

SCHEDULE 2 – THE SERVICES

A. Service Specifications

Service Specification No.	E07/S/a
Service	Level 3 - Paediatric Critical Care (PCC)
Commissioner Lead	
Provider Lead	
Period	12 Months
Date of Review	

1. Population Needs

1.1 National/local context and evidence base

Paediatric Critical Care (PCC) services look after children and young people whose conditions are life-threatening and need constant close monitoring and support from equipment and medication to restore and/or maintain normal body functions. The definitions of the full range of Paediatric Critical Care is provided below.

This specification specifically covers care provided in Level 3 Paediatric Critical Care (PCC) units previously known as PICUs, (Paediatric Intensive Care Units) which are usually located in tertiary centres or specialist hospitals which provide all 3 levels of PCC. However PCC level 3 units will care for patients across the whole range of PCC levels 1 – 3.

PCC level 3 units provide care for children requiring intensive care and monitoring, including medically unstable patients requiring intubation or ventilation, single or multi-organ support, and continuous or intensive medical or nursing supervision. PCC level 3 units also provides routine planned post-operative care for surgical procedures, or during some planned medical admissions.

The definitions of the full range of Paediatric Critical Care (PCC) are as follows:

- Level 1 paediatric Critical Care Units (PCCUs) will be located in all hospitals providing inpatient care to children and will deliver level 1 PCC care. (Provided in all District General Hospitals which have in-patient facilities. This level of activity is not specialised and is not commissioned directly by NHS England and is the responsibility of CCG's.
- Level 2 PCCUs may be specialist or non-specialist and are provided in tertiary hospitals and a limited number of DGHs and will deliver level 1 & 2 care. These were formerly classified as HDUs. (Commissioned by NHS England)
- Level 3 PCCUs (PICUs) are usually located in tertiary centres or specialist hospitals and can provide all 3 levels of PCC.(Commissioned by NHS England)

The service model and standards outlined in this specification are congruent with the revised *Standards for the Care of Critically Ill Children* (4th Edition, 2010), produced by The Paediatric Intensive Care Society (see section 1.2 for link).

Case-mix and level of intervention performed varies substantially between units depending on the tertiary services supported and local provision of level 2 PCC services.

In England 1.4 children per 100,000 population are admitted to a PCC Level 3 unit.

Paediatric Critical Care Minimum Data Set (PCCMDS) data submitted to Paediatric Intensive Care Audit Network (PICANet) from PCC care providers in the UK and Ireland, presented in the Annual Report of PICANet, Jan 2008 to Dec 2010 for the 0–15 age group, indicate the following national averages:

- 40.9% of admissions (52,337 in total) to PIC level 3 are planned - 34.2% (17,891) following surgery, and 6.7% (3,513) for non-surgical reasons.
- 59.1% (30,933) of admissions are for unplanned emergency care.
- The top three indications for admission to a PCC level 3 unit are:
 - cardiovascular (28.6%); respiratory (26.0%); and neurological (11.0%).
- 65.7% require invasive mechanical ventilation (i.e. via an endotracheal tube) during their stay; 14.9% will require non-invasive ventilation.
- These averages conceal substantial inter-unit variation, with the percentage of children on PCC requiring invasive ventilation varying from 6 to 85%.

http://www.picanet.org.uk/:.Documents/General/Annual%20report%20published%202011/Annual_report_02_12_11v2.pdf

PCC should be planned on an annualised overall average occupancy of around 80%. However, there is considerable seasonal variation in demand, and PCC units are especially susceptible to “winter pressures” due to the increase in severe respiratory infections (especially bronchiolitis) during the winter months.

Providers need to make contingency plans to manage this pressure. A PCC unit must be able to plan to meet demand based on local/regional circumstances and historical activity patterns.

An important aspect of capacity planning is to ensure the ability to flex staffing to meet the demand for occupancy levels above normal levels where necessary, while maintaining a safe service. Close cooperation between the following partners is essential to maintain adequate capacity at times of peak demand:

- PCC units and referring hospitals within networks
- Adult and neonatal critical care networks
- Transport services.

Level 3 PCC units need to co-operate, as part of a national system, with other units to deliver optimal flexibility during periods of peak demand.

1.3. Evidence Base

National reference documents relating to the service standards for paediatric critical care services, and referenced in this specification are:

- Department of Health (2008) Commissioning Safe and Sustainable Paediatric Services: A Framework of Critical Interdependencies
http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_088068
- Department of Health (2006) Review of Commissioning Arrangements for Specialised Services (the Carter Review)
http://webarchive.nationalarchives.gov.uk/+/www.dh.gov.uk/en/Managingyourorganisation/Commissioning/Commissioningspecialisedservices/DH_4135174
- Department of Health (2006) The acutely or critically sick or injured child in the district general hospital
http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_062668
- Department of Health (2003) Getting the Right Start: National Service Framework for Children; Standards for Hospital Services
http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4006182
- Department of Health (1997) A Bridge to the Future: nursing standards, education, workforce and planning in paediatric intensive care
http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4005506
- Department of Health/Health Services Directorate (1997) Paediatric Intensive Care: "A Framework for the Future"
http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4005760
- Healthcare Commission (2007) Improving Services for Children in Hospital
http://caredirectory.cqc.org.uk/db/documents/Improving_services_for_children_in_hospital.pdf
- Paediatric Intensive Care Society (2010) Standards for the Care of Critically Ill Children (v.2, 4th ed.)
http://www.ukpics.org.uk/documents/PICS_standards.pdf
- Royal College of Nursing (2011) Health care service standards in caring for neonates, children and young people

http://www.rcn.org.uk/_data/assets/pdf_file/0010/378091/003823.pdf

- Safeguarding children and young people-roles and competencies for health care staff. Intercollegiate document, September 2010.
<http://www.rcpch.ac.uk/safeguarding>
- Protecting children and young people: responsibilities of all doctors. GMC Sept 2012. <http://www.gmc-uk.org/guidance>
- PICS – 2010 – Appendices to Standards For the Care of the Critically Ill Child (4th Edition)
<http://www.ukpics.org.uk/documents/PICS%20Appx%204th%20Edn%20V2%2020100707.pdf>
- HSCIC PCC MDS – Overview 2014
http://www.datadictionary.nhs.uk/data_dictionary/messages/supporting_data_sets/data_sets/paediatric_critical_care_minimum_data_set_fr.asp?shownav=1

2. Outcomes

2.1 NHS Outcomes Framework Domains & Indicators

Domain 1	Preventing people from dying prematurely	✓
Domain 2	Enhancing quality of life for people with long-term conditions	✓
Domain 3	Helping people to recover from episodes of ill-health or following injury	✓
Domain 4	Ensuring people have a positive experience of care	✓
Domain 5	Treating and caring for people in safe environment and protecting them from avoidable harm	✓

Key Outcomes:

1. Risk Adjusted Mortality – (Domain 1, 4, 5,)
2. Refused emergency admissions for the population served, resulting in an out of network transfer (Domain 1, 3, 4, 5,)
3. Cancelled elective surgical procedures due to lack of PIC bed (Domain 1, 3, 4, 5,)
4. Unplanned readmissions to PICU within 48 hours of a previous discharge / transfer from PICU (Domain 1, 3, 4,5,)
5. Patient deaths in PICU discussed at a multi-disciplinary review meeting (M&M) within 3 months of date of death, with written documentation of the findings and an action plan (Domain 1, 4, 5,)
6. Timely participation in PICANET (Domains 1, 3, 5)
7. Discharge letters to the next lead carer dispatched within 48 hours of discharge from PCC (Domain 3,4,)

8. Rate of accidental extubation of patients (Domain, 1,3,4,5,)

PCC level 3 providers are required to submit data to the SUS and PICANet. Furthermore there is a national quality dashboard in place for PIC level 3 services, and data submission is mandated via CQUIN.

3. Scope

3.1 Aims and objectives of service

The aim of the PCC level 3 service is to provide care for the critically ill or injured child, including those recovering from elective surgery and that care is delivered “within PCC level 3 units conforming to agreed guidelines and standards, including the appendices. (PIC Standards June 2010). These national standards set out the optimal requirements for the care of critically ill children and their families and identify specific medical, nursing, technical and emotional needs that are best provided by a specialist Paediatric Intensive Care multidisciplinary team in a PCC level 3 unit. .

The PCC level 3 service will deliver care in line with the national standards (PICS 2010).

Key Service Principles are:

- PCC level 3 is provided as part of a pathway of care and co-located with other specialist children’s services and facilities.
- PCC level 3 will not normally be provided outside of a level 3 centre with the exception of short term care until the arrival of the PCC retrieval team. PCC level 3 care should only be provided in adult Intensive care units as part of a local agreement with the lead centre and in line with agreed network pathways.
- PCC level 3 units must provide or have access to a 24 hour Retrieval Service.
- PIC must be provided by appropriately trained staff in equipped facilities. Families should be able to participate fully in decisions about the care of their child and wherever possible, in giving this care.
- Appropriate support services to children and families during the child’s critical illness and, if necessary, through bereavement must be provided.
- There must be active support to the care of critically ill children in referring hospitals, including through advice, training and audit delivered through a network.

3.2 Service description/care pathway

Children will access level 3 PCC through a number of routes including:

- Inpatient children’s services within the same hospital
- Operating theatres
- Neonatal units and occasionally, labour wards.
- Emergency Department

PCC Transport Services (as per Service Specification E07/S/d) will facilitate many of the admissions to from level 1 and 2 PCC units into level 3 PCC units and protocols for transfer will apply as per the PCC Transport Service Specification.

Level 3 PCC units must ensure that comprehensive referral pathways and mechanisms are in place, and that similar pathways are in place to support egress from the service.

Paediatric critical care services must be available and fully operational 24 hours per day, 365 days per year.

PCC Level 3 care is delivered in 3 types of hospital within a network model:

- Level 3 PCCUs , providing most of the PCC level 3 care needed in the area and supporting the whole service for the area through provision of advice and training.
- Major acute general hospitals with large adult intensive care units, which already provide a significant volume of paediatric intensive care.
- Specialist hospitals providing some PCC level 3 in support of specific specialties (e.g. cardiac surgery, neurosurgery, burn care).

3.2.1.

The level 3 PCC, working as part of a Network will be responsible for the development of appropriate referral and care pathways with other level 2 and 1 PCC providers within its catchment.

The level of complexity of patients will vary as described in the table below:

PCC level	Provided in:	Description	Nurse: patient ratio
1	Level 1,2 & 3 PCCU	Children requiring monitoring or interventions defined by PCC HRG 07Z	0.5:1 (1:1 if in a cubicle)
2		Children requiring monitoring or interventions defined by PCC HRG 06Z	
3	Level 3 PCCU	Children requiring ventilatory support or support of two or more organs systems. Children at level 3 are usually intubated to assist breathing. PCC HRG 05Z/04Z	1: 1
		Children undergoing complex monitoring and/or therapeutic procedures, including advanced respiratory support.PCC	1.5 : 1

		HRG 03Z/02Z	
	Level 3 PCCU which supports cardiac surgery	Children receiving treatment by extra-corporeal membrane oxygenation (ECMO) PCC 01Z	2 : 1

Not all level 3 PCC units offer all levels of care. Some PICUs act as Lead Centres with a fuller range of paediatric intensive care services and capabilities whereas other units offer more limited levels of care in consultation with a Lead Centre.

Children may require cardiovascular or renal support, intracranial pressure monitoring or other advanced interventions, or may need to be nursed separately in a cubicle. The complexity of nursing and medical support for these aspects of care necessitates a high staff to patient ratio follows:

In most cases, patients undertake a "step-down" pathway to level 2 or level 1 PCC and/or regular paediatric wards (often to a hospital closer to the patient's home) prior to discharge home. The standards and commissioning responsibilities for level 2 PCC services are outlined in a separate service specification. (Ref:E07/S/b)

Patients may require care in a PCCU if they are in the process of transitioning to alternative permanent long-term ventilation (LTV) facilities (possibly requiring home adaptations), or to palliative care placements. However, once a patient has been medically stable (see LTV service specification for definition of medical stability) on LTV for 90 days, commissioning responsibility and charges pass to local Clinical Commissioning Group commissioners.

Further information on LTV services is available in the separate Long Term Ventilation service specification. (Ref: E07/S/C)

PCC units which are co-located with paediatric cardiac surgery centres are occasionally required to undertake ECMO.

Further information on cardiac ECMO services is available in the paediatric cardiac surgery specification. (E05/S/a)

There should be arrangements for the transfer of children requiring specialised intensive care (including for specialist burns care, respiratory ECMO, organ transplant etc.) not available at the admitting unit.

3.2.2 Multidisciplinary Team

Level 3 PCC units will need to maintain excellent working relationships and undertake frequent liaison with appropriate areas/bodies according to the needs of the child as per PICS standards.

Complex discharge planning may need to involve external agencies such as continuing health care teams, education and housing authorities and social services.

3.3 Population covered

Children up to the age of 16 are normally cared for in a Paediatric Critical Care environment, although the *National Service Framework for Children* (section 1.2 for link) states the age range for inclusion within paediatric care is 0-18 years (up to but not including the 19th birthday).

PCC services shall be available to all critically ill children from the point of discharge from maternity or a neonatal unit until their 16th birthday.

In addition, on rare occasions a PCC unit may be deemed to be the most clinically appropriate place to provide critical care to young adults between the ages of 16-24 years (up to but not including the 24th birthday) – for instance as part of a long-term pathway of care managed by a paediatric team or because of their stage of physical or emotional development. Young people who have not completed transition to adult services will usually be cared for in a PICU unless they, or their carers, express a different preference.

Therefore, any patient between the ages of 0-24 years cared for in a designated level 3 PCC or transferred to or from a level 3 PCC unit by a commissioned paediatric critical care transport service, will be considered to be accessing paediatric critical care.

Ensuring equity of access to any specialised service can present challenges, particularly in areas with a large geographical area and sparse population. There is a balance to be found in ensuring that a PCC unit has sufficient activity to maintain clinical competence and safety, but allowing access to as much of the population being served as possible within a limited travelling distance.

It is important that all level 3 PCC units are supported by PCC Transport Services, and that level 3 PCC units have systems in place to ensure that capacity is optimally managed with sufficient flex so that beds are available as required, both for emergency admissions and to support any complex elective or non-elective surgery. Further information on paediatric critical care transport services is available in the Paediatric Critical Care Transport specification.

Level 3 PCC units will agree region-wide policies with referring hospitals and paediatric critical care transport services for the management of time critical referrals, for example in the event of spinal or head injury trauma cases who may need to be transferred directly to a neurosurgical centre for emergency surgery.

The service outlined in this specification is for patients ordinarily resident in England*; or otherwise the commissioning responsibility of the NHS in England (as defined in *Who Pays?: Establishing the responsible commissioner* and other Department of Health guidance relating to patients entitled to NHS care or exempt from charges).

*Note: for the purposes of commissioning health services, this EXCLUDES patients who, whilst resident in England, are registered with a GP Practice in Wales, but INCLUDES patients resident in Wales who are registered with a GP Practice in England.

3.4 Any acceptance and exclusion criteria and thresholds

3.4.1. Acceptance criteria

Referral for admission to level 3 PCC is via secondary care (usually consultant) referral, and is possible from the following sources:

Internal sources (from within the same hospital)	<ul style="list-style-type: none">• Planned booked admission following complex surgery• Emergency admission following surgery (following unexpected complications)• Paediatric ward• Paediatric HDU• Neonatal intensive care unit (NICU), Local Neonatal Unit (LNU) or Special Care Unit (SCU)• A&E
External sources	<ul style="list-style-type: none">• Paediatric Critical Care Transport services.• Occasionally, transfer by ambulance from another hospital using hospital staff.

Referral from external sources is in the majority of cases via specialised paediatric Critical Care Transport, and must be the result of a consultant-to-consultant discussion.

Paediatric intensive care admission is mandatory for children likely to require advanced respiratory support (i.e. acute or medium term mechanical ventilation). Other children can be referred to level 3 PCC according to locally agreed pathways.

Patients will be transferred to a level 3 PCC unit if the expected length of intubation is more than 24 hours, unless a longer period has been explicitly agreed with the lead centre.

3.4.2. Exclusion criteria

Following delivery a baby is defined as a neonate for the first 28 days of their life. Neonates that have not been discharged home following birth are not usually cared for in a PICU. Babies born prematurely are usually cared for in a NICU rather than a PICU. However, arrangements for PICU admission may be agreed locally relating to the management of pre-term neonates requiring intensive care following surgery – for example, cardiac and gastrointestinal surgery, or admission for a specialist opinion not available in the hospital housing the NICU. Babies born at term who require intensive care may be best managed in a NICU or a PICU depending on the baby's underlying diagnosis and whether specialist paediatric services are available on the same hospital site as the NICU. Local pathways of care will be agreed. Any neonate admitted to PICU will be classified as receiving paediatric critical care, be subject to PICS Standards and should have the Paediatric Critical Care Minimum Dataset (PCCMDS) collected. Due regard should also be given to the DH Neonatal Toolkit (2009) in these circumstances.

Adult patients should not be treated in a paediatric critical care environment, though patients aged 16-18 years (or in exceptional circumstances, up to 24 years) may be treated in a paediatric critical care environment if this is deemed to be the most appropriate location care based on individual needs (see section 2.3 above).

Children with a paediatric critical care stay of 4 hours or less will not be classified as having a chargeable PCC stay.

Only a limited number of centres nationally have the facilities to provide respiratory ECMO and other highly specialised paediatric intensive care, for example, Burns Care, though some PICUs providing Level 3 care have the ability to "step-up" their care level on a short-term basis.

This specification excludes respiratory ECMO.

3.5 Interdependencies with other services/providers

Paediatric Critical Care is a key interdependent service for a large number of specialised services, and also has several dependencies of its own, as detailed in *Commissioning Safe and Sustainable Paediatric Services: A Framework of Critical Interdependencies* (section 1.2 for link).

Paediatric Critical Care providers must comply with the co-location and adjacency requirements as set out in the interdependencies framework. Whilst links to adult specialised services are important, the interdependencies between specialised children's services should take precedence.

Any failure to secure, or loss of, services identified with a red, amber 3 or amber 2 interdependency should provoke an immediate review by Area Team Commissioners, of the safety and sustainability of the delivery of paediatric intensive care.

Co-location in this context is defined as meaning either location:

- on the same hospital site or
- in other neighbouring hospitals if specialist opinion and intervention were available within the same parameters as if services were on the same site. These would be reinforced through formal links such as consultant job plans and on-call rotas.
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4. Applicable Service Standards

4.1 Applicable national standards e.g. NICE

Not applicable

4.2 Applicable standards set out in Guidance and/or issued by a competent body (e.g. Royal Colleges)

- Department of Health (1997) A Bridge to the Future: nursing standards, education, workforce and planning in paediatric intensive care
<http://webarchive.nationalarchives.gov.uk/+www.dh.gov.uk/en/Publicationsandstatis>

tics/Publications/PublicationsPolicyAndGuidance/DH_4005506

- Paediatric Intensive Care Society (2010) Standards for the Care of Critically Ill Children (v.2, 4th ed.) http://www.ukpics.org.uk/documents/PICS_standards.pdf
- Royal College of Nursing (2011) Health care service standards in caring for neonates, children and young people
http://www.rcn.org.uk/data/assets/pdf_file/0010/378091/003823.pdf

5. Applicable quality requirements and CQUIN goals

5.1 Applicable quality requirements (See Schedule 4 Parts A-D)

5.2 Applicable CQUIN goals (See Schedule 4 Part E)

There are two PCC CQUINs on the national pick list which are as follows:

Prevention of Unplanned Readmissions to PICU within 48 hours
Transfers out of normal catchment/ network to PICU

There is a Quality Dashboard in Place for PCC the list of indicator reference numbers is provided below:

PIC01	Domain 1	Risk adjusted mortality
PIC02	Domain 5	Refusal Rate for Emergency Admissions
PIC03	Domain 4	Cancellation of Elective Paediatric Surgery
PIC04	Domain 5	Emergency Readmissions to PCC within 48 hours
PIC05a	Domain 5	Bed Occupancy
PIC05b	Domain 5	Bed Throughput Rates
PIC08	Domain 5	Rate of accidental extubation of patients
PIC09	Domain 5	% of death reviews conducted within 3 months
PIC10	Timeliness of PICANET Data submissions	% of data submissions within 3 months of discharge
PIC12	Effective Communication	% of handover letters to the next lead carer dispatched within 48 hours of discharge from PCC
PIC13	Retrieval Service Performance	% of refused requests for retrieval of a patient within define catchment
PIC14	Domain 1	Mobilisation of PIC retrieval team

6. Location of Provider Premises

The Provider's Premises are located at:

To be identified by Area Teams

7. Individual Service User Placement

Not Applicable

ADOPTED

Appendix One

Quality standards specific to the service using the following template:

Quality Requirement	Threshold	Method of Measurement	Consequence of breach
Domain 1: Preventing people dying prematurely			
Access to care within Network boundary , reducing transfer delays	<5% refused admissions	Quality Dashboard/PICANET	Non-compliance with contract General Conditions 8 & 9
Standardised mortality	Remain within 99.9% confidence limits	PICANET Data	Non-compliance with contract General Conditions 8 & 9
Domain 2: Enhancing the quality of life of people with long-term conditions			
Effective and timely communication is supplied to receiving health care professionals following transfer / discharge from PICU	To be agreed	Quality Dashboard	Non-compliance with contract General Conditions 8 & 9
Domain 3: Helping people to recover from episodes of ill-health or following injury			
Cancellation of elective surgery due to bed unavailability	<5% elective surgery cancelled on the day of surgery owing to a lack of a PICU bed	Quality Dashboard	Non-compliance with contract General Conditions 8 & 9
Domain 4: Ensuring that people have a positive experience of care			
Transfer team departs from the transport base within 30 minutes of the clinical decision that PCC Transport is indicated.	To be agreed	Local collection	Non-compliance with contract General Conditions 8 & 9

Quality Requirement	Threshold	Method of Measurement	Consequence of breach
(Domain 1, 3, 4, 5,)			
Domain 5: Treating and caring for people in a safe environment and protecting them from avoidable harm			
Rate of accidental extubation, reduced number of unplanned extubation,	To be agreed	PICANET/Quality Dashboard	Non-compliance with contract General Conditions 8 & 9

ADOPTED