/min)
- This guideline is intended to assist clinical decision making for individual patients, not replace it. It will not apply equally to all infants, despite similar diagnoses.

### Exclusions to Neonatal ECMO

- Gestational age < 34 weeks
- Birth weight or current dry weight < 1700 grams
- Serious ongoing hemorrhage
- Coagulopathy that is unlikely to resolve with transfusion therapy. Ex. Liver failure.
- Recent (< 3 days) intracranial hemorrhage > Grade I germinal matrix hemorrhage

- Irreversible lung disease, or high pressure mechanical ventilation > 14 days
- Cardiac lesion that cannot be corrected or palliated
- Lethal condition incompatible with long life, including trisomy 13 and 18.
- Evidence of serious brain injury or asphyxia

Recommended Studies prior to transfer (if time allows) to rule out exclusions to ECMO

- Cardiac ultrasound
- Cranial ultrasound
- Plasma lactate

For additional questions, please see Cochrane Review at the following URL.  
<http://www.nichd.nih.gov/cochrane/Elbourne/Elbourne.htm>