PAEDIATRIC ACUTE CARE GUIDELINE	
Post Resuscitation Care	
Scope (Staff):	All Emergency Department Clinicians
Scope (Area):	Emergency Department

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Post Resuscitation Care

This refers to the period of time post return of spontaneous circulation and after resuscitation and prior to transfer for definitive care in a Paediatric Intensive Care Unit (PICU).

Background

- After return of spontaneous circulation, post arrest patients should be admitted and managed in a Paediatric Intensive Care Unit (PICU).
- Frequent clinical reassessment using the ABCD approach will detect deterioration or improvement in the patient's condition.
- The main goal of therapy is to maintain oxygenation and perfusion to vital organs to prevent secondary damage.

General

- A child who is successfully resuscitated from cardiac arrest typically suffers from multiple organ system problems resulting from hypoxia and ischemia and subsequent reperfusion.
- Management challenges of these children include acute lung injury (ALI, ARDS), post arrest myocardial dysfunction, hepatic and renal insufficiency, and neurologic injury.
- Post resuscitation management aims to achieve and maintain homeostasis to minimise secondary organ damage and optimise recovery.
- Management should be directed in a systematic (ABCD) approach

Management

Initial management

Airway

Confirm adequate endotracheal tube size and position by checking:

- For leaks
- Symmetrical chest movement and air entry
- Capnography (end tidal CO2)
- Chest X Ray

Breathing

Ventilation settings should be maintained to keep:

- Oxygen saturations > 95%
- pH > 7.30
- pCO2 35-40 mmHg

Circulation

Following resuscitation, patients will usually have poor cardiac output.
Ensure: **Adequate circulating volume**

- Adequate heart rate and rhythm
- Adequate blood pressure and perfusion
- Optimal oxygenation and ventilation
- Normal pH, electrolytes and blood sugar

Manage with:

- Fluid boluses
- Inotrope infusions
- Antiarrhythmics

Disability

Perform a rapid secondary survey including a brief neurological examination.
Minimise secondary brain injury:
- Maintain oxygenation and normocapnia (not hyperventilation)
- Optimise cerebral perfusion pressure (CPP) – optimise mean arterial pressure (MAP), may need to reduce intracranial pressure (ICP)
- Normalise pH, electrolytes
- Normoglycaemia (note: hyperglycaemia worsens cerebral outcome)

Reduce the metabolic requirements of the brain:
- Sedation (morphine and midazolam infusion)
- Pain control
- Seizure control

Kidneys:
- maximise renal perfusion and renal tubular patency

Optimise oxygenation and circulation:
- Maintain urine output > 1 mL/kg/hour (use frusemide if necessary)

Coagulation disturbances result from hepatocellular damage and disseminated intravascular coagulation (DIC):
- Replace clotting factors as necessary by giving FFP

Exposure

Evidence shows post arrest hypothermia (32 – 34°C) may improve neurological outcome in adults after VF arrest but there is insufficient data in paediatric arrests. However, current recommendations are if the core temperature is:
- < 33°C then actively rewarm to 34°C
- 34 – 37.5° C then no active warming, control shivering with sedation +/- paralysis
- > 37.5°C commence active cooling

Further management

Monitoring

All post arrest patients should have the following monitoring prior to transfer to PICU:

- ECG monitor
- Pulse oximeter
- Core temperature
- Blood pressure

- Urine output
- Capnography
- Regular blood gases

Consider:

- Invasive blood pressure (arterial line)
- Central venous pressure
- Intracranial pressure monitoring

Follow up investigations

Post resuscitation investigations should include:

- Chest X-Ray
- Blood gases
- Full blood count
- Electrolytes, Urea, Creatinine
- Blood Glucose
- Coagulation profile
- Group & Hold
- 12 lead ECG

Medications

DRUG	INDICATION	DILUTION	DOSE RANGE	COMMENTS
Morphine	• Analgesia • Sedation	1mg/kg to make a combined total volume of 50ml of 5% dextrose or 0.9% saline 1mL/hr = 20 **micrograms/kg/hour**	10-40 **micrograms/kg/hour** Rate: 0.5 – 2 mL/hr	• Opioid analgesic • No amnesia • Respiratory depression • Hepatic metabolism • Histamine mediated vasodilatation may cause hypotension
Midazolam	• Sedation	2.5mg/kg to make a combined total volume of 50mL of 5% dextrose or 0.9% saline 1mL/hr = 50 **micrograms/kg/hour**	50 – 200 **micrograms/kg/hour** Rate: 1 – 4 mL/hr	• Benzodiazepine • Anxiolysis, amnesia, anticonvulsant • Good cardiovascular stability • Short half life

Adrenaline	• Maintenance of adequate post-arrest perfusion in patients unresponsive to fluid resuscitation. • Symptomatic bradycardia not responding to oxygen and ventilation	0.15mg/kg to make a combined total volume of 50mL of 5% dextrose or 0.9% saline 1mL/hr = 0.05 **micrograms/kg/minute**	0.05 – 0.5 **micrograms/kg/minute** Rate: 1 – 10 mL/hr	• Inotrope, chronotrope • Vasodilator at low dose • Pressor at higher doses • Beware tachyarrhythmias and hypertension • Local tissue necrosis if extravasation occurs
Noradrenaline	• Maintenance of adequate post-arrest perfusion in children with low systemic vascular resistance, not responding to fluid resuscitation (eg. Septic or anaphylactic shock)	0.15mg/kg to make a combined total volume of 50mL of 5% dextrose or 0.9% saline 1mL/hr = 0.05 **micrograms/kg/minute**	0.05-0.5 **micrograms/kg/minute** Rate: 1 – 10 mL/hr	• Vasopressor • Local tissue necrosis if extravasation occurs • Consider combining with low-dose dopamine to improve renal and splanchnic perfusion
Dopamine	• Maintenance of adequate post-arrest perfusion in patients unresponsive to fluid resuscitation • Characterised by low systemic vascular resistance	15mg/kg to make a combined total volume of 50mL of 5% dextrose or 0.9% saline 1mL/hr = 5 **micrograms/kg/minute**	5 – 20 **micrograms/kg/minute** Rate: 1 – 4 mL/hr	• Inotrope, chronotrope • Renal and splanchnic vasodilator at low dose, pressor at high dose • Beware hypertension and tachyarrhythmias • Hypovolaemia should be corrected before using • Preferably via central line
Dobutamine	• Inotropic support in normovolaemic patients following cardiac arrest due to a primary cardiac cause (eg. Myocarditis)	15mg/kg to make a combined total volume of 50mL of 5% dextrose or 0.9% saline 1mL/hr = 5 **micrograms/kg/minute**	5 – 20 **micrograms/kg/minute** Rate: 1 – 4 mL/hr	• Inotrope • Vasodilator (mild) • Dobutamine can be given through a peripheral lin

Tags

adrenaline, airway, arrest, breathing, circulation, critical, disability, dopamine, doputamine, epinephrine, exposure, icu, infusion, infusions, inotrope, inotropes, inotropic, lidocaine, lignocaine, noradrenaline, norepinephrine, oxygen, oxygenation, peep, PICU, pip, post, Post-resuscitation care, resus, resuscitation, shock, transport, ventilation, ventilator

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