**Inclusion Criteria:**
Any patient who has a cardiac arrest lasting > 1 min before ROSC who is admitted to PICU

**Exclusion Criteria:**
Cardiac arrest patients admitted to CICU or NICU

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**Conscious**
Arousable, attentive, follows commands, localized painful stimuli, not intubated

**Initial Studies**
- Blood gas, lactate, type and screen, CXR, EKG
- Additional studies as clinically indicated

- Schedule antipyretics for 48 hrs
- Target normal vital signs for age
- Consider Neurocritical care consult

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**Coma**
Not conscious or requiring intubation

**Initial Studies**
- CMP, Mg, phos, iCa, glucose, CBC, coags, fibrinogen, blood gas, lactate, type and screen, CXR, EKG, troponin
- Consider tox screen, cultures, ECHO

- Place arterial line
- cEEG x 24 hrs
- Rectal temp probe (esophageal probe if rectal contraindicated)
- ETCO2 monitor
- Consult Neurocritical care

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**Controlled Normothermia**
- Refer to Targeted Temperature Management order set
- Goal temp of 36C – 37.5C

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**Other Considerations**
(all patients)
- Consider Rehab consult as indicated
- Consider Cardiology consult for v-fib or v-tach arrests
- Early enteral nutrition when clinically stable, goal to start within 48 hrs

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**Clinical Goals/Strategies**
- Avoid hypotension
- Normoxia (sat 92%-95%)
- Normocarbia (pCO2 35-45 mmHg)
- Normonatremia (Na 140-145 mmol/L)
- Isotonic IV fluids w/o dextrose (except with hypoglycemia or age < 1 yr)

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**Recommended Lab Schedule**
- Blood glucose q 2 x 6 hrs or until dextrose added to IV fluids
- ABG, iCA, RFP, Mg q 6 x 25-48 hrs
- CBC, coags, CMP daily
- Consider brain MRI at 72 hrs
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TARGET POPULATION

Inclusion Criteria

- Sustaining cardiac arrest who regains spontaneous circulation after CPR lasting greater than or equal to 1 minute, OR
- Who undergo eCPR (CPR with cannulation to ECMO), AND
- Admitted to the Pediatric Intensive Care Unit (PICU)

Exclusion Criteria

- Admitted to the CICU or NICU

DEFINITIONS

- Cardiac Arrest: The cessation of cardiac mechanical activity as confirmed by the absence of signs of circulation
- Respiratory Arrest: The cessation of spontaneous respiratory effort such that there is ineffective ventilation and oxygenation
- Return of Spontaneous Circulation (ROSC): The restoration of a spontaneous perfusing rhythm that results in more than spontaneous gasp, fleeting palpable pulse or arterial waveform
- Conscious: arousable, attentive, follows commands, localizes painful stimuli, and not intubated
- Coma: not conscious and/or requiring intubation

INITIAL EVALUATION

Initial Evaluation in the PICU

- Comprehensive physical exam including comprehensive neurologic exam
- Specific attention to certain aspects of the neurologic exam:
  - Assess cranial nerves, Glasgow Coma Scale, level of consciousness (careful consideration given to pre-arrest neurologic baseline, as patients who have had short in-hospital cardiac arrest with no change in neurologic status from baseline proceed down the algorithm differently than those with change in neurologic functioning)
• For patients who are conscious with minimal new neurologic impairment (arousable, attentive, follow commands, localize painful stimuli, not intubated)
  o Arterial or Venous Blood Gas
  o Lactate
  o Type and Screen
  o Chest radiograph
  o EKG
  o Other labs to be obtained at the discretion of the attending based on clinical scenario: CMP, Magnesium, Phosphorus, ionized Calcium, CBC, Coagulation panel, fibrinogen, troponin

• For patients who are comatose (unconscious and/or requiring intubation)
  o Complete Metabolic Panel
  o Magnesium
  o Phosphorus
  o Ionized calcium
  o Complete Blood Count
  o Coagulation Panel
  o Fibrinogen
  o Lactate
  o Troponin
  o Arterial Blood Gas
  o Type and Screen
  o Chest radiograph
  o EKG

• Additional studies to be obtained for selected patients at the discretion of the attending physician:
  o Echocardiogram
  o Urine toxicology screen
  o Co-oximetry
  o Blood culture
  o Urine cultures
  o Cortisol
  o Non-contrast head CT to evaluate for acute pathology
CLINICAL MANAGEMENT

For patients who are conscious with minimal new neurologic impairment (arousable, attentive, follow commands, localize painful stimuli, not intubated)

Monitoring
- Routine PICU monitoring

Clinical Goals and Strategies
- Avoidance of fever: schedule antipyretics for 48 hours
- Target normal vital signs for age
- Consider Neurocritical care team consultation if abnormal neurologic findings or change from baseline exam

For patients who are comatose (unconscious and/or requiring intubation)

Monitoring
- Routine PICU monitoring
- Arterial catheter
- Continuous EEG for 24 hours
  - Prolonged monitoring may be indicated based on clinical scenario
- Rectal temperature probe, esophageal probe if rectal contraindicated (refer to normothermia order set)
- Continuous end-tidal CO₂ monitor while intubated

Clinical Goals and Strategies
- Controlled normothermia: use Targeted Temperature Management Order Set
- Normotension: hypotension is associated with worsened outcomes following pediatric cardiac arrest
- Normoxia (sat 92%-95%)
- Normocarbia (pCO₂ 35-45 mmHg; can target normal pH if the patient has evidence of chronic CO₂ retention)
- Normoglycemia (80-180 mg/dL)
- Normal serum sodium (140-145 mmol/L)
- IV fluids: use isotonic fluids without dextrose initially (recommend dextrose containing fluids in cases of documented hypoglycemia or age < 1 year)
  - Target euvoolemia/even fluid balance once hemodynamically stable (defined as no fluid boluses and/or no escalation of vasoactive medications for 6 hours)
  - Add dextrose to IV fluids at 24 hours post-resuscitation or if serum glucose falls below 80 mg/dl
- Early enteral nutrition: recommend placing nasoenteric tube when the patient is clinically stable with a goal of initiating enteral feeding within 48 hours of admission
- Recommended lab schedule:
  - Arterial Blood Gas, iCa, Renal Function Panel, Magnesium every 6 hours for 24-48 hours
  - CBC, coags, CMP daily
- Consult Neurocritical care team at admission
Other Considerations (all patients)

- For patients with documented or suspected ventricular fibrillation or ventricular tachycardia as initial arrest rhythm, consider Cardiology consultation to rule out arrhythmia syndrome
- Rehabilitation Medicine: consider consultation for assistance with tone, prognostication and/or transition of care out of the PICU

IMAGING

- Consider brain MRI as an aid for prognostication if clinical neurologic recovery is concerning
- If MRI brain is desired, do not obtain earlier than 72 hours after admission (wait an additional 48-72 hours if hypothermic arrest and/or if patient has undergone therapeutic hypothermia)
REFERENCES


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