

INCLUSION CRITERIA

Patients 30 days of age and older with a cardiac arrest lasting greater than 1 min with sustained ROSC

EXCLUSION CRITERIA

Infants less than 30 days of age

MEASURES

- Blood glucose obtained in ED
- Blood pressure cycle in ED
- Time from ED ROSC to PICU transfer

POST-CPR GOALS

- Achieve Minimum Blood Pressure Goal per Age
- Normoxia (SpO2 94-99%) *Cardiac pts may differ*
- Normocapnia (CO2 35-45), use pH if chronic hypercapnia/metabolic alkalosis, *Cardiac pts may differ*
- Normoglycemia (80-200 mg/dl)
- Monitor/treat seizures

RN PRIORITIES AFTER CPR

1. Stabilize blood pressure
2. Elevate head of bed 30 degrees
3. Monitor oxygen saturation
4. Monitor glucose control
5. Monitor temperature

Standard Monitoring:

Pulse ox, Urine Output, Telemetry, Continuous temperature probe (rectal or foley), End-tidal Co2

Return of Spontaneous Circulation (ROSC)

- **Activate PICU response**, prioritize PICU transfer
- Monitor BP closely, aggressively prevent **hypotension**, see *minimum BP goal by Age table*
- Elevate Head of Bed 30 degrees
- Utilize **ED Post Cardiac Arrest Order Set**

Immediately Post ROSC

- Cycle blood pressure every 3 mins until BP goals reached, then space to every 5 mins

SBP and MAP $\geq$ Goal?

No

Yes

- Consider rapid administration fluid bolus (max 2 post ROSC)
- Consider initiating epi infusion if hypotensive after fluid bolus

- Monitor and treat seizures
- Obtain point of care glucose, target glucose >80 mg/dl
- Obtain blood gas, targeting **PaCo2 35-45** (attempt to achieve normocapnia)
- Monitor end tidal closely

- Consider STAT head CT if neurologic exam asymmetrical or loss of brain stem reflexes (Do not delay treatment or transfer awaiting imaging)

Admit to PICU

Minimum Blood Pressure Goals by Age

Age	MAP	SBP
1 to 6 months	>45	>70
> 6 months – 2 years	>55	>80
> 2 years – 10 years	>65	>90
> 10 years	>75	>100

*Consider lower BP goals if severely depressed ventricular function or postoperative bleeding
*Consider higher BP goals if high central venous pressure

Components of Post-Cardiac Arrest Care	Check
Oxygenation and ventilation	
Measure oxygenation and target normoxemia 94%-99% (or child's normal/appropriate oxygen saturation).	☐
Measure and target $Paco_2$ appropriate to the patient's underlying condition and limit exposure to severe hypercapnia or hypocapnia.	☐
Hemodynamic monitoring	
Set specific hemodynamic goals during post-cardiac arrest care and review daily.	☐
Monitor with cardiac telemetry.	☐
Monitor arterial blood pressure.	☐
Monitor serum lactate, urine output, and central venous oxygen saturation to help guide therapies.	☐
Use parenteral fluid bolus with or without inotropes or vasopressors to maintain a systolic blood pressure greater than the fifth percentile for age and sex.	☐
Targeted temperature management (TTM)	
Measure and continuously monitor core temperature.	☐
Prevent and treat fever immediately after arrest and during rewarming.	☐
If patient is comatose apply TTM (32°C-34°C) followed by (36°C-37.5°C) or only TTM (36°C-37.5°C).	☐
Prevent shivering.	☐
Monitor blood pressure and treat hypotension during rewarming.	☐
Neuromonitoring	
If patient has encephalopathy and resources are available, monitor with continuous electroencephalogram.	☐
Treat seizures.	☐
Consider early brain imaging to diagnose treatable causes of cardiac arrest.	☐
Electrolytes and glucose	
Measure blood glucose and avoid hypoglycemia.	☐
Maintain electrolytes within normal ranges to avoid possible life-threatening arrhythmias.	☐
Sedation	
Treat with sedatives and anxiolytics.	☐
Prognosis	
Always consider multiple modalities (clinical and other) over any single predictive factor.	☐
Remember that assessments may be modified by TTM or induced hypothermia.	☐
Consider electroencephalogram in conjunction with other factors within the first 7 days after cardiac arrest.	☐
Consider neuroimaging such as magnetic resonance imaging during the first 7 days.	☐

Disclaimer: The clinical pathways are based upon publicly available medical evidence and/or a consensus of medical practitioners at Nemours Children's Health ("Nemours") and are current at the time of publication. These clinical pathways are intended to be a guide for practitioners and may need to be adapted for each specific patient based on the practitioner's professional judgment, consideration of any unique circumstances, the needs of each patient and their family, and/or the availability of various resources at the health care institution where the patient is located.

VERSION MANAGEMENT

- Version 1.0 (2/25/2025): Go Live.

Questions about this pathway should be directed to clinicalpathways@nemours.org.

AUTHORS & REFERENCES

Central Florida Authors: Robert Smith (Critical Care), Kamal Chavda (Emergency Medicine), Amit Patel (Emergency Medicine), Sandra Williams (Emergency Nursing)

Delaware Valley Authors: Jigar Chauhan (Critical Care), Maricar Diaz (Emergency Medicine, Simulation), Solomiya Veturs (Trauma Quality)

- Hong JM, Choi ES, Park SY. Selective Brain Cooling: A New Horizon of Neuroprotection. *Front Neurol*. 2022 Jun 20;13:873165. doi: 10.3389/fneur.2022.873165. PMID: 35795804; PMCID: PMC9251464.
- Jacobs SE, Berg M, Hunt R, Tarnow-Mordi WO, Inder TE, Davis PG. Cooling for newborns with hypoxic ischaemic encephalopathy. *Cochrane Database Syst Rev*. 2013 Jan 31;2013(1):CD003311. doi: 10.1002/14651858.CD003311.pub3. PMID: 23440789; PMCID: PMC7003568.
- Bettécourt AP, Gorman M, Mullen JE. Pediatric Resuscitation. *Crit Care Nurs Clin North Am*. 2021 Sep;33(3):287-302. doi: 10.1016/j.cnc.2021.05.005. Epub 2021 Jul 7. PMID: 34340791; PMCID: PMC8445069.
- Gardner KJ, Murphy S, Paris JJ, Lantos JD, Cummings BM. Controversy About Withdrawal of Postresuscitation Care After Cardiac Arrest. *Pediatrics*. 2020 Aug;146(2):e20194061. doi: 10.1542/peds.2019-4061. PMID: 32732263.
- Marino BS, Tabbutt S, MacLaren G, Hazinski MF, Adatia I, Atkins DL, Checchia PA, DeCaen A, Fink EL, Hoffman GM, Jeffries HL, Kleinman M, Kravitz JN, Licht DJ, Macrae D, Ravishankar C, Samson RA, Thiagarajan RR, Toms R, Tweddell JS, Tweddell JS, Wernovsky G; Council on Cardiovascular Disease in the Young; Council on Cardiopulmonary, Critical Care, Perioperative and Resuscitation; Council on Clinical Cardiology; Council on Cardiovascular Surgery and Anesthesia; and Emergency Cardiovascular Care Committee. Cardiopulmonary Resuscitation in Infants and Children With Cardiac Disease: A Scientific Statement From the American Heart Association. *Circulation*. 2018 May 29;137(22):e691-e782. doi: 10.1161/CIR.0000000000000524. Epub 2018 Apr 23. PMID: 29685887.
- Scholefield BR, Silverstein FS, Telford R, Holubkov R, Slonim BS, Meert KL, Christensen JR, Nadkarni VM, Dean JM, Moler FW. Therapeutic hypothermia after paediatric cardiac arrest: Pooled randomized controlled trials. *Resuscitation*. 2018 Dec;133:101-107. doi: 10.1016/j.resuscitation.2018.09.011. Epub 2018 Oct 3. PMID: 30291883; PMCID: PMC6361524.
- Topjian AA, de Caen A, Wainwright MS, Abella BS, Abend NS, Atkins DL, Bembea MM, Fink EL, Guerguerian AM, Haskell SE, Kligerman JI, Lasa JJ, Hazinski MF. Pediatric Post-Cardiac Arrest Care: A Scientific Statement From the American Heart Association. *Circulation*. 2019 Aug 6;140(6):e194-e233. doi: 10.1161/CIR.0000000000000697. Epub 2019 Jun 27. PMID: 31242751.
- Wiecek W, Meyer-Szary J, Jaguszewski M, Filipiak KJ, Cyran M, Smerka J, Gąsecka A, Ruetzler K, Szarpak L. Efficacy of Targeted Temperature Management after Pediatric Cardiac Arrest: A Meta-Analysis of 2002 Patients. *J Clin Med*. 2021 Mar 30;10(7):1389. doi: 10.3390/jcm10071389. PMID: 33808425; PMCID: PMC8037776.