Implementing the Recommendations of the Neonatal Critical Care Transformation Review

NHS England and NHS Improvement

Contents

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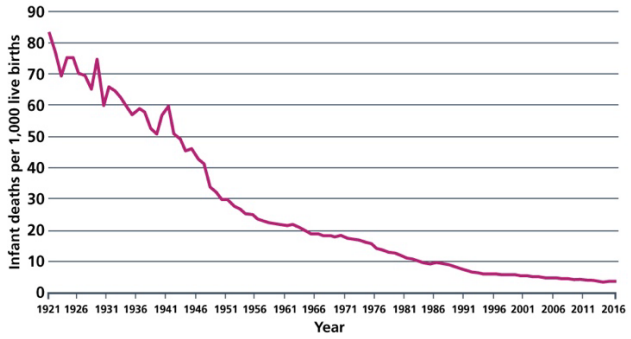
Introduction

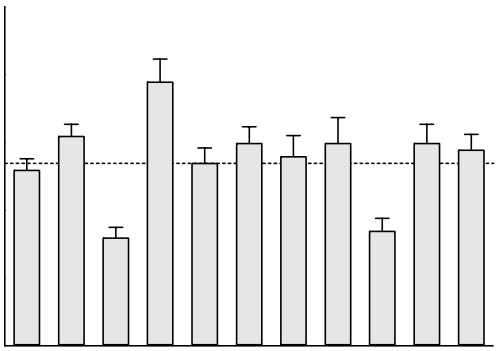
Over the last 25 years the prospects for babies who are born very premature, have congenital anomalies requiring surgery, or who develop illnesses after birth, have improved greatly (Figure 1). We have seen many clinical improvements in care such as the introduction of treatments for lung disease and a recognition of the importance of parents in playing an active role, alongside health care professionals, in the provision of neonatal care.

Figure 1: **Infant mortality in England and Wales between 1921 and 2016 (source: Office for National Statistics)**



Alongside this, services have been re-organised into a series of networks so that hospitals can work together to ensure that expert care can be delivered when it is needed. In particular, getting early care right means that many more babies grow up within their family with a full range of life chances than was the case before. For example, in babies born at extremely low gestational ages (23-25 weeks of gestation) survival increased between 1995 and 2006 by 15%,[1] and since then has continued to improve year on year.[2]

Figure 2: **Variation in proportion of babies born at 30 weeks gestation or less who survive with bronchopulmonary dysplasia by operational delivery network (source National Neonatal Audit Report 2017)**



Improving outcomes should not mean we are complacent. The evidence shows that there are further gains that can and should be achieved. We know that some of the variation in outcomes is due to babies being born in maternity units without intensive care services. However, there is also unexplained variation in a range of important neonatal conditions. One such example is the significant chronic lung disorder called bronchopulmonary dysplasia (Figure 2). If we can reduce these

[1] Moore et al BMJ 2012
[2] Santhakumaran et al ADC F&N 2017

differences, outcomes will improve further and put us on track to achieve our goal in *the NHS Long Term Plan to halve neonatal deaths by 2025.*

In February 2016 *Better Births* set out the *Five Year Forward View* for NHS maternity services in England. This report highlighted several challenges facing neonatal medical and nurse staffing, nurse training, the provision of support staff and cot capacity. It recommended a dedicated review of neonatal services. In response NHS England commissioned the Neonatal Critical Care Review (NCCR).

Phase one of the NCCR comprised an evidence review undertaken by the NHS England Neonatal Critical Care Clinical Reference Group (CRG) across several work streams.

Phase two of the NCCR focuses on turning the evidence review into a specific action plan for Regional Commissioning Teams, Neonatal Operational Delivery Networks (ODNs) and Local Maternity Systems (LMSs) to inform commissioner plans and, where required, service change.

This report sets out the actions required to inform commissioner planning, which are directly linked to the case for change (appendix). For each action it sets out:

- the evidence that underpins the action;
- the actions that should be taken and who should complete them;
- timetable;
- the support that is available.

The NHS Long Term Plan has committed to new investment over the next 5 years to meet the action plan. Its three key commitments are focused on:

1. Developing neonatal capacity: redesigning and expanding neonatal critical care services to further enhance safety, effectiveness and the experience of families, to improve neonatal capacity and triage within expert maternity and neonatal centres.
2. Further developing the expert neonatal workforce required: extra neonatal nurses and expanded roles for some allied health professionals to support clinical care.
3. Enhancing the experience of families through care coordinators and investment in improved parental accommodation.

The action plan is aligned with these commitments and the “Making it happen” section sets out how to ensure delivery of the actions contained in the plan, and how to track outcomes. To support this, links are provided throughout to sources of further information.

NHS England’s directly commissioned services include Neonatal Critical Care Services. Specialised Commissioning Teams work across regional and national footprints to support the commissioning and delivery of specialised services and the implementation of national policies.

The action plan is intended to support regional and local systems to take ownership of the issues raised, rather than setting a detailed national blueprint. It will inform and support the development of commissioner planning that will be subject to NHS service change and assurance processes; including where appropriate, public and patient engagement and consultation.

Further information

https://www.england.nhs.uk/mat-transformation/implementing-better-births/mat-review/

https://www.longtermplan.nhs.uk/

https://www.england.nhs.uk/mat-transformation/

Our vision

Neonatal critical care forms a key element of the NHS maternity service, providing part of the service available for all women and their new-born babies in the birthing room and during the early postnatal period. Neonatal critical care also provides an emergency service and ongoing support for babies and their families when a baby is born very prematurely, becomes sick or develops a medical problem. Involving the family and providing support and advice to them is integral to the delivery of high quality, personalised, neonatal critical care. This enables the family to become part of the team looking after their new baby, minimises separation, promotes attachment, helps families to understand their baby's needs and to develop confidence in caring for their baby.

The vision for neonatal services across England

A seamless, responsive and multidisciplinary service built around the needs of new-born babies and the involvement of families in their care. High quality neonatal care will be networked together across England, to improve outcomes for all families, provide safe expert care as close to their home as possible, and keep mother and baby together while they need care.

Neonatal services are inextricably interdependent with maternity services and are a key part of the Maternity Transformation Programme, established to implement Better Births. Together, the Maternity Transformation Programme and the NCCR form a coherent programme to improve outcomes for women and babies using maternity and neonatal services, including actions to improve pre-conception, antenatal, intrapartum and postnatal care, all of which have an impact on neonatal outcomes. Ensuring that implementation of both neonatal and maternity transformation plans remain coordinated and proceed together is an important part of national, regional and local planning. However, this report focuses specifically on neonatal services and the interface with maternity services.

The delivery of this vision is dependent on a highly skilled, multidisciplinary and expert workforce, working in a network of teams, each contributing different expertise in supporting the baby and their family in a way that is appropriate to their needs. In some circumstances, babies with particular clinical needs will require transfer of care from the local team to a Neonatal Intensive Care Unit elsewhere in the network, so appropriate expert care can be provided.

How neonatal care is organised

Over the past 20 years neonatal services have been organised into networks of providers that work together to deliver care. Neonatal care pathways involve highly specialist care being available in local Neonatal Intensive Care Units (NICUs) in each area to minimise necessary travel for parents and their child.

Ten Neonatal ODNs are commissioned by NHS England's Specialised Commissioning team. These have a mandate to develop and implement programmes of work to improve access to specialist resources, and to improve neonatal outcomes and patient experience, working closely with both providers and commissioners.

Maternity and neonatal care are inextricably linked and work together to produce the best outcomes for women and their babies who need specialised care. Neonatal ODNs work closely with LMSs to ensure that high quality care is provided that is responsive to the needs of women and their babies and maintains care as close to their home as is possible.

There are three types of neonatal unit, as described below, and three types of care Some NHS Trusts host more than one neonatal unit.

Neonatal care is currently delivered in 161 Neonatal Units across England:

- 44 Neonatal Intensive Care Units (18 of which also support a co-located neonatal surgical service).
- 77 Local Neonatal Units.
- 35 Special Care Units.

The units deliver 3 types of care (special care, high dependency and intensive care).

Neonatal Intensive Care Units (NICU) provide care for the whole range of neonatal care. They are staffed to care for the sickest and most immature babies and staff work closely with their local maternity teams and fetal medicine services. The NHS England Neonatal Critical Care service specification [E08/S/a] indicates that all women and their babies who are born <27 weeks of gestation or birthweight <800g, and multiple pregnancies <28 weeks of gestation, should receive perinatal and early neonatal care in a maternity service with a NICU facility.

Local Neonatal Units (LNU) provide care for all babies born at their hospital at 27 weeks of gestation or more, >800g birthweight or multiple pregnancies >28 weeks (which includes short-term intensive care where necessary) and they may receive babies 27-31 weeks who require high dependency care.

Special Care Units (SCU) provide local care for babies born at 32 weeks or more and >1000g birthweight who require only special care or short-term high dependency care. All pregnant women who fall outside these categories or babies who unexpectedly need intensive care are transferred to an appropriate unit in the local care pathway.

Care Pathways: Each neonatal network should comprise a number of maternity and neonatal services with one or two NICUs and a small number of LNUs/SCUs depending on local population need. All these units working together should support the delivery of a "local care pathway" which should have the capacity and resources to care for women who live within the network area and their babies for all conditions, except neonatal surgical or cardiac services and extremely rare conditions that are provided on a regional or supra-regional service.

What did the review find?

The NCCR examined evidence from the units themselves, the parents whose infants were cared for by the NHS and other professional groups and national data. The NCCR Team identified 5 main areas that required attention, which are described in detail in the Appendix. Findings of the review can be summarised as follows:

1. **Outcomes** – There was variation in outcomes in different types of neonatal unit and in different ODNs. This included infant deaths and complications of neonatal care. We have already taken action to ensure that premature births before 27 weeks of gestation are born in the right place and in 2018 we met our first target for this – during 2017, in three of four regions, 80% of women gave birth in a centre with an NICU. Perinatal mortality review for all babies is now an accepted part of standard practice, so we can learn and improve services where necessary. We are developing measures which will tell us how well our services are improving so we can monitor these important outcomes and concentrate resources in areas where there are the greatest difficulties.

2. **Activity, demand and capacity** for neonatal critical care – The NCCR found that in several areas an increase in the number of cots available to deliver care for their population would reduce the number of transfers out of a baby's normal pathway of care that can occur. This would reduce the requirement on families to travel longer distances to access the care their baby needs. The need to improve the availability of accommodation for parents was also identified, particularly

when their baby needed care for more than a few days. To address this demand, we have already asked regional commissioning teams to review their local practice to ensure that, wherever possible, babies are looked after in their normal care pathway and that travelling is minimised, while ensuring each baby gets the level of expert care it needs. Often this expert care is best given by a baby's parents and we are increasing the support available for family integrated care using Network level coordinators to ensure practice is the same whichever type of neonatal service the baby is being cared in.

3. **Transfers –** Transfer teams were often challenged by the number of emergency requests. Some of this can be avoided if babies are delivered in an appropriate setting when intensive care need is predicted, but lack of capacity means long journeys for some babies and their families. Some of the challenges might be addressed by improving capacity (see above), but regional commissioning teams will need to ensure that transfer teams are appropriately staffed and monitor their activity using simple measures developed to tell us which transfers are the most critical.

4. **Staffing levels** – Common with other clinical areas, neonatal nurse and medical staffing are both posing challenges. Recruitment and retention of nurses varies across the country and is particularly difficult in London in contrast with a less challenging situation in the North West. We will help teams to learn from good practice elsewhere and, through the NHS Long Term Plan, increase funding for posts and training to ensure we have the best expert teams. Medical staffing has become more challenging over the past 5-10 years and the Royal College of Paediatrics and Child Health (RCPCH) and Health Education England are working to ensure that medical cover for neonatal care is improved.

5. **Pricing –** There is significant variation in the money received by Trusts for neonatal care which leads to differences in what can be provided. The NHSE/I Pricing Team is working with the Neonatal Critical Care Clinical Reference Group to introduce new prices for neonatal care so that there is much more clarity and consistency as to what resources are available in each Trust.

Based on the findings of the NCCR, resources have been allocated as part of the NHS Long Term Plan and the Maternity Transformation Programme (MTP) to help to develop and monitor neonatal services. Specialised Commissioning and the MTP will work in partnership to ensure that the review plans are delivered through the actions described below, working through regional commissioning teams and the development of regional neonatal critical care commissioning plans. A Neonatal Implementation Board has been established to lead this as Workstream 10 of the MTP with representatives from all the main national and regional stakeholders to ensure that this goes forward.

The Action Plan

The NCCR has made a series of recommendations to address the above findings. They are grouped under the following themes, which align with commitments made in the NHS Long Term Plan (2019):

- **Aligning capacity (Actions 1 – 2)**
- **Developing the expert neonatal workforce (Actions 3-5)**
- **Enhancing the experience of families (Action 6)**
- **Making it happen (Actions 7-10)**

For each theme, the report summarises the evidence for the change, who needs to do what by when to inform regional commissioning planning processes and decision making and what support is available. The 'making it happen' section focusses on the implementation infrastructure that has been put in place to support local planning, commissioning and delivery**.**

Aligning capacity

This theme sets out the rationale for investing in capacity in neonatal units and ensuring that appropriate neonatal transport services are in place for babies that require transfer.

Action 1: Review and invest in neonatal capacity

What does the evidence say?

In England there is variation in the intensive care activity between units. The survival of babies born before 27 weeks is improved when this occurs in a maternity service with a Neonatal Intensive Care Unit (NICU). Survival is improved if NICUs look after at least 100 very low birth weight (VLBW) infants (<1500g) per year and survival is even better when born in busier units delivering >2000 intensive care days.

All NICUs should, as a minimum, look after at least 100 VLBW infants and unless geographically challenging, should be performing >2000 intensive care days (Health Resource Group 2016 definitions) each year.

Local Neonatal Units should aim to undertake a minimum of 500 days of combined intensive and high dependency care per year. This is a minimum requirement to maintain expertise. Services providing ongoing high dependency care should be expected to have higher levels of activity and all should work towards becoming services that provide at least 1000 combined Intensive Care/High Dependency days

in the long term. Smaller services would be designated as Special Care Services. Designation determines the type of activity and staffing required in the centre.

Action to be taken

Neonatal ODNs should undertake a review to determine which units have the correct capacity in place for the kind of neonatal care they provide, in line with the criteria above, and the additional capacity that is required. They should bear in mind that, along with increasing survival, particularly at low gestational ages, the demand for neonatal care is rising year on year.

ODNs and provider Trusts should then develop a plan, in conjunction with all key stakeholders including Regional Specialised Commissioning Teams, to address any mismatch between the criteria and the existing capacity and demand. Where a NICU does not meet the criteria, the ODN and the provider Trust should produce a viable plan to develop the unit to meet it within a 5-year timescale.

Alternatively, the ODN and provider Trust may conclude that activity will need to be combined on a single site, re-designating other sites as Local Neonatal Units or Special Care Units. There may be a very small number of exceptions for geographically remote services where the alternative would result in very long travel times.

A similar process should apply to Local Neonatal Services. Smaller services can be re-designated as Special Care Services and policy concerning activity and delivery adjusted accordingly.

Local systems will be expected to develop detailed plans to engage with patients and public in advance of any proposed changes to services. These will ensure not only that legislative requirements are met, but also that all views are taken into account and any proposed services are clearly communicated in advance.

ODNs should maintain supervision of the Transport teams operative locally to ensure appropriate staffing and capacity, monitoring the quality markers set by the Neonatal Transport Group (NTG). The impact of any changes in unit designation and/or patient pathway on the transport service should be considered and consulted on where necessary to ensure the service can continue to meet NTG quality standards.

ODNs should lead on gathering and analysing data and information to determine the optimal patient pathways and designation of units. Information from the regional GIRFT reviews should also be used to further refine the model where necessary. Consideration should be given to surrounding units and networks.

Timetable

Plans should aim to develop units to bring them into line with the criteria within five years, in line with the NHS Long Term Plan.

Indicative plans for neonatal services will be part of Regional NHS LTP Implementation Plans in the Autumn of 2019.

Regional Commissioners will work with ODNs, LMS and Maternity Clinical Networks to support the development of Commissioning Plans for the network by March 2020

Support available

Funding for investment is available through the NHS Long Term Plan from 2021/22. The funding will be allocated via regional specialised commissioning teams and prioritised to areas of need.

The national Specialised Commissioning team at NHS England and NHS Improvement along with the Neonatal Critical Care Clinical Reference Group will undertake a review of the existing service specifications for Neonatal Critical Care and Neonatal Transport Services. This will result in specifications that reflect the evidence and allow commissioners to be able to implement the service developments required in a consistent way through neonatal provider contracts.

Further information

Toolkit for High Quality Neonatal Services:

https://webarchive.nationalarchives.gov.uk/20130123200735/http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_107845

Optimal arrangements for Local Neonatal Units and Special Care Units in the UK including guidance on their staffing: A Framework for Practice

https://www.bapm.org/resources/2-optimal-arrangements-for-local-neonatal-units-and-special-care-units-in-the-uk-2018

Action 2: Develop transport pathways

What does the evidence say?

Neonatal transfer teams have been developed over the past 20 years as independent units in many areas. The independent professional advisory group, The Neonatal Transport Group (NTG), monitors their activity and outcomes regularly. Their results indicate that there can be intermittent difficulties for some transfer services in mobilising transfers in a timely fashion. They identified a wide variation between ODNs in the need for early transfer of extremely preterm babies, matching the difficulties in getting such babies delivered in the right setting with an on-site NICU and a variation in transfers out of NICU because of lack of capacity.

These reflect local system challenges in the provision of care, which in some areas is compounded by difficulties in staffing.

Action to be taken

Transfer during the provision of intensive care may be avoided by ensuring that births occur in the right setting, requiring aligned capacity in maternity and neonatal services. Only by doing this can the risks associated with transfer be mitigated.

Aligned with other actions on neonatal capacity ODNs, working in partnership with LMSs and supported by Maternity Clinical Networks, should evaluate the capacity of their neonatal transport services carefully to ensure adequate provision both now and following any changes to service provision across the ODN.

ODNs and LMSs should track performance against the transport key performance indicators in the current and revised transport service specification.

Timetable

LMSs and ODNs should include an evaluation of transport team performance against KPIs and action plans and address gaps in services in implementation plans by the end of March 2020.

Performance should be monitored and reported on an ongoing basis

Support available

The Neonatal Transport Group (NTG) is a professional, advisory and representative organisation with the defined role of representing neonatal transport through the British Association of Perinatal Medicine (BAPM).

The NTG maintain an overview of neonatal transport service provision and promote best practice. They act as a source of professional advice on neonatal transport matters to healthcare bodies and drive the collection of reliable, good quality transport data and support benchmarking and reporting.

The NTG will work with commissioners to promote equity of neonatal transport provision nationally.

Further Information

The NTG

https://ukntg.net/

Neonatal Transport Service Specification

https://www.england.nhs.uk/commissioning/wp-content/uploads/sites/12/2015/01/e08-serv-spec-neonatal-critical-transp.pdf

Staffing

Developing the expert neonatal workforce

Although it is critical that NHS Trusts take responsibility for providing a well-trained workforce in sufficient numbers and with appropriate skills to carry out the work they are asked to do, policy makers at a national level must facilitate entry and progression in neonatal nursing. The Neonatal Review considered these to be the most important developments that are needed in neonatal care, alongside capacity. The Review asked professional groups to consider identifying those situations in

which 1:1 nursing is mandatory, but after much debate the review team supported the use of nurse staffing ratios to define the establishment required to deliver neonatal care, as recommended in the Toolkit for Quality Neonatal Services (Department of Health 2009). This theme sets out the actions required to address neonatal staffing.

Action 3: Develop the neonatal nursing workforce

What does the evidence say?

Mortality, other outcomes and quality of care are improved when the national standard for nurse staffing is achieved. In 2016-17 there were 2263 fewer nurses in post than the standard recommends, as determined by the activity that was being undertaken. Some of this will be because of increased demand for neonatal care not matched by increased nursing numbers. However, entry into neonatal nursing has become more difficult and accessing role-essential neonatal specialist training opportunities is challenging. In some areas there were high vacancy rates, particularly in London. Furthermore, 25% of the nursing workforce are now aged over 50 years and are likely to retire in the next 10 years; 22% of current leavers were retirees.

Action to be taken

As part of the capacity review mentioned above, ODNs and NHS providers should produce a gap analysis of staffing within the ODN.

The staffing element of the plan will need to be built up from submissions from providers which outline how they will go about addressing their staffing gaps. Where necessary, NHS providers should include an interim plan to mitigate high vacancy rates as part of their submission, using as support, for example:

- Float nurses
- Team support workers
- Escalation plans
- Non-registered staff
- Specially trained Allied Health Professional staff

ODNs should then work with the Maternity Clinical Networks and LMSs to develop longer term actions aimed at addressing the issues identified.

ODNs should also monitor staffing/vacancy levels against outcomes using quality dashboard models in liaison with commissioning teams, thereby providing an audit of mitigation strategies.

ODNs should also support neonatal services to develop non-registered workforce roles to support families receiving special and transitional care.

Timetable

LMSs and ODNs should produce staffing action plans as part of their ODN Implementation Plan by the end of March 2020 and aim to complete implementation within five years, in line with the NHS Long Term Plan.

Support available

Funding for investment in staffing will be made available through the NHS Long Term Plan from 2021/22 and will be allocated via regional specialised commissioning teams.

Further information

BAPM LNU/SCU Guidance:

https://www.bapm.org/resources/2-optimal-arrangements-for-local-neonatal-units-and-special-care-units-in-the-uk-2018

HEE Innovative Workforce:

https://www.londonpaediatrics.co.uk/wp-content/uploads/2017/11/ExploringNewWaysofWorkingintheNeonatalUnitv4.pdf

HEE Maternity Workforce Strategy:

https://www.hee.nhs.uk/sites/default/files/document/MWS_Report_Web.pdf

Action 4: Optimise medical staffing

What does the evidence say?

At present around 15-18% of posts (excluding Consultant posts) are unfilled and in 2017 there was a 28% fall in national applications to train in paediatrics, where neonatal specialist registrars are drawn from. Sub-specialty training posts are frequently unfilled in some areas of the country. In part, this may be due to the demands placed on staff, making the discipline less attractive (in contrast to the situation across Europe where neonatology is a popular and oversubscribed discipline). Allied to this, 6% of consultant posts were unfilled with a shortage of candidates with sub-specialty training posts.

Evidence suggests that mortality is lower for babies receiving even short term neonatal intensive care with immediate access to a doctor trained and experienced in advanced resuscitation skills without commitments in other parts of the hospital that may make them unavailable in an emergency.

Providing neonatal medical rotas with sufficient trained staff has been challenging over the past 20 years, and several services have trained nurses in advanced practice to support medical cover at tier one or two as Advanced Neonatal Nurse Practitioners (ANNP). Some non-consultant career grade doctors also work on tier one or two rotas.

Action to be taken

As part of the capacity review we are requesting, ODNs and NHS providers should produce a gap analysis of medical staffing within the ODN.

NHS Trusts should ensure that there are sufficient medical staff available at all times during intensive care as set out in the BAPM Optimal Arrangements for Neonatal Intensive Care Units A Framework for Practice, 2014.

In parallel, workforce transformation is recommended including, for example the training of physician assistants to support medical workforce and consideration of the recruitment of trained and competent Advanced Neonatal Nurse Practitioners to fulfil appropriate roles within the service. In smaller services (LNU/SCU) a two-tier model may be appropriate, with monitoring. This will be taken forward by HEE working closely with the Royal College of Paediatrics and Child Health (RCPCH) workforce team.

Timetable

LMSs and ODNs should work with HEE to produce action plans by the end of March 2020 and aim to complete implementation within five years, in line with the NHS Long Term Plan.

Support available

Medical workforce planning will be supported by the GIRFT process, with standardised data collection from all neonatal units which will be shared with the local ODN teams. Support will be available from HEE and the RCPCH via the Neonatal Implementation Board membership.

Supporting information

BAPM LNU/SCU Guidance:

https://www.bapm.org/resources/2-optimal-arrangements-for-local-neonatal-units-and-special-care-units-in-the-uk-2018

HEE Innovative Workforce:

https://www.londonpaediatrics.co.uk/wp-content/uploads/2017/11/ExploringNewWaysofWorkingintheNeonatalUnitv4.pdf

HEE Maternity Workforce Strategy:

https://www.hee.nhs.uk/sites/default/files/document/MWS_Report_Web.pdf

Action 5: Develop strategies for the allied health professions

What does the evidence say?

In addition to medical and nursing staff, neonatal units require key contributions from an essential group of allied health professionals (AHPs), many of whom develop special expertise in their discipline as it applies to new-born babies. These disciplines comprise dietitians, occupational therapists, physiotherapists, speech and language therapists, pharmacists and psychologists, among others.

AHP practice in the neonatal period is very different to practice in older children and adults, demonstrating the need for AHP's with specific skill sets. Each of the major professions listed above have developed recommendations for the provision of AHP support for neonatal services, available from their professional websites.

AHPs have been central to the implementation and embedding of developmentally sensitive care into neonatal practice in many neonatal units (see Action 6), and champion the need to view neonatal care that looks forward to improving longer term outcomes for babies and their families.

Action to be taken

NHS Trusts should develop an AHP strategy as part of workforce planning which sets out the level and expertise of pharmacy and AHP required, the level currently available, and how any gaps will be filled. In some organisations, individuals within the provider Trust will be able to manage this, but for some smaller services ODNs may need to support the process.

ODNs, with support from NHS providers, Maternity Clinical Networks and LMSs should identify where action needs to be taken at ODN level and assist in directing resources to the appropriate places.

Timetable

LMSs and ODNs should produce action plans by the end of March 2020 and aim to complete implementation within five years, in line with the NHS Long Term Plan.

Supporting information

Dietetics:

https://www.bda.uk.com/regionsgroups/groups/paediatric/neonatal/neonatal_dietitian_competencies.pdf

Occupational therapy:

https://www.rcot.co.uk/practice-resources/rcot-publications/downloads/neonatal-services

Physiotherapy:

https://www.csp.org.uk/system/files/documents/2019-07/a_competence_framework_and_evidence_based_practice_guidance_for_the_physiotherapist_working_in_the_neonatal_intensive_care_and_special_care_unit_in_the_uk.pdf

Speech & language therapy

https://www.rcslt.org/clinical_resources/neonatal_care/overview

Support for Parents

Enhancing the experience of families

As the evidence shows, high quality neonatal care must include a substantive role for parents in the care of their baby; in this respect, neonatal care differs from many branches of inpatient medicine. Parents are not bystanders as illness develops and resolves but perform an active role as a member of the care team. To perform this role, and in order to minimise morbidity, parents require support and facilitation by a service that has appropriately focussed and trained nursing or AHP staff, working alongside medical and nursing clinical practice staff. There are various models of care that can support parents in this way and the Bliss Baby Charter has described how the service should offer family centred facilities. This theme sets out how ODNs and LMSs should work together to ensure that parents are given the opportunity to be involved in the care of their babies.

Action 6: Develop and invest in support for parents

What does the evidence say?

The evidence shows that outcomes are better for babies whose parents are able to play an active role in their neonatal care. Their inclusion benefits the neurodevelopment of the baby during critical periods of early life and promotes long-term quality of life and family cohesion. Breast feeding is more successful, bonding is encouraged, and parental stress is reduced, all of which have long term benefits for babies and families. NICE guidance NG124 recommends the provision of developmentally focused care.

Parents should be the primary care provider for their child and thereby facilitated to work with the clinical practice team to deliver as much cot-side care as is feasible, depending on the acuity of their baby's need and their family circumstances. To be able to engage in the care of their baby, two resources need to be in place. Firstly, parents require support and facilitation by a service that has appropriately focussed and trained nursing or AHP staff, working alongside medical and nursing clinical practice staff. Parental support involves education for parents in the specialised

needs of their baby and training of all staff in the provision of developmentally sensitive care from a multidisciplinary team.

Secondly, parents need facilities and resources for them to be resident with their new-born or sick baby for some or all of the 24-hour period if their circumstances permit. This is particularly important when they have to relocate to another unit when their baby is transferred for step up or step-down care. Bliss recommends that sufficient accommodation is available close to the neonatal unit during periods of intensive care, including resources to prepare and eat meals, and quiet space. Support for travel (car parking etc.) is equally important as babies often remain critically ill for weeks or even months, particularly when born at extremely low gestational ages. Without such provision, parents will face further stress to remain with their baby.

Action to be taken

LMSs and ODNs should work together to profile the provision in local providers by reviewing the extent to which providers are integrating families into care and providing developmentally supportive care, which should also include information on, and access to, emotional wellbeing and psychological support and the provision of resources and accommodation.

LMSs and ODNs should then develop action plans to address any issues, including:

- Initiatives to develop facilities available for parents to be resident with their child.
- Initiatives to develop integration of the family as the primary carer (examples of which include Family Integrated Care; the Bliss Family and Infant Neurodevelopmental Education (FINE) programme or Neonatal Individualised Developmental Care) to promote parental confidence in caring for their baby, reduce stress and adverse effects on maternal mental health.
- Supporting neonatal services to seek and acquire accreditation under the Bliss Baby Charter Scheme and the UNICEF Baby Friendly Initiative
- Gaps in availability of information on emotional wellbeing and provision of psychological support for all parents whose baby experiences a period of critical care in a neonatal unit (including transition out of care and subsequent follow up), and staff training needs.
- Ensuring clear pathways for identification of mental health need and onward referral, including to more specialist services where necessary (e.g. where parents are experiencing moderate/complex – severe mental health problems). This should include partnerships with local specialist perinatal mental health services and networks where appropriate.

Timetable

LMS and ODNs should produce action plans as part of the ODN Implementation Plan by the end of March 2020 and aim to complete implementation within five years, in line with the NHS Long Term Plan.

Support available

Funding for investment in Care Co-ordinators to facilitate the development of Family Integrated Care and parental involvement in the care of their baby will be made available through the NHS Long Term Plan. The criteria used to allocate resources and how it will be accessed will be shared when it is available.

The national Specialised Commissioning team at NHS England and NHS Improvement working with the Neonatal Critical Care Clinical Reference Group will incorporate requirements related to support for parents into their review of service specifications.

Resources which can help LMS and ODNs to invest in good parental support include the Bliss Baby Charter and the UNICEF Baby Friendly Initiative.

Further information

Family Integrated Care

http://familyintegratedcare.com/

https://www.bliss.org.uk/health-professionals/training-and-events/the-fine-programme

https://nidcap.org/en/

Bliss Baby Charter

https://www.bliss.org.uk/health-professionals/bliss-baby-charter

Baby Friendly Initiative

https://www.unicef.org.uk/babyfriendly/

https://www.unicef.org.uk/babyfriendly/baby-friendly-resources/implementing-standards-resources/neonatal-guide-to-the-standards/

NICE:

https://www.nice.org.uk/guidance/ng124

Making it happen

This theme sets out how the delivery of the actions will be assured, and how the outcomes will be tracked. It sets out what needs to happen now to realise the vision for neonatal services and describes the governance structures that will support delivery.

Action 7: Develop local implementation plans

The organisation of neonatal services and their staffing provide modifiable factors through which we can meet the national ambition and improve outcomes. There is no single blueprint for a successful neonatal service, nor one way to implement one. Services have built up initially through local custom and practice, but since the introduction of formal neonatal networks over the last 20 years, network structures have become better defined.

Action to be taken

Regional Commissioners with ODNs, NHS Trusts and Maternity Clinical Networks, should develop an outline 5-year Neonatal Critical Care Implementation Commissioning Plan for each of the neonatal ODN areas. The plan should set out how all the action points outlined above will be taken forward with clear milestones, the investment required and funding sources.

LMSs should ensure details of the collaborative work to develop an ODN Implementation Plan is included within their LTP submissions. The submission should include a brief overview of neonatal services in the LMS, details on performance and outcomes and work undertaken to date between maternity and neonatal services in the LMS to drive improvement. The submission should also include a summary of how the LMS and ODN are working together to support the development of neonatal critical care commissioning plans and any progress already being made towards implementing the actions.

Get It Right First Time (GIRFT) Neonatology Reviews

A Neonatology GIRFT review has been initiated in 2019.

GIRFT is a national quality improvement programme operating in over 40 clinical specialities. The programme identifies unwarranted variation and shares good practice to improve patient outcomes.

GIRFT methodology involves the development of an individual data pack for every Trust, which contains key benchmarking data relevant to each clinical speciality. This data is shared and discussed with each Trust as part of the GIRFT review process (deep dives), during which the clinical lead for the speciality notes areas of good practice and makes recommendations for how to improve performance. Action plans are then agreed by Trusts, who are supported in delivery by the GIRFT implementation team.

The GIRFT review for neonatology will include deep dive visits at both Trust and network level. These will compliment and support the neonatal critical care review and will report to the Neonatal Implementation Board

How will GIRFT support implementation of recommendations

Questionnaires

The GIRFT team have sent out questionnaires for neonatal networks, transport services and neonatal units which were completed and returned by the end September 2019. These questionnaires will support key areas of work required by networks for the national review.

Questionnaires were sent out via the ODNs. A key priority for Neonatal ODNs will be to ensure 100% returns and to validate the data.

Providers have ownership of their own GIRFT action plans keeping ODNs informed of progress.

Visits

GIRFT is developing data packs for use at both network and individual Trust level. The network data packs will have detailed information on workflow and capacity, in addition to information on workforce and parental support. It will also contain key clinical benchmarking data.

GIRFT network deep dive visits will take place between January and March 2020. ODNs will have an important role in determining the structure and attendance for the visits (e.g. whole ODN or individual clinical networks done separately in 2 or more visits or sessions). Attendance will include the full ODN management team, key neonatal and maternity clinical and managerial staff from each Trust, network transport service representatives, senior specialist commissioning team and LMS representatives, regional directors and medical directors.

Actions arising out of the GIRFT network deep dive visits will inform further iterations of the ODN Implementation Plans.

GIRFT findings following the neonatal network deep dive visits will be shared with the Neonatal Implementation Board and included in the GIRFT national report which will be published following completion of the individual Trust GIRFT visits.

ODN Implementation Plans

To support the development of neonatal critical care commissioning plans and processes, ODNs should develop an ODN Implementation Plan by end of March 2020 including:

1. Demand and capacity plan across the network covering capacity, activity, occupancy and parental support. The plan will be based on existing ODN data and data obtained from the GIRFT questionnaires collected and verified by the networks in September 2019.
2. Agreement on a process for developing the above plans in partnership with LMS to ensure that ODN and LMS planning is aligned and jointly agreed i.e. taking into account clinical pathways, neonatal capacity, current and future birth rates, neonatal and maternity workforce, parent facilities and FIC and potential/planned maternity and neonatal service developments.
3. Incorporation of any existing ODN plans that are in place to address ongoing issues or reconfiguration plans within the network e.g. addressing governance and safety issues that the network is already aware of.
4. How ODNs will assist GIRFT to ensure 100% completion and validation of questionnaires for network providers and transport teams.
5. How ODNs will work with GIRFT to ensure network deep dive visits are arranged for January – March 2020 and that all key stakeholders are invited and encouraged to attend.

Following the GIRFT ODN deep dive visit (between January and March 2020), further iterations of the ODN Implementation Plans should include actions arising from the visit. Any additional actions should be fully incorporated into plans by August 2020.

Timetable

ODNs should produce an ODN Implementation Plan jointly with LMSs to support the development of commissioning plans by end March 2020

GIRFT will confirm ODN visit dates in October 2019 for visits to take place January – March 2020.

GIRFT data packs will be released to ODNs to assist with next iteration of ODN Implementation Plans from April 2020.

LMSs to include details of the collaborative work to develop an ODN Implementation Plan and progress to date within their LTP submissions from November 2019.

Support available

ODNs will lead and will be supported by LMS and Maternity Clinical Networks who have the expertise to be able to advise on the development of action plans.

The Neonatal Implementation Board will oversee the governance of the programme, the overarching Review and LTP implementation plan for neonatal and assure the plans submitted by Regional Maternity Programme Boards.

GIRFT will share workforce and parent support information with the neonatal ODNs prior to the deep dive visits.

GIRFT will provide data packs and undertake network deep dive visits which will provide further information on capacity, patient pathways, transfers, workforce, parent support information, and key clinical outcome data. This data will be benchmarked nationally where appropriate.

GIRFT will provide a summary report of findings at a network level to be shared with the Neonatal Implementation Board.

GIRFT will provide Trust level data packs and deep dive visits to all neonatal units with Trust level action plans agreed. Implementation of these plans will be supported by the GIRFT implementation team.

GIRFT will publish a national report of findings and recommendations following completion of Trust visits in 2021.

Action 8: Ensure neonatal services are integrated into maternity planning

Neonatal services are an integral part of maternity services and are interdependent. The evidence tells us that, for extremely preterm and ill babies, alignment of maternity with neonatal services is a critical part of ensuring healthy survival and delivery in the appropriate setting is necessary to optimise this. The odds of survival for extremely preterm babies are improved by 70% in appropriate settings, where more 1:1 nursing is available, and improved further by centralising expertise in larger maternity and neonatal settings.

Regional maternity teams and ODNs have been asked to work together to ensure that all women who are likely to deliver before 27 weeks of gestation give birth in a maternity unit with an on-site NICU. This is because research evidence suggests this is associated with a reduction in mortality in this group and current data indicate wide variation in the proportion of births in such centres.

Since the recommendation was initially made in 2009, several networks have made great strides in achieving this, such that in 2015 73% of births occurred in the right setting, compared to 56% in 2006. Following interim guidance that set out the actions required by LMSs and ODNs to begin to address the findings of the evidence review, three of four regions met the target of 80% in 2017. However, this figure

masks significant local variation and women and babies are still transferred significant distances within large ODN areas.

Action to be taken

LMSs and ODNs have primary responsibility for ensuring neonatal and LMS planning is integrated. This planning should include defining local care pathways within the ODN boundary and monitoring capacity within each. Each ODN may contain several local care pathways based on natural patient flows to ensure that sick babies and their families have minimal distances to travel. LMSs should ensure that Neonatal ODNs are represented in each LMS and that local maternity transformation plans include consideration of how neonatal services will be delivered.

Each NHS provider Trust board already has a named Maternity Safety Champion as part of Maternity Transformation Programme efforts to improve outcomes from maternity services. Each neonatal provider Trust board should now appoint a named Neonatal Safety Champion, whose remit should include ensuring integration between maternity and neonatal service planning.

Regional Directors of Specialised Commissioning and Regional Maternity Programme Boards will provide oversight and assurance. They should monitor transfer rates and deliveries of babies <27 weeks of gestation in appropriate settings, defined by the normal care pathway for women who deliver <27 weeks. They should also regularly review key data at LMS level to identify variations in care provision and help identify solutions.

Support available

ODNs and Maternity Clinical Networks have the expertise to be able to advise on integration of maternity and neonatal service planning and the role of safety champions.

Timetable

Neonatal Safety Champions and ODN members of LMS boards should be in place. Any changes to local maternity transformation plans should be made in alignment with local neonatal action plans due by the end of March 2020.

Action 9: Establish a national infrastructure to oversee implementation of the actions in this plan

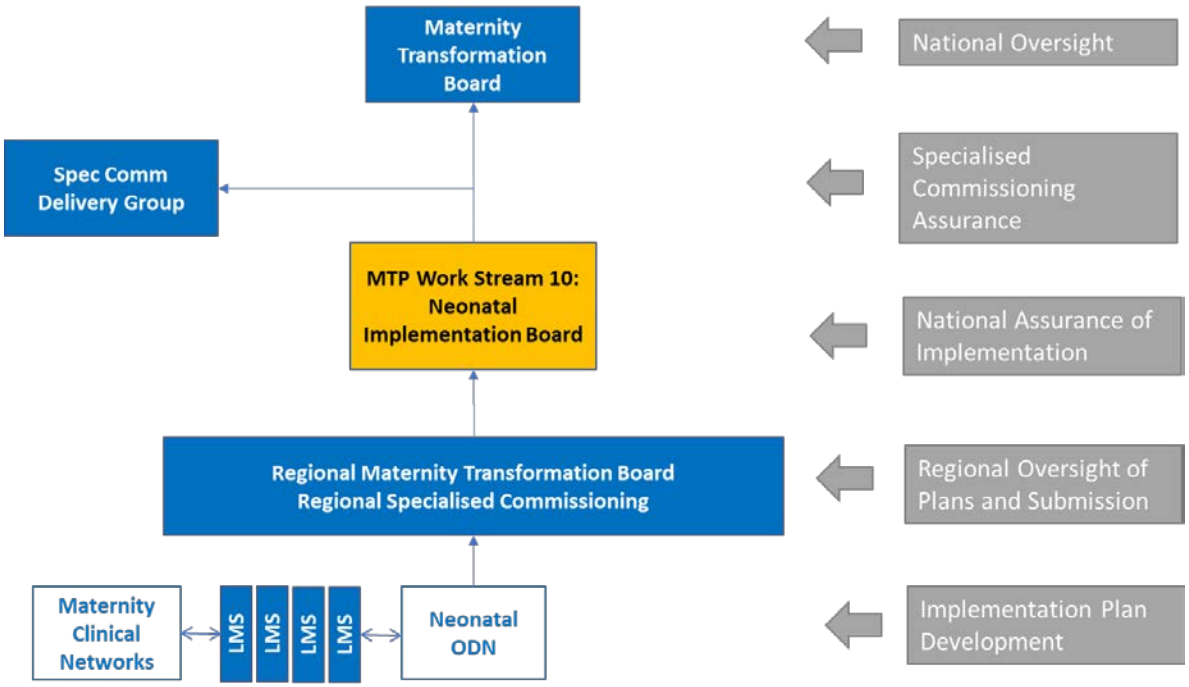
Outcomes from neonatal services are affected by a range of care services including pre-conception, antenatal, intrapartum and postnatal services, as well as neonatal services.

Action to be taken

At national level a Neonatal Implementation Board (NIB) will be established to bring together those responsible for neonatal and maternity services, to oversee the delivery of this action. The NIB will operate as Work Stream 10 of the Maternity Transformation Programme. This will be a new work stream recognising that the implementation of the NCCR and the NHS Long Term Plan commitments is an important and discrete area of work with its own governance. It will be a shared work stream with Specialised Commissioning.

The Work Stream 10 NIB will pull together existing national programmes of work as well as recommending the initiation of other national and regional work aligned with existing work programmes to ensure the delivery of the commitments in the NHS Long Term Plan.

It will report jointly to the national Maternity Transformation Board and the national Specialised Commissioning Delivery Group.



It will also be responsible for:

- Oversight of work to develop a clear and consistent ODN structure, function and funding mechanisms. This work will result in interim arrangements in 2019/20 and new funding mechanisms in 2020/21.

- Review of the existing National NHSE Service Specifications for Neonatal Critical Care and Neonatal Transport Services. This will result in specifications that reflect the review recommendations and allow commissioners to be able to implement the service developments required in a consistent way through neonatal provider contracts.
- Continuation of work towards a national tariff that will result in new national tariffs against the existing Healthcare Resource Groups (HRGs) to provide fairer reimbursement from 2022/23:
    - The new HRG definitions (known as HRG 2016) will be implemented over the next 2 years. Working in parallel, an extended Neonatal Critical Care Expert Working Group has been formed comprising members from the National Casemix Office, NHS England (Commissioning & Finance) and NHS Improvement, alongside parents, clinicians and RCPCH representation. This group will propose a National Tariff for Neonatal Critical Care. This will exclude funding for neonatal work carried out locally via the maternity contract.
    - A non-mandatory national tariff is expected for April 2020, with a formal national tariff from April 2022 following a shadowing process.

Action 10: Establish national reporting of regional neonatal outcomes

What does the evidence say?

The NCCR and the Quality Surveillance Team peer review process identified significant variation in outcomes and service profiles across England. However, pulling together the data was a complex process. For outcomes to be monitored going forward to provide assurance that local implementation plans are delivering the required improvements, the reporting of data needs to be simplified.

Action to be taken

The Neonatal Critical Care Clinical Reference Group and the NHS England and NHS Improvement Quality Surveillance Team should define constituent data (and source) for national reporting and expand the quarterly National Neonatal Critical Care Specialised Services Quality Dashboard using National Neonatal Audit Programme (NNAP) criteria. Once this is established then these data will be reported to the Neonatal Implementation Board.

Timetable

The dataset and sources should be agreed, with the reporting mechanism and governance in place by April 2020, and the first national report completed and published by June 2020.

Further information

https://www.rcpch.ac.uk/work-we-do/quality-improvement-patient-safety/national-neonatal-audit-programme

Appendix: The Case for Change

The case for change rests on the investigations of the NCCR Team in 5 main areas:

1. Outcomes – mortality
2. Activity demand and capacity for neonatal critical care
3. Transfers
4. Staffing levels – nursing and medical
5. Pricing

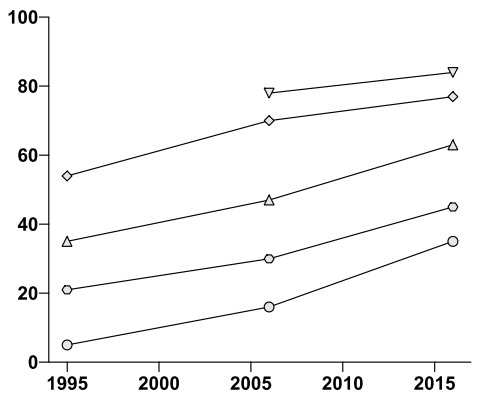
This appendix provides an overview of the key evidence.

Outcomes

Perinatal and neonatal mortality rates have fallen steadily over the past 30 years. Deaths in the neonatal period are highest for babies born at very low gestational ages, which are falling steadily, and immaturity contributes the highest proportion of all infant deaths, followed by congenital anomaly. [3]

MBRRACE-UK monitors stillbirths and neonatal deaths (to 28 days) across the UK (https://www.npeu.ox.ac.uk/mbrrace-uk/reports). Their latest reports highlight substantial variation in neonatal mortality between 1.0 and 3.04 per thousand live births by Local Maternity System/STP populations and the report recommends that each STP addresses existing inequalities especially in relation to neonatal mortality. In particular, the 2017 MBRRACE-UK report calls for research to identify the extent to which deaths of babies born before 32 weeks of gestation are avoidable and to develop practices and policies that could reduce potential variation in management.

Figure A1: **Survival to discharge for infants born 22–26 weeks of gestation and admitted to neonatal units in England in 1995 (EPICure), 2006 (EPICure 2) and 2016 (MBRRACE-UK).**
NICU: neonatal intensive care unit.



Following the publication of the first UK wide study of births before 26 weeks of gestation in 1995, for babies admitted for neonatal care there has been continuing improvement in mortality rates in England (Figure A1). However, among extremely preterm babies, the interpretation of mortality rates is highly complex because

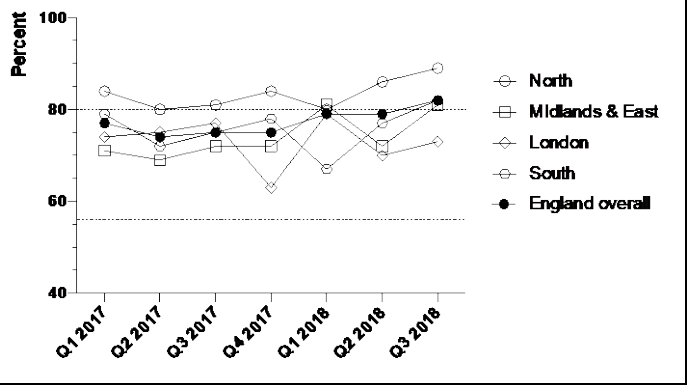
[3] Office of National Statistics

variation is caused not only by differences in practice at these low gestations,[1] but also by important organisational factors such as the proportion of babies who are born outside centres with expert neonatal services[4] [5] and the availability of expert nursing staff.[6] By addressing these important issues, variation in mortality will be reduced even further.

In 2017, NHS Specialised Commissioning instigated an Action on Neonatal Mortality through two immediate actions:

(a) **All regional maternity teams and Neonatal ODNs should work together to ensure that all women who are likely to deliver before 27 weeks of gestation are able to give birth in a maternity unit with an on-site Neonatal Intensive Care Unit.** In 2006 only 56% of births occurred in centres with an NICU. In December 2017, an initial target of 80% was set as the upper quartile of current practice. In 2107 only one region met this standard and subsequently it was met in 3 of 4 NHS regions in the third quarter of 2018 (Figure A2).

Figure A2: **Specialised Commissioning monitoring of place of birth for babies born before 27 weeks of gestation (January 2017-September 2018)**

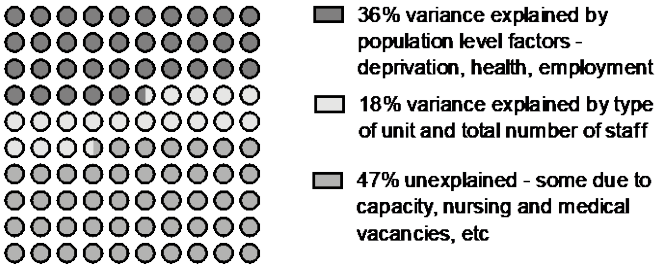


(b) **Neonatal services should ensure that a formal investigation of all neonatal deaths is undertaken to support the delivery of systematic, multidisciplinary, high quality reviews of the circumstances and care leading up to and surrounding each stillbirth and neonatal death.** Since we published this Action, all Trusts are now monitoring using the PMRT and this is monitored by MBRRACE-UK in its annual reporting. For term babies reports are assessed for quality as part of the Each Baby Counts programme and NHS Resolution.

[4] Marlow et al Archives of Disease in Childhood Fetal & Neonatal Ed 2014
[5] Watson et al BMJ Open 2015
[6] Watson et al Archives of Disease in Childhood Fetal & Neonatal Ed 2016

Further analysis of the available evidence suggests that one third of regional variation in mortality may be explained by population or socioeconomic factors, such as deprivation, employment, smoking etc (Figure A3). One fifth of the variance was explained by the type of neonatal service (NICU, local neonatal unit or special care unit) and the number of staff available. Half of the variation was unexplained and current work is analysing the reasons behind this including resource availability factors and underlying health issues of babies, such as chronic respiratory disease and disability/impairment. These health factors vary similarly across England[7] and understanding the relationship of these outcomes to care practices is important. We continue to investigate the reasons for this so that we can develop monitoring to ensure a reduction in avoidable variation across the country.

Figure A3: **Results of an analysis to explain variation in neonatal mortality levels in England using data from April 2015 – March 2016.** Source: Badgernet, MBRRACE and Arden & Gem CSU.



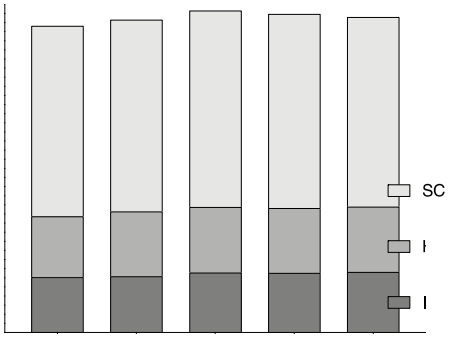
Activity, demand and capacity

Over the three years 2013-2016 there was a steady increase in the number of babies admitted to neonatal units, comprising babies born within their home network and, importantly, those born outside their network; the latter reflects a lack of capacity within home networks. From a baseline of just over 65,000 admissions each year, over the three years admissions from the normal care pathways rose by 1598 babies per year and there were an extra 150 babies each year transferred from other networks.

[7] National Neonatal Audit Project Annual Report

The increase was across all three care categories, intensive, high dependency and special care, ranging from a year on year increase of 3613 days per year for intensive care and 2968 days for high dependency which has continued in 2017 and 2018 (Figure A4). The increase in intensive and high dependency care days reflects increasing demand for babies who need significant respiratory support and therefore is a real increase in demand. Some of the increase in activity is because more babies are surviving each year, particularly at very low gestational ages. At low gestations, babies have prolonged stays in intensive and high dependency neonatal care. The ATAIN (avoiding term admissions into neonatal units) programme aims to minimise the number of babies admitted to neonatal units who were born at full term and the fall in special care activity in the last two years might reflect the effect of this national programme.

Figure A4: **Clinical activity in neonatal units 2013-8 (Fiscal years) in England.** Note that annually intensive care (IC) days are rising by 3613 days and high dependency (HD) days by 2968 days; in 2016 the ATAIN (avoiding term admissions into neonatal units) project commenced and has led to reductions in special care (SC) days which are now at the same level as in 2013.



The Review matched activity recorded against declared cot numbers in 2016. The Toolkit for Quality Neonatal Services recommends that neonatal cot numbers should be sufficient to carry out the activity on average at 80% occupancy. This is used as a standard because it is impossible to predict admissions and admission numbers which fluctuate randomly depending on births. There appeared to be sufficient cots for activity in all but 3 ODN areas. London, West Midlands and Staffordshire Shropshire and Black Country had a calculated overall deficit of 74 cots on 2016 data. Furthermore, looking within ODN areas, some capacity may not be in the optimal configuration to maximise occupancy. Local reviews are necessary to ensure that services are configured to optimise their ability to care for local populations, minimising unnecessary or long-distance transfers.

Size of neonatal units

Intensive care activity varies between hospitals designated as an NICU from 1000 to over 5500 intensive care days per year. There is evidence from England that survival of babies born before 27 weeks of gestation is higher when this occurs in a maternity service with an NICU, and that survival for this group is higher still when born in a service that either carries out more than 2000 respiratory care days per year or is in the highest quartile of intensive care activity in the UK.[8][9] This concept,

[8] Marlow et al Archives of Disease in Childhood Fetal & Neonatal Ed 2014
[9] Watson et al BMJ Open 2015

that busier services have better outcomes, is supported by international data, mainly from the USA, and which was reviewed in 2014 by a working group established by BAPM.[10] Using these data one third of UK specialist NICUs are considered 'small'. The American Academy of Pediatrics and American College of Obstetricians and Gynecologists recommend that deliveries before 32 weeks of gestation occur at subspecialty perinatal centres, equivalent to UK maternity units situated alongside a NICU, but evidence from UK studies suggests that outcomes from 27 to 32 weeks of gestation are similar in centres with an LNU to those with an NICU.[9]

The BAPM working group recommended criteria for designating units as an NICU and were based on respiratory care days and number of very low birthweight admissions. These recommendations were considered alongside the other international evidence by the NCCR. The Review recommended Intensive Care Days as the marker of activity, which approximates to but slightly underestimates overall respiratory care. This was chosen because it is collected nationally in the Neonatal Critical Care Minimum Dataset and Review data show that 18 of 44 NICU (41%) have more than 2500 intensive care (IC) days per year, 10 (23%) have 2000-2500 IC days and 16 (36%) are of lower throughput. Several of these designated NICUs with lower activity or low throughput are in close proximity; the Review recommended that Regional Teams consider service development to increase throughput to >2000 intensive care days, which would lead to improvements in survival, and to significant economies of scale that permit better staffing and less marked fluctuations in daily admissions. Although this may increase either the need for transfers or lead to increased travel times for parents in some settings, the trade-off for improved survival and economy of scale must be seriously considered as part of the local implementation plan.

Evaluating local services without NICU designation, the Review identified a similar variation in activity for Local and Special Care Units. There is only a little overlap in activity between the busiest LNUs and the least busy NICUs. In contrast several local units carry out very little activity. To some extent this is necessary and unavoidable as women may deliver rapidly after presentation to the maternity service. However, such services are not staffed to carry out long term neonatal intensive care and rapid transfer is necessary to continue care safely. ODNs vary by the proportion of neonatal intensive care which is carried out in Local Neonatal or Special Care Services. In all areas <5% of intensive care happens in SCU, mainly short term, unavoidable episodes and while awaiting transfer. In contrast between 12 and 31% of intensive care activity occurs in LNUs across the 11 ODN areas. This is monitored by ODN teams and exception reporting identifies where this is inappropriate and the reasons for it.

[10] Optimal Arrangements for Neonatal Intensive Care Units in the UK including guidance on their medical staffing BAPM: London (2014)

BAPM have recently reviewed activity/throughput recommendations for Local Neonatal Services.[11] The NCCR agreed with these recommendations and confirmed that all LNUs should undertake at least 500 combined intensive and high dependency days per year. After much discussion, the NCCR considered that activity levels under 500 intensive care days or 1000 combined intensive and high dependency days per year were not sustainable in the long term and that similar outcome improvements and economies of scale to those predicted for NICUs were achievable in the long term. Regional Teams should consider service developments to achieve these recommendations.

Transitional care

An overriding principle of neonatal practice is that a mother and her baby should not be separated by admission to a neonatal unit unless absolutely necessary. This has been facilitated by the development of "transitional care', whereby a baby with needs defined under the umbrella of "special care" is managed alongside their mother, supported by both midwifery and neonatal teams. The impact of this has been to reduce unnecessary admissions and to allow earlier discharge from the neonatal unit. The recording and payment for transitional care is inconsistent across the country at present. In some Trusts, any intervention by the neonatal team is claimed as transitional care, whereas in other areas common interventions are recognised to be part of normal care and paid under the maternity contract. This leads to perverse incentives to either keep babies in neonatal units where they attract a higher reimbursement or to claim transitional care payments for care that is part of routine practice. This has been addressed within the new Healthcare Resource Group definitions (see below – pricing)

The ATAIN (avoiding term admissions into neonatal units) programme aims to minimise admissions and to promote transitional care. The NCCR considered that this successful programme should continue, and this has been recognised by inclusion in the 'top 10' requirements for Trusts for the CNST maternity incentive scheme by NHS Resolution.

Further information

https://resolution.nhs.uk/services/claims-management/clinical-schemes/clinical-negligence-scheme-for-trusts/maternity-incentive-scheme/

Neonatal transfers

Transport teams carried out approximately 15,784 transfers in 2014, 15,994 in 2015, and 15,820 in 2016. Transfer activity varies widely between teams, who cover very different geographical areas and populations. Between January and June 2016 there

[11] Optimal arrangements for Local Neonatal Units and Special Care Units in the UK including guidance on their staffing: A BAPM Framework for Practice BAPM: London (2018)
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were 197 transfers for intensive care in the first 72 hours after birth for babies <27 weeks of gestation, representing approximately 400 births in a non-NICU setting. Over the same 6-month period, there were approximately 275 transfers of babies born 27-31 weeks who developed unanticipated neonatal illness and needed intensive care.

The Neonatal Transport Group (NTG) have developed two quality measures for infants needing transfer for intensive care – "time critical transfers for intensive care" (response within 60 minutes of telephone call and time to arrival of team within 3.5 hours of telephone call). In 2016 there was variation from 54% to 100% in the ability of a transport team to deliver time critical responses when needed and eight of thirteen services did not always meet predefined criteria. Many delays occur because the team are already deployed on another emergency. Problems are also caused by teams having to repatriate over long distances into other networks, which contributed to 11% of transfers for intensive care being done by another team.

Neonatal ODNs and LMSs need to provide careful oversight over the sustainability and activity of their transport teams. Some of the pressure on teams may be reduced by initiatives to ensure that women give birth in settings with appropriate on-site neonatal care (and therefore do not need transfer), and by ensuring that capacity and cot distribution are optimal in their localities, both reducing the need to provide so many time critical transfers and reducing the risk of adverse outcomes.

Staffing

Nurse staffing

The Neonatal Nurses Association and BAPM have worked together to develop recommendations for staffing neonatal units and these have been confirmed in the 2003 Department of Health and Social Care report, in the 2009 Toolkit for Quality Neonatal Services and in the Service Specification (Figure A5).

Figure A5: **Summary of recommended Nurse Staffing for Neonatal Units on each shift** [6]

Babies requiring special care:	1:4 staff-to-baby ratio[a]
Babies requiring high dependency care	1:2 staff-to-baby ratio[b]
Babies requiring intensive care	1:1 staff-to-baby ratio[b]
One nursing coordinator per shift	

[a] *registered nurse or midwife, or non-registered staff with NVQ level 3 or Foundation degree under supervision of QIS staff*

[b] *registered nurse with specialised training in neonatal care (qualified in specialty (QIS)), or training for the same and under supervision of QIS staff*

The attainment of staffing levels to meet these evidence-based recommendations has proven difficult in a period where generally entry into nursing has decreased, recruiting from midwifery has ceased because of direct entry, and the training has

moved away from entry into a clearly focused children's nursing curriculum to a more generic and more adult-based initial training and competency validation. This has resulted in restricted exposure to the neonatal speciality in pre-registration education and the clinical experience available to potential staff.

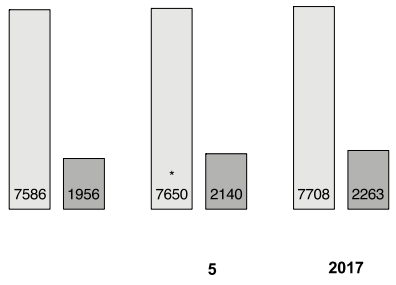
In keeping with many disciplines there are a significant number of vacancies in neonatal nursing. Nurse staffing was surveyed in 2013 (Clinical Reference Group), 2015 (Bliss) and 2017 (Neonatal Nurses Group) using the same tool to categorise staffing against activity and budget. Unfilled nursing posts are not evenly distributed across ODNs – being highest in South East and lowest in the North West. Vacancy rates are higher in NICU settings (13.7%) compared to LNU (11.9%) and SCU (8.5%). The age distribution of neonatal nurses also varies in different settings with significant implications: within the next 10 years, 40% of neonatal nurses in SCU will retire, compared to 29% in LNU and 23% in NICU settings

Using the agreed nurse:baby ratios as specified, neonatal services require a further 1791 nurses to fully staff current activity. Added to this, the present level of vacancies has increased steadily over 5 years related to increasing intensive care and high dependency activity, and the full nursing deficit was 2263 posts in 2017 (Figure A6). The deficit is concentrated in band 5/6 clinical practice nurses.

Medical staffing

Neonatal staffing is provided from within the paediatric workforce and the career path for neonatal training only specialises for the final three years before consultant appointment. Neonatal care comprises a large proportion of the work for trainees at all levels and all paediatric trainees spend time in neonatal services. Consultant staffing is provided by neonatal specialists in NICU settings and by either neonatologists, paediatricians with a special interest in neonatal medicine or general paediatricians in others, depending upon the type and activity that is undertaken.

Figure A6: **Nursing posts filled and required to meet current deficit as assed by activity using staffing levels recommended in the Neonatal Toolkit, using similar methodology at all 3 time points.** Note that the deficit is calculated using staffing recommendations in Figure A5 to calculate the number of nurses needed to support the work being carried out. *estimated from Bliss Report (Hanging in the Balance 2015)



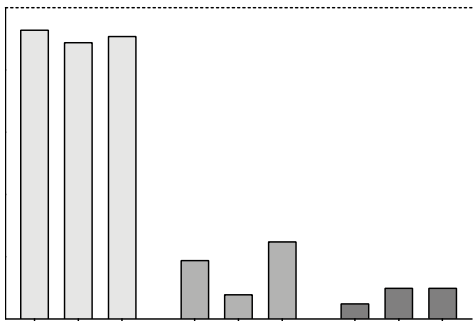
Where intensive care is undertaken it is critically important that trained and experienced staff are available immediately to deal with emergency situations, this usually means within the same building with only a short distance to get to the neonatal unit and delivery suite.

This leads to difficulties in hospitals where relatively little intensive care occurs, usually prior to transfer to a more appropriate setting. In these units, tier 1 or 2 doctors are asked to cover both acute paediatrics and neonatal care out of hours. Each hospital must assess the risk occasioned by asking doctors to cover two acute clinical areas and to set in place back up plans to provide immediate emergency cover while a baby is receiving intensive care. Most large local neonatal units and almost all NICUs have separate staffing. BAPM has recommended staffing levels in relation to the activity undertaken in neonatal intensive care units.

The most recent RCPCH workforce census (2015 data; https://www.rcpch.ac.uk/workforce) indicates that there are 348 consultant neonatal specialists in the UK working in NICUs, and 307 consultants in other types of neonatal unit, who form the specialist tier of staff (tier 3). Tier 2 staff are usually doctors with professional qualifications and tier 1 doctors who are working towards professional qualifications. In some units tier 1 and tier 2 duties are undertaken by advanced neonatal nurse practitioners. Not all units designated as NICUs are able to field separate Tier 1 and Tier 2 neonatal rotas despite this being an absolute requirement (Figure A7).

Within NICUs the NCCR found variation in the availability of tier 1 and 2 staff, varying from 2.3 to 9.6 doctors per 1000 intensive care days at tier 1 and 2.7-12.0 at tier 2. Applications for entry to paediatric training have fallen and the traditional three tier staffing (technical – expert – consultant) is being eroded by the absolute need to provide cover. Several hospitals have moved to 24-hour resident consultant cover providing tier 2 and 3 (usually with back up non-resident consultant support), requiring expansion of consultant numbers.

Figure A7: **Separate neonatal unit rotas by service designation (UK data) (The State of Child Health: The Paediatric Workforce. RCPCH 2017);** 2015 data: Tier 3 is consultant staffing; tier 1 and 2 are doctors in training, all NICU's should have separate medical staffing rotas at tier 1 and 2. NICU: neonatal intensive care unit; LNU: Local neonatal unit; SCU: special care unit



The low throughput of several designated NICUs may explain this but action is required to assure the immediate availability of medical cover during intensive care. In 2015, there were significant vacancies across all three tiers for specialist rotas and unit closures because of medical staff shortages.

There are no models that exist to aid in planning junior medical staffing numbers for neonatal intensive care units. This

is unlike the situation in paediatric intensive care where there are the Paediatric Intensive Care Society (PICS) standards.

Pricing

Figure A8: **The currency of neonatal care (2016)**

The payment structure is organised around 6 Healthcare Resource Groups:

XA01Z – Neonatal Critical Care, Intensive Care
XA02Z – Neonatal Critical Care, High Dependency Care
XA03Z – Neonatal Critical Care, Special Care, carer not resident alongside baby
XA04Z – Neonatal Critical Care, Special Care, carer resident at cot side and caring for baby
XA05Z – Neonatal Critical Care, Normal Care
XA06Z – Neonatal Critical Care, Transport (paid per patient journey)

These groupings are derived from the mandatory Neonatal Critical Care Minimum Dataset, derived from daily data items collected by BadgerNet.

When babies are born very prematurely (or become unwell), CCGs and NHS England specialised commissioning share the cost of their care. A core neonatal HRG is generated (usually PB04*-PB06*) and charged to CCGs or NHS England (according to the relevant specialised identification rule) at circa £1k per spell, provided there are no significant surgical procedures. When a baby is treated in a neonatal unit or transitional care cot, the costs are excluded (unbundled) from the cost of the core spell. The bed days are also removed from the core HRG length of stay. The costs of the transitional and neonatal care are reimbursed separately by NHS England specialised commissioning at a local bed day rate using the XA HRG currencies.

Under the current commissioning system, the price for each neonatal contract is negotiated locally. This leads to large variation in the price paid to each Trust for neonatal care. Some areas will reimburse for transitional care, while others do not, and many areas still practice a block contract system. This local variation reduces transparency about what funds are available to support neonatal critical care.

Glossary

Advanced Neonatal Nurse Practitioners:
An advanced practice registered nurse (APRN) with at least 2 years' experience as a registered nurse in a level 3 NICU, who is able to practice across the continuum, providing primary, acute, chronic, and critical care to neonates, infants, and toddlers through age 2.

ATAIN (avoiding term admissions into neonatal units):
A programme designed to reduce admissions of infants born at term (i.e. ≥ 37+0 weeks gestation) to a neonatal unit.

Better Births:
The report of the National Maternity Review.

Bronchopulmonary Dysplasia (BPD):
Chronic breathing problems arising from lung tissue damage due to artificial pulmonary ventilation. Children who require respirator support and/or supplemental oxygen for more than 28 days are diagnosed with this condition. Also known as chronic lung disease (CLD).

Clinical Negligence Scheme for Trusts (CNST):
Handles all clinical negligence claims against member NHS bodies where the incident in question took place on or after 1 April 1995 (or when the body joined the scheme, if that is later). Although membership of the scheme is voluntary, all NHS Trusts (including Foundation Trusts) in England currently belong to the scheme.

Congenital Anomalies:
Also known as birth defects, congenital disorders or congenital malformations. Congenital anomalies can be defined as structural or functional anomalies (e.g. metabolic disorders) that occur during intrauterine life and can be identified prenatally, at birth or later in life.

Each Baby Counts:
Each Baby Counts is the Royal College of Obstetricians and Gynaecologists' national quality improvement programme to reduce the number of babies who die or are left severely disabled as a result of incidents occurring during term labour.

Family Integrated Care:
Family Centered Care is an approach to planning and delivery of health care that encourages greater parent involvement in their infants care. The Family Integrated Care (FICare) model is an extension of the principles of Family Centred Care. It is a model by which parents are true partners in their infant's care, even when in the NICU.

Gestational Age: The time period in weeks from conception to delivery.

Getting it Right First Time (GIRFT):
GIRFT is an NHS Improvement programme delivered in partnership with the Royal National Orthopaedic Hospital NHS Trust. GIRFT is designed to improve the quality of care within the NHS by reducing unwarranted variations.

Health Resource Groups:
Developed by the National Casemix Office, Healthcare Resource Groups (HRGs) are standard groupings of clinically similar treatments which use common levels of healthcare resource. Healthcare Resource Groups are currently used as a means of determining fair and equitable reimbursement for care services delivered by Health Care Providers. Their use as consistent 'units of currency' supports standardised healthcare commissioning across the NHS. They improve the flow of finances within - and sometimes beyond - the NHS.

Local Maternity Systems (LMS):
Providers and commissioners of maternity services have come together to form Local Maternity Systems, which plan the design and delivery of services of populations of 500,000 – 1,500,000 people. The LMS is the mechanism through which it is expected that transformation of maternity services will occur, with a focus on delivering high quality, safe and sustainable maternity services and improved outcomes and experience for woman and their families.

Local Neonatal Unit (LNU):
Provides special and high dependency care for the local population. Provides short term intensive care to babies born at less than 27 weeks gestation, except for those who are very unwell and need complex or longer-term intensive care.

Maternity Clinical Networks:
Support the delivery of high quality care for women during pregnancy, childbirth and the post-natal period. These clinical networks exist to support the reduction of variation in high quality healthcare, sharing good practice and innovation in clinical practice.

Maternity Transformation Programme:
Following the publication of the National Maternity Review in February 2016 the MTP seeks to achieve the vision set out in the Better Births report by bringing together a wide range of organisations to lead and deliver across 9 work streams. The Neonatal Implementation Board represents work stream 10 of the programme.

Neonatal Safety Champion:
Someone nominated from the existing staff who takes on a specific role to support safety initiatives, working with the Maternity Safety Champion across the neonatal and maternity service. They will receive regular communication on initiatives that are being rolled out and support to enable them to in turn support activities in their provider trusts. It is an important role and one that is incentivised via the CNST.

MBRRACE-UK:
The collaboration appointed by the Healthcare Quality Improvement Partnership (HQIP) to run the national Maternal, Newborn and Infant clinical Outcome Review

Programme (MNI-CORP) which continues the national programme of work conducting surveillance and investigating the causes of maternal deaths, stillbirths and infant deaths.

Neonatal Morbidity:
The risk of death during the newborn period - the first 28 days of life.

Neonatal Mortality:
A neonatal death is defined as a death during the first 28 days of life. The neonatal mortality rate differs from the perinatal mortality rate in that it focuses only on deaths among live births and covers a longer period after birth.

National Neonatal Audit Programme (NNAP):
The National Neonatal Audit Programme is a national project funded by the Healthcare Quality Improvement Partnership (HQIP) and supported by the Department of Health and the Royal College of Paediatrics and Child Health.

National Tariff:
A set of prices and rules used by providers of NHS care and commissioners to support the delivery of the most efficient, cost effective care to patients.

Neonatal Critical Care:
Neonatal care is a highly intensive environment in which nurses and doctors provide continuous support for very sick children and their families 24 hours a day. Since 2013, services have been operated and coordinated within Operational Delivery Networks.

Neonatal Critical Care Clinical Reference Group (CRG):
CRGs lead on the development of clinical commissioning policies, service specifications and quality standards. They also provide advice on innovation, horizon scanning, service reviews and guide work to reduce variation and deliver increased value. CRGs, through their Patient and Public Voice (PPV) members, also help ensure that any changes to the commissioning of specialised services involve patients and the public.

Neonatal Implementation Board (NIB):
The forum that represents work stream 10 of the Maternity Transformation Programme.

Neonatal Intensive Care Unit (NICU):
Provides care for babies from within the network area with the highest level of dependency. Often these babies will have been born before 27 weeks gestation or be very unwell after birth. Will also provide special and high dependency care for the local population. NICU also offer specialist services such as support for babies undergoing surgery.

Neurodevelopment:
The brain's ability to develop the neurological pathways responsible for the normal functioning of the brain's ability to learn, focus, develop memories and social skills, etc.

Operational Delivery Networks (ODNs):
A managed network of neonatal providers focused on coordinating patient pathways between neonatal units over a wide area to ensure access to specialist resources and expertise.

Perinatal:
The time immediately before and after birth.

Perinatal Mortality Review Tool (PMRT):
A collaboration led by MBRRACE-UK was appointed by the Healthcare Quality Improvement Partnership (HQIP) to develop and establish a national standardised Perinatal Mortality Review Tool. The tool is to be used to support standardised perinatal mortality reviews across NHS maternity and neonatal units in England, Scotland and Wales.

Premature/Preterm:
A birth that takes place more than three weeks before the baby's estimated due date. A premature birth is one that occurs before the start of the 37th week of pregnancy. There are sub-categories of preterm birth, based on gestational age.

Regional Commissioning Teams:
The 7 regional teams are responsible for the quality, financial and operational performance of all NHS organisations in their region, drawing on the expertise and support of our national teams to improve services for patients and support local transformation.

Regional Maternity Programme Boards:
Take forward the implementation of Better Births, the report of the National Maternity Review, including work to reduce the rate of stillbirths, neonatal and maternal deaths in England.

Service Specifications:
Clearly define the standards of care expected from organisations funded by NHS England to provide specialised care. The specifications have been developed by specialised clinicians, commissioners, expert patients and public health representatives to describe both core and developmental service standards.

Special Care Unit (SCU):
Provides special care for babies in the local area who do not need intensive care. Usually, this will be for babies born after 30 weeks gestation or after 32 weeks if it is a multiple pregnancy.

Neonatal Transport Group (NTG):
A group of doctors, nurses, nurse practitioners, ambulance personnel and managers who specialise in neonatal transport; the NTG aims to improve care for infants who need transportation and is a professional, advisory and representative organisation. It has a memorandum of understanding with the British Association of Perinatal Medicine (BAPM) which sets out the role of NTG in representing neonatal transport through BAPM.

Transitional Care:
A level of care where mother and baby stay together in hospital either in the postnatal ward or a room on the neonatal unit, with support from hospital staff.