

Paediatric critical care and surgery in children review

Summary report

November 2019



Paediatric critical care and surgery in children review: Summary report

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1. Acknowledgements

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 - Association of Paediatric Anaesthetists of Great Britain and Ireland
 - British Association of Paediatric Surgeons
 - Children’s Hospital Alliance
 - Children’s Surgical Forum
 - Clinical Reference Group: Neonatal Critical Care, NHS England
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 - Congenital Committee, Society for Cardiothoracic Surgery in Great Britain and Ireland
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- Royal College of Nursing
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- Royal College of Radiology
- Royal College of Surgeons
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- Women and Children’s National Programme of Care Co-Chair, NHS England

2. Foreword

Since qualifying as a doctor I have already seen enormous changes in the field of paediatric intensive care medicine. It is only in the past 20 years that dedicated paediatric critical care units and transport services have been established across the country, which have delivered significant improvement in the clinical outcomes for critically ill children. Rapid medical advancements and treatment innovations mean more children are living longer with more complex conditions, who may require critical care support at least once in their childhood. In particular the numbers of children living with long term ventilation support has increased enormously, and services have needed to adapt to cope with these increasing patient numbers – often among our more vulnerable young patients whose health can become critical quickly. Sometimes it's hard to keep up with the pace of change, but as clinicians it is absolutely right to step back and reflect on how our practice needs to adapt and evolve with the changing needs of our patients.

What's being presented here isn't a blueprint for radical change, but does provide the guiding principles for sustaining these services into the future and offers an opportunity to drive meaningful improvements by working better together and sharing our expertise and resources. Not every hospital can provide all the services that our young patients need and we must look beyond our workplace boundaries to provide care that serves our local populations – ensuring access to specialist care while minimising travel and disruption for families, wherever possible. Critical care and surgery in children are not services that are wholly specialised, but these are not considerations that should matter to patients and their families who just want to make sure they can access the right care in the best place for them, so it is important to look at how local systems provide all levels of care.

The Long Term Plan sets out NHS England and NHS Improvement's commitment to ensure paediatric critical care and surgery in children services are developed through operational delivery networks (ODNs) to ensure services meet the needs of patients now, and into the future.

The ODNs, as set out in this report, will be able to support the development of services in each area to ensure they are co-ordinated and a patient's whole pathway through both critical care and/or surgery are appropriately managed. We know that workforce issues are a challenge and we need to work towards robust local plans to

address gaps in professional skills and numbers, with training and education in place to support local services, and consideration of the demand and capacity across a system so the model of care for paediatric critical care and surgical services, set out in this report, can be appropriately adopted to reflect local need. Some informal networks have established around these services, but these have been inconsistent across the country and require consistent commissioning to deliver. However throughout this review we have been able to learn from some of the lessons learned across the country to understand what works well and where we need to take a different approach.

In surgery, we have seen the retirement of a number of consultants, both surgical and anaesthetic, who previously undertook routine surgery on children. Changes in clinical culture and training have meant some of their successors have not felt adequately trained to undertake this work, leading to a trend of children going to specialist children's hospitals for routine surgery, which are often further away from home and already have large workloads of patient's requiring specialised care.

Care should be provided based on a holistic assessment of the child to ensure that their needs are foremost in the provision of services across the country. We need to ensure that children are able to access the full multi-disciplinary team required to support a child's acute and long term needs so that patients can access the right care, right time, right place and continue to deliver high clinical outcomes and patient experience.

This report summarises our work to date and the recommendations around the model of care and the role of ODNs to support adoption of this across the country for both surgery in children and paediatric critical care. It reflects the examples of best practice we've seen across the country, and covers a range of related issues, such as long-term ventilation needs and transport services. Regional teams are now driving this forward, through the commissioning of ODNs in 2019/20 to support the development of services locally to meet the needs of all children and young people needing this support now and in the future.

Importantly, what a report like this can never fully capture, is the huge amount of effort and enthusiasm that has gone on to get to this place. We have embarked on frank and challenging conversations to understand the issues and start to find solutions together. It's been an honour to spend time visiting and talking to colleagues across the country, all doing a fantastic job to support children, young people and their families through some of the most difficult situations imaginable,

and I would like to thank everyone for their contributions so far, and the work still ahead of us within our developing networks.

Dr Peter Wilson

Paediatric Intensive Care Consultant, University of Southampton NHS Foundation Trust

Clinical Chair Women and Children's Programme of Care

Clinical Lead for the Paediatric Critical Care and Surgery in Children Review

3. Introduction

Paediatric critical care (PCC) and surgery in children (SIC) services provide life-saving treatments across the NHS to thousands of children every year. The development of dedicated paediatric intensive care facilities in the 1990s dramatically improved outcomes for some of the sickest children needing care and overall the quality of care being delivered remains high. However, recent increases in demand for treatment has meant that some children and their families can face hospital stays that are not always as close to home as they could be due to the availability of beds and local services, and services starting to show sustainability issues linked to staffing and pathway issues for patients with evolving and sometimes long-term needs.

The PICANet¹ Annual Report (2018) reported rates of occupancy in PICUs were very high during the staffing census week with intensive care (IC) bed occupancy rates of at least 90% in England (NHS), and a high dependency bed occupancy rate of 100% in England (NHS) during normal working hours. Rates of bed occupancy showed little reduction 'out of hours' across the UK.

The Paediatric Intensive Care Society (PICS) standards (2015) highlighted the issue within current critical care services:

“Too often a child and family are transferred to a tertiary centre when care closer to home should be possible. This is not good for the family and it places a strain on PICU beds which are under ever increasing pressure.”

In response, NHS England convened a review of both services to address the delivery challenges and ensure that children and their families receive the best possible care (see box: Services covered by the review).

The aim of the review has been to identify an optimal model of care for providing sustainable, high quality, responsive PCC and SIC services. It has involved commissioners, clinicians, national health organisations and professional organisations, patients and the public across England. The guiding vision of the review is that services should be organised so that all children can access high

¹ Paediatric Intensive Care Audit Network (PICANet)

quality care that meets their individual needs as close to home as possible and at the time that they need it.

Evidence on challenges facing PCC and SIC services was gathered and analysed to consider the best route to realising the vision for these services. A local networked model of care emerged as the best option for meeting patients' needs, while maximising local staff and service development. To deliver this, operational delivery networks (ODNs) will be established to support all critical care and surgical services for children in an area.

An ODN is a way to bring different parties (clinicians, providers, commissioners, patients) together to realise change across complex systems of care in order to improve care quality and outcomes. ODNs have three main functions: increasing operational effectiveness and consistency improving care and managing patient flows. Developing an ODN is now acknowledged as a successful way of achieving strategic change in the NHS.

The review therefore concluded that regional NHS England commissioners of children and young people's services across England should commission ODNs, which will work with commissioners and providers to identify the best configuration of services to meet the needs of children in their area.

This document is the final report summarising the review. NHS England will now undertake the formal commissioning of these services and has developed guidance to support the development and running of PCC and SIC ODNs, which is available to NHS professionals through the [Future NHS Collaboration Platform](#).

Services covered by the review

Paediatric critical care (PCC) services provide a care pathway for very sick children. This ranges from recognising and stabilising conditions to providing care in appropriate paediatric facilities, staffed by specialists in care for critically ill children, and includes transferring them to such facilities if need be. PCC services are split into three levels according to the complexity of the care that they can provide, with level three (also known as **paediatric intensive care or PIC**) being the most complex. Level three specialist care for critically

ill children has been offered by **paediatric intensive care units (PICUs)** following a review² in the 1990s.

Surgery in children (SIC) may be performed by a range of surgeons and includes procedures of varying complexity. Some SIC is performed by surgeons in a given adult speciality who have had additional training in the treatment of children. Other SIC is undertaken by surgeons trained specifically in paediatric surgery. Both groups may perform some types of surgery and procedures classified as specialised. These require higher levels of expertise. For this reason, only a small number of hospitals provide **specialised surgery in children (SSIC)** to make sure that suitably qualified surgeons do enough procedures to maintain their competence.

² *Framework for the Future* (1997), National Co-ordinating Group on Paediatric Intensive Care, https://webarchive.nationalarchives.gov.uk/20130123203829/http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4005760 and *Bridge to the Future* (1997), Department of Health, https://webarchive.nationalarchives.gov.uk/20080205191111/http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4005506

4. Scope

The review looked at the connected and distinct elements of PCC and SIC, including related services such as patient transport. In particular, it sought to:

- clarify links between pathways in PCC and SIC
- understand how to optimise the use of all levels of PCC beds, particularly the level 3 PCC (intensive care) beds, through understanding the differences in care required by children with stable and unstable conditions of different levels of acuity
- consider possible ways to support care closer to patients' homes where clinically appropriate
- consider how best to organise services transporting children to and from PCC units
- take into account critical links between this and related service reviews, especially those covering congenital heart disease (CHD), burns, cancer and neonatal intensive care.

5. Approach

A national programme team was established, with executive leadership from the National Director of Specialised Commissioning and clinical leadership from the Clinical Chair of the Women and Children's Programme of Care. Additional clinical leads were appointed for PCC and SIC. The review also had clinical leads for the key workstreams of transport, ECMO, workforce, and long-term ventilation, along with the review's two test sites.

Throughout its work, the review has sought to:

- engage widely with commissioners, clinicians, national health organisations, professional organisations, patients and the public
- base its assessments of the current state of services, issues and future requirements on evidence
- consider the costs, benefits and implementation challenges of proposals
- achieve a broad consensus around final proposals.

The review's programme was informed by an Expert Stakeholder Panel made up of representatives of a wide range of professional organisations and groups, commissioners, and patient representatives. This panel worked on: developing the case for change; appraising the options for addressing issues that are set out below; overcoming barriers to change; and supporting implementation of the preferred model of care.

6. Findings

6.1. Paediatric critical care

Demand for **PCC** services has increased over the past 20 years, with the most significant growth in demand in recent years being for level 2 PCC. Capacity in PCC services, including paediatric transport, has also expanded over this period, albeit with minimal regional or national strategies to co-ordinate that expansion.

There have been notable successes. In particular, the centralisation of specialist PICUs that provide the highest level of PCC (level 3) in the 1990s, with services delivering a significant improvement in clinical outcomes and patient experience over the past two decades.

However, a number of challenges affecting some patients have emerged, which have been previously identified in the Paediatric Intensive Care Audit. These include capacity issues at peak times, resulting in patients sometimes having to travel across the country to access a bed and cancellation of operations due to a lack of critical care beds locally, indicating a continuing imbalance between capacity and demand. Projecting recent levels of activity growth without any corresponding changes to the current service model (linked to increasing numbers of patients living longer with more complex needs), would require an increase in paediatric capacity by 60 beds a year from current provision to meet future demand and bring units to a level where they are able to respond to spikes in activity.

National data shows that PICUs were operating at an average of 92% of their maximum staffed capacity in 2016³, reflecting rising demand. This is above the recommended operational average capacity of 85%,⁴ the standard set to ensure that each facility has the capacity to absorb normal fluctuations in activity.

Attempts to expand level 3 PCC services to meet rising demand have had limited success, largely because of a shortage of qualified staff to enable more beds to be

³ PICANet Annual Report 2016 reports in hours occupancy rates of 95% in the staff survey week in level 3 paediatric intensive care units. Analysis of average occupancy over the year demonstrates an average occupancy of 92% in 2016.

⁴ The PICS Standards 2015 have a requirement for escalation should a unit have an average occupancy over 85% for two or more consecutive months as a key performance indicator. The National Audit Office (*Reducing Emergency Admissions*, 2018) found that bed occupancy levels in wards admitting emergency patients that regularly went above 85% occupancy lead to frequent bed shortages and periodic bed crisis.

opened. As a result, many PICUs find it difficult to staff all their beds consistently to recommended levels, limiting the numbers of patients that they can treat to fewer than their physical bed space would allow.

Rising demand for paediatric intensive care is linked to growing numbers of children with complex and long-term conditions requiring treatment. Their treatment often involves long stays in PICUs, although these may sometimes be longer than clinically required.

Capacity challenges also make it hard for critical care units to balance demand for elective and emergency care, especially in winter, when demand for emergency admissions rises. Patients needing specialist elective surgery, such as children with congenital heart defects, and those needing emergency treatment are affected during surges in demand, either through cancellation of their operation, or the patient having to travel far from their home to get a critical care bed.

6.2. Surgery in children

In **SIC** services, some areas of the country have seen a change in workforce where some clinicians have undertaken different training routes meaning they are not able to operate on some patients. This means that it can be difficult to access services locally where routine surgery is needed, or there could be long waiting times at specialised centres.

These pathway changes, which have evolved organically, have been further affected by changes in workforce training and surgical experience for both surgeons and anaesthetists, which mean that services have stopped being provided from some centres, increasing the demand for routine activity in specialised centres.

For commissioners, there are issues accessing data on accurate levels of activity and costs of the different types of surgery (split between specialised and routine) due to how the data is currently coded.

For all surgical specialities over the past 20 years there has been a gradual decline in the number of children who have received their surgery in a District General Hospital (DGH), whilst the numbers of children receiving surgery in specialist centres has risen by a corresponding level. This was most marked for children aged 0-4 years of age for routine surgical procedures. Specifically, for General Paediatric Surgery (GPS) (eg inguinal hernia, undescended testes, acute appendicitis) analysis

from NHS England (2013-17) demonstrates a continuing steady year on year growth in GPS activity performed in specialist centres of around 6%.

In some areas of the country, this development has led to increased waiting times for elective procedures in specialised centres and limited children's access to urgent or emergency routine surgical procedures out of hours, outside of specialised centres.

Most specialist hospitals now provide some level of outreach to non-specialised providers, enabling more children to have elective non-specialised surgery locally. Nevertheless, to get all the care that they need, some children and their families have to travel to more than one hospital, some of them out of their local area. Emerging evidence shows that this can have a negative impact on clinical outcomes and delivers a poor experience for patients and their families.

Children needing specialised surgery often need a PCC bed to enable their complex surgery to be undertaken safely. The pressures on critical care beds noted above is another factor impacting on increasing waiting times for some specialised surgery.

7. Recommended model of care

The review, working with the Expert Stakeholder Panel and other stakeholders, found that a networked model of care offered the most flexible and sustainable solution. This model enables the ability to facilitate local leadership and accountability to support changes in services, to meet the changing needs of patients while maximising staff development. It also fits with the place-based approach to commissioning, as it brings together all local stakeholders to consider the needs of their local population and provides a framework for joint working across the system.

7.1. Alternative approaches

Continuing with the current approach of focusing purely on addressing the capacity issues was not felt by the expert panel to be a feasible option, as attempts to increase capacity, particularly in PCC, have been restricted by the lack of available qualified staff. This approach could also deskill the clinicians within non-specialised district general hospitals who are required to provide urgent/emergency surgery out of hours.

Consolidation of centres as a way of maximising the staff available, was also considered but not supported by the expert panel given the increased travel times this would incur for a large proportion of patients and the required closure of local services. This would be against the direction of travel for the NHS as set out in the Long Term Plan, especially where providers can demonstrate that they meet set quality and outcome measures. Furthermore, the expert panel concluded that designating super centres would require significant capital investment to build the appropriate clinical accommodation.

Other routes to achieve the aims of the review would be the use of a compliance exercise to ensure that only services that meet standards set by NHS England would be commissioned to provide this work or the lead provider model where a single provider in a given area would manage a service across an area. However, the expert panel felt that these approaches could lead variation in access and not

support system wide approaches to managing these services, which involve a range of commissioners and providers.

7.2. The networked model of care

A networked model of care was agreed by the expert panel as the best approach to develop system-wide solutions to these issues, supporting providers in the networks to develop services and to respond to times of surge flexibly whilst maintaining patient safety and the experience of patients, their families and staff.

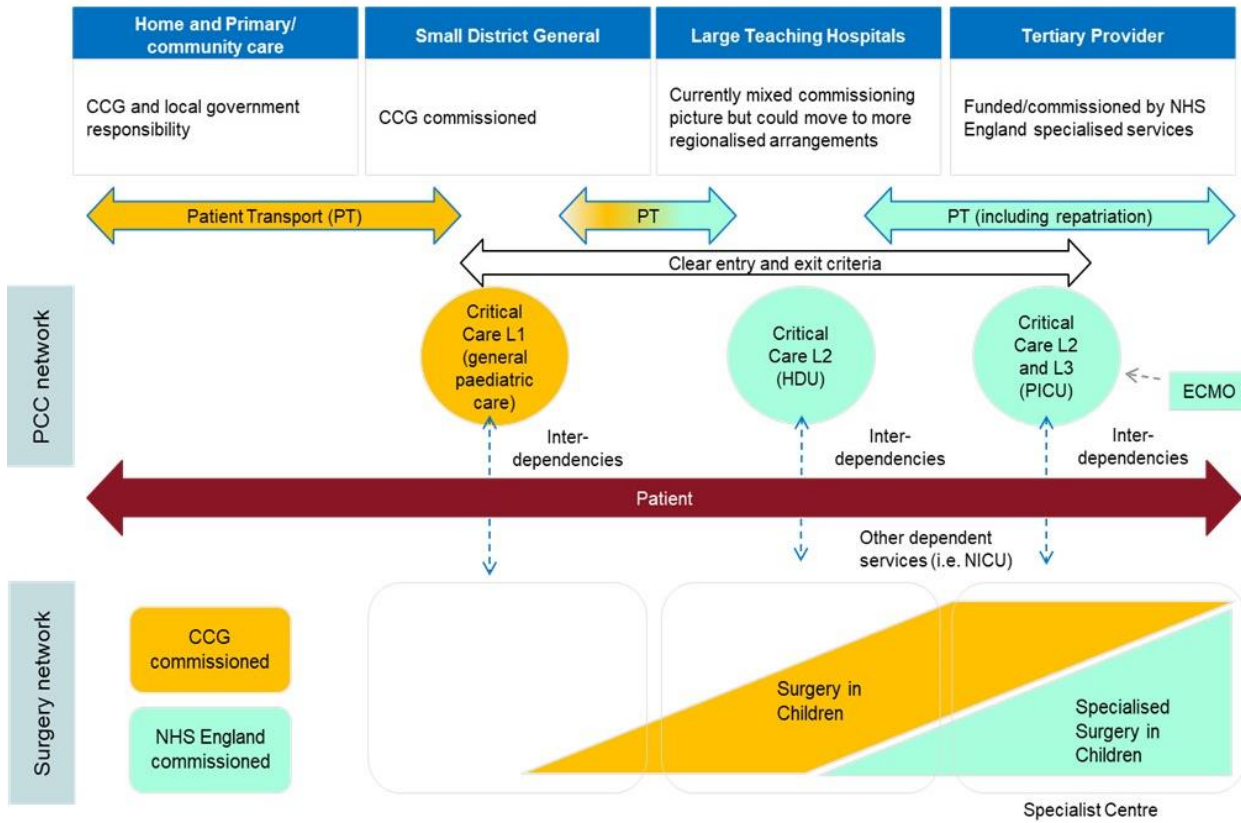
This approach would develop ODNs, which bring together key stakeholders to manage the local health system. This model of care enables appropriate response to local issues and changes in demand in a way that optimises local health system resources. This would entail longer-term changes in training so that services for children develop outside specialised centres, and it would need clear network governance structures to ensure that the network functions efficiently and that all its members are held to account for delivery.

The model of care looks at care provided across all levels of provision, from services provided at home/in the community, through small district general hospitals, teaching hospitals/ larger district general hospitals to specialised tertiary providers.

For PCC services, the highest level of PCC (level 3) will be provided in specialised tertiary hospitals, with level 2 PCC being provided in these centres and/or standalone units in large district general/ teaching hospitals (depending on local need). All hospitals that provide inpatient paediatric care are required to provide level 1 PCC.

For SIC, specialised surgery will be provided in the specialised tertiary hospitals, with some specific services being accommodated in large district general/ teaching hospitals (eg cochlear implants in a specialised ENT centre). Non-specialised surgery will be provided in all levels of hospital, with local pathways being agreed through the ODN for the type of surgery provided in each hospital linked to the skills and competency of staff, type of patient and clinical indication. Transport services will be in place across a network to ensure that patients are able to be transferred between providers where required (eg a deteriorating patient requiring a higher level of critical care, or a patient that is improving and no longer needing treatment at a specialised tertiary centre which may be a distance from home).

Model of care for paediatric critical care and surgery in children



Operational delivery networks will be commissioned by NHS England from 2019/20, providing clear governance over the whole pathway for patients with critical care or surgical needs. These networks are expected to deliver the following benefits:

Benefits in population health:

- improved sustainability of services and equity of access across the country
- delivery of more joined-up services for children with different levels of need, as a benefit of the network's support for closer professional collaboration.

Quality of care:

- reductions in current variations in care quality, such as different admission criteria, different thresholds for intervention and different outcomes for children linked to the availability of local services and trained staff
- treatment of children closer to home wherever possible and improving patient and family experience of care.

Value for money:

- better value for money due to, whenever possible, preventing children from needing specialised services by giving them more support in lower acuity beds, and personalising care to meet their needs
- providing care in an appropriate setting and location for each child, which will optimise the use of the highest level of critical care and specialised surgical services.

Sustainable workforce:

- networks will carry out a workforce gap analysis to inform the workforce strategy specific to their region, identifying opportunities to expand the workforce (such as by adopting new roles) and to improve rates of staff retention (eg by focusing on continued professional development of existing staff through the appointment of network clinical educators, by appointing staff to a network or group of hospitals, and by implementing policies on flexible or 50/50 contracts, where staff spend some of their time practising in tertiary centre and the remainder in referring hospitals)
- networks will provide opportunities for managing workforce capacity in the region by facilitating outreach and rotation (eg through skills passports), and by establishing mechanisms that allow clinicians in tertiary centres to work with clinicians in referring hospitals, which will help to manage workload, develop skills and confidence and build relationships between hospitals.

The review recommends that ODNs for PCC and SIC cover an area of around 1.5 million child population, building on the existing links between specialist and non-specialist hospitals. In most cases, this will be in line with the areas that the PCC transport services cover, unless there is a clear local reason to cover a different geographical area.

The review also recommends the establishment of strategic forums spanning several local speciality ODNs covering children and young people's services or including this function in existing forum where these exist. These forums bring together commissioners and senior provider representatives and provide system-wide oversight of children and young people's services. They will also help to safeguard against any unwelcome knock-on effects of developments in one ODN area on another. These forums could also help to co-ordinate the pooling of resources

needed by ODNs, such as analytical and managerial resources, increasing the sustainability and efficiency of ODNs.

It is recognised that ODNs for different children's services (eg neonatal critical care and children and young people's cancer services) will cover different geographical areas and may need to link with other national programmes of work, such as maternity and cancer transformation programmes. Further work will be undertaken to work through the detail of how different networks can link strategically whilst recognising their individual governance requirements, as part of NHS England's strategic approach to ODNs.

7.3. Paediatric critical care and surgery in children networks map

The map below outlines the indicative areas for the PCC and SIC ODNs. It is proposed that there will be ten networks that collectively cover the whole of England⁵, with each network area establishing both a PCC and SIC ODN. The network footprints have been designed around existing patient flows and PCC Transport services. These may vary after local consideration of travel times, any planned changes in patient flow and any other locally identified issues, with commissioner agreement.

Many providers, especially those on or near the boundary of an ODN area, will need to refer patients into more than one network, depending on a number of factors including: clinical need, where the patient lives, and network capacity. These providers may choose to join more than one ODN to make sure that their patients continue to access relevant services. **Clinical decisions on the most appropriate place for a patient to receive care remain paramount.**

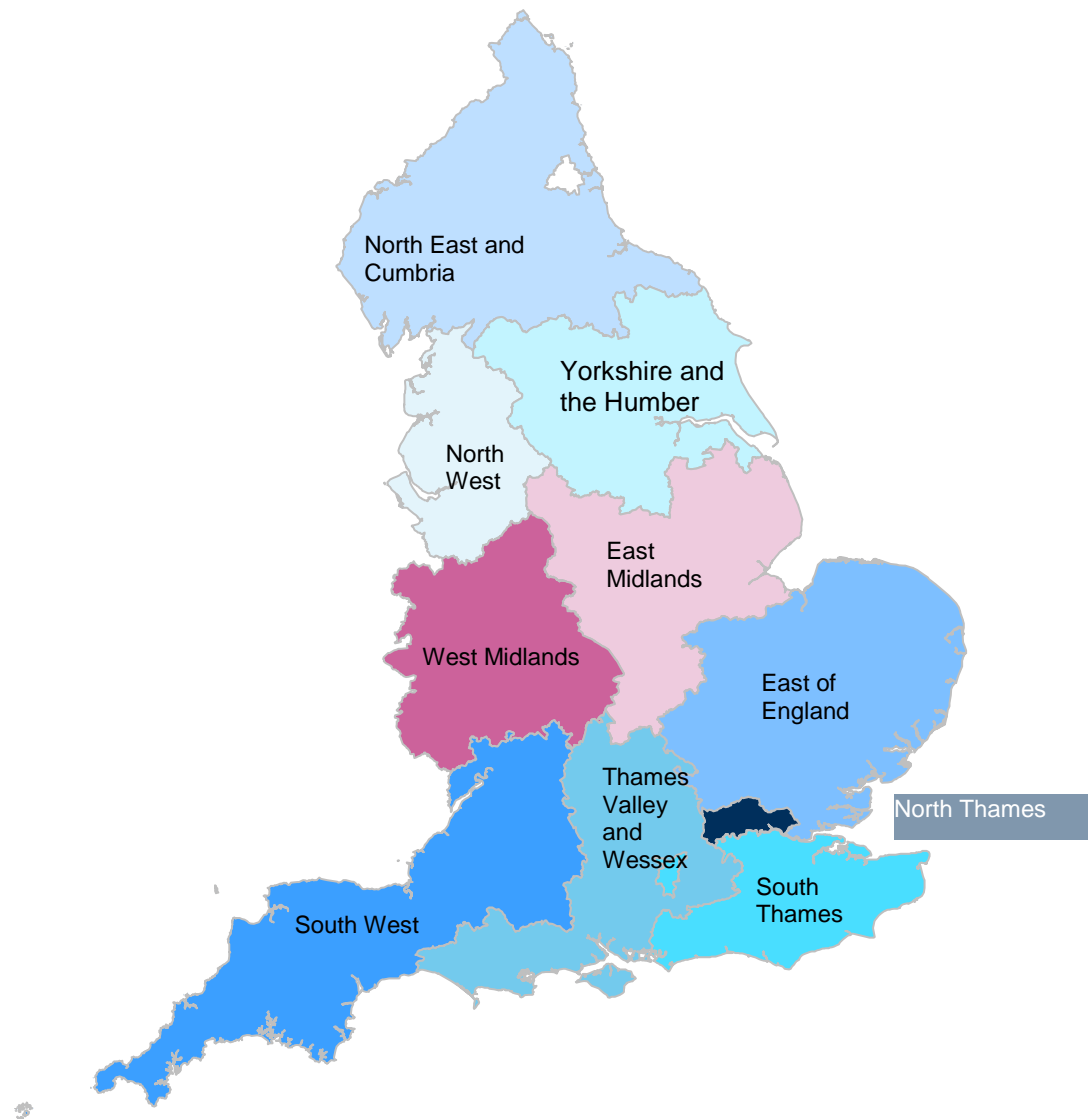
ODNs will need to have good lines of communication and, where appropriate, joint working to make sure that providers on network boundaries can tap into either network.

The review also promotes setting up national provider network groups, of the kind established to support existing ODNs (eg Neonatal and Adult Critical Care Network groups). Such groups are already being created to link representatives from emerging PCC networks. They input into developing national protocols to respond

⁵ The proposed network areas are North East & Cumbria; North West; Yorkshire & Humber; East Midlands; West Midlands; East of England; South West; Thames Valley & Wessex; North London; and South Thames.

collectively to national issues, sharing resources and providing peer support and challenge.

Map of proposed PCC and SIC ODNs, based on existing patient flows for paediatric critical care and surgery in children services



8. Next steps

8.1. Operational delivery networks

Commissioning of ODNs will now take place across the country, with ODNs for PCC and SIC being established during 2019/20, alongside the governance structures and local case for change. Work programmes to address local priority areas and design the model of care across the network will then be developed with implementation of these work programmes starting in 2019/20.

Full implementation will progress at different stages throughout the country, given that not all local health economies are starting from the same position, as there are different levels of service and network development. It is, however, envisaged that collaborative working between clinicians and providers will identify early opportunities to improve local pathways and make a positive impact on services for children, eg alignment of infection control policies to facilitate discharges and the ability for patients to move to hospitals closer to home as soon as they are clinically fit to move.

Local systems will need to work with all partners to support any proposed reconfiguration required. This will need to include working with service users and providers to co-design any proposed solutions, aligning to any existing plans of the STP/ICS. If reconfiguration of services is required, networks will need to work with commissioners to support the necessary public engagement and consultation linked to the scale of any changes, ensuring that they meet with relevant statutory requirements (also known as 13Q).

Implementation will be incremental to ensure that services are ready to accommodate any changes in pathway/ services, with the governance in place to oversee changes for any unintended consequences.

Networks will undertake an assessment of the local workforce, services, and data on demand and capacity for their network area and will make proposals on the configuration of services for PCC and SIC, which commissioners will then need to consider along with the proposed configuration of other children and young people's services. Commissioners will then formally designate and commission centres as appropriate.

National oversight of implementation will be via existing NHS England structures, namely the Programme of Care for Women and Children, the Specialised Commissioning Oversight Group, and the Children and Young People's Transformation Programme.

Key performance indicators to support network development and assurance, alongside guidance on establishing ODNs and identifying how best to adopt the model of care for PCC and SIC across a network footprint, will be made available to NHS professionals to support implementation. These tools include models to help commissioners and ODNs identify the number of beds and optimal configuration of services to adopt the national model of care.

8.2. Ongoing national work

National organisations that have been working with the review are also taking forward related work, including a review of the Paediatric Intensive Care Services Standards to look at the standards for standalone level 2 PCC units, and the establishment of a Children and Young People's Programme Board in Health Education England to co-ordinate the development of the paediatric workforce. The focus of this work programme will be on, among other things, taking a co-ordinated approach to the delivery of training courses, particularly for nurses, as well as the delivery of online education and training, and workforce requirements to support children and young people with long term ventilation needs. The programme is also taking forward the implementation and development of a demand-side analytical model.

NHS England and NHS Improvement have jointly commissioned a GIRFT (Getting it Right First Time) review of PCC services, to investigate variation between providers and consider how best to optimise resources within PCC services. The recommendations from this will be taken forward by the relevant ODNs as part of the improvement work locally.

Nationally, work will now be undertaken by the relevant clinical reference groups⁶ within NHS England to review the service specifications used to commission services, to ensure that these reflect the outcomes of this work and support the delivery of the new model of care. These will include details of applicable standards, interdependencies and metrics to monitor the quality of services.

⁶ <https://www.england.nhs.uk/commissioning/spec-services/npc-crg/>

9. Looking to the future of paediatric critical care and surgery in children services

The [NHS Long Term Plan](#) sets out the importance of getting pathways right for children and their families, ensuring that all patients can access the right care, in the right place, at the right time. The need for PCC and SIC services to evolve to meet the changing needs of patients is clear, and securing the sustainability of services will be a priority for the coming years.

Through the Long Term Plan, NHS England has committed to establishing ODNs for PCC and SIC. This work will now be taken forward through the regional NHS England teams, with support and oversight from national structures to ensure that momentum of delivery is in place and maintained.

The input of clinicians, children and families will also be vital to ensure that the NHS continues to deliver high quality and sustainable services for children and young people when they are needed.

10. Glossary

PCC	Paediatric critical care (refers to all levels of paediatric critical care)	ECMO	Extracorporeal membrane oxygenation
PIC	Paediatric intensive care (level 3 paediatric critical care)	ALOS	Average length of stay
SIC	Surgery in children (covers all types of surgery for children and young people)	HDU	High dependency unit (can refer to level 1 or level 2 paediatric critical care)
SSIC	Specialised surgery in children	NICU	Neonatal intensive care unit
LTV	Long term ventilation	CCG	Clinical commissioning group
DGH	District general hospital	STP	Sustainability and transformation partnership
ODN	Operational delivery network	ICS	Integrated care system
PICU	Paediatric intensive care unit (level 3 paediatric critical care)	National health organisations	These include NHS Improvement, Health Education England and NHS Digital