The Shrewsbury and Telford Hospital NHS Trust

PICU Transfer V8

Version 8

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Comments	:	References to SaTH Guidelines in the text pertain to the latest version of the Guideline on the intranet. Printed copies may not be the most up to date version.

Version	Implementation Date	History	Ratified By	Full Review Date
1	01.08.99	New guidance		Aug 2002
2	18.06.02	Full review		June 2005
2.1	19.03.03	Minor amendments		June 2005
3	06.12.05	Full review		Dec 2008
4	Jan 2007			Jan 2010
5	May 2010			May 2013
6	19.06.12		Anaesthetics Clin Gov Group	June 2015
6.1	07.08.12	Minor amendments	Anaesthetics Clin Gov Group	June 2015
7	10.04.15	Full review following service reconfiguration	Anaesthetics Clin Gov Group Paediatric Gov	April 18
8	29.08.18	Full review	Clinical Lead, Guideline Leaad	29.08.21

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1. Introduction

1.1 Terminology has moved away from “HDU and Paediatric Intensive Care (PIC)”, to instead describe units capable of delivering 3 levels of Paediatric Critical Care:

Level 1 PCCU	All hospitals that admit children should be able to deliver Level 1 PCC in a defined Critical Care area. The Royal Shrewsbury Hospital and Princess Royal Hospitals are Level I PCCUs.
Level 2 PCCU	A more limited number of hospitals delivering defined additional PCC
Level 3 PCCU	Hospitals capable of managing severely ill children within a Paediatric Intensive Care Unit (PICU)

As Level 1 PCCUs, both the SaTH acute hospital sites will also be expected to initiate PCC for severely ill and injured children prior to transfer to a Level 2 or 3 unit should the need arise.

It is the intervention and support that a child requires that defines the Level of PCC – see Appendix 2

1.2 Children are not normally admitted to AITU at RSH or PRH. Refer to separate guideline “Continuing Paediatric Critical Care, including Admission to Adult Intensive Care”

1.3 A child that has required resuscitation and stabilisation in RSH ED would normally be retrieved and transferred to a Level 3 PCCU by the BCH-based KIDS Team. Children presenting to RSH ED who have only Level 1 PCC needs may be transferred to PRH Children’s Ward for ongoing care, but will still require KIDS discussion beforehand, and must follow “Transfer of Children” guideline recommendations.

2. Abbreviations

PCC(U)	Paediatric Critical Care (Unit)
AITU	Adult Intensive Care Unit
KIDS	Kids Intensive Care & Decision Support
BCH	Birmingham Children’s Hospital
ED	Emergency Department

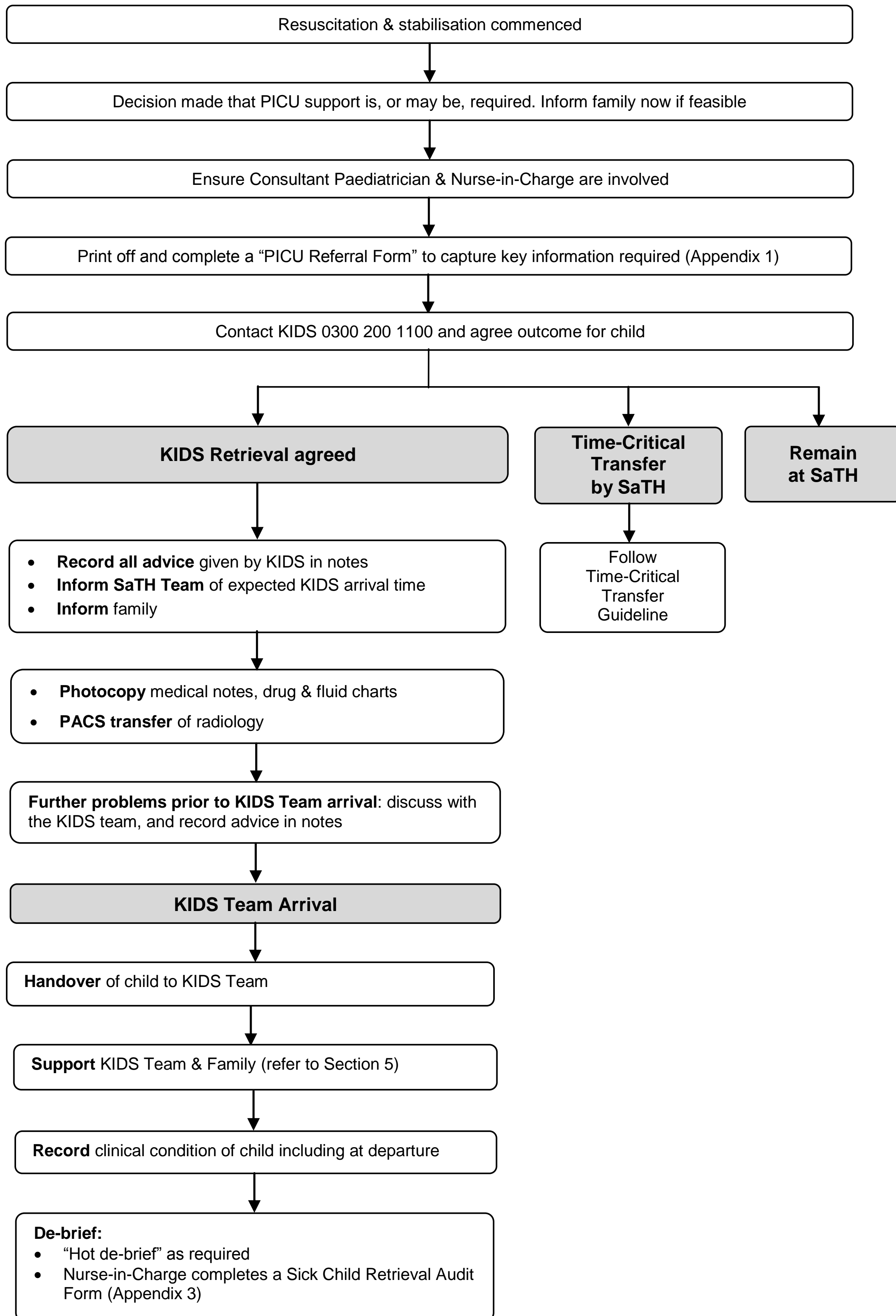
3 Patient Groups

3.1 Children are defined as age up to 16 years.

3.2 Patients age 16 years and above requiring intensive care unit support will normally be admitted to an AITU. Children age 16 years and over who are still under the care of the paediatric service, and with specific needs best delivered by a Level 3 PCCU are included in this guideline.

4. Key Steps Summary

The below pathway is a guide to the Transfer of a child to a PICU:



5. Communication & Responsibility Sharing

5.1. Consultant Paediatrician needs to be involved (duty or on call) from the outset.

5.2. Consultant Anaesthetist on call needs to be involved for any child requiring airway support

5.3. The senior paediatric nurse for Children's Ward needs to be informed at the outset for all critically ill or injured children, at both PRH and RSH sites

5.4. Contact KIDS (Kids Intensive Care and Decision Support, on 0300 200 1100) and discuss all critically Ill or injured children, or for clinical uncertainty over management or transfer (see also "Transfer of Children guideline). KIDS can:

- give clinical advice and support
- coordinate communication with PICU and relevant clinical specialities e.g. neurosurgery
- provide PICU retrieval

5.5. Ensure all relevant information is available for KIDS referrals – use Form Appendix 1

5.6. Ensure parents/carers are fully informed of all events, clinical problems and need to for transfer to a PICU

5.7. Copies of medical notes, drug and fluid charts and radiological investigations to be made available to PICU retrieval team.

5.8. Clinical responsibility for a child becomes shared when a referral is made to the KIDS Team, as depicted by the graph illustration below. New problems that arise, or significant changes in the child's condition should be communicated to the KIDS Team prior to their arrival, and advice taken. After the child has been retrieved the local SaTH Team remain responsible for communicating important results, and to support the family

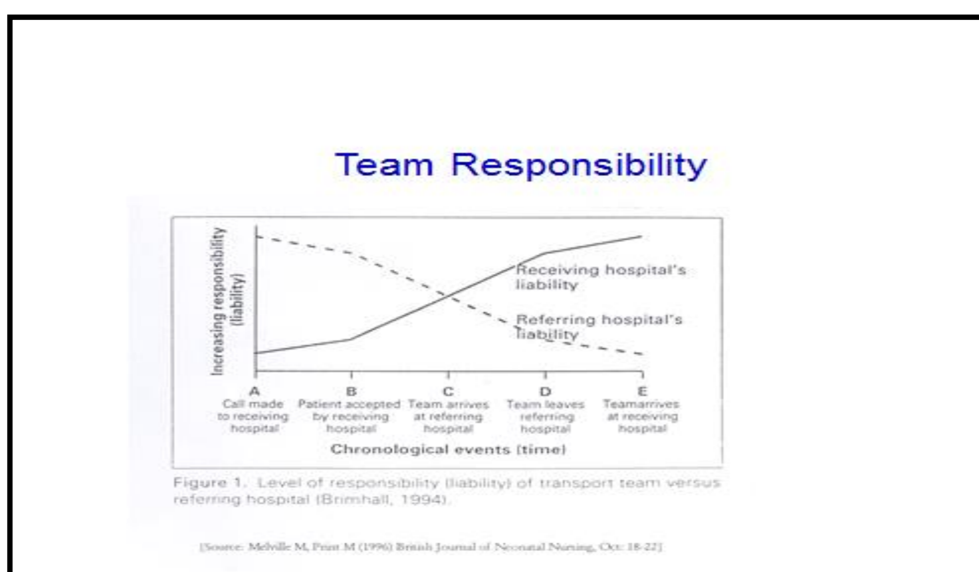


Figure 1. Level of responsibility (liability) of transport team versus referring hospital (Brimhall, 1994).

[Source: Melville M, Print M (1996) British Journal of Neonatal Nursing, Oct: 18-22]

6. Resuscitation & Stabilisation

It is the responsibility of the SaTH Team to resuscitate and stabilise critically ill and injured children. It is not appropriate defer important interventions whilst waiting for a KIDS Retrieval Team to arrive. Print out and refer to KIDS drug calculator available from: http://kids.bwc.nhs.uk/kids-nts-clinical-guidelines/

APLS principles should be adhered to, including:

6.1. AIRWAY

Ensure ETT is correct size
- internal diameter: “age/4 + 3.5” for cuffed & “age/4 + 4” for non-cuffed tubes
- tube length: age/2 + 12 cms oral, & age/2 + 15cms nasal tubes

Induction agent to be discussed with KIDS, time-allowing
Insert NGT and leave on free drainage (OGT if neurosurgical patient)
CXR shows ETT at mid-trachea and NGT below diaphragm
C-spine immobilised if trauma victim

6.2 BREATHING

Pulse oximetry and capnography monitoring to guide adequate ventilation
PaCO2 4.5-5.3 if neurosurgical case
Co2, tidal volume and oxygen saturation targets discussed with KIDS consultant

6.3 CIRCULATION

2 or more peripheral IV lines
ECG and blood pressure monitoring
Central line and arterial line if inotropic support required and sufficient time
Remember inotropes and vasopressors can be given through well sited I/O access
Hemodynamic parameters discussed with KIDS consultant
Consider volume expansion, e.g. 10ml/kg boluses 0.9%NaCl for trauma, 20ml/kg for medical shock, and 4.5% albumin for meningococcemia after the initial bolus.
Maintenance fluid as discussed with KIDS consultant
If neurosurgical patient, also: request cross-match (aim Hb >100), aim for normovolemia and avoid hypotension

6.4 DISABILITY AND OTHER MANAGEMENT

Maintain normothermia (36-37 ^{o}C)
Maintain normal glucose
Keep adequately sedated with Morphine/Midazolam (see PICU drugs calculator in this chapter of guidelines under “useful documents”)
Consider muscle relaxant once adequately sedated
Urinary catheterisation unless contraindicated
If neurosurgical patient: 15 min neuro-obs; CT scan in discussion with neurosurgeon/KIDS; phenytoin 18mg/kg over 20 mins if seizures; maintain plasma Na >140mmol; possible hyper-osmolar therapy in discussion with neurosurgeon/ KIDS; secondary survey if trauma

7. Equipment & Personnel

In most circumstances the KIDS team will be undertaking the transfer and so are responsible for this. In exceptional circumstances (for example time-critical transfers or when the KIDS team have no capacity), SaTH staff will be responsible. Please refer to the separate PICU Time-Critical Transfer Guideline.

8. Time Critical Transfers

For children requiring a time-critical transfer refer to the separate PICU Time-Critical Transfer Guideline.

9. Audit & De-brief

For every child requiring PICU retrieval there should be:

- Completion of a Sick Child Retrieval Audit Proforma, led by the Nurse-in-Charge, with support from the lead paediatrician (Appendix 3)
- Consideration of a "hot debrief" shortly after the child has been retrieved, involving personnel involved

10. Training

10.1. Personnel escorting patients should have training in transfer and resuscitation of children. Refer to the "Transfer of Children" guideline for further information

10.2. On induction staff will receive training on Paediatric Guidelines access and content

11. References

This guideline has been prepared with reference to:

1. http://kids.bch.nhs.uk/
2. NCEPOD Surgery in children: Are we there yet? 2011
3. Royal College of Anaesthetists: Raising the standard: a compendium of audit recipes. Second edition 2006. Pp 220-225
4. Royal College of Anaesthetists: Guidelines for the provision of anaesthetic services, 22nd April 2010

12. Appendices

Appendix 1 KIDS (PICU) Referral Form
Appendix 2 PCC Level 1 and 2 Clinical Interventions
Appendix 3 Sick Child Retrieval Audit Form

APPENDIX 1: KIDS (PICU) Referral form

KIDS Referrals		Date		Time	

PATIENT DETAILS		REFERRER	
First Name(s)		Referring Doctor	
Surname		Hospital	
DOB		Ward	
Weight		Consultant	
GP Name & Address		Contact no. given	

REASON FOR REFERRAL & RELEVANT HISTORY

ALLERGIES, MEDICATIONS, IMMUNISATIONS (INCL. TETANUS)

STATUS AT REFERRAL

AIRWAY & C-SPINE	
☐ CLEAR	DETAILS
☐ COMPROMISED	
☐ INTUBATED	SIZE, ROUTE, LENGTH, CUFFED
☐ BEING INTUBATED	
☐ TRACHEOSTOMY	
☐ COLLAR	☐ BLOCKS & TAPE

BREATHING						
☐ VENTILATED		PIP/ΔP		SPO2	
☐ SV (AIR/O2 ……….)		PEEP		INSP TIME	
☐ CPAP		FiO2		EXP TIME	
☐ BIPAP		MAP		NITRIC ppm	
☐ HFOV		RR/HZ		OXY INDEX	
COMMENTS					

CIRCULATION			
OBSERVATIONS		FLUID BOLUSES (ML/KG)	
HR		COLLOID	
BP	/	CRYSTALLOID	
MEAN BP		BLOOD	
CAP REFILL		FFP / CRYO	
U/OUTPUT		MAINTENANCE	
INOTROPES		ACCESS	
		☐ PERIPHERAL	
		☐ IO	
		☐ CENTRAL	
		☐ ARTERIAL	

BLOOD GASES				
TIME				
SAMPLE	ART/VEN /CAP	ART/VEN /CAP	ART/VEN /CAP	ART/VEN /CAP
pH				
pCO2				
pO2				
HCO3				
BE				
LACTATE				
GLUCOSE				
Na^+				
K^+				

NEUROLOGY						
GCS	E	M	V	PUPILS REACTION	R	L
A	V	P	U		R	L
☐ SEDATED				☐ 3% SALINE	☐ MANNITOL	
☐ PARALYSED				☐ NG TUBE	☐ OG TUBE	

INFECTION		
TEMP	CORE	PERIPH
ANTIBIOTICS		
CULTURE RESULTS		

RETRIEVAL INFORMATION REQUIRED

BLOOD RESULTS			
DATE &TIME			
HB			
WCC (NEUT)			
PLATELETS			
Na^+			
K^+			
UREA			
CREATININE			
INR/PT			
APTT			
FIBRINOGEN			
AST			
BILIRUBIN			
ALP			
CRP			
BLOOD GROUP			
CROSS MATCH			
OTHER			

IMAGING	PLAIN X-RAYS	CT/US/MRI
DATE & TIME		
HEAD		
CHEST		
SPINE		
ABDOMEN		
PELVIS		
LIMBS		

☐ DOES RADIOLOGY NEED TO BE TRANSMITTED TO WMPRS?

ADVICE PROVIDED (SUMMARY OF DISCUSSION)

WORKING DIAGNOSIS	
CO-MORBIDITY	

FINAL OUTCOME OF REFERRAL

TRANSFER ACCEPTED	NO PICU TRANSFER	OTHER TRANSFER ARRANGED
☐ WMPRS TEAM MOBILISED	☐ ADVICE ONLY	☐ NEONATAL TRANSPORT
☐ OUT OF REGION	☐ CANCELLED BY SaTH – stayed in SaTH	☐ HDU TRANSFER
	☐ PATIENT DIED DURING REFERRAL	☐ ELECTIVE TRANSFER AT OTHER TIME
	☐ WARD TRANSFER	☐ TIME CRITICAL TRANSFER BY SaTH
	☐ FOR PALLIATIVE CARE	
	☐ TEAM NOT AVAILABLE	

Appendix 2: PCC Level 1 and 2 Clinical Interventions

Level 1 PCC Interventions

Oxygen therapy AND pulse oximetry AND ECG (electrocardiography) monitoring (includes Nasal High Flow Oxygen Therapy)
Arrhythmia requiring intravenous anti-arrhythmic
Diabetic Ketoacidosis requiring continuous infusion of insulin
Severe Asthma requiring intravenous bronchodilator therapy
Reduced conscious level (Glasgow Coma Scale (GCS) 12 or below) AND hourly (or more frequent) GCS monitoring
Upper airway obstruction requiring nebulised adrenaline
Apnoea

Level 2 PCC interventions:

Any of the above where there is a failure to respond to treatment as expected and/or requirement for intervention persists >24 hours
Cardiopulmonary resuscitation (CPR) in past 24 hours
Nasopharyngeal airway
Acute non-invasive ventilation including continuous positive airway pressure (CPAP) and Bi-level positive airway pressure (BIPAP)
>80ml/kg fluid bolus in 24 hours
Status epilepticus requiring treatment with continuous intravenous (IV) infusion e.g. Midazolam
Arterial line
Central venous pressure monitoring
Epidural
Care of tracheostomy (first 7 days of admission)
Inotropic/vasopressor treatment
Acute cardiac pacing
Intravenous thrombolysis
Acute renal replacement therapy (CVVH (Continuous veno-venous haemofiltration) or HD (haemodialysis) or PD (peritoneal dialysis)
ICP (intracranial pressure) monitoring or EVD (external ventricular drain)
Exchange transfusion
Plasma Exchange
MARS (liver) therapy
Invasive ventilation of the Long Term Ventilated Child via a tracheostomy

Appendix 3: Sick Child Retrieval Audit Form

KIDS Retrieval Review

Date of retrieval

Time of departure

Name

Unit no.

DOB

Reason(s) for KIDS Retrieval

1 ……………………………………………………………………………………………

2 ……………………………………………………………………………………………

3 ……………………………………………………………………………………………

What went well?

Clinical ……………………………………………………………………………………

……………………………………………………………………………………

Staffing ……………………………………………………………………………………

……………………………………………………………………………………

Equipment ……………………………………………………………………………………

……………………………………………………………………………………

Transport ……………………………………………………………………………………

……………………………………………………………………………………

Other …………………………………………………………………… (& continue overleaf)

Problems Encountered?

Clinical **No / Yes** ……………………………………………………………………………

……………………………………………………………………………

Staffing **No / Yes** ……………………………………………………………………………

……………………………………………………………………………

Equipment **No / Yes** ……………………………………………………………………………

……………………………………………………………………………

Transport **No / Yes** ……………………………………………………………………………

……………………………………………………………………………

Other **No / Yes** ……………………………………………………………(& continue overleaf)

Completed by: Name ……………………… Signature ……………………… Role ………………………

Send completed form to: Emma Dodson, Matron, W&C Centre