

Neuroprognostication After Cardiac Arrest

Purpose: To support physicians in the process of Neuroprognostication of adult patients post-cardiac arrest, with resources available in the Edmonton zone.



First 24 hours:

- ☐ Neuroprotective measures
- ☐ Daily physical exam
- ☐ Nonenhanced CT head - r/o intracranial cause for arrest or catastrophic hypoxic injury
- ☐ EEG - r/o nonconvulsive status or seizures if myoclonus is present
- ☐ Treat seizures and myoclonus



Myoclonus
information



24-72 hours:

- ☐ Daily physical exam with daily GCS (see mGCS QR code)
- ☐ Rule out confounders and if present treat to normal values (see page 2)
- ☐ Consider unconfounded EEG for neuroprognostication in this timeframe for best assessment



mGCS video



≥72 hours:

- ☐ 72 hrs post-ROSC or once rewarmed
- ☐ Consider neuroprognostication if mGCS ≤ 4
- ☐ If confounders are present, treat to normal values
- ☐ Off sedation (x 5 context-sensitive half-lives)



Pupillometer
video

Multimodal Assessment: For high probability for poor outcome, consider unfavourable findings from at least 2 separate modalities

- ☐ **Modality 1- Physical exam:**
 - Bilaterally fixed pupils or Neuroptic pupillometer NPI ≤ 2 bilaterally
 - Status myoclonus – Continuous and generalized myoclonus for > 30 minutes once seizures ruled out on EEG
- ☐ **Modality 2 - Neuroradiology**
 - Nonenhanced CT head at ≥ 72 hours, qualitative summary by neuro-radiologist
 - CT Head reported as severe HIBI (Hypoxic Ischemic Brain Injury)
 - If CT head not reported as severe HIBI consider MRI with DWI (3-7 days post-arrest)
- ☐ **Modality 3 - Neuroelectrophysiology**
 - Consider EEG > 72 hrs if not yet completed. Malignant patterns include isoelectric, suppression, burst suppression, GPD's with suppression
 - SSEP demonstrating bilaterally absent N20 peaks



Decision Tool for Neuroprognostication:

Consider unfavorable criteria from separate modalities

- ☐ **0 criteria** —————> Continue support and reassess treatment.
- ☐ **1 criterion** —————> Moderate probability for poor outcome. Continue support and consider delaying prognostication for several days.
- ☐ **2 criteria** —————> High probability for poor outcome. Discuss with family possible WLST with consideration of patient's wishes.



References



1. Drugs

- ☐ Minimize/discontinue sedation - as guide use > 5 context sensitive t1/2 (enlist pharmacist assistance)
- ☐ Minimize narcotics
- ☐ Recreational drugs - consider toxicology screen
- ☐ Mydriatic eye drops
- ☐ Nebulized acetylcholine antagonist bronchodilators - may affect pupillary function

2. Acute physiologic abnormalities:

- ☐ Hypothermia - target euthermia 36-37.5
- ☐ Hypoxia - ensure PaO₂ > 60
- ☐ Hypercarbia - target PaCO₂ 35-45 (or patient's baseline)
- ☐ Untreated shock - ensure SBP > 100 MAP > 65

4. Acute electrolyte abnormalities:

- ☐ Na, K, Mg, iCa, PO₄ - severe derangements may affect consciousness and/or motor strength. Target normal

3. Acute metabolic abnormalities:

- ☐ Glucose - target normal
- ☐ Severe metabolic acidosis - target normal pH
- ☐ AKI - assess for uremia and consider CRRT
- ☐ Transaminitis - assess for synthetic dysfunction- NH₃ and Rx with lactulose
- ☐ Sepsis - Rx with appropriate Abx for at least 24-48 hrs

5. Neurologic:

- ☐ Seizures - nonconvulsive status epilepticus
- ☐ TBI - Patients with a primary neurological cause may warrant expert consultation
- ☐ SCI - myelopathies - may affect the motor exam and/or SSEP
- ☐ Neuromuscular disorders - critical illness neuro/myopathy/severe GBS- may affect motor exam
- ☐ Ophthalmic trauma/prior surgery - may affect pupillary function

