

## Paediatric Resuscitation, Stabilisation Retrieval and Transfer

<b>Key Document code:</b>	WAHT-TP- 054	
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<b>Approved by:</b>	Paediatric Quality Improvement meeting	
<b>Date of Approval:</b>	9 <sup>th</sup> February 2024	
<b>Date of review:</b> This is the most current document and should be used until a revised version is in place	9 <sup>th</sup> February 2027	

### Key Amendments to this guideline

Date	Amendment	By:
14.06.10	Extended for a further period without amendment to allow for review.	Dr G Sellors
27.10.10	No amendments to guideline	Dr M McCabe
27.12.12	Change to KIDS (Kids Intensive Care and Decision Support). Amended details – training, equipment etc. from KIDS (see appendices)	Dr M McCabe
28.03.14	Addition of telephone numbers for ECMO and Burns Unit	D Picken
19 <sup>th</sup> Nov 2020	Document extended for 1 year	Dr J West/Paediatric QIM
26 <sup>th</sup> March 2021	Document approved with no amendments	Paediatric Guideline Review Day Meeting
9 <sup>th</sup> Feb 2024	Minor amendments to Document	Paediatric Guideline review day meeting

## Paediatric Resuscitation, Stabilisation, Retrieval and Transfer

### Introduction

The resuscitation and stabilisation of ill and injured children is a stressful affair for parents and staff alike. The purpose of this guideline is to describe a process that may be followed in order to help staff to manage these patients. It concentrates on the practical aspects of who should manage the patients and where, rather than on the clinical management of specific conditions. It includes contact details of the West Midlands Paediatric Retrieval Service (WMPRS) who can offer advice and coordinate ongoing care for the patients in further specialised paediatric centres.

### Details of Guideline

1. Resuscitation and stabilisation will generally commence where the child presents.
2. First line equipment and drugs are to be found on the nearest paediatric resuscitation trolley.
3. In line with trust policy, Resuscitation Council & APLS guidelines should be followed.
4. At the earliest opportunity, the duty consultant paediatrician, consultant anaesthetist (ICCU on call or general on call) and senior paediatric nurse should be informed and should attend.
5. When practical, the child should be transferred to one of the following areas where stabilisation can continue: Paediatric ward assigned HDU side room, A&E resuscitation room, operating theatre suite or neonatal unit (if clinically appropriate).

6. The advanced paediatric resuscitation equipment and portable ventilator should be brought to the patient. This includes equipment for further resuscitation and stabilisation- lines, transducers, catheters and drains etc.

Location of equipment: Alex: Theatre recovery.

TC: Theatre recovery.

WRH: ICCU.

7. Printed guidelines, inotrope and infusion doses are available in the areas listed above and with the advanced equipment.

Current Kids Clinical Guideline Drug Dose Calculator is available via [www.kids.bch.nhs.uk](http://www.kids.bch.nhs.uk)

Decisions about the child's need for Paediatric Intensive Care will be taken in discussion with the PICU consultant, local pediatrician and anaesthetist.

8. Further management will depend on PICU bed and retrieval team availability and the urgency for transfer. This should be done in consultation with KIDS (Kids Intensive Care and Decision Support <http://kids.bch.nhs.uk/>

Phone - 0300 200 1100

KIDS is a children's acute retrieval and advice service which specialises in the management of critically ill children requiring Intensive Care in the Midlands.

They operate from the Paediatric Intensive Care Units of Birmingham Children's Hospital and the University Hospital of North Staffordshire, and are a skilled Paediatric Intensive Care team available 24 hours a day to assist in the treatment of critically ill children, both before and during transfer to intensive care.

#### **Useful telephone numbers:**

ECMO - Glenfield Hospital 0116 256 3288

Burns Unit - BCH 0121 333 8964

## **RETRIEVAL REFERRAL PROCESS**

### **Step 1 – Phone call to the KIDS NTS call centre**

**Phone number: 0300 200 1100**

Any clinician can call the KIDS Call Centre 24 hours a day.

Calls are free within the UK.

The KIDS referral documentation can be found **here**. It may be useful to refer to this document when referring a patient.

**All referral calls should come through to this number, and not the individual PICUs.**

All telephone calls are recorded for audit, training and patient record purposes.

### **Step 2 – Initial details taken by the call centre operator**

Reason for referral Name of child Child's date of birth Child's address Child's weight Child's GP name  
Child's GP address

Referring doctor's name Referring consultant's name Referring doctor's contact number Referring  
hospital and ward

Clinician preference of receiving PICU

### **Step 3 – Conference call with KIDS consultant**

The call centre operator will call back the referring clinician and connect them onto a conference call with the KIDS duty consultant. Any other relevant clinicians can also be added to the conference call.

### **Step 4 – Management plan**

The KIDS consultant will give advice and agree an initial management plan with the referring clinicians. When a decision is made to retrieve the child, KIDS will mobilise a retrieval team.

### **Step 5 – Further advice**

Whilst the retrieval team is travelling to the referring hospital, the KIDS consultant can give further advice regarding the patient's management if required.

### **Step 6 – PICU bed found for the patient**

A paediatric intensive care bed will be found and the KIDS consultant will liaise with the receiving intensive care unit's consultant.

### **Step 7 – Referring hospital updated with progress**

KIDS contacts the referring hospital to update them that a PICU bed has been found for the child. You will not be required to find a local PICU bed; this will be undertaken by the coordination centre who will be monitoring local intensive care capacity continuously.

Children who require a primary transport, for a time critical transportation, such as for neurosurgery should still be transported to PICU by the referring hospital. Please however still refer this child to the coordination centre in order to receive paediatric intensive care advice, access specialized services, such as neurosurgery, and for the PICU bed allocation process to take place.

#### **A. Bed and Retrieval team available**

- Stabilise.
- Await retrieval.
- Management to be jointly coordinated by consultant pediatrician and consultant anaesthetist.
- If arrival of team likely to be delayed, continue stabilization in operating theatres, A&E resuscitation room or neonatal unit.

#### **B. Time critical transfer**

When the time for a retrieval team to arrive to transport the child would involve delay in the child's treatment that would outweigh the extra risks associated with transfer by potentially less- experienced local staff. e.g. intracranial haematoma.

*Or*

#### **C. Bed available but no retrieval team available**

Joint discussion between KIDS, PICU and referring team needed to agree on transfer by local staff.

- Transfer equipment (ventilator and transfer bag) located on ICCU.
- Decisions about the most appropriate staff to transfer the patient will be taken jointly by consultant anaesthetist, paediatrician and senior nurse.
- Transferring clinician should be trained in paediatric resuscitation, airway skills and critical care and have clinical experience of such transfers. Most commonly, this will be a senior anaesthetic SpR who has done a paediatric module or a consultant anaesthetist, but could be a senior paediatric SpR with PICU experience(if available).

The nurse escort should similarly have experience of transfers and assistance with airway management and would ordinarily be either an anaesthetic nurse/ODP, or senior nurse from the paediatric ward or A&E.

## Appendix 1 Paediatric Resuscitation Training and Updating

PICS does not endorse any particular Course in preference, whether European Paediatric Life Support ('EPLS' - UK Resuscitation Council), or the Advanced Life Support Courses ('APLS' – Advanced Life Support Group), though the undoubted value of such courses is recognised. Paediatric Resuscitation training should be tailored for individuals' functions and working environment, taking into account existing background knowledge & skills

<i>Staff Group</i>	<b>Appropriate Minimum Training</b>
<b>MEDICAL STAFF</b>	
Consultant who may be on call for acute paediatrics, ED, ICU/Anaesthesia or PICU	Advanced Life Support
ST3-8 in acute paediatrics, ED, ICU/Anaesthesia or PICU	Advanced Life Support
ST1-2 in acute paediatrics, ED or ICU/Anaesthesia	One day Paediatric Life Support
Medical staff (all grades) caring for children in settings other than acute paediatrics and ED	One day Paediatric Life Support
<b>NURSING STAFF</b>	
Retrieval team	Advanced Life Support
Nominated Lead Nurse for an area such as HDU/ICU	Advanced Life Support
Senior Nurses on PICU/Theatres & Recovery	Advanced Life Support
Nurses in Paediatrics, ED, ICU or PICU/Theatres & Recovery	One-day Paediatric Life Support
Health care assistants	Basic Life

### Notes:

1. Updates: Basic Life Support should be updated yearly. Advanced Resuscitation skills should be refreshed every three/four years. Please also refer to the recommendations of any providing agencies.
2. The expected level of Advanced Life Support training can be met by courses such as APLS or EPLS. However, more may be expected from already highly qualified practitioners, so training should be tailored to the individual and identified by formal yearly Appraisal. For example, Simulation Training & Clinical Attachments may be required
3. Paediatric Life Support training (Basic or One-day, according to the individual's role) should be undertaken within the first 20 days of working with acutely ill children. This training should be transferable between posts (and Hospitals). Advanced Life Support should be of at least 8 hours duration in total and include both lectures in recognition of ill children and practical skills training in defibrillation, basic airway management and intraosseous access. Assessment of competence should be undertaken and evidence of competence should be documented

## Appendix 2 - Drugs & Equipment for Resuscitation and Stabilisation Areas

The *KIDS* (Kids Intensive Care and Decision Support) website [www.kids.bch.nhs.uk](http://www.kids.bch.nhs.uk) should be checked for any updates to the information detailed in this appendix. *KIDS* is the new name for the West Midlands Paediatric Retrieval Service.

Adenosine	3 mg/ml
Alprostadil (prostaglandin E1)	500 micrograms/ml
Aminophylline	25 mg/ml
Amiodarone	50 mg/ml
Antibiotics customised to local microbiology	
Atracurium	10 mg/ml
Atropine sulphate	600 micrograms/ml
Budesonide	Nebuliser solution
Calcium chloride	10%
Calcium gluconate	10%
Chlorphenamine	10 mg/ml
Dexamethasone	4mg/ml
Diazepam (intravenous)	5 mg/ml
Diazepam (rectal)	5 mg and 10 mg
Dobutamine	5 mg/ml
Dopamine	40 mg/ml
Epinephrine (adrenaline)	1:1000
Epinephrine (adrenaline)	1:10000
Flecainide	10 mg/ml
Flumezanil	100 micrograms/ml
Furosemide	10 mg/ml
Hydrocortisone	100 mg/ml
Insulin (soluble)	100 units/ml
Ketamine	10 mg/ml, 50 mg/ml
Lignocaine 1%	10 mg/ml
Lorazepam	4 mg/ml
Mannitol	10% and 20%
Midazolam	5 mg/ml
Morphine	20 mg/ml
Naloxone	400 micrograms/ml
Paraldehyde	Enema
Phenobarbitone	15 mg/ml
Phenytoin sodium	50 mg/ml
Propofol	10 mg/ml. 20mg/ml
Propranolol	1 mg/ml
Rocuronium	10 mg/ml
Salbutamol intravenous solution	1 mg/ml
Salbutamol or terbutaline	Nebuliser solution
Saline 2.7%	100 ml bags
Sodium bicarbonate	8.4%
Suxamethonium	50 mg/ml
Thiopental sodium	500 mg vials

### Equipment List

	All areas		HDU/GICU	
	Essential	Desirable	Essential	Desirable
<b>General Items</b>				
Dry White board and markers	•		•	
Advanced Paediatric Life Support algorithms	•		•	
Organized emergency trolley	•		•	
Paediatric Drug Dose Guide	•		•	
Weighing scales	•		•	
Heating source (for infant warming)	•		•	
Access to cold packs (for cooling)				
Clock (with timer)	•		•	
<b>Monitoring Equipment</b>				
Electronic monitoring with: <ul style="list-style-type: none"> <li>• ECG monitor</li> <li>• Pulse oximeter (adult / paediatric / neonatal probes)</li> <li>• Noninvasive blood pressure monitoring (infant, child, adult cuffs)</li> <li>• Rectal and esophageal thermometer probe(28–42°C)</li> <li>• Invasive arterial and central venous pressure transducers &amp; connections</li> <li>• Capnography with paediatric and adult adapters</li> </ul>	•		•	
Otoscope, ophthalmoscope, stethoscope	•		•	
Defibrillator with paediatric paddles (0-400 joules)				
Arterial / capillary blood glucose monitor	•		•	
Access to blood gas machine	•		•	
Access to 12 lead ECG	•		•	

	All areas		HDU/GICU	
	Essential	Desirable	Essential	Desirable
<b>Airway Control/Ventilation Equipment</b>				
Bag-valve-mask device: paediatric (500 mL) & adult (1000 / 2000 mL) with oxygen reservoir bags	•		•	
Infant, child, and adult masks	•		•	
Oxygen delivery device with flow meter and Schrader Valve Outlet	•		•	

Clear oxygen masks, standard and non-rebreathing (neonatal, infant, child, adult)	•		•	
Nasal cannulae (infant, child, adult)	•		•	
Oral airways (sizes 0–5)	•		•	
Suction devices-catheters 6–14 FG Yankauer-tip	•		•	
Nasal airways (infant, child, adult)	•		•	
Nasogastric tubes (sizes 6-16 fr)	•		•	
Laryngoscope handles (large/small) Blades: <ul style="list-style-type: none"> <li>• Macintosh 1,2,3,4</li> <li>• Miller 00, 0 and 1</li> <li>• Robert Shaw 1</li> </ul>	•		•	
Endotracheal tubes + tape for securing: uncuffed (2.5-5.5), cuffed (3.0-9.0)	•		•	
Introducer Stylets for endotracheal tubes (neonatal, paediatric & adult)	•		•	
Lubricant Jelly, water soluble	•		•	
Magill forceps (large and small)	•		•	
Laryngeal masks (size 0–3)	•		•	
Bougies (neonatal, paediatric & adult)		•		•
Tracheostomy tubes (Sizes 3-6mm ID)		•		•
Oxygen / Air Blender blender	•		•	
Mechanical Ventilator/s (Infant to Adult)	•		•	
Chest drain set	•		•	
Cricoidotomy set	•		•	
<b>Vascular Access</b>				
Butterflies (19–25 gauge)	•		•	
Needles (18–27 gauge)	•		•	
Intraosseous needles / EZ IO	•		•	
Catheters for intravenous lines (16–24 gauge)	•		•	

	All areas		HDU/GICU	
	Essential	Desirable	Essential	Desirable
IV administration sets and extension tubing with calibrated chambers	•		•	
Volumetric Fluid Pumps	•		•	
Syringe drivers	•		•	
I.V. fluids	•		•	



Fluid Administration Warming Device		•	•	
Lumbar puncture set		•	•	
Urinary catheters: Foley 6–14 Fr	•		•	
Fracture immobilisation	•			•
Cervical Collar (hard) Various Sizes	•		•	
Head blocks & Tape	•			•
Femur & Pelvic splint	•			•
Extremity splints		•		•

## References

WMQRS – Care of Critically ill child 2012