Neurological care for ECMO patients

Neurological complications

- Anoxic injury acquired prior to ECMO
- Intracranial hemorrhage (ICH)
- Embolic infarcts
- Hypoperfusion injury
- Symptomatic seizures

Nursing Care

- Monitor for clinical events
- Push event button on EEG machine for suspected clinical events
- Alert MD for suspicious or recurring events

Seizure Management

Clinical seizure
1.**Ativan** 0.1 mg/kg (max 4mg/dose) PRN seizure then load with Pb or FosP
Electrographic seizures
- Phenobarbital 20 mg/kg load and start maintenance 5mg/kg/day divided BID
- Fosphenytoin 20mg/kg load and start maintenance 5mg/kg/day divided BID
- Consider additional Phenobarbital 10mg/kg load for continuing seizures

AED Monitoring

AED Monitoring
- Anticipate need for repeat load and higher maintenance dosing due to multiple med interactions and increased blood volume.
- CRRT/dialysis may impact AED levels.
- Obtain levels 2 hours post initiation of ECMO or dialysis.

Phenobarbital: (Goal 20-40)
- Level 2 hours after loading dose
- Daily phenobarbital troughs

Fosphenytoin: (Goal 15-20)
- TOTAL phenytoin level 2 hours after loading dose
- Daily TOTAL phenytoin troughs

Neuroimaging

- Portable CT: Limited availability nights and weekends.
  - **Post arrest:** If concern for catastrophic injury consider CT. Best to obtain immediately after arrest/event and next at 48 hours post event. Scan at 24 hours not likely to change management.
  - ICH: obtain to define extent of ICH
- MRI: Not available for ECMO patients

Other Considerations

ECMO requires anticoagulation.
- Consider bleeding protocol for patients with intracranial hemorrhage on ECMO.
- Intracranial hemorrhage alone is not an indication to discontinue ECMO.

Circuit change is high risk for neurological injury (e.g. emboli)
ECMO indication (elective vs emergent):
Emergent deployment —> Increased risk for hypoxic ischemic injury and seizures.