5 Minute Friday-
Neurologic Considerations on ECMO

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NEUROLOGIC COMPLICATIONS OF ECMO

• Hemorrhage
• Seizures
• Infarction or hypoxic ischemic injury
• Long-term Neurodevelopmental Impairment
  – Sensorineural hearing loss
NEUROLOGIC MONITORING

- Head ultrasounds qAM
  - Grade I-II IVH = high risk for extension of bleeding
    - Decrease ACT goals (e.g. 150-170)
    - Maintain normal clotting factors and platelet count
    - Amicar
    - Aggressively treat hypertension, agitation
  - Grade III-IV IVH = need to stop ECMO

- NeuroNICU: NIRS, consider aEEG/EEG
- MRI before discharge
HEMORRHAGE

• Incidence on ECMO ~7-10%
• 93% of IVH occur in the first 5 days on ECMO
• Risk factors: lower GA, acidosis, sepsis, coagulopathy, inotropic support
SEIZURES

- Seen in 11-13% of infants on ECMO
- Numerous risk factors
  - Pre-ECMO cerebral hypoxemia
  - Reperfusion injury
  - Thromboembolic event
  - IVH
- EEG to confirm
- Treat with phenobarbital (monitor levels)
HYPOXIC ISCHEMIC INJURY

- Risks include- poor cardiac output, ongoing hypoxemia, risk of emboli.
- Hard to determine timing of injury.
- Cooling while on ECMO
  - Consider for history of birth asphyxia or if CPR required at time of cannulation
  - UK study found no difference in 2-year neurologic outcomes, if routine hypothermia done with ECMO
NEURODEVELOPMENTAL IMPAIRMENT

• Almost all ECMO patients have hypotonia/weakness at 1-2 months...
• Sensorineural hearing loss (may be progressive)
  – 10-25% risk. Possible associations include diagnosis of CDH, prolonged length of time on ECMO, duration of aminoglycoside antibiotic and diuretic use, clinical seizure activity prior to ECMO
• Cognitive impairment ~10% at age 5.
• CP ~5%. Seizure disorder 2% at age 5.
  ◆ Best predictor for impairment is extent and severity of post-ECMO neuroimaging abnormality