CRITERIA FOR NEONATAL ECMO

All criteria assume optimal support of respiratory and/or cardiovascular failure including mechanical ventilation, trial of nitric oxide, and appropriate inotropic support. Stress hydrocortisone may also be indicated. We recommend not exceeding: a PIP of 35 (30 for diaphragmatic hernia patients) on conventional ventilation, a Jet PIP of 45, an HFO AMPitude of 45 or a MAP of 20 (15 for CDH patients), prior to qualifying for ECMO. A transient improvement should not cancel plans for ECMO.

Any 1 of the following criteria qualifies a patient for ECMO:

Respiratory Criteria-

- Oxygenation Index (OI) =MAPxFiO2x100/PaO2:
  - All Infants
    - >60 for 30 min.
    - >40 for 60 min
    - >35 for 6 hours
    - >30 for 24 hours
    - >25 for 72 hours
  - Infants with Diaphragmatic Hernia:
    - >35 for 30 min.
    - >30 for 2 hours
    - >25 for 4 hours
    - OR need for MAP>15, Jet PIP or HFO AMP>45, or conventional PIP>30

- Barotrauma:
  - Ventilator settings exceeding: PIP>35, MAP>20, Jet PIP or HFO AMP>45.
  - Hypercapnia with pH <7.10 for 4 hours on: PIP>35, Jet PIP or HFO AMP >45.
  - Severe air leak unresponsive to other therapies.

- Acute Deterioration:
  - PaO2 <30 at a single time point or preductal SaO2 <70%

Cardiovascular/Oxygen Delivery Criteria-

- Plasma lactate: >45 mg/dl (5 mM/L) and not improving, despite volume expansion and inotropic support.

- Inotropic equivalent (IE): >50 for 1 hour or >45 for 8 hours.
  - IE=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).

- Mixed Venous Sat of <55% for 60 min. (<60% for CDH patients)

- Rapidly deteriorating or severe ventricular dysfunction

- Intractable arrhythmia with poor perfusion

- Cardiac Arrest

Exclusions & References: see General Exclusions to Neonatal ECMO.

Provider Signature: _______________________________ MD   Date: __________ Time: ________
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Exclusions to Neonatal ECMO
1. Gestational age <34 weeks
2. Birth weight or current dry weight <1700 grams
3. Serious ongoing hemorrhage
4. Coagulopathy that is unlikely to resolve with transfusion therapy (i.e. severe liver failure).
5. Recent (<3 days) intracranial hemorrhage > Grade I germinal matrix hemorrhage
6. Irreversible lung disease, or high pressure mechanical ventilation >14 days
7. Cardiac lesion that cannot be corrected or palliated
8. Lethal condition incompatible with long life including trisomy 13 and 18
9. Evidence of serious brain injury or asphyxia – may be difficult to define but some experts recommend using:
   a. Severe neurological syndrome persisting after respiratory and metabolic resuscitation (i.e. stuporous, flaccid, and absent primitive reflexes)
   b. Plasma lactate >225 mg/dL (25 mM/L). Note: >225 mg/dl is highly predictive of death, whereas >135 mg/dl (15 mM/L) is highly predictive of adverse neurologic outcome.
   c. Base deficit >30 on 2 ABGs
10. Disseminated herpes
11. Renal agenesis or severe irreversible renal failure

References: